Report No. BC/MB/07.24.04.

Coal Mining Risk Assessment: Land at Pen Cae'r Lan, Seven Sisters, Neath.

Prepared on behalf of:

Greenteck Invest UK (8) Ltd.

By:

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Coal Mining Risk Assessment:
Land at Pen Cae'r Lan, Seven Sisters, Neath.

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Drawing No:		Scale:
BC/MB/07.24.04.01.	***General Location Plan.***	*1:50,000.*
BC/MB/07.24.04.02.	***Detailed Location Plan.***	*1:10,000.*
BC/MB/07.24.04.03.	***Geology Plan (North).***	*1:10,560.*
BC/MB/07.24.04.04	***Geology Plan.***	*1:50,000.*
BC/MB/07.24.04.05.	***Structure Contour Plan: Nine Feet Seam.***	*1:10,560.*
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Coal Mining Risk Assessment: Land at Pen Cae'r Lan, Seven Sisters, Neath.

1 Introduction

This report has been prepared on behalf of our client:

Greenteck Invest UK (8) Ltd.,
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Tec Marina,
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and relates to a parcel of land at and around Pen Cae'r Lan Farm near Seven Sisters (the Site), where it is proposed to construct a solar farm. This report describes the geology and mining history of the Site and assesses the risk to the development from both.

The following sources of data were used in the compilation of this report:

i) *Research of published geological records;*

ii) *Research of mining records held at The Coal Authority's archive in Mansfield;*

iii) *Research of The Coal Authority's interactive map, accessed on the 31st July 2024;*

iv) *The findings of The Coal Authority's mining report, reference no. 71009799115001;*

v) *The findings of 'Proposed Solar DNS Pen Caer Lan Farm, Seven Sister Supplementary Coal Mining Risk Assessment, reference no. ESP.8713.4045-01, prepared by Earth Science Partnership;*

vi) *'The Geology of Part of the North Crop of the South Wales Coalfield', unpublished Ph.D. Thesis, Leicester University;*

vii) *Walkover site survey* and

viii) *the archive records of Blandford Consulting.*

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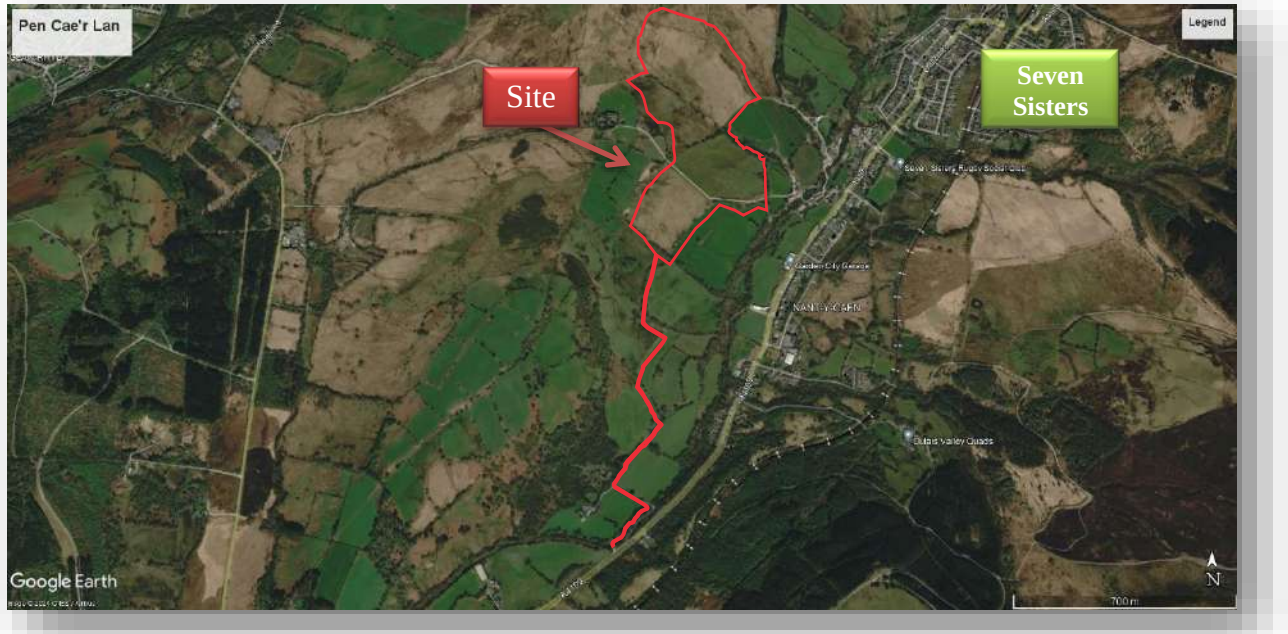
The findings of this report are necessarily based upon the data used in its compilation and may be amended in the future in the light of additional material information. The report must only be used in its entirety for its stated purpose.

2 Brief Description of the Site

The land that is the subject of this report, 'the Site', is located in the Dulais Valley beyond the north-western fringes of Seven Sisters (see Figure 1 and *General Location Plan, drawing no. BC/MB/07.24.04.01*). The Site is agricultural land comprised of a number of agricultural enclosures bounded with a mixture of fences and hedges and served by a series of farm tracks. The main part of the Site where the solar panels are to be constructed is irregular in outline and occupies an area of approximately 33 hectares. The land slopes gently southwards from an approximate elevation of 210m aod in the north to 150m aod at the southern extremity.

Figure 1
Aerial View of Site



3 Geology of the Site

The Site is situated near the northern margin of the former South Wales Coalfield and is underlain at shallow depths by strata assigned to the Middle Coal Measures, themselves a sub-

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division of the Upper Carboniferous Period. The most recently published geological sheet at 1:10,560 scale (SN 80 NW) shows the inferred positions of the outcrop of the Red Vein (variously inferred and proven) to follow a sinuous trace around the hillside to the west of the Site and then across the Dulais Valley to the south (see *Geology Plans, drawing nos. BC/MB/07.24.04.03* and *BC/MB/07.24.04.04* and *Structure Contour Plan: Red Vein, drawing no BC/MB/07.24.04.06*). With the exception of two short lengths of the access track at the south-west corner of the development, the Red Vein does not underlie any part of the development.

The shallow coal measures underlying the Site include a number of thin coal seams that have all been proved in exploratory boreholes drilled by British Coal and the Institute of Geological Sciences (now the British Geological Survey) to be too thin to have supported underground mining operations. The positions of fault planes on the *Structure Contour Plan: Nine Feet Seam, drawing no BC/MB/07.24.04.05* are at the datum of the Nine Feet Seam and are not the positions of the fault planes at the surface. The plan has been included to provide the basis for the *Simplified Geological Cross Section A-B, drawing no. BC/MB/07.24.04.07*, which shows which coal seams are present near the surface across the main area of the Site where the solar panels are to be placed. The cross section has been constructed using the detailed information captured by British Coal's deep boreholes drilled in the mid to late 1970s and by earlier Boreholes drilled by the Institute of Geological Sciences. The positions of the boreholes are shown on the two structure contour plans with some also shown on the published geological sheet.

From the cross section it can be seen that the coal seams that are present at shallow depths across the main area of the Site are those between the thin coal seam associated with the Five Roads Marine Band and the Gorllwyn Seam. The detailed proving of the thicknesses of these seams in the various boreholes show that none of these shallow coal seams offer a viable underground mining resource. The coal seams are variously too thin, have dirt bands within them (resulting in a very high ash, unsaleable product), or have a coal seam section that is very variable, which would make it too difficult to mine (see Table 1).

Two lengths of the access track are underlain by the Red Vein where it is at shallow depths. The Red Vein has been widely mined across the locality.

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Table 1

Details of the Coal Seams That Underlie the Main Site Area at Shallow Depths

Horizon	Stratum	Dulais Valley BH 1	Dulais Valley BH 2	Treforgan BH 1	Treforgan BH 2	Treforgan BH 3	Treforgan BH 4	Treforgan BH 5	Treforgan BH 6
Five Roads Marine Band	Coal								12cm
Forminfera Marine Band	Coal ptg Coal	20.3cm	2.8cm 2.5cm	35cm	40cm	34cm	40cm		
Pentre Rider Group	Coal ptg Coal ptg Coal			6cm 2cm 5cm		5cm		45cm 14cm	35cm 5cm
Pentre	Coal ptg Coal					25cm	3cm 11cm	5cm	10cm
Pentre Group	Coal Dirt Coal Dirt Coal	2.5cm 20.3cm 13.9cm	2.5cm 4.0cm 2.7cm	15cm	25cm 4cm 31cm	25cm 15cm 34cm	42cm 8cm 13cm	31cm 20cm 20cm	

'Dirt' is a thin bed of carbonaceous mudstone or seatearth within a coal seam.
'ptg' refers to a thicker bed of carbonaceous mudstone or seatearth between coals.
Measurements are all in centimetres.

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Table 1

Details of the Coal Seams That Underlie the Main Site Area at Shallow Depths

Horizon	Stratum	Dulais Valley BH 1	Dulais Valley BH 2	Treforgan BH 1	Treforgan BH 2	Treforgan BH 3	Treforgan BH 4	Treforgan BH 5	Treforgan BH 6
Lower Pentre	Coal			26cm	11cm	17cm		2cm	1cm
Eighteen Inch	Coal ptg Coal			25cm	39cm			4cm 5cm	21cm
Gorllwyn Rider	Coal Dirt Coal Dirt Coal		43cm	12cm 4cm 4cm 6cm 12cm	5cm 4cm	6cm 4cm			19cm 87cm 8cm
Gorllwyn	Coal Dirt Coal Dirt Coal Dirt Coal		5cm 5cm	30cm 7cm 5cm 7cm 28cm 3cm 18cm	32cm	78cm	17cm 16cm 27cm 5cm	10cm	D 18cm 10cm 7cm 60cm

'Dirt' is a thin bed of carbonaceous mudstone or seatearth within a coal seam.
'ptg' refers to a thicker bed of carbonaceous mudstone or seatearth between coals.
Measurements are all in centimetres.

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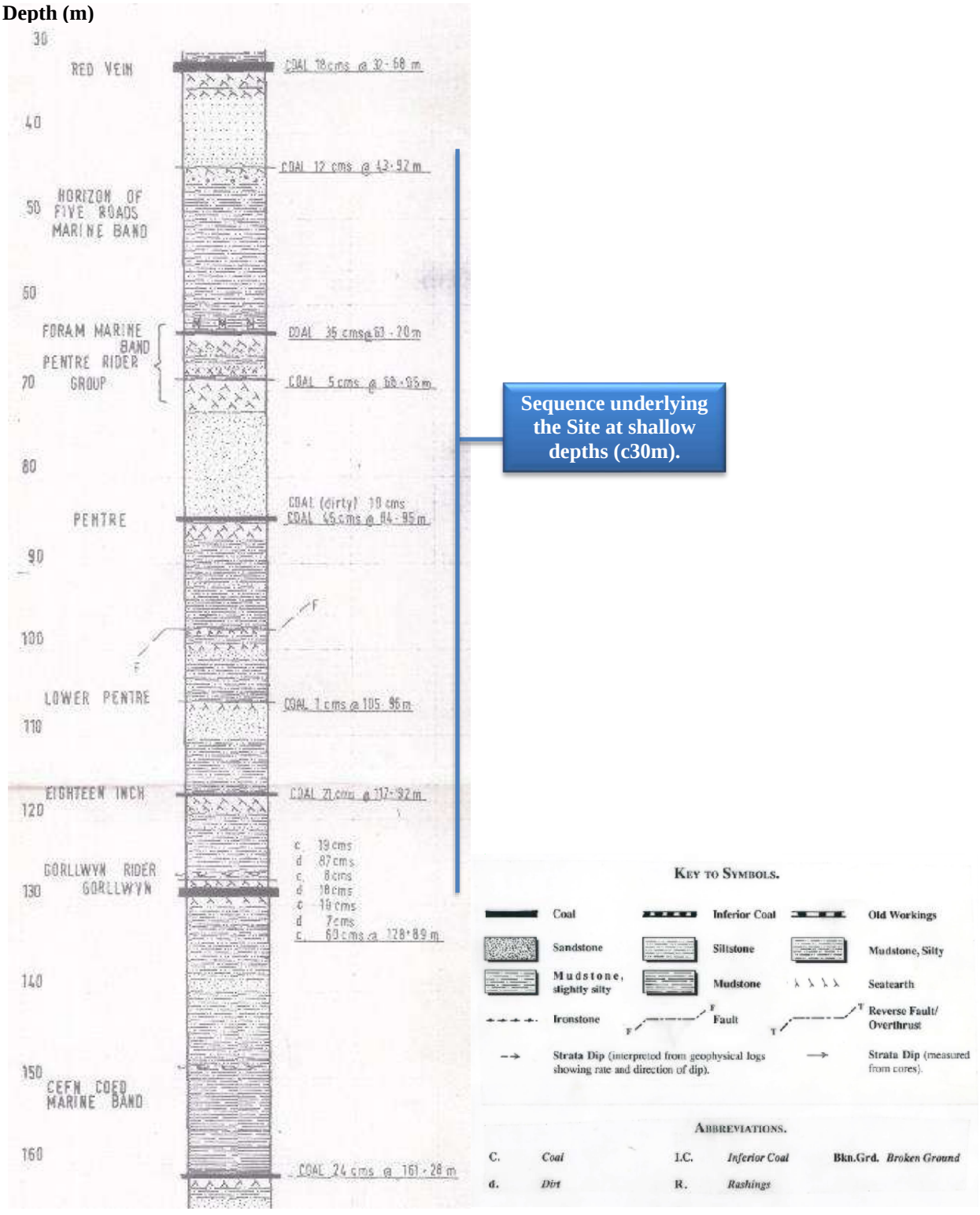
Figure 2
Indicative Stratigraphic Column Illustrating the Coal Measures Within 30m of the Surface Across the Main Surface Area
(Taken from Treforgan BH6)



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The coal measures of the South Wales Coalfield have been affected by large normal faults sometimes referred to as cross-faults. In the Pen Cae'r Lan area these large faults have a slightly sinuous trace at the surface and average trends towards the north and north-west with occasional faults trending towards the north-east (see *Geology Plans, drawing nos. BC/MB/07.24.04.03* and *BC/MB/07.24.04.04, Structure Contour Plan: Nine Feet Seam, drawing no BC/MB/07.24.04.05* and *Structure Contour Plan: Red Vein, drawing no BC/MB/07.24.04.06*). The area is also affected by overthrusts that generally follow curved traces with a north-west to south-east trend.

The published geological sheet indicates that the main Site is not affected by any cross-faults (see *Geology Plan (North), drawing nos. BC/MB/07.24.04.03*). An overthrust fault with a north-west to south-easterly trend is shown at the horizon of the Upper Six Feet Seam (locally known as the Four Feet), when projected to the surface this fault plane would be beyond the north-eastern boundary of the Site.

At its western end, near Ynys-fforch Fawr, the access road is crossed by a north trending normal fault (see *Geology Plan, drawing nos. BC/MB/07.24.04.04*).

The published geological sheet indicates that across the main area of the Site the coal measures are variously overlain with deposits of glacial till, Boulder Clay, and with locally derived soils, the result of weathering of the coal measures. Areas of peat are present on the hillside, but none are shown to impinge on the main Site area.

The published geological sheet indicates that along the length of the access track the coal measures are variously overlain with deposits of glacial till and river alluvium.

Published geological records indicate that the Site is not affected by landslip.

4 History of the Site

The Earth Science Partnership (ESP) report included a set of historic Ordnance Survey Plans, included at Appendix I. There is no evidence on any of the plans of any mining operations within the main Site area. The 1913-1914 Edition shows a number of adits, trial levels and trial

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shafts to the west of the main Site area, close to Hengaer. All the features are annotated 'old', indicating that they were disused at the date of the plan.

The above cluster of disused mine entries extends southwards, with further entries present to the west of the northern approximately 400m of the access track. One further adit, labelled the Dillwyn Colliery, is shown approximately 200m west of the access road, near Ynys-fforch Fawr. The Colliery first appears on the 1913 Edition and is annotated as 'disused' on the 1948 Edition.

A small quarry is shown on the 1897-1901 Edition, near Pen Cae'r Lan. The quarry is annotated 'old', *i.e.* disused, it is not present on the previous 1876-1877 Edition. The small aerial extent and limited duration of the quarry strongly indicates that it was a borrow pit to obtain stone for local buildings and walls.

5 Mining History

The general area has been subject to extensive coal mining operations dating back to the nineteenth century. Coal seams were accessed by adits driven into the mining horizons near their outcrops and by shafts sunk into the deeper coal seams. Air shafts were also sunk in order to provide ventilation to the underground mining operations. Our search of mining records identified no record of old workings beneath the Site at shallow depths and no 'probable workings, *i.e.* possible shallow old workings for which The Coal Authority holds no plan records (see Figure 3).

The Coal Authority's mining report (Appendix II) identifies the presence of old workings beneath the Site in three coal seams, the Lower Six Feet, Lower Nine Feet and Bute Seams at various depths between 178m and 267m and last mined in 1954. These old workings are too deep and are of an age that they pose no risk of surface subsidence.

The mining report also identifies that there are no recorded spine roads underlying the Site at shallow depths.

Our searches found a record of fourteen disused mine entries within the confines of the Site or 100m of its boundary. Only three of the disused mine entries, adits, are recorded as being present within the confines of the Site, situated fairly centrally within the main Site area.

/Cont….

Figure 3
Print-out of The Coal Authority's Interactive Map
(Accessed 31st July 2024)

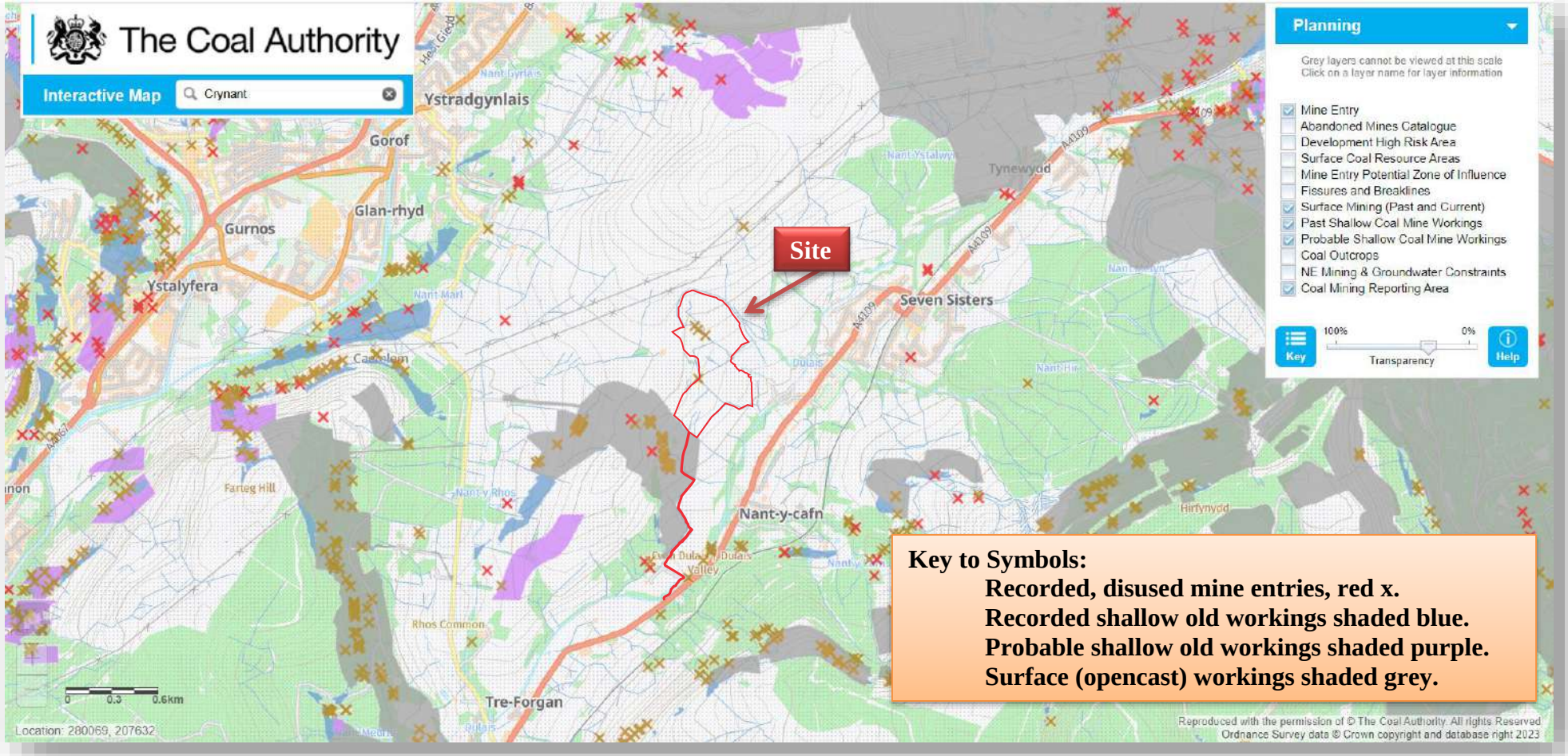

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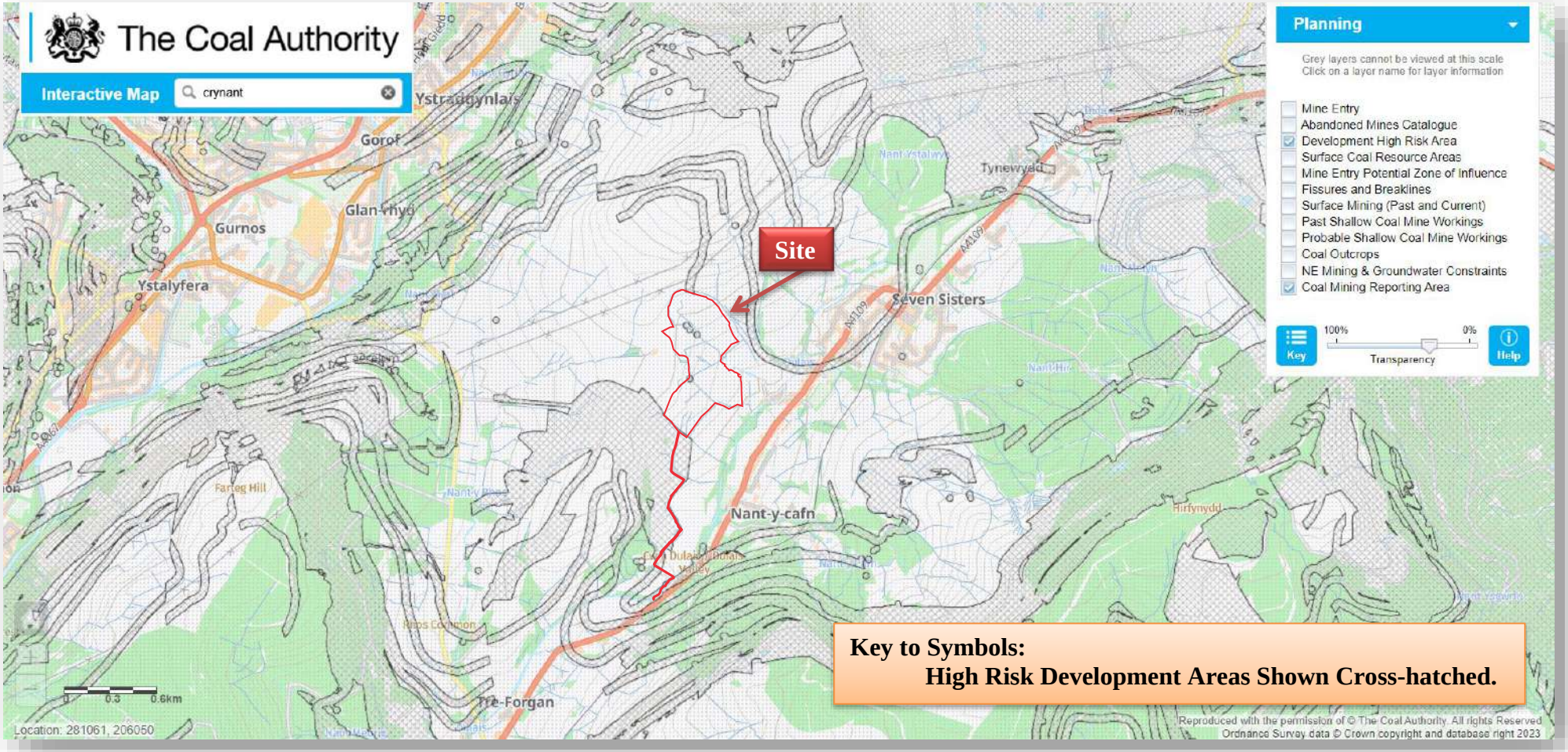
Figure 4
Print-out of The Coal Authority's Interactive Map
(Accessed 31st July 2024)



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The former Crynant, Henllan Uchaf and Henllan Uchaf Additional Opencast Coal Sites operated in the area immediately to the west of the Site, up to the western boundary of the main Site area. The northern length of the access road crosses the area of the opencast operations.

The only high risk development areas affecting the development are the above former opencast mining operations and an area affecting the south-western length of the access track.

There are no active underground coal mines in the locality that would affect the structural integrity of a development at the Site.

The mining report identifies that there has been no record of a mine gas incident within 500m of the Site.

The Coal Authority's mining report identifies that there is a 'future' mining licence affecting the Site. The mining report does not provide any information on the licence. However, the report does identify that 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 Site is in an area where a notice to withdraw support was given in 1979, the Site 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. In terms of payments to owners of former copyhold land, the Site is not in an area where a relevant withdrawal of support notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

The mining report identifies that The Coal Authority has not received a damage notice or claim for the Site, 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 Site. 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. There are no court orders relating to the Site.

6 Mine Gas

When coal is mined methane is released and may accumulate in the voids left by the mining operations, other mine gases (carbon dioxide, carbon monoxide and depleted oxygen) may

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subsequently accumulate in mining voids as a result of various chemical processes. These gases may later vent to atmosphere or be displaced by mine water flooding the mining voids and forced to the surface. Mine gases may, in certain circumstances, accumulate within dwellings and pose a risk of asphyxiation, fire or explosion.

A detailed assessment of the risk from mine gases based on the non-statutory CL:AIRE document is outside the scope of this report. However, based on the geological and mining data used in this report and taking cognisance of the nature of the development, the risk from mine gases can, in general, be taken to be 'low'.

7 Discussion and Recommendations

7.1 Solid Geology

The main Site area is not affected by any large-scale cross-faulting. Small scale faulting is very common throughout the South Wales Coalfield, and it is likely that small scale faulting is present within the coal measures at shallow depths beneath the main Site area. This scale of faulting poses no risk to the proposed development.

One larger normal fault affects the western end of the access track, near Ynys-fforch Fawr (see *Structure Contour Plan: Red Vein, drawing no BC/MB/07.24.04.06*). Large faults can act as the locus for differential ground movement during earthquakes and where shallow mine workings are inducing surface subsidence, particularly where the pattern of workings is different on either side of the fault. The fault in question is not one of the main 'cross faults' that have a large lateral and vertical extent, and the risk of it acting as a locus for differential ground movement during an earthquake is considered to be very low to negligible. There are no shallow mine workings near the fault plane where it crosses the access track, with the result that there is no risk of differential movement across the fault plane as a result of the surface collapse of shallow mine workings. In the extremely unlikely event that differential movement takes place across the fault plane, the access track would be capable of being reinstated using routine maintenance techniques.

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There is no significant recognised risk to the proposed development resulting from the solid geology of the area.

7.2 Mining History

A detailed assessment of the shallow geology underlying the Site (30m depth) identifies that the coal seams present within 30m of the surface across the main Site area includes only thin and poor-quality coal seams that offer no prospect of underground mining. The absence of any recorded, shallow spine roads is consistent with the geology and the absence of coal seams of mineable thickness within 30m of the surface. Coal seams at depth greater than 30m are generally considered to pose little or no risk of inducing surface subsidence. Subject to the comments below on mine entries, it is considered that there is no risk of surface subsidence from past underground workings across the main Site area.

For most of its length the access track is underlain by coal measures that are too thin to have supported underground mining operations. Two very short lengths of the access track near its western end are underlain by the Red Vein where it is at shallow depths, a coal seam that has been widely mined underground in the locality (see *Structure Contour Plan: Red Vein, drawing no BC/MB/07.24.04.06*). The risk of unrecorded workings being present beneath either area is low, given the detailed mine plans that are available for the local mine workings. The low risk may be reduced by means of intrusive site investigation along the two lengths of the access track.

Our searches found a record of fourteen disused mine entries within the confines of the Site or within 100m of its boundary. Three (280207-013, 280208-014 and 280208-015) are within the main Site. The disused adit 2802080016 is approximately 30m west of the main Site area and was driven westwards into the hillside, away from the main Site area. The absence of a mineable coal seam at the locality strongly suggest that it was a 'trial' that failed to encounter a useful mining opportunity. In any event it was driven westwards and is too remote from the Site to pose a risk from surface collapse.

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Six of the disused mine entries (280207-006, 280207-0007 and 280207-008, 280278-025, 280207-031 and 280207-032) are approximately 100m west of the access track and are almost certainly associated with the Red Vein, it is highly likely that all six disused entries were excavated during opencast mining operations and no longer exist.

Disused mine entries 280207-010 and 280207-028 are associated with the former Dilwyn (Henllan) Colliery and are too distant from the access road to pose a risk from collapse.

The two disused adits near the southern length of the access road (280207-011 and 280206-013) are both too remote to pose a risk to the access road from a surface collapse.

Three disused mine adits are recorded as being present within the confines of the Site. The location of the three 'adits' was visited during the walkover survey on the 27th July. The three 'adits' are excavations into the western side of a small, shallow stream valley (see Figure 5). There is no evidence of any significant surface features in the valley that might be associated with the surface facilities of an underground mine and there is no room where such features could have been located.

Figure 5
General View of the Valley With Exposed Coal Measures

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Historical Ordnance Survey plans included in the ESP report identify no mining features associated with the 'adits' (surface buildings, spoil heaps, *etc.*) and no tracks or tramways where materials could be brought to the 'adits' or coal transported away (see Appendix I). The only surface features that are evidence that any mining has taken place are the three 'adits' themselves and the three areas of colliery spoil excavated from the 'adits' and deposited on the eastern side of the valley (see Figure 6). The features are noted on Figure 3a of the mining risk plans included in the ESP draft report (see Appendix III). The spoil heaps are of very small size and are a testimony to how little underground excavation has taken place (see Figure 6).

Figure 6
Example of a Small Area of Colliery Spoil

The three adits are of similar nature, low excavations into the side of the valley with mudstone debris on the floor of the excavation and a void where coal and other rock had been excavated to recover the coal. Unfortunately, on the day of the site visit the area surrounding the 'adits' was heavily overgrown, making it difficult to view and photograph them.

Helpfully, there was much less vegetation cover when ESP undertook their site survey, and they were able to obtain clear photographs of all three 'adits' (see Figure 7).

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Figure 7
Photographs of Three ‘Adits’ After ESP

It was clear from the walkover survey and it is also clear from the photographs that the roof of each of the three ‘adits’ is formed only by the overlying coal measures, no constructed support has been used.

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The widely accepted use of the word ‘adit’ is for the mouth (entrance) of a horizontal or sub-horizontal roadway (tunnel) that extends into a hillside, providing access to an underground resource that is being mined. Adits often occur in pairs to allow supplies to be carried into the mine and the mineral to be brought out. In the case of coal mining operations, the pair of adits are also required to provide a ventilation circuit (fresh air in and stale air out). The adit mouth itself will be soundly supported because it is the critical

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access in and out of the mine. In the case of older mining operations, the adit was typically supported by a stone arch (see Figure 8) or by other methods. No such arch or other support is evident at the 'adits' on the Site.

Figure 8
Example of Stone Arched Adit

The so-called 'adits' situated on the Site are clearly not adits that served as the mouthings for roadways extending underground serving an underground mining operation. The excavations are classic examples of crop robbing operations where very limited opportunist coal extraction has taken place where coal seams happened to be exposed at the surface. The mining that would have taken place would have been limited by the effort of excavating rock to create working height, transporting the rock to the surface whilst crawling and then depositing it on the opposite bank of the stream, mining the coal and transporting it to the surface, all by hand without any underground transport facility. The recovered coal would then have had to be carried off the hillside, again, by hand, or perhaps

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using a cart. The value of the coal recovered from the excavations would have been balanced against the not inconsiderable effort of recovering it and transporting it away from the 'adits'. By their very nature, crop robbing operations tend to be of limited extent. In the case of the 'adits' on the Site, the coal seam is very thin, with the result that the extent of the workings is almost certainly very limited.

The 'adits' potentially pose a risk of collapse around the 'adit' mouths themselves, resulting in an as yet unspecified cautionary/exclusion zone around the 'adits' where solar panels would be excluded or alternatively where intrusive investigation would be required, potentially followed by remediation. In addition, any potential shallow underground excavation leading westwards from the 'adits' would additionally result in an area where there would be a high risk of the excavation collapsing to the surface to produce crown holes or areas of reduced bearing capacity. A hypothetical collapse/exclusion area is shown on the *Mining Risk Plan, drawing no. BC/MB/07.24.04.08*, within which no solar panels should be placed unless intrusive investigation proves that it is stable. The zone is based on the assumption that the crop robbing excavations extend no more than 20m into the river bank, based on the effort required to recover small quantities of coal; it is not based on any mining records and should, itself, be treated with caution. Intrusive ground investigation will be required in order to define precisely the area where underground excavations have taken place. Depending upon results, the underground excavations could be stabilised by drilling and grouting or by excavation or, alternatively, an exclusion zone could be defined more precisely, within which no solar panels may be constructed. Any intrusive site investigation of the features will require a permit from The Coal Authority.

It is highly likely that the underground excavations associated with the 'adits' are of very small extent, they are situated where slopes are not conducive to placing solar panels and it may prove to be the case that any area at risk of subsidence associated with them may not extend (subject to intrusive investigation) too far into the field to the west of the stream where slopes are more accommodating.

The risk of an unrecorded disused mine entry being present within the confines of the Site or close to it cannot be entirely ruled out given the mining history of the general area.

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However, given the geology of the Site the risk of a disused mine shaft being present is extremely low and the risk of a disused mine adit is very low. All excavations during the development of the Site should be carefully monitored and if any unusual features are encountered then the excavation work must stop immediately and advice sought from a Consultant Geologist or from The Coal Authority before work recommences.

The former Crynant, Henllan Uchaf and Henllan Uchaf Additional Opencast Coal Sites operated in the area immediately to the west of the Site, they impinge on the western boundary of the main Site are but do not encroach onto it. The area shown on plans to have been involved in the opencast operations is the whole of the area occupied by the mining operation, the actual opencast excavation area would have been smaller than the area shown. The perimeter of opencast sites tend to be occupied with drainage ditches and screening bunds. The excavation area would have been remote from the main Site area. In any event, the opencast operations nearest the development Site were the area where the Red Vein outcrops, with the result that the excavation there would have been shallow, resulting in a very limited risk of differential settlement at the edge of the excavation. The very limited risk of differential settlement does not extend into the main Site area.

The northern length of the access track crosses the area that has been subject to the opencast mining operations. There is a limited risk of differential settlement where the track crosses the edge of the excavation. Any differential settlement that might take place would pose a risk to a hard development. If the access track is to remain as a track with no hard surfacing, then any differential settlement that might occur could be repaired using straightforward maintenance techniques. If the track were to be surfaced, then any limited differential settlement that might occur could also be repaired with a limited scope of works.

7.3 Mine Gases

The risk from mine gases is considered to be ‘low’ for the majority of the Site, particularly given the nature of the proposed development. The absence of a recorded mine gas incident within 500m of the Site does not prove, of itself, that there is a low or no risk from mine gases, but it is one line of evidence that supports the conclusion. There may be a very

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limited risk from mine gases in the immediate vicinity of the 'adits'. A more detailed assessment may be required to support a planning application.

7.4 Future Mining Licence

The Coal Authority's mining report identifies that the Site lies within an area where permission was given in 1979 to withdraw support. No subsequent cancellation of the right to remove support has been made. The timing of the 1979 permission coincides with the development of the Treforgan Colliery in Crynant. Following limited mining of the Lower Nine Feet and Bute Seams the colliery closed, and the former surface area is now a light industrial estate. Recently, the mining licence for Aberpergwm Colliery in Glyn Neath was extended westwards, towards the Site. The details of the area(s) affected by the withdrawal of support are not included in the mining report and must be confirmed in order to assess the risk of surface subsidence as a result of future coal mining operations.

Whilst it is prudent for underground mining operations to take cognisance of surface features, mining operations may sometimes cause damage to developments on the surface. Claims for damage to structures on the surface resulting from underground mining operations can be made under the terms of the various Coal Mining Acts.

7.5 Quarry

The small quarry situated to the west of the main Site area is considered to be a disused borrow pit and poses no risk of subsidence to the proposed development.

Dr Malcolm Blandford,
Chartered Geologist.

Report Date 6th August 2024.

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PLANS

The Enterprise Centre,
Merthyr Industrial Park,
Pentrebach,
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South Wales,
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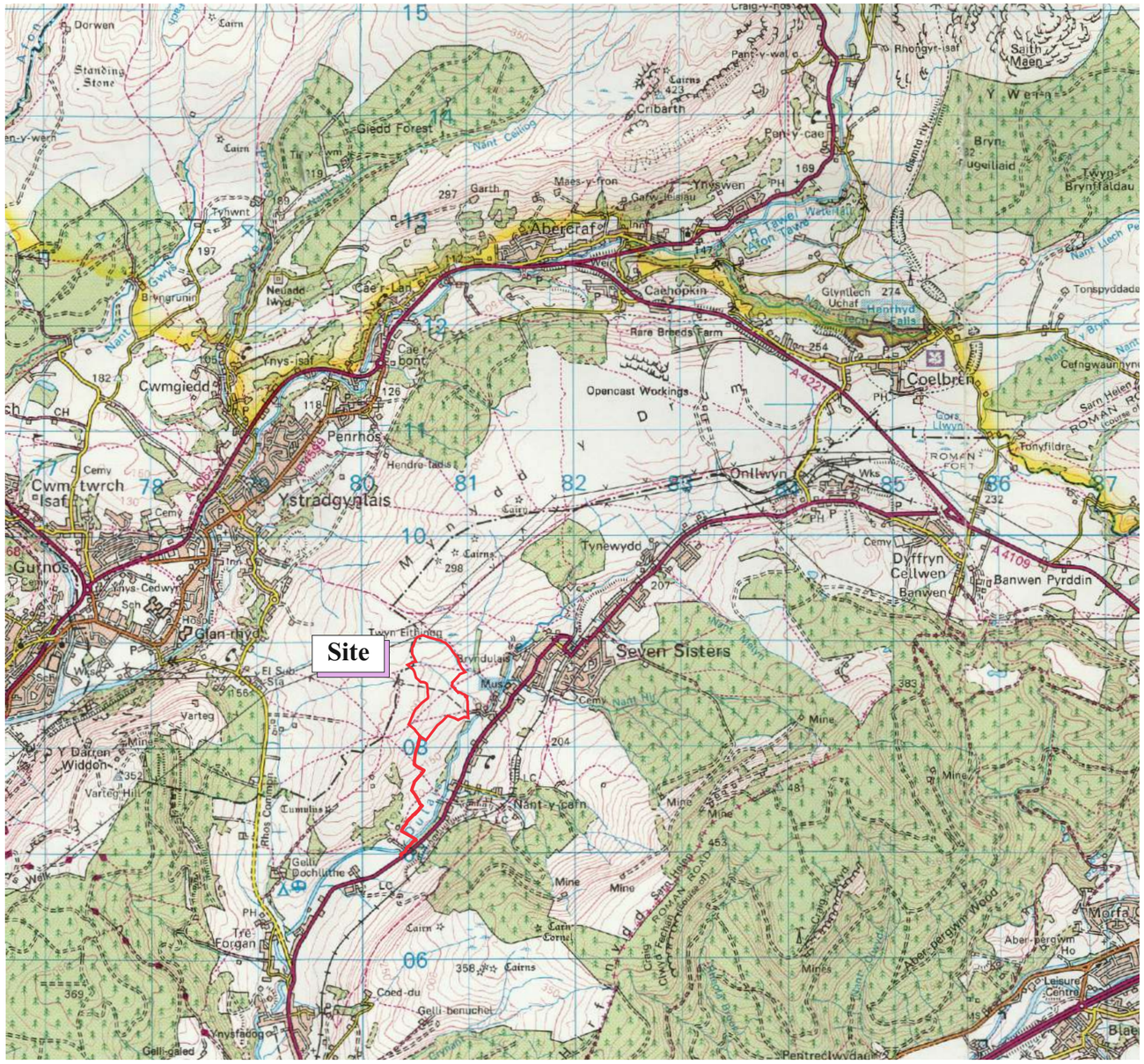
Geologists Working With The Environment....

Study on Land at Pen Cae'r Lan, Seven Sisters, Neath.

General Location Plan.

Plan Scale: 1:50,000.



Key to Symbols:

Approximate Site Boundary.

Note:

North is at top of plan.

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Merthyr Industrial Park,
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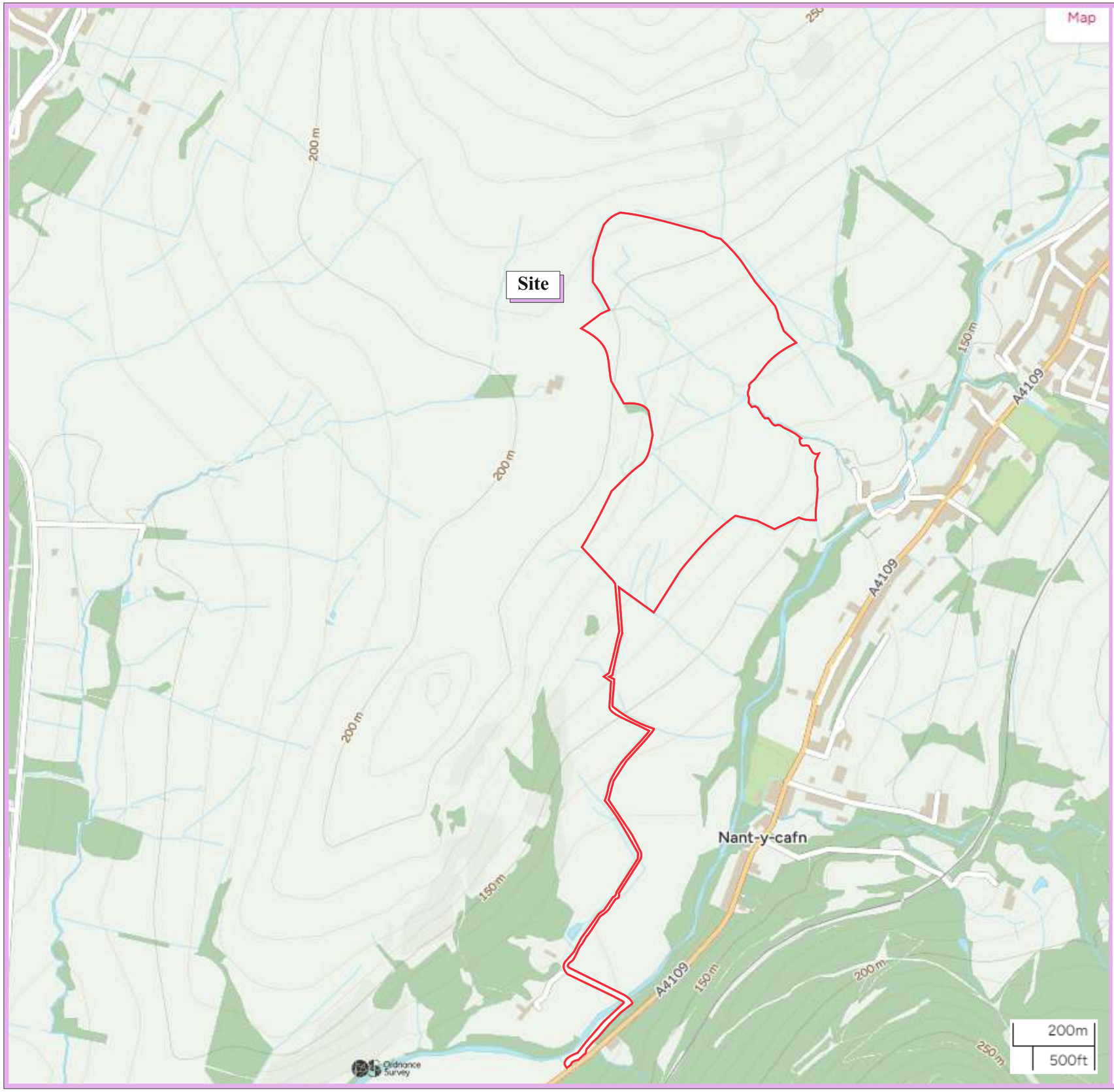
Geologists Working With The Environment....

Drawing No: BC/MB/07.24.04.01.



Study on Land at Pen Cae'r Lan, Seven Sisters, Neath.

Detailed Location Plan.

Plan Scale: 1:10,000.

Key to Symbols:

Approximate Site Boundary.

Notes:

North is at top of plan.

Plan is for identification only, do not scale from this plan.

The Enterprise Centre,
Merthyr Industrial Park,
Pentrebach,
Merthyr Tydfil,
South Wales,
CF48 4DR.

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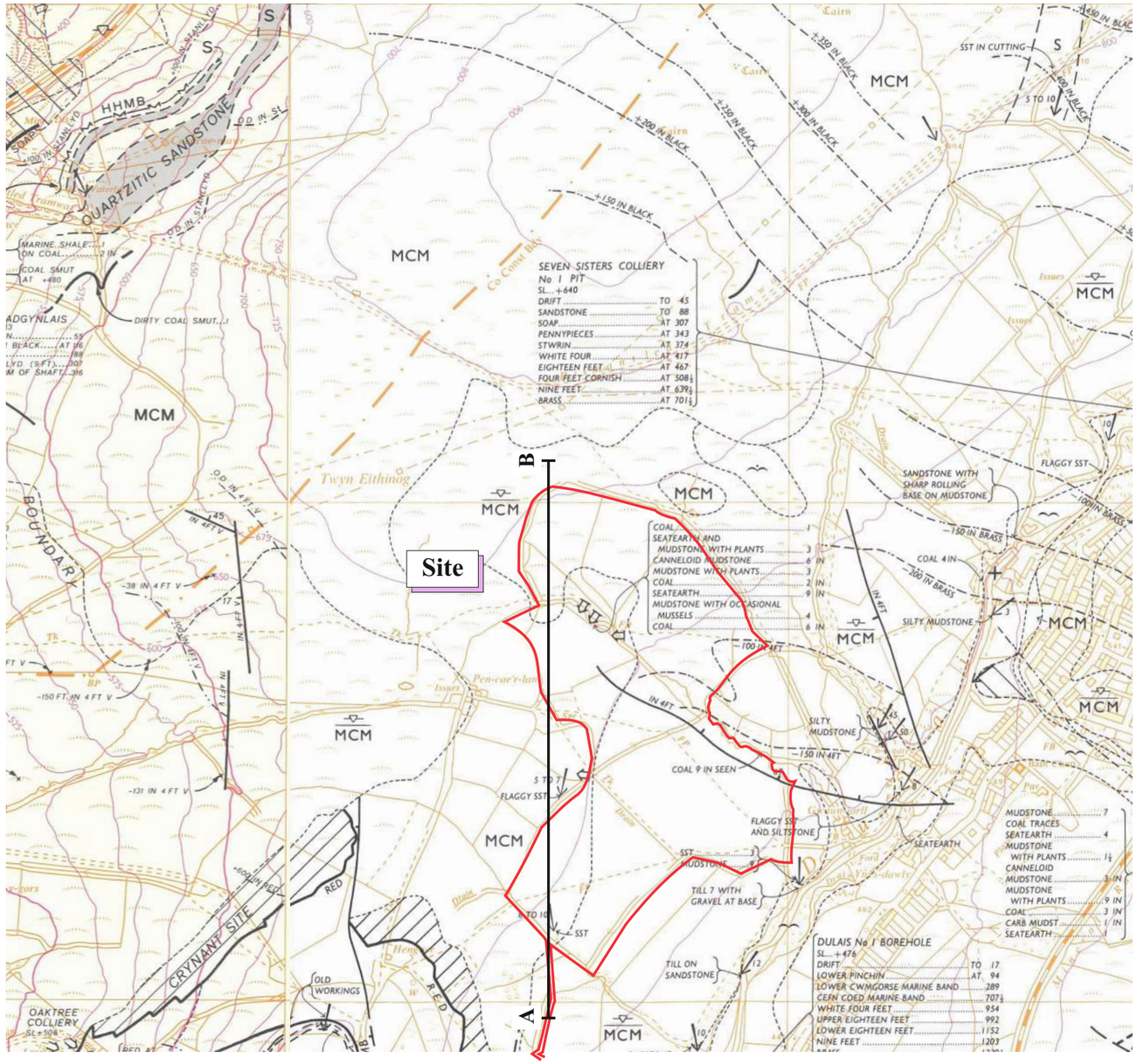
Drawing No: BC/MB/07.24.04.02.

Study on Land at Pen Cae'r Lan, Seven Sisters, Neath.

Geology Plan (North).

Plan Scale: 1:10,560.



Key to Symbols:

Approximate Site Boundary.

Cross Section.

Notes:

North is at top of plan.

Plan is for identification only, do not scale from this plan.

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South Wales,
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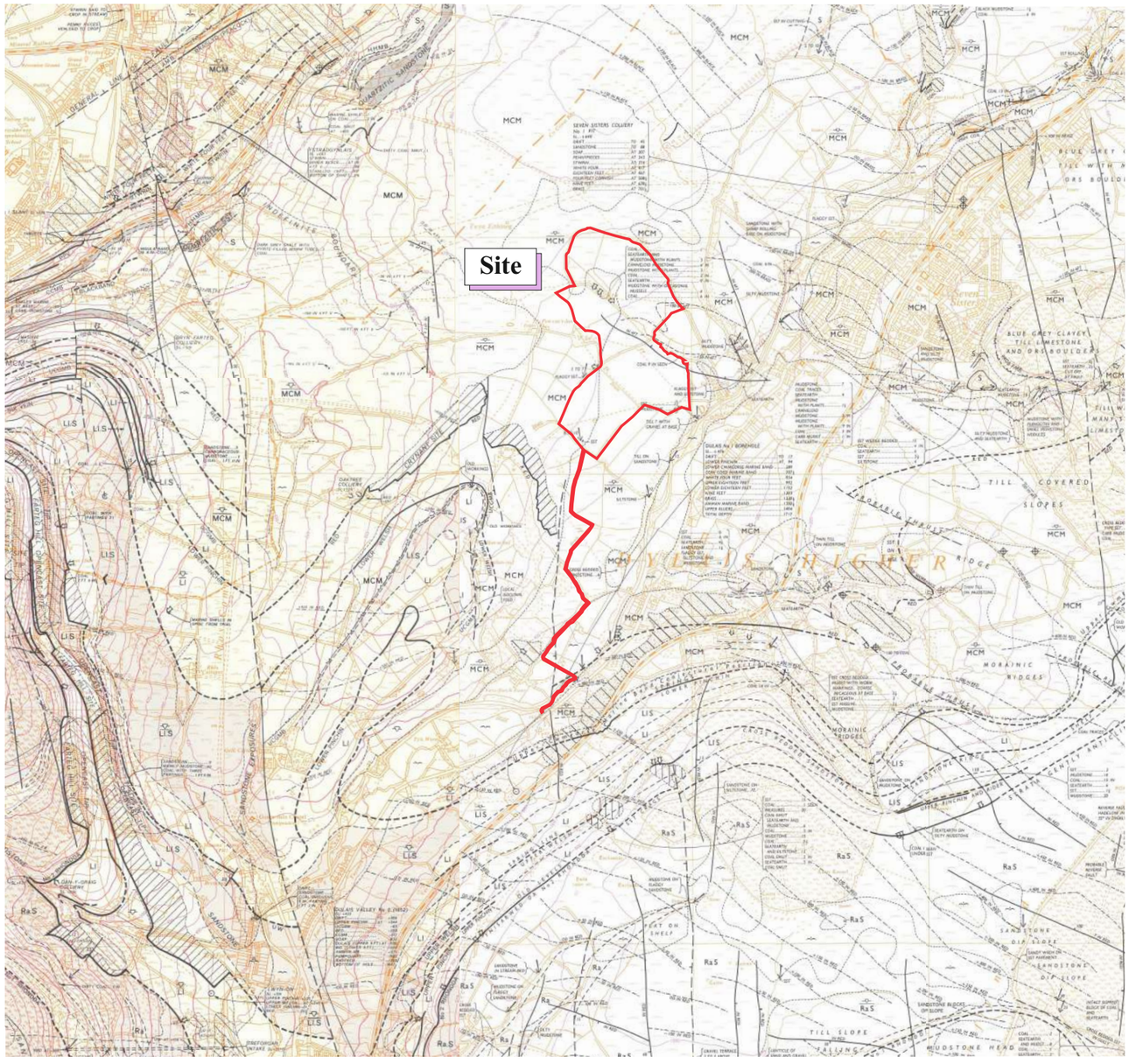
Geologists Working With The Environment....

Drawing No: BC/MB/07.24.04.03.



Study on Land at Pen Cae'r Lan, Seven Sisters, Neath.

Geology Plan.

Plan Scale: 1:50,000.

Key to Symbols:

Approximate Site Boundary.

Notes:

North is at top of plan.

Plan taken from 1:10,560 scale plans.

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South Wales,
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Drawing No: BC/MB/07.24.04.04.

Study on Land at Pen Cae'r Lan, Seven Sisters, Neath.

Structure Contour Plan: Nine Feet Seam.

Plan Scale: 1:10,560.

Key to Symbols:

- **Approximate Site Boundary.**
- **Boundary of Recorded Old Workings.**
- **Basal Contour of Nine Feet Seam, Values in Metres below O.D.**
- **Fault Plane in Red Seam, Direction of Displacement Shown By Arrow, Values in Metres.**
- **Fold Axis (Synclinal).**
- **Cross Section.**

Notes:

North is at top of plan.

Plan is for identification only, do not scale from this plan.

Old Workings shown up to 1986.

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Merthyr Tydfil,
South Wales,
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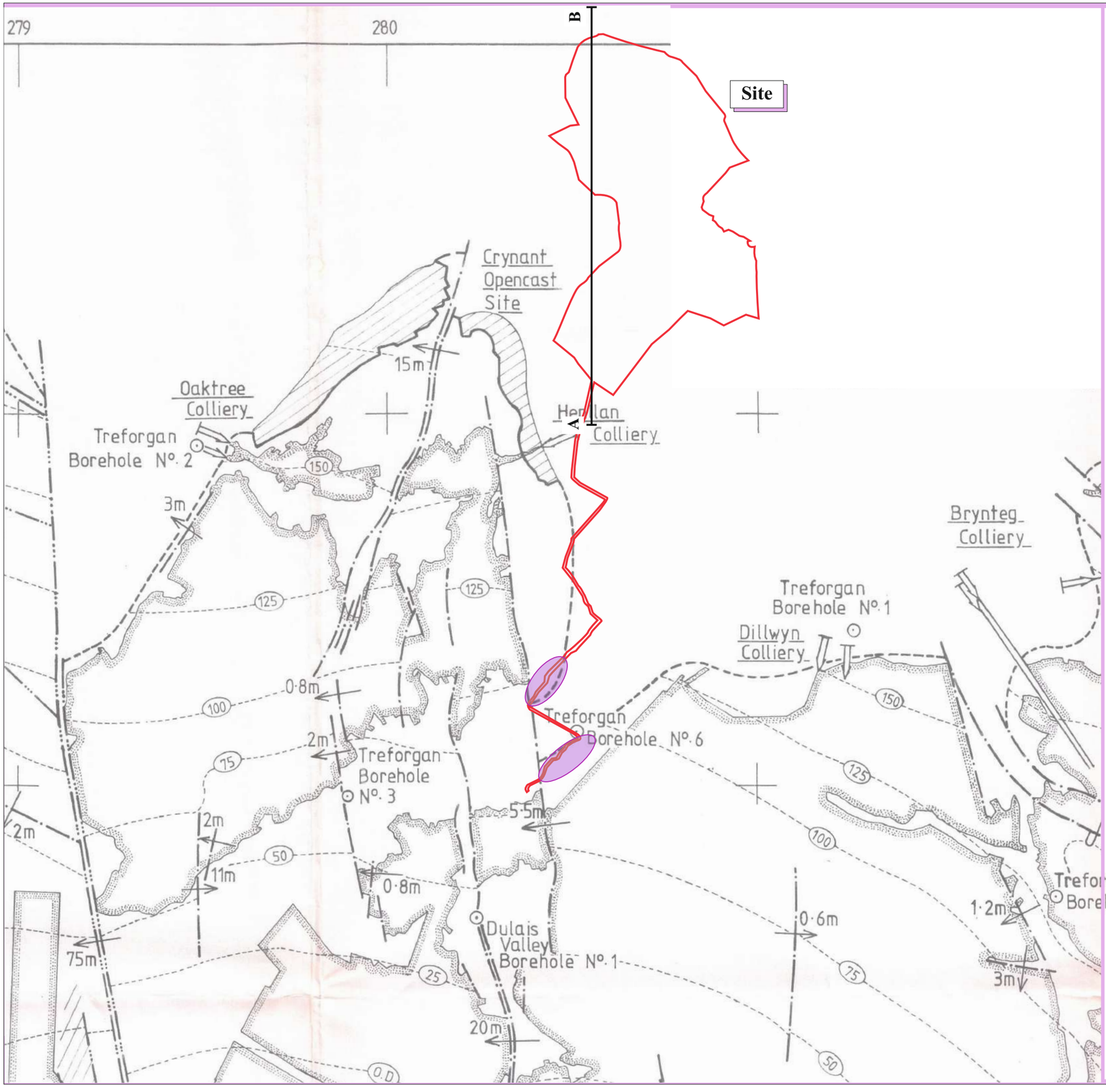
Geologists Working With The Environment....

Drawing No: BC/MB/07.24.04.05.



Study on Land at Pen Cae'r Lan, Seven Sisters, Neath.

Structure Contour Plan: Red Vein.

Plan Scale: 1:10,560.

Key to Symbols:

- **Approximate Site Boundary.**
- **Outcrop of Red Vein.**
- **Boundary of Recorded Old Workings.**
- **Basal Contour of Red Seam, Values in Metres above O.D.**
- **Fault Plane in Red Seam, Direction of Displacement Shown By Arrow, Values in Metres.**
- **Location of Mine Adit.**
- **Access Track Underlain by the Red Vein at Shallow Depths.**
- **Cross Section.**

Notes:

North is at top of plan.

Plan is for identification only, do not scale from this plan.

Old Workings shown up to 1986.

The Enterprise Centre,
Merthyr Industrial Park,
Pentrebach,
Merthyr Tydfil,
South Wales,
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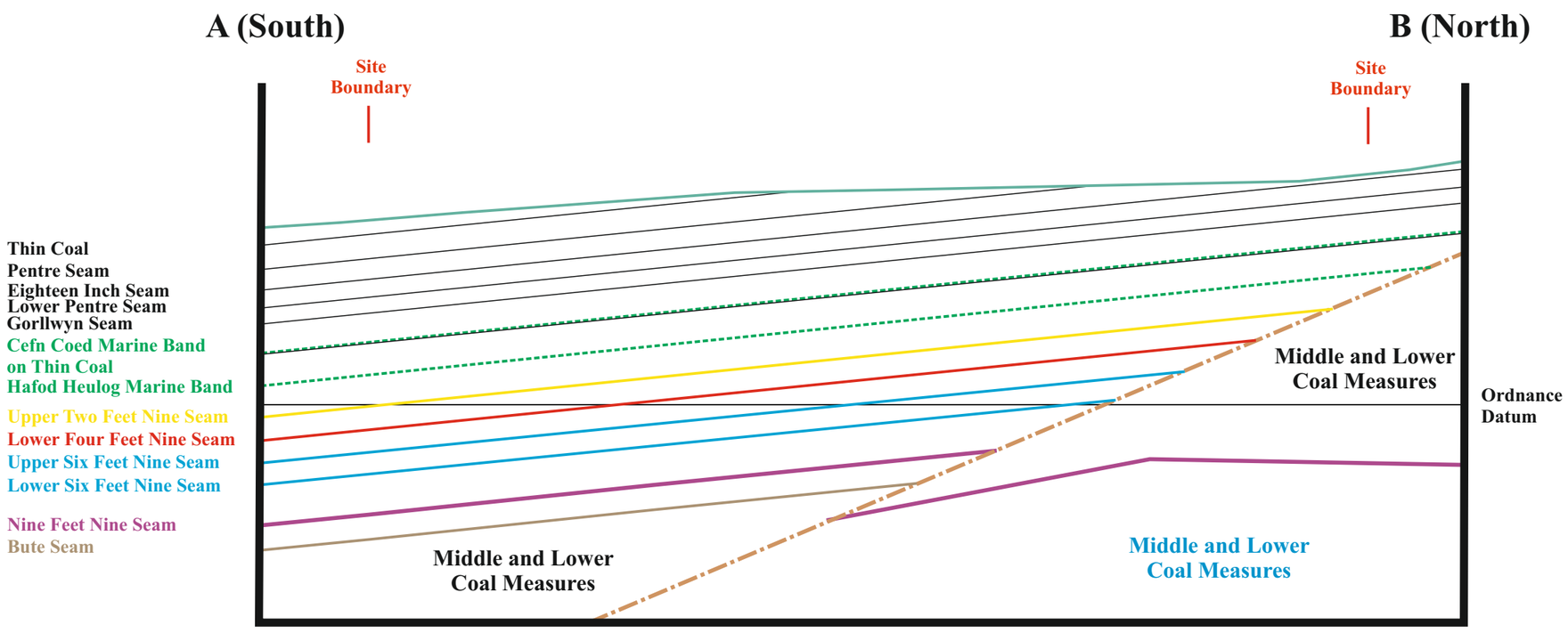
Geologists Working With The Environment....

Drawing No: BC/MB/07.24.04.06.

Study on Land at Pen Cae'r Lan, Seven Sisters, Neath.

Simplified Geological Cross Section A-B.

Natural Scale: 1:5,000.



Geologists Working With The Environment....

Notes:

Coal measure sequence based on Treforgan BH6 (Nant-y-Cafn). Some of the lower coal seams have been omitted for clarity.

Structure based on Nine Feet Seam.

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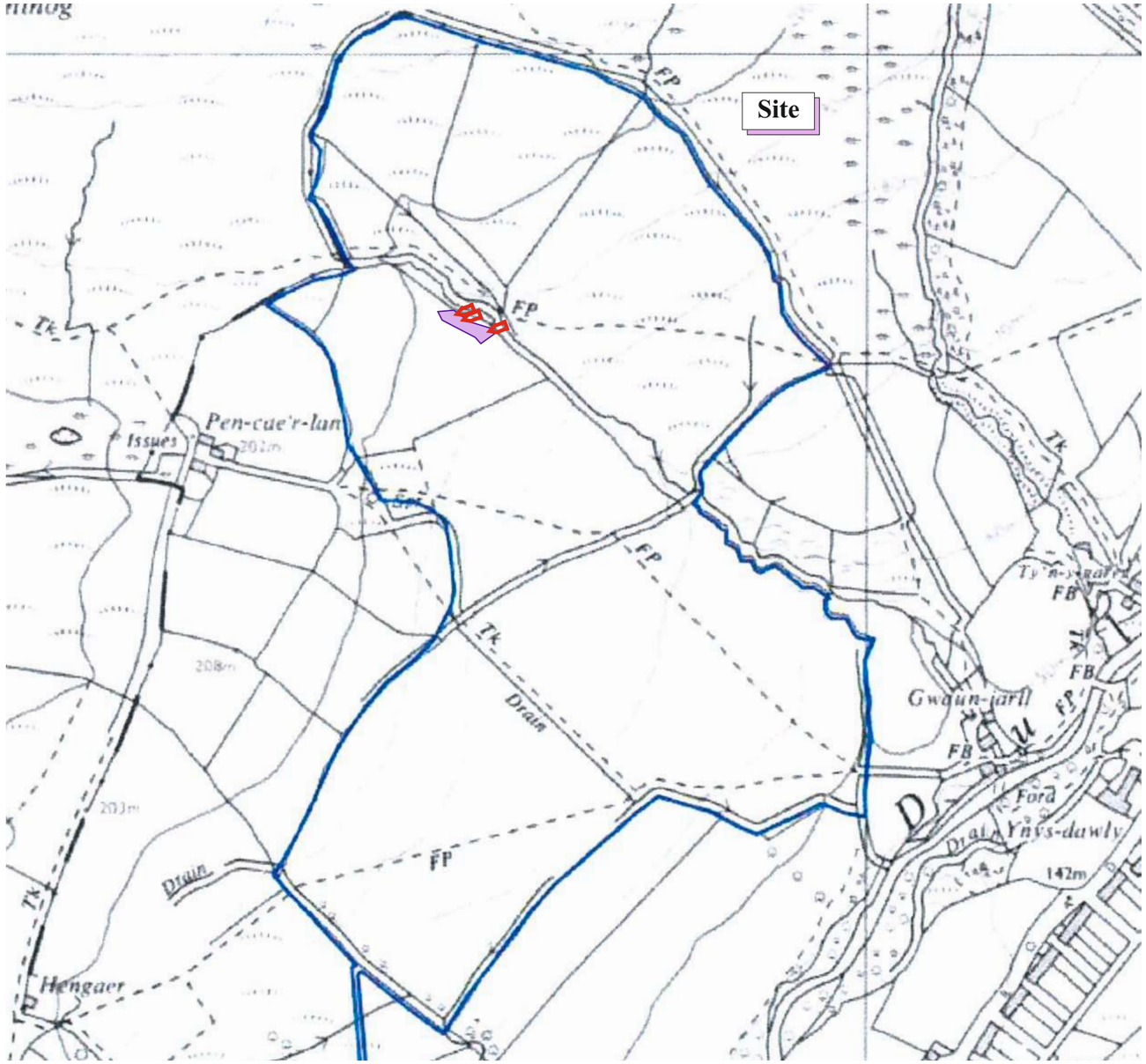
Merthyr Tydfil,
South Wales,
CF48 4DR.

Blandford Consulting

Key to Symbols:

Fault (Overthrust)

Drawing No: BC/MB/07.24.04.07.



Study on Land at Pen Cae'r Lan, Seven Sisters, Neath.

Mining Risk Plan.

Plan Scale: 1:1,250.

Key to Symbols:

Approximate Site Boundary.

Approximate Position of 'Adit'.

Exclusion Zone.

Notes:

North is at top of plan.

Plan is for identification only, do not scale from this plan.

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Merthyr Tydfil,
South Wales,
CF48 4DR.

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Drawing No: BC/MB/07.24.04.08.

Appendix I

Copy of Historic Ordnance Survey Plans

The Enterprise Centre,
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Pentrebach,
Merthyr Tydfil,
South Wales,
CF48 4DR.

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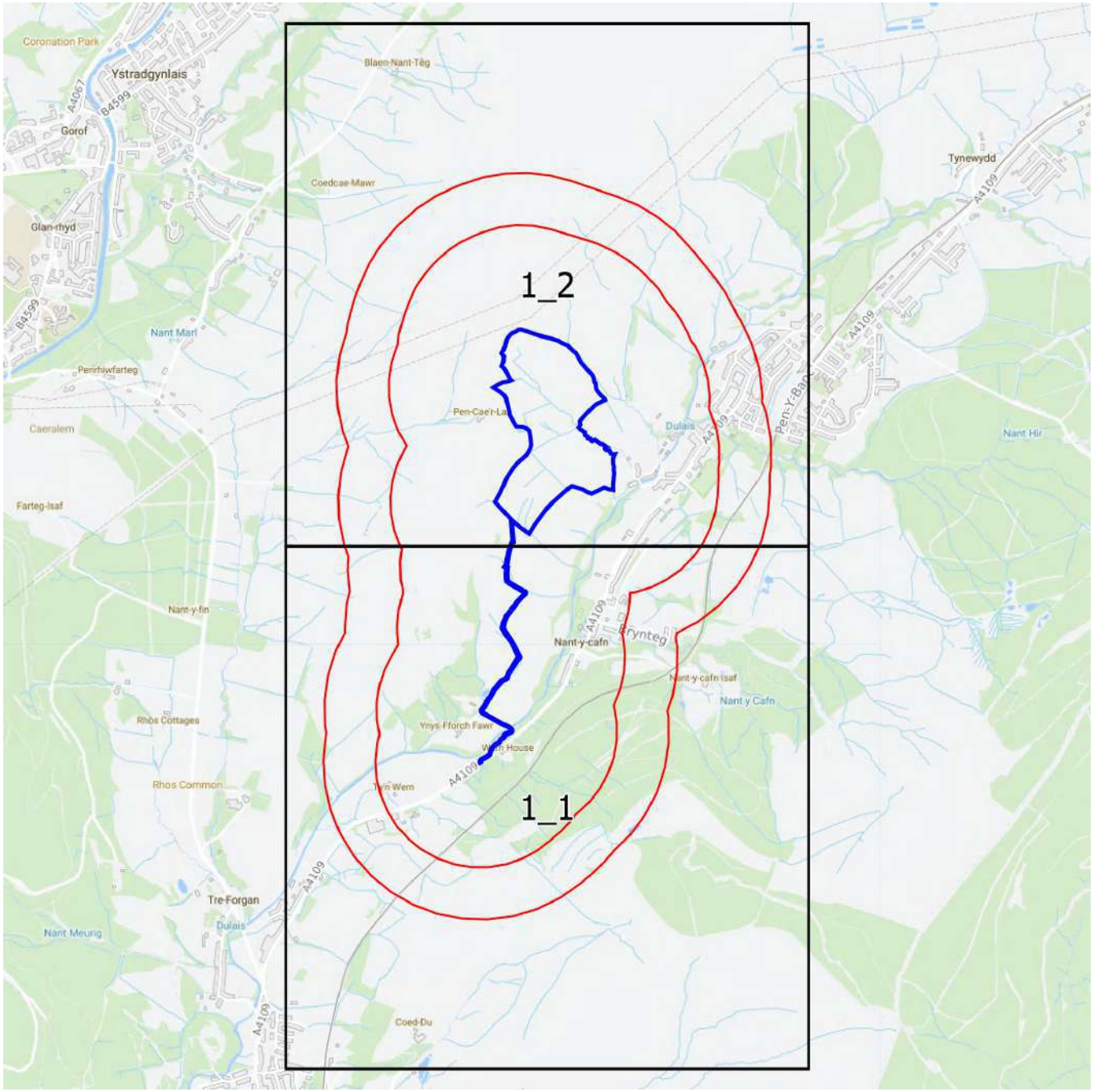
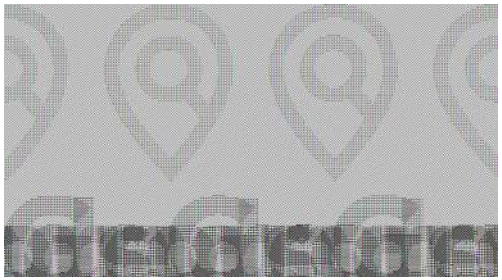
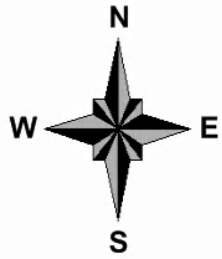
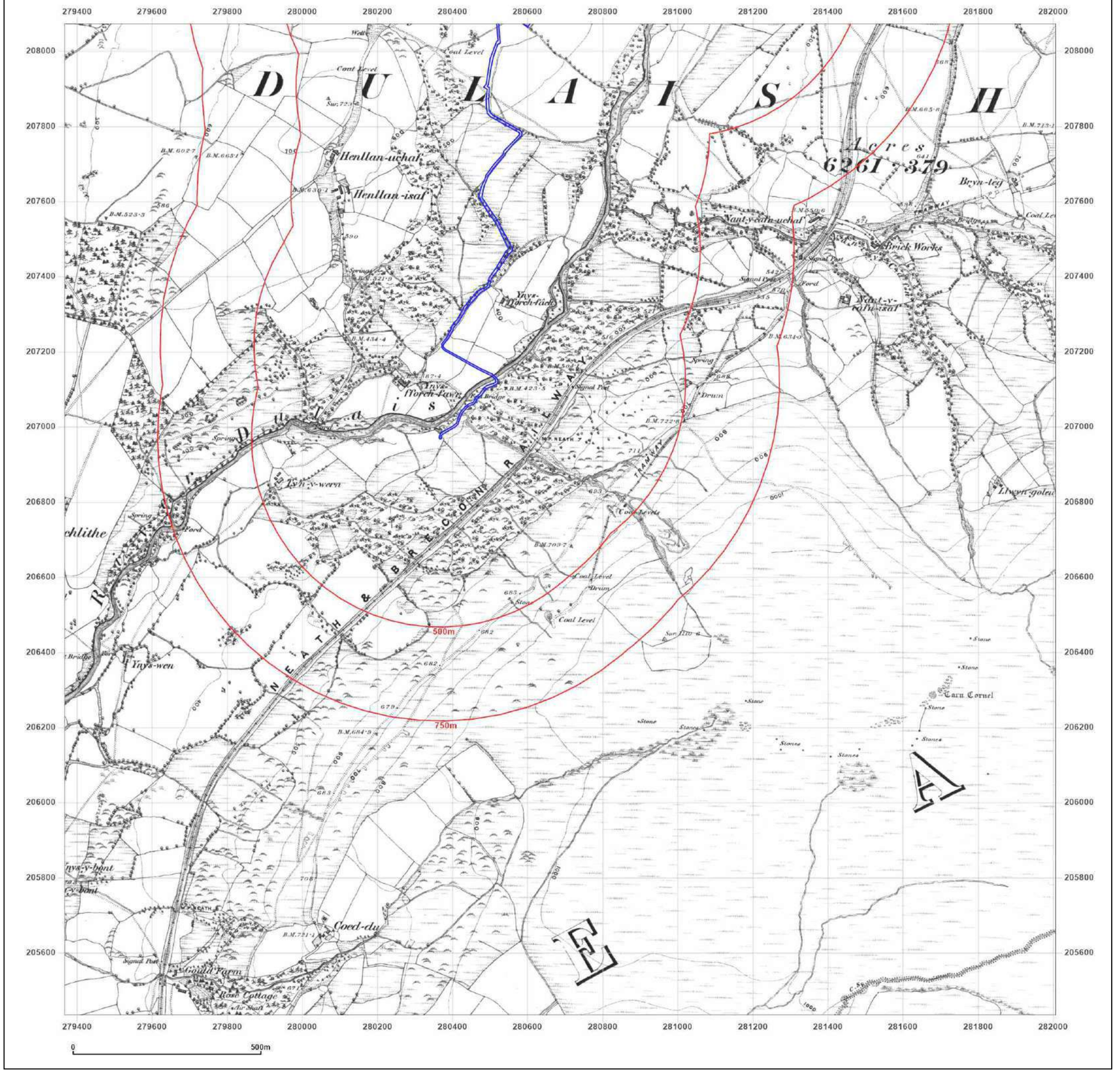
Geologists Working With The Environment....





Small Scale Grid Index





Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: County Series

Map date: **1877**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

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Map legend available at:
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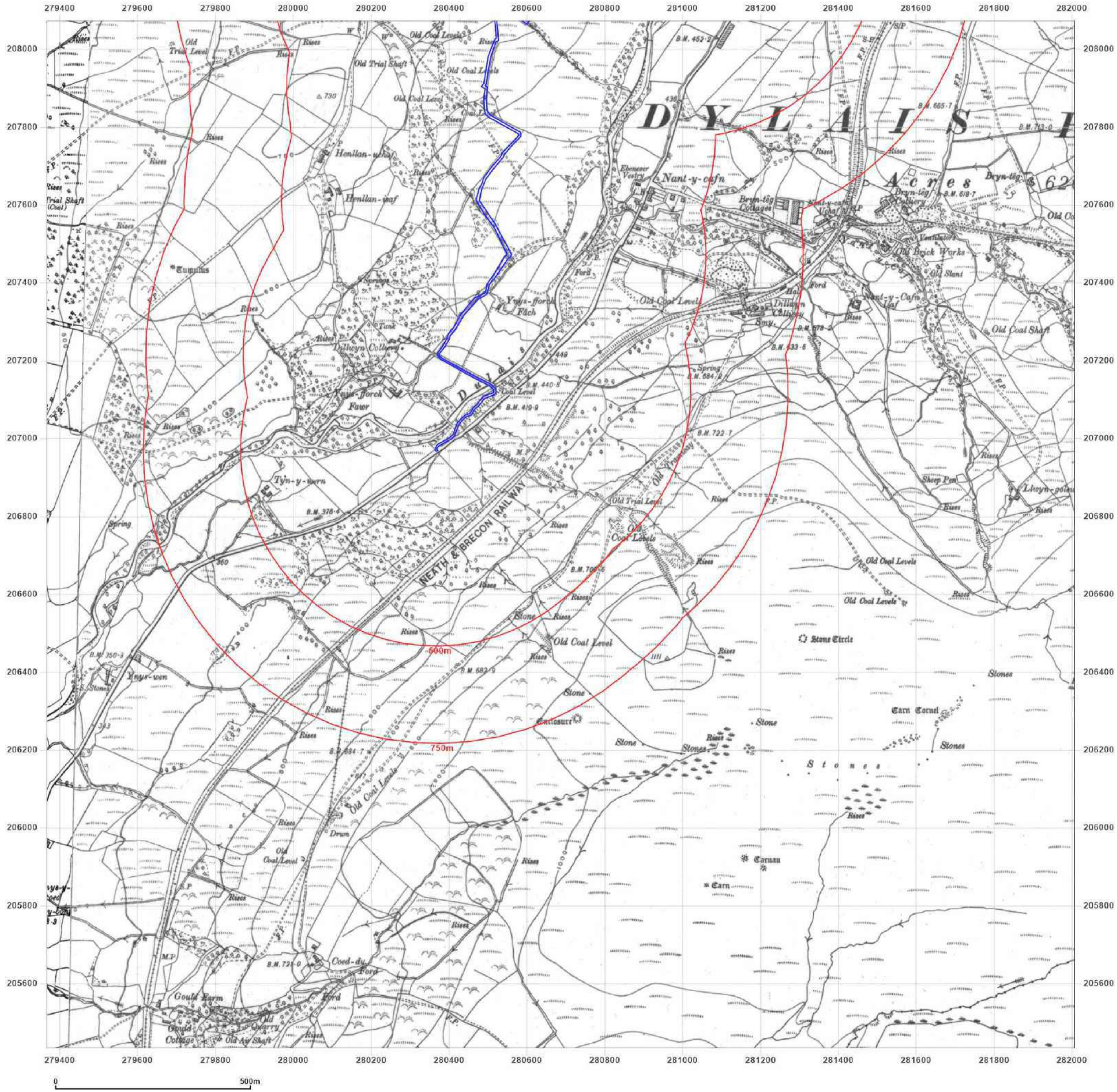

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: County Series

Map date: **1913**

Scale: 1:10,560

Printed at: 1:10,560

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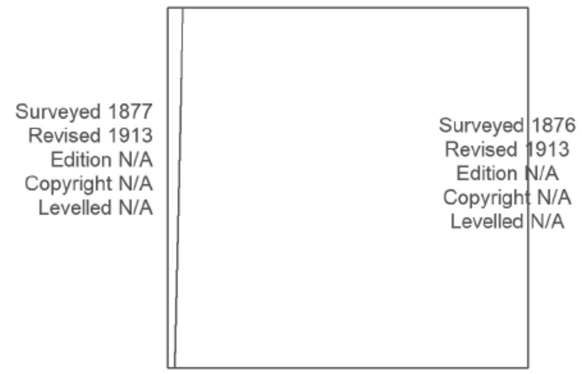

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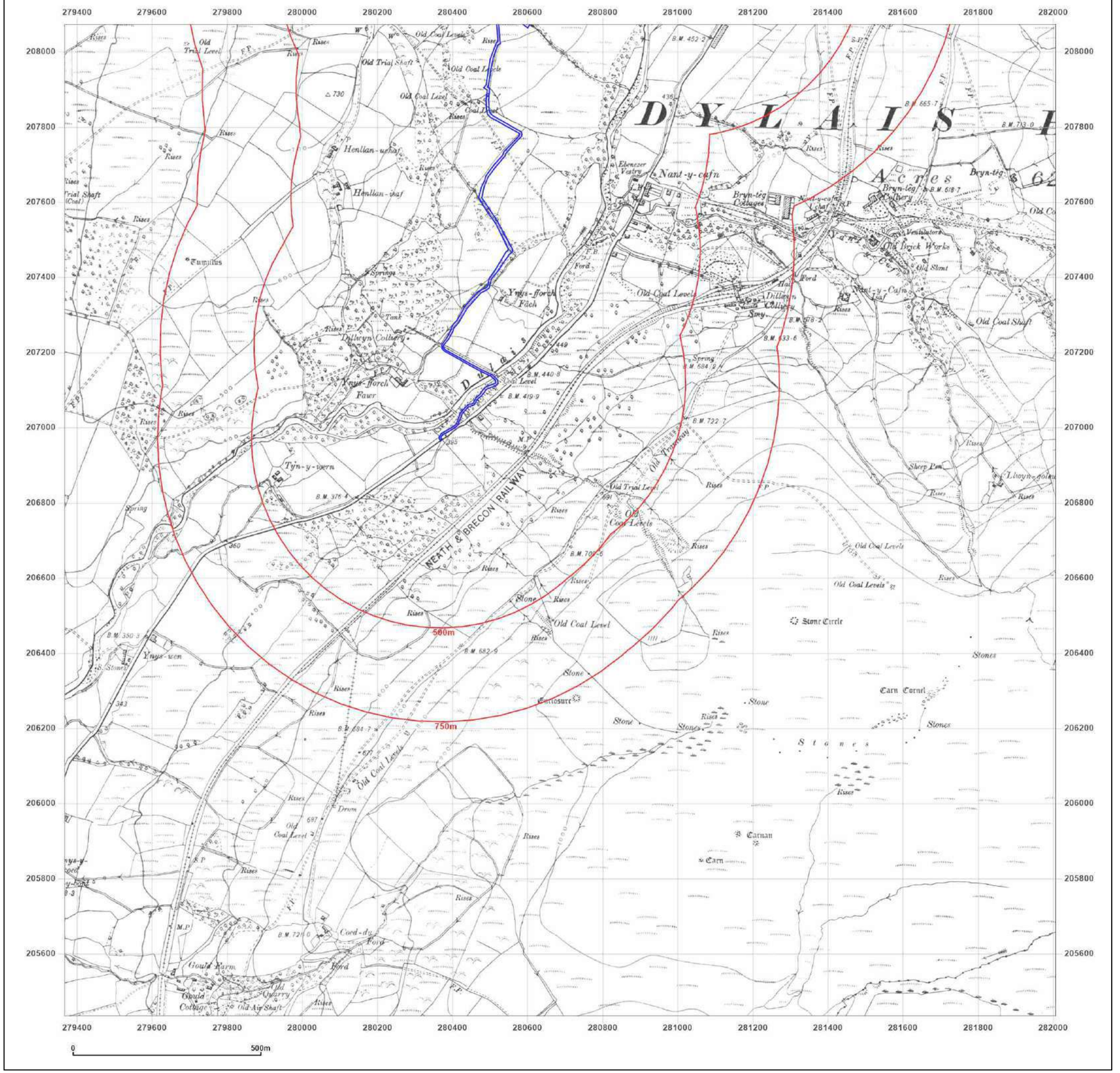

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: County Series
Map date: **1921**
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1877
Revised 1921
Edition N/A
Copyright N/A
Levelled N/A

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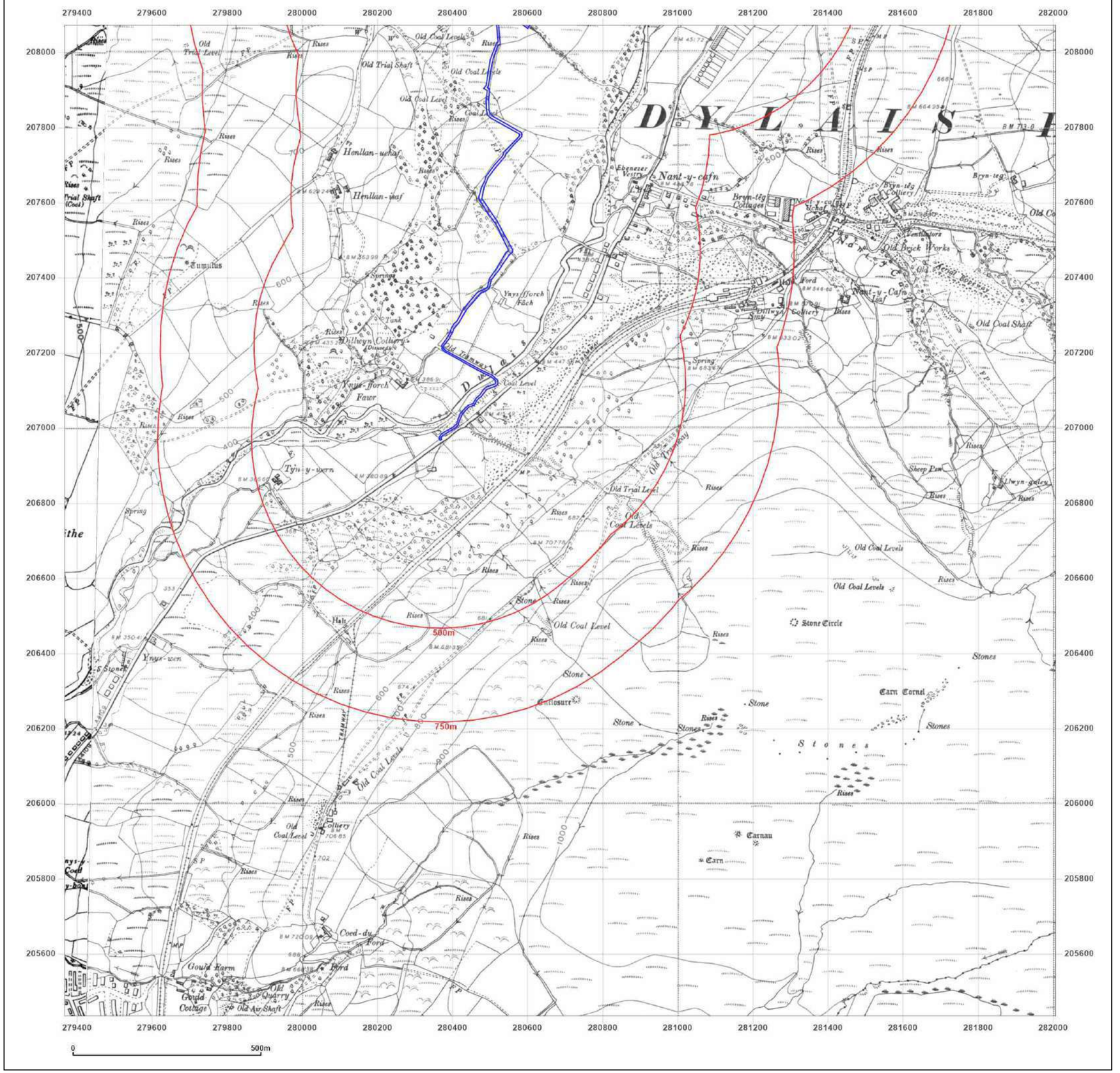

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: County Series

Map date: **1948**

Scale: 1:10,560

Printed at: 1:10,560

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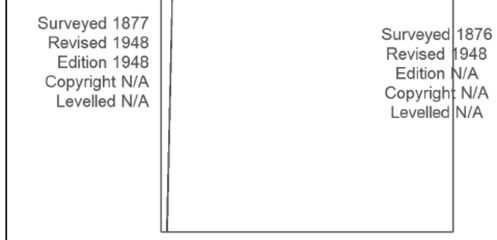

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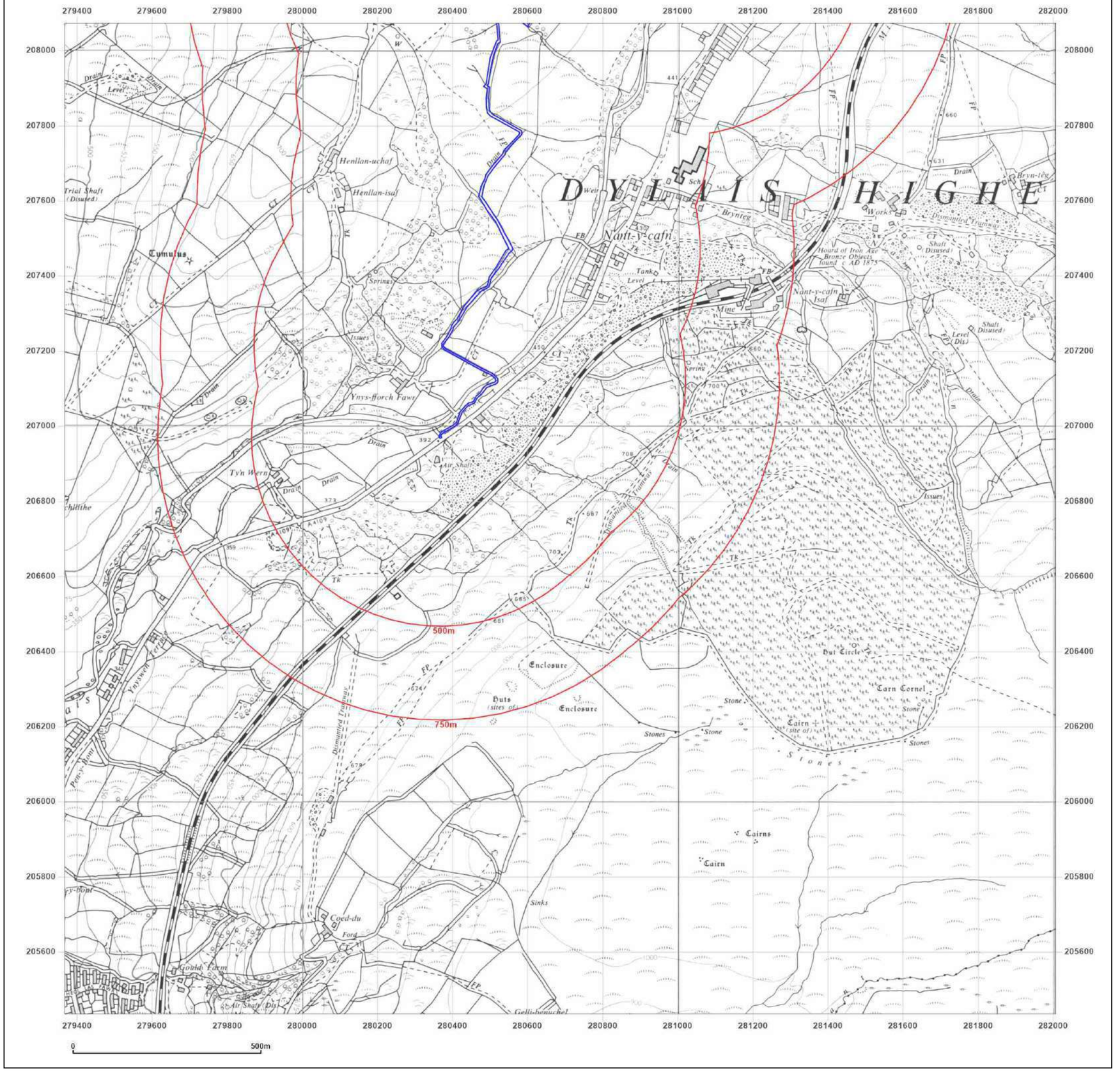

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: Provisional
Map date: **1964-1965**
Scale: 1:10,560
Printed at: 1:10,560

N
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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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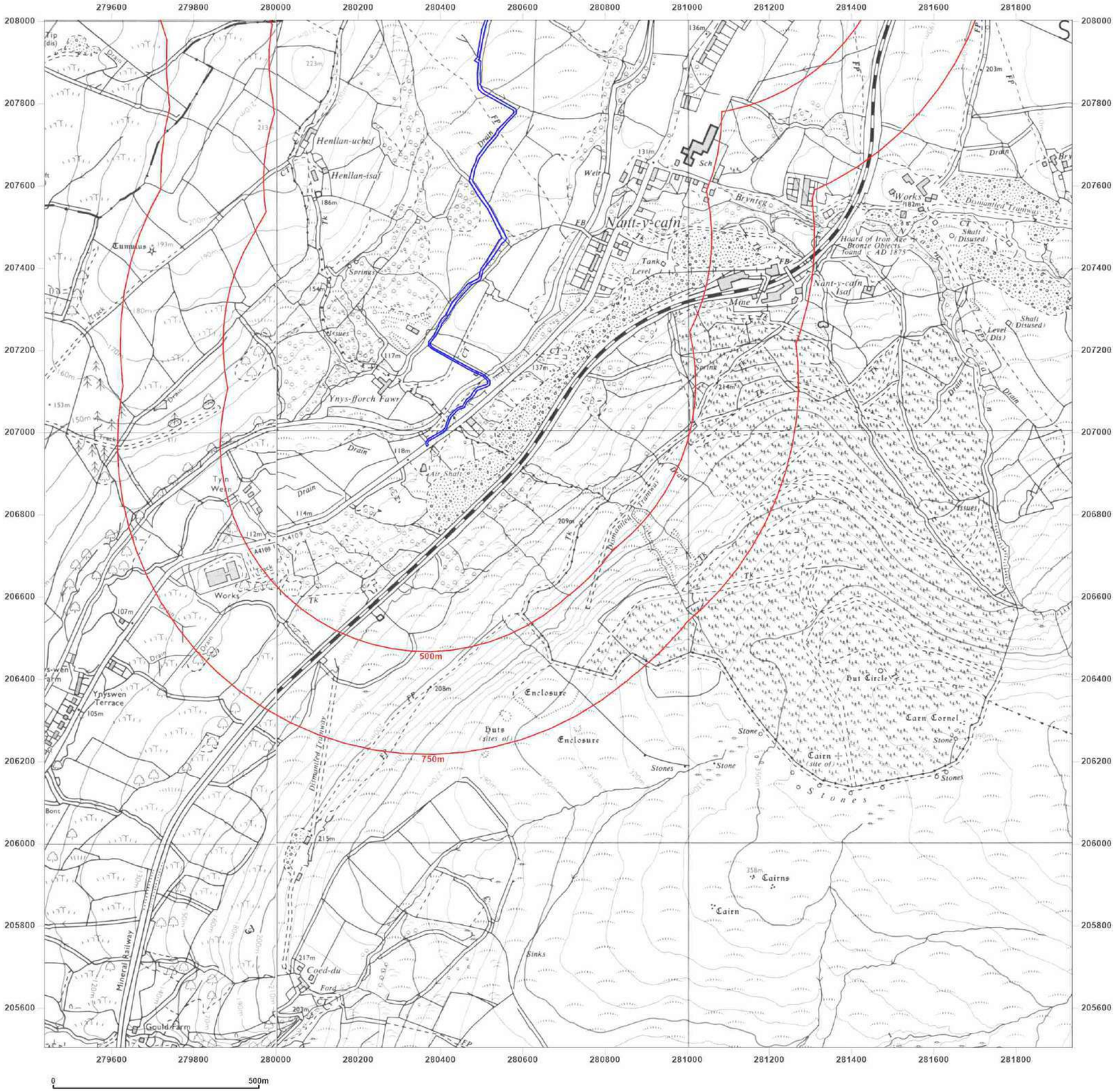

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: National Grid

Map date: **1983-1988**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1975
Revised 1983
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1962
Revised 1988
Edition N/A
Copyright N/A
Levelled N/A

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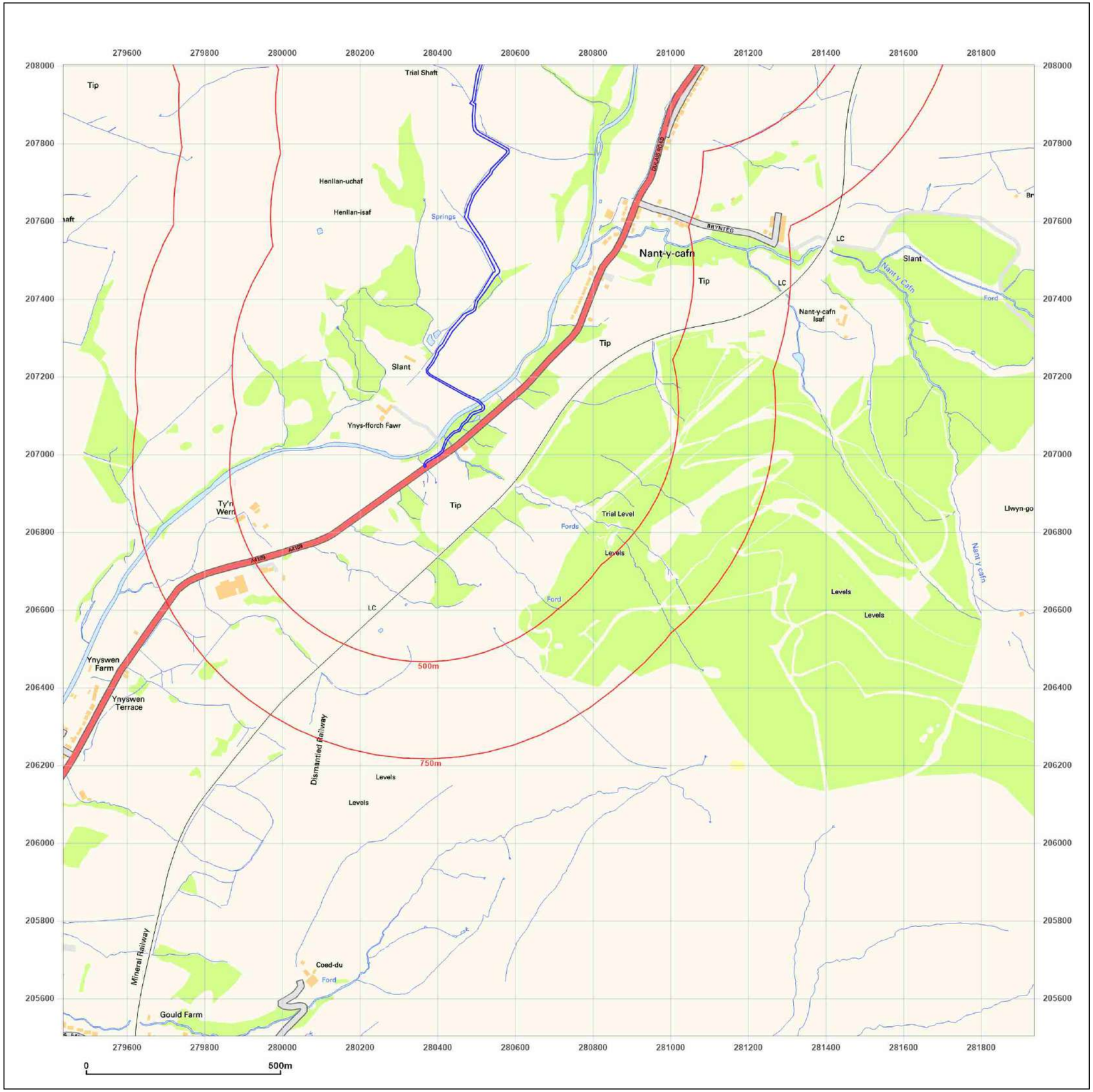

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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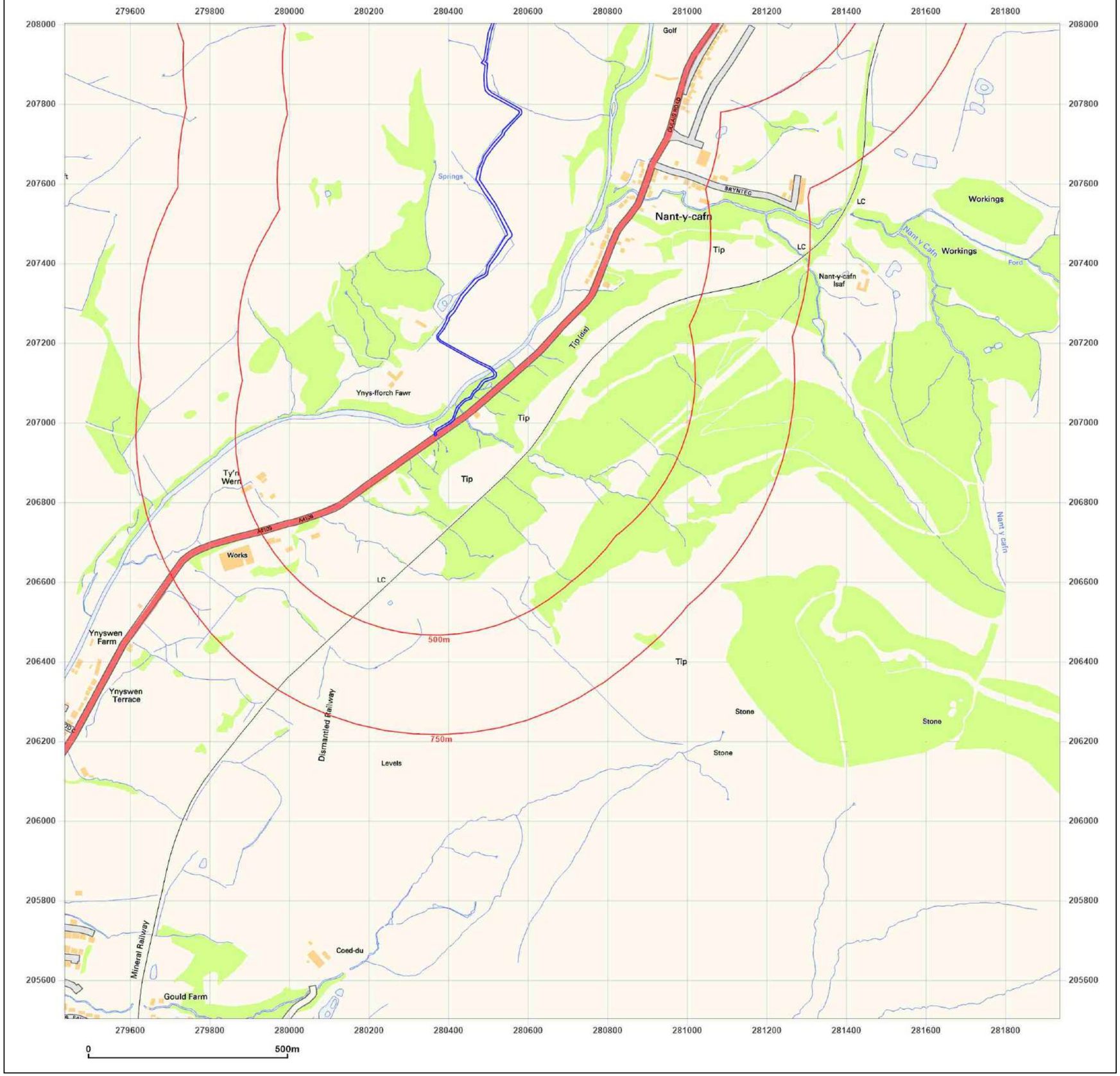

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: National Grid
Map date: **2010**
Scale: 1:10,000
Printed at: 1:10,000

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2010

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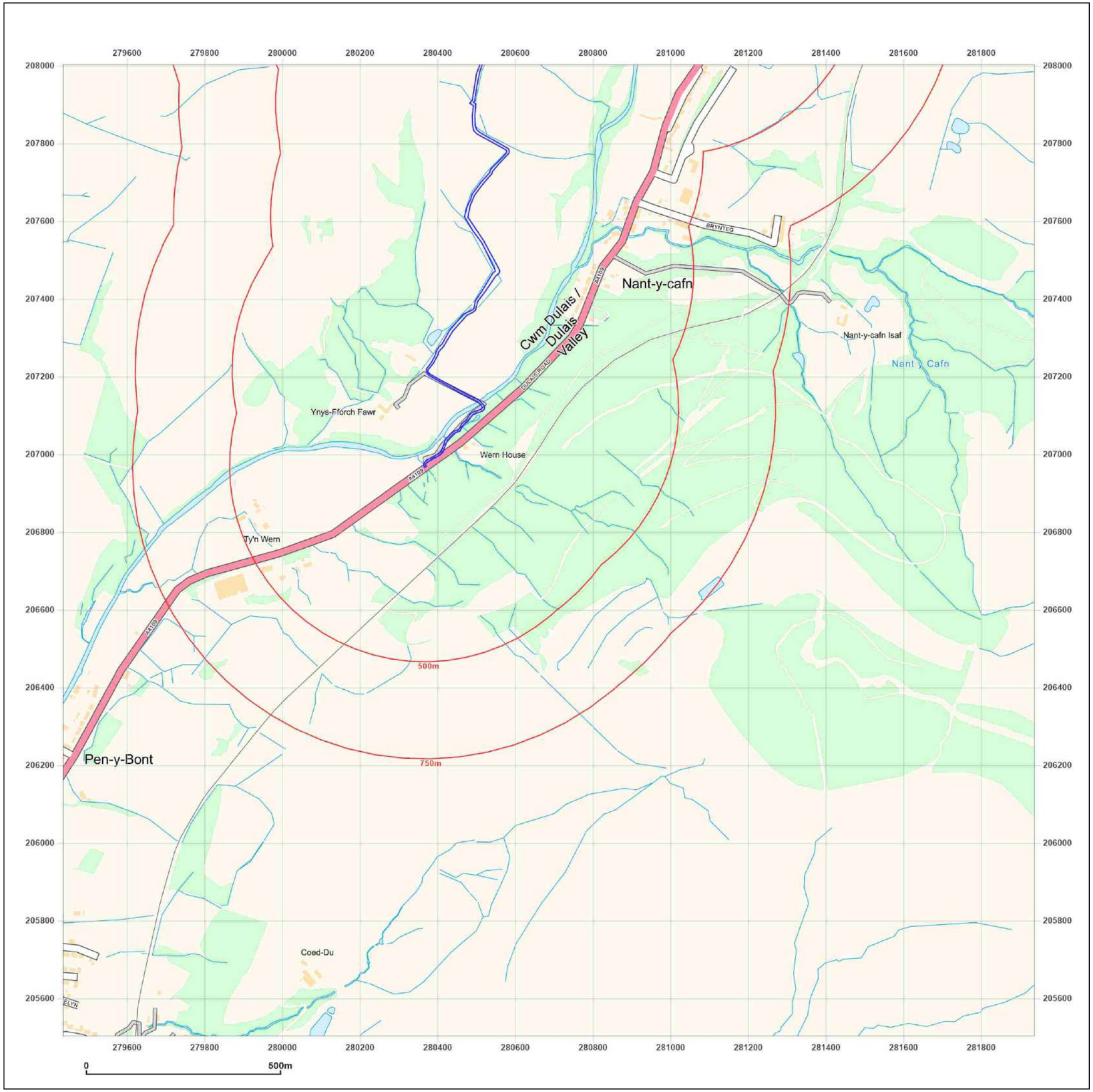

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_1
Grid Ref: 280686, 206753

Map Name: National Grid
Map date: **2024**
Scale: 1:10,000
Printed at: 1:10,000

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2024

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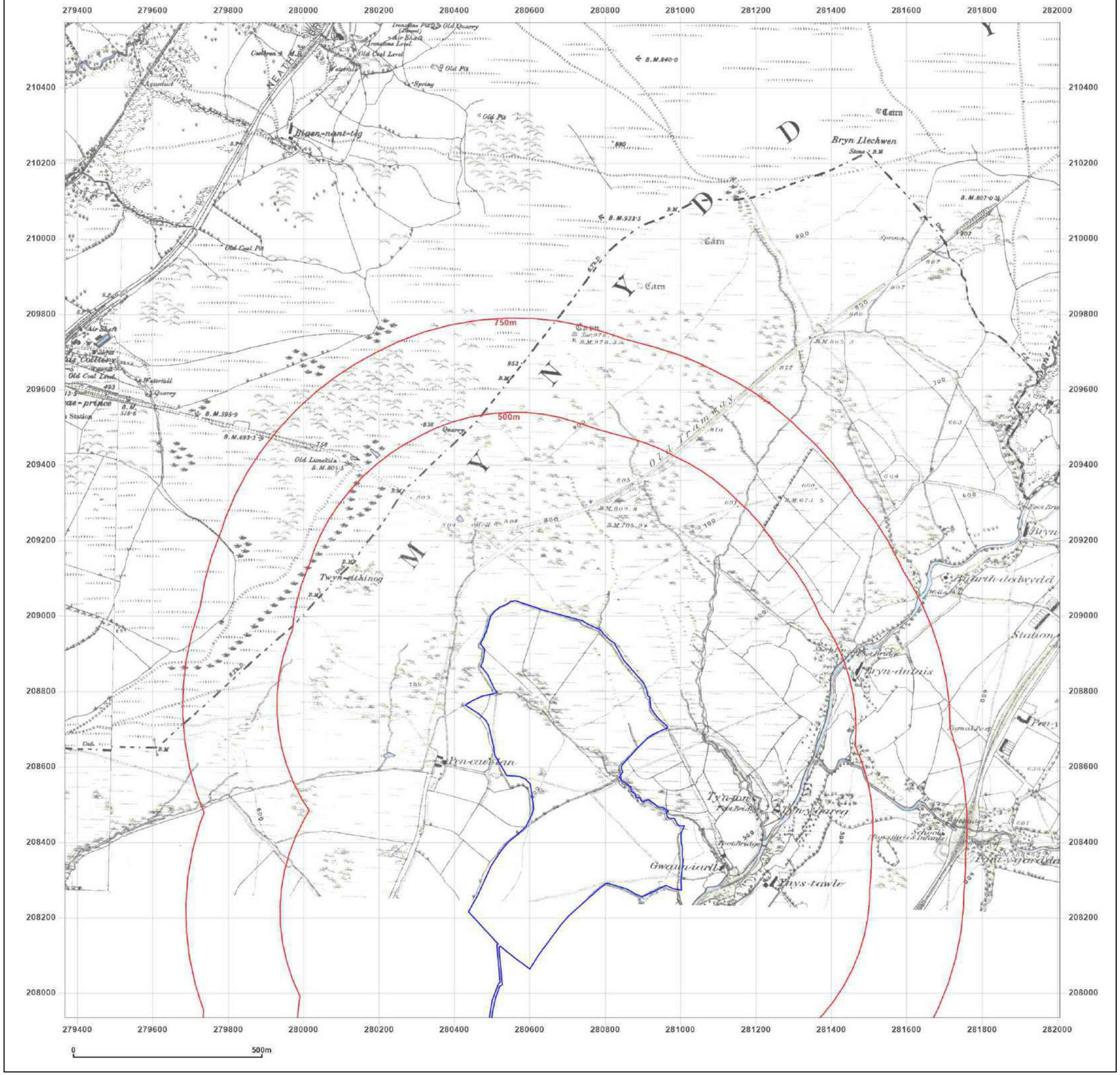

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series

Map date: **1877**

Scale: 1:10,560

Printed at: 1:10,560

N
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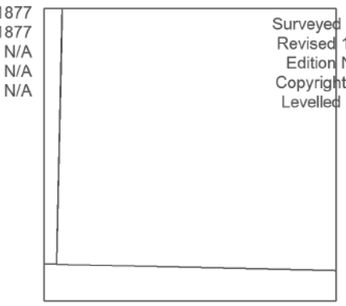
Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 24 January 2024

Map legend available at:
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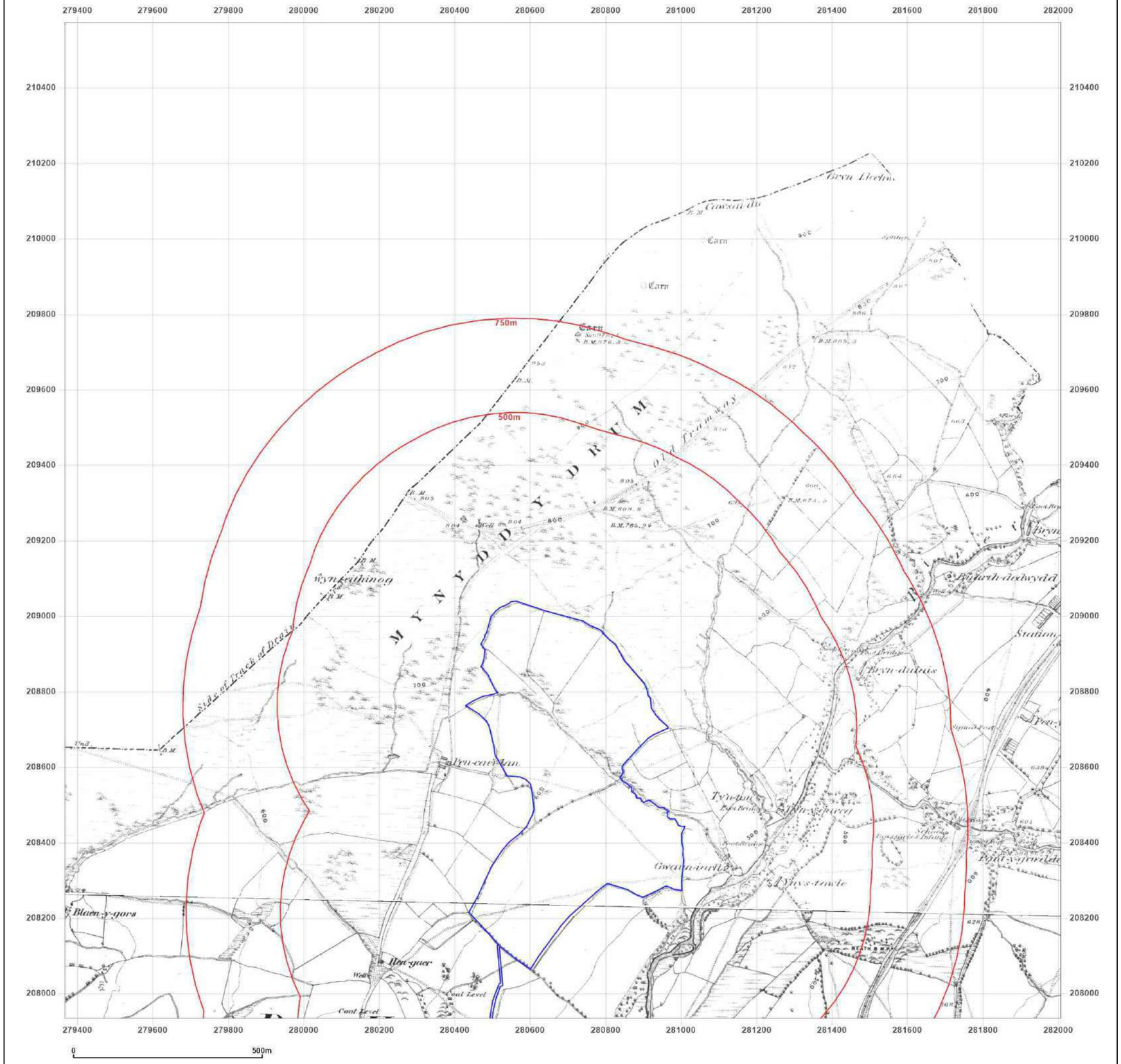

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series

Map date: **1876-1877**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1876
Revised 1876
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1877
Edition N/A
Copyright N/A
Levelled N/A

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Map legend available at:
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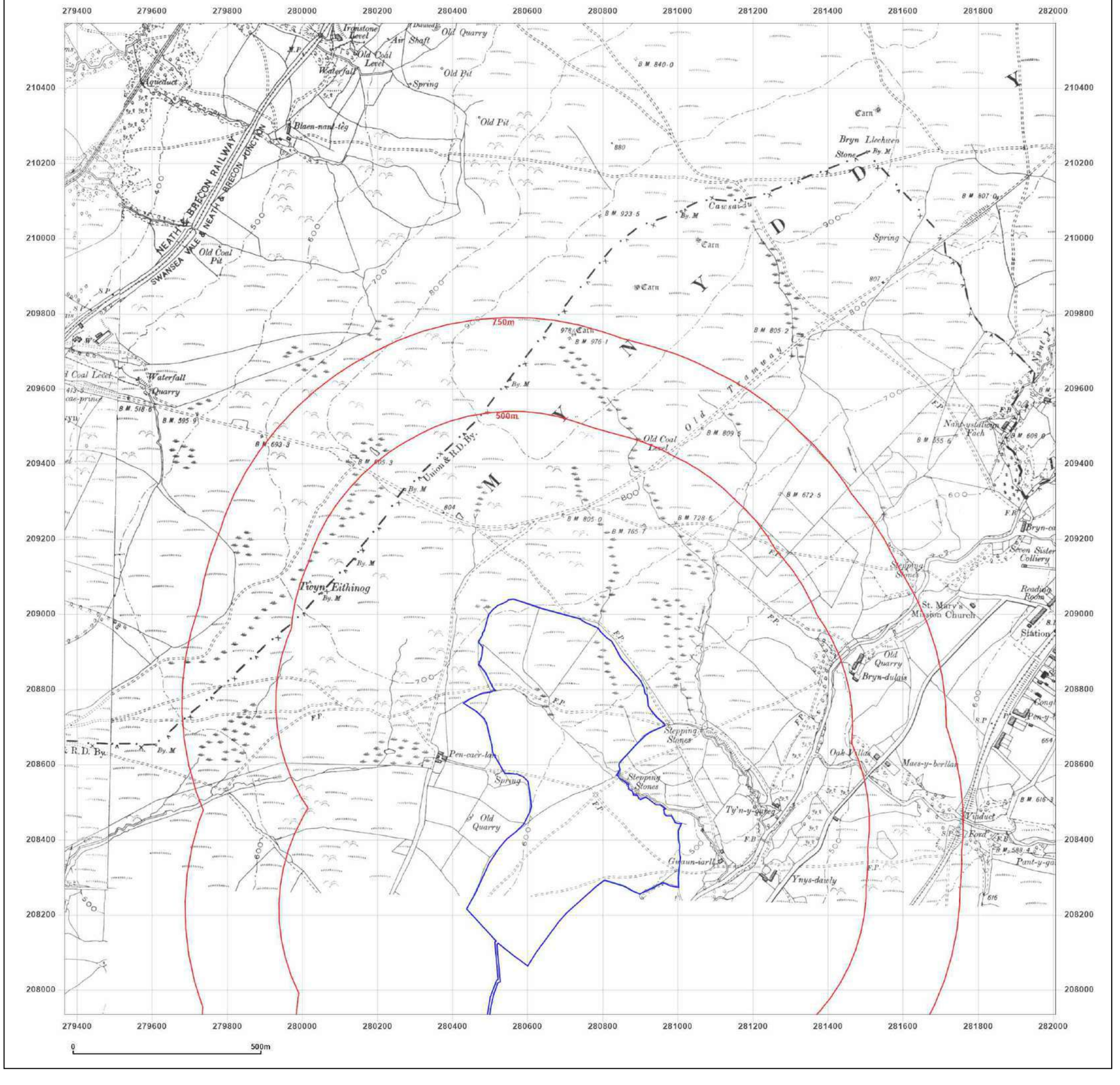

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series

Map date: **1897-1901**

Scale: 1:10,560

Printed at: 1:10,560

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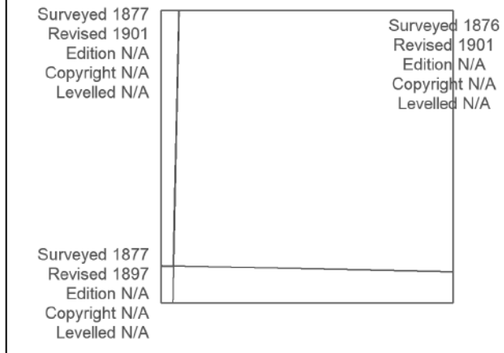

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Production date: 24 January 2024

Map legend available at:
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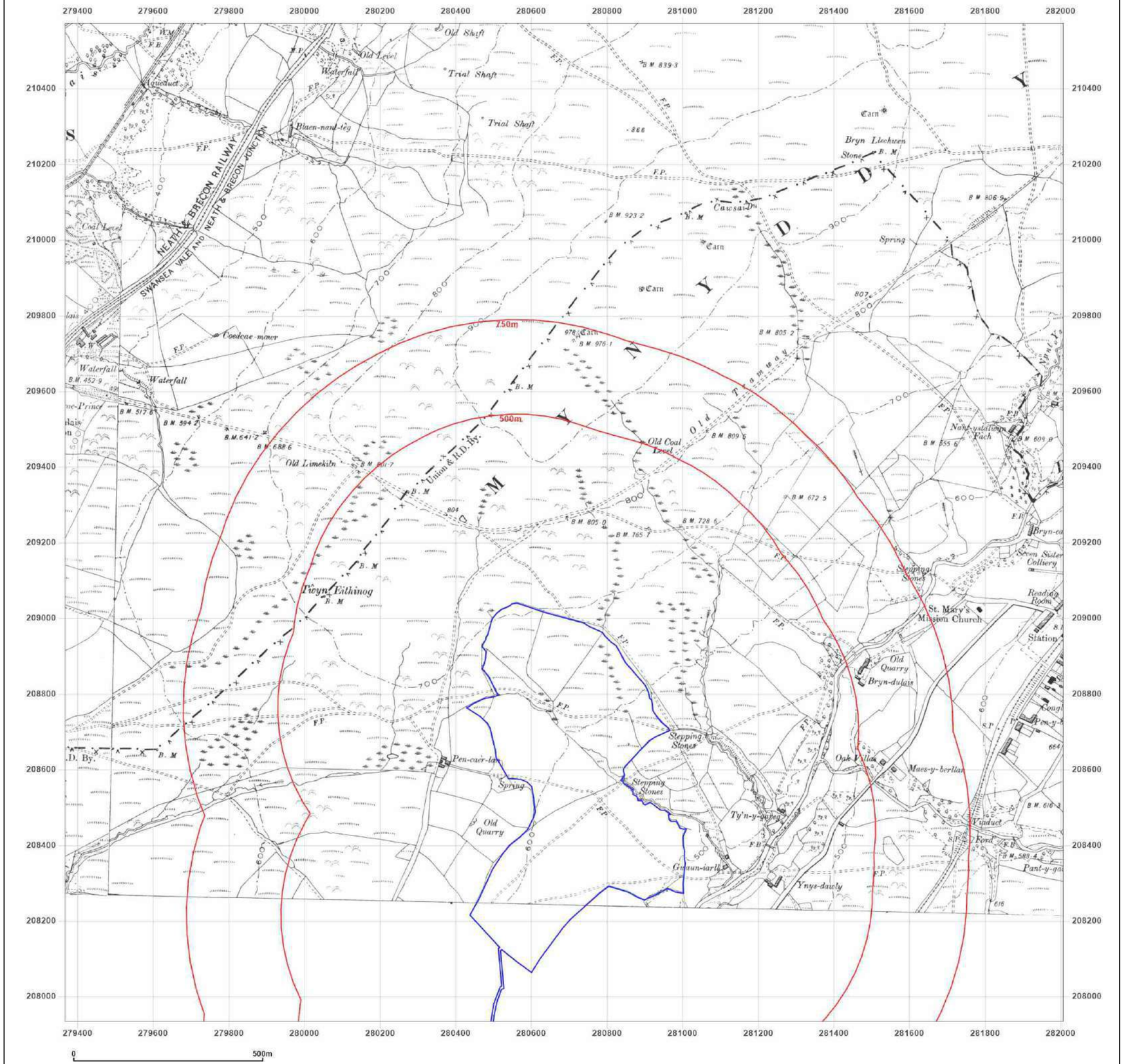

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series

Map date: **1903**

Scale: 1:10,560

Printed at: 1:10,560

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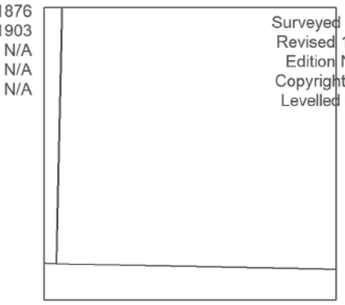
Surveyed 1876
Revised 1903
Edition N/A
Copyright N/A
Levelled N/A



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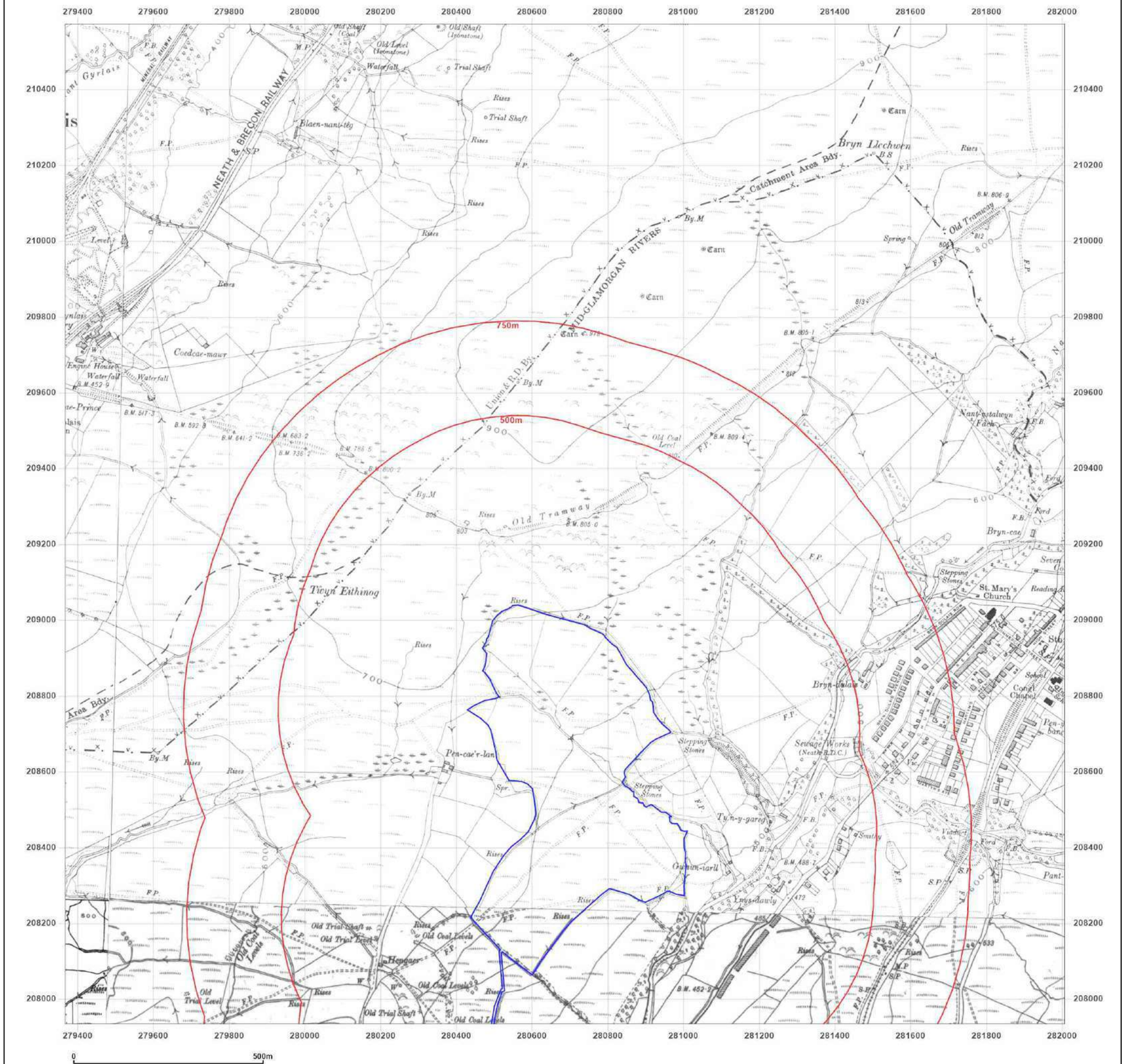

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series

Map date: **1913-1914**

Scale: 1:10,560

Printed at: 1:10,560

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Surveyed 1876
Revised 1914
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1914
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1877
Revised 1913
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1876
Revised 1913
Edition N/A
Copyright N/A
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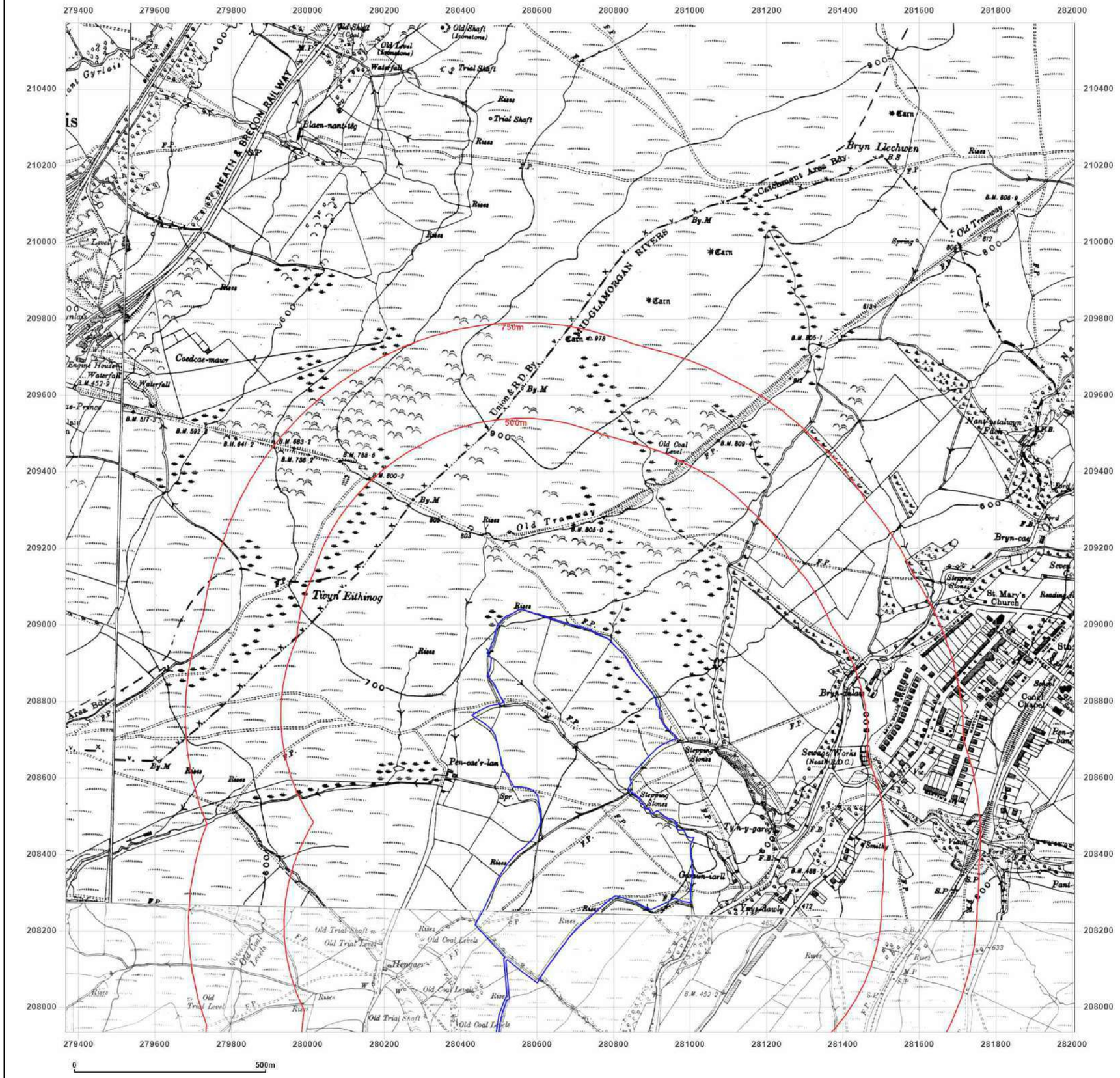
Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series

Map date: **1921**

Scale: 1:10,560

Printed at: 1:10,560

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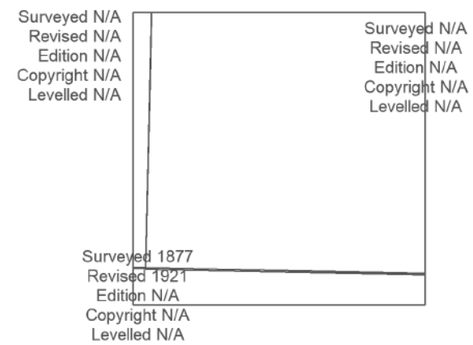

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Production date: 24 January 2024

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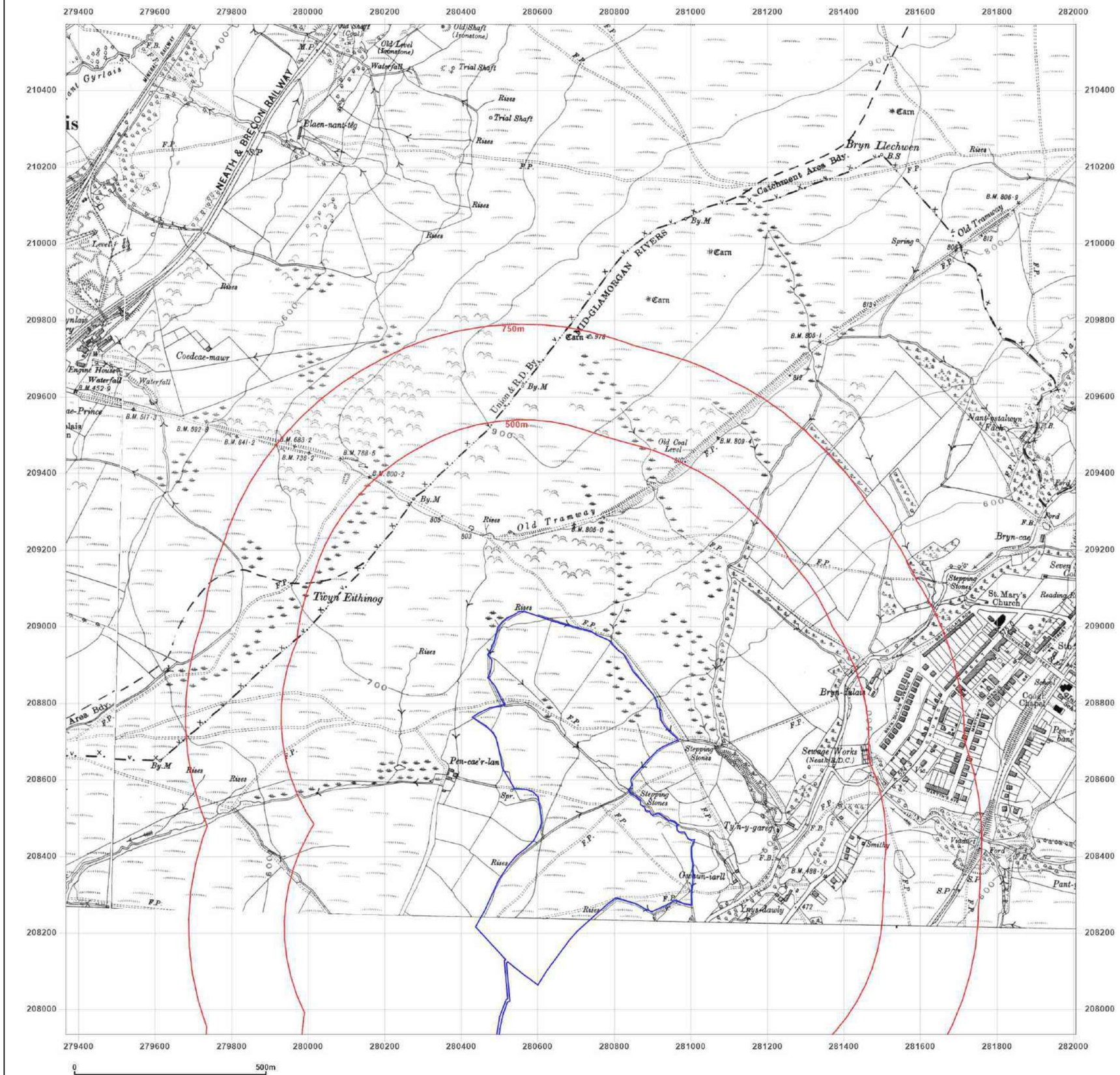

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series

Map date: **1921**

Scale: 1:10,560

Printed at: 1:10,560

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

Surveyed 1921
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Map legend available at:
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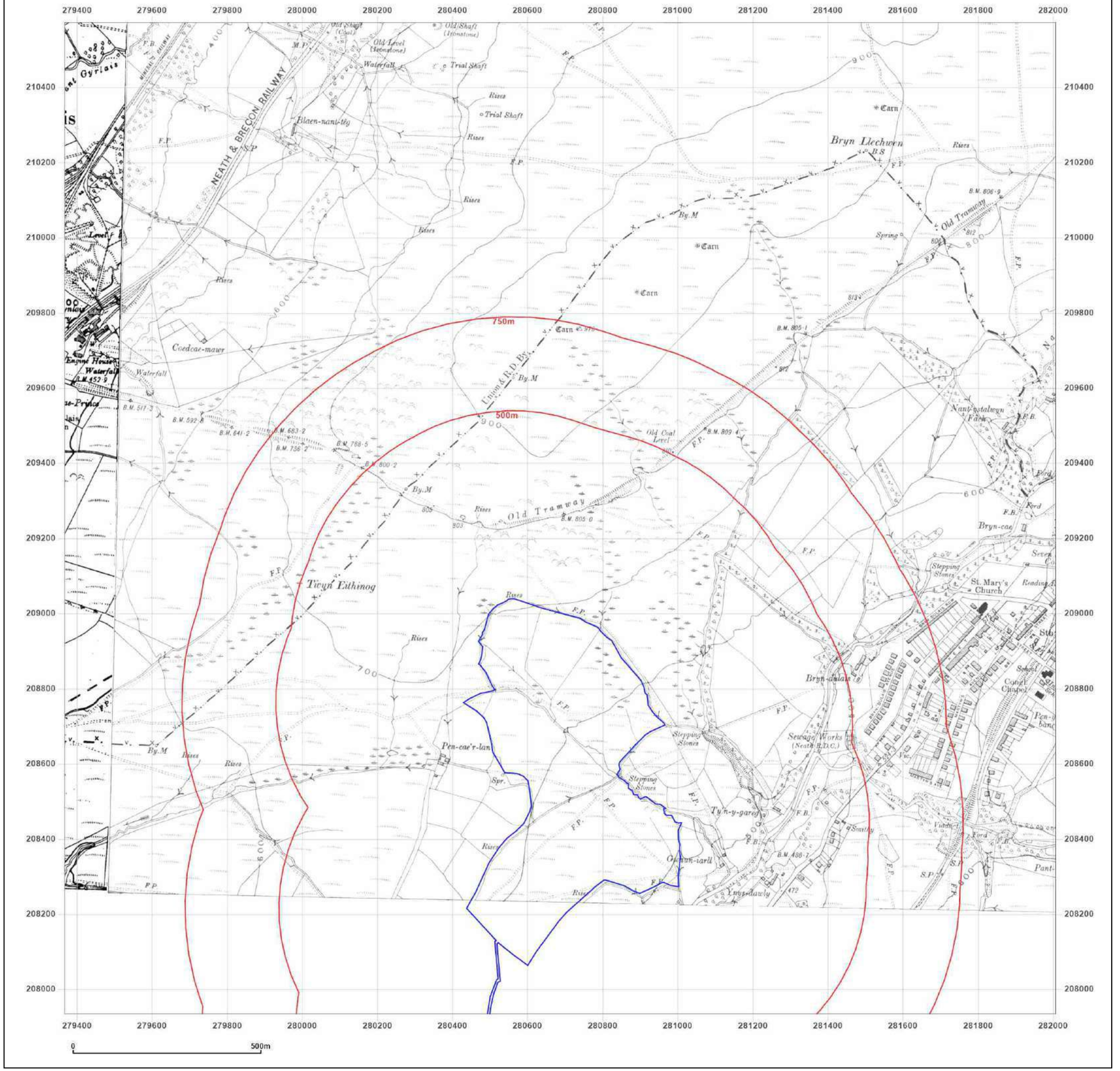

Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series
Map date: **1921**
Scale: 1:10,560
Printed at: 1:10,560

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

Surveyed 1876
Revised 1921
Edition 1921
Copyright N/A
Levelled N/A

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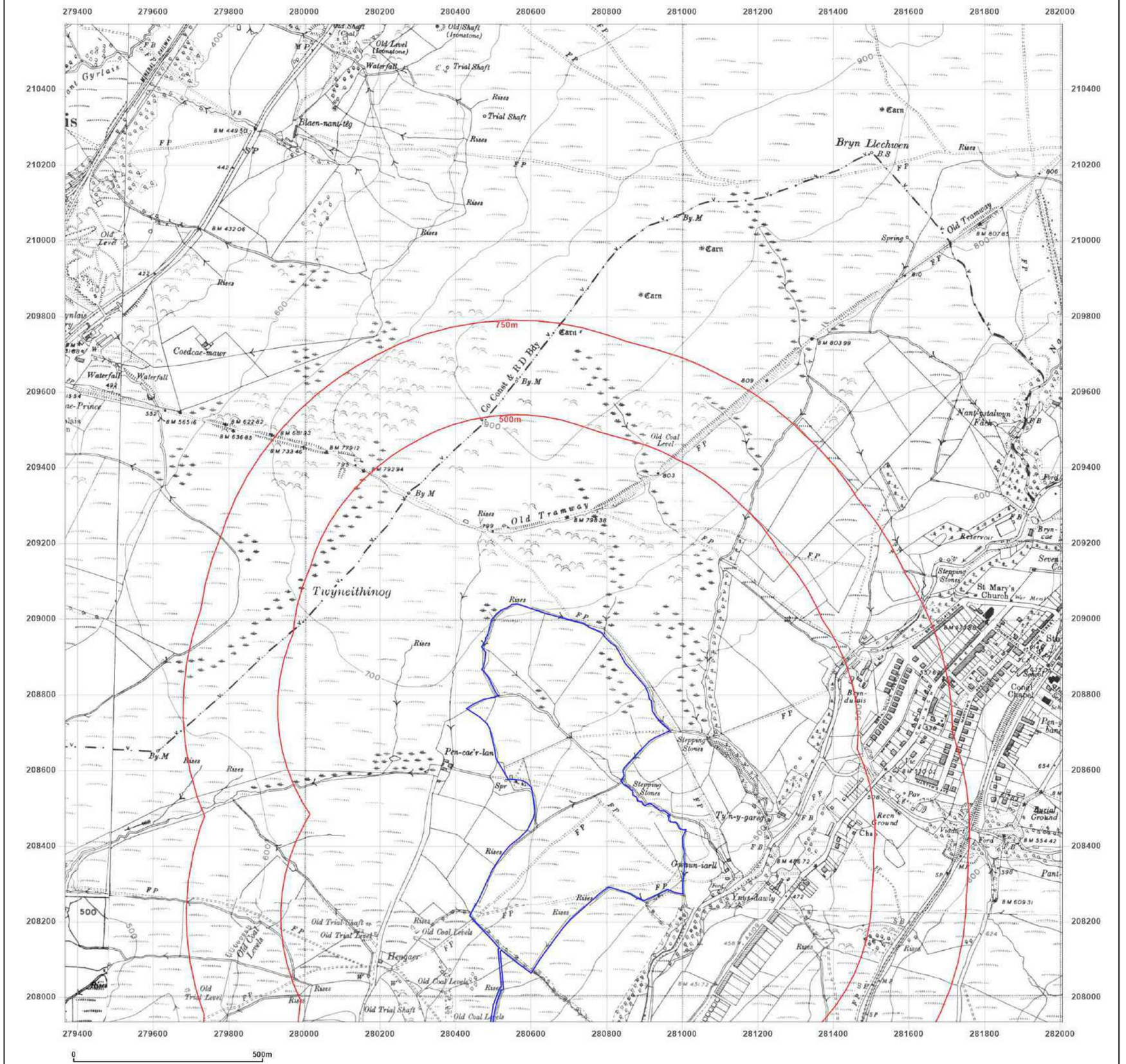
W: www.groundsure.com

Production date: 24 January 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: County Series

Map date: **1948**

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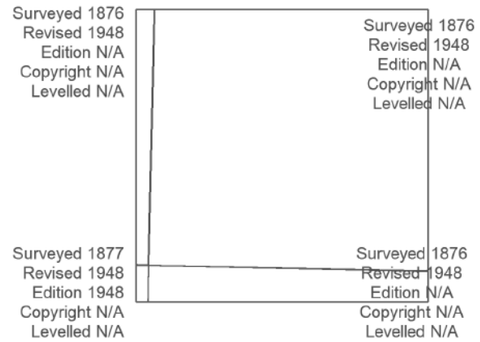

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W: www.groundsure.com

Production date: 24 January 2024

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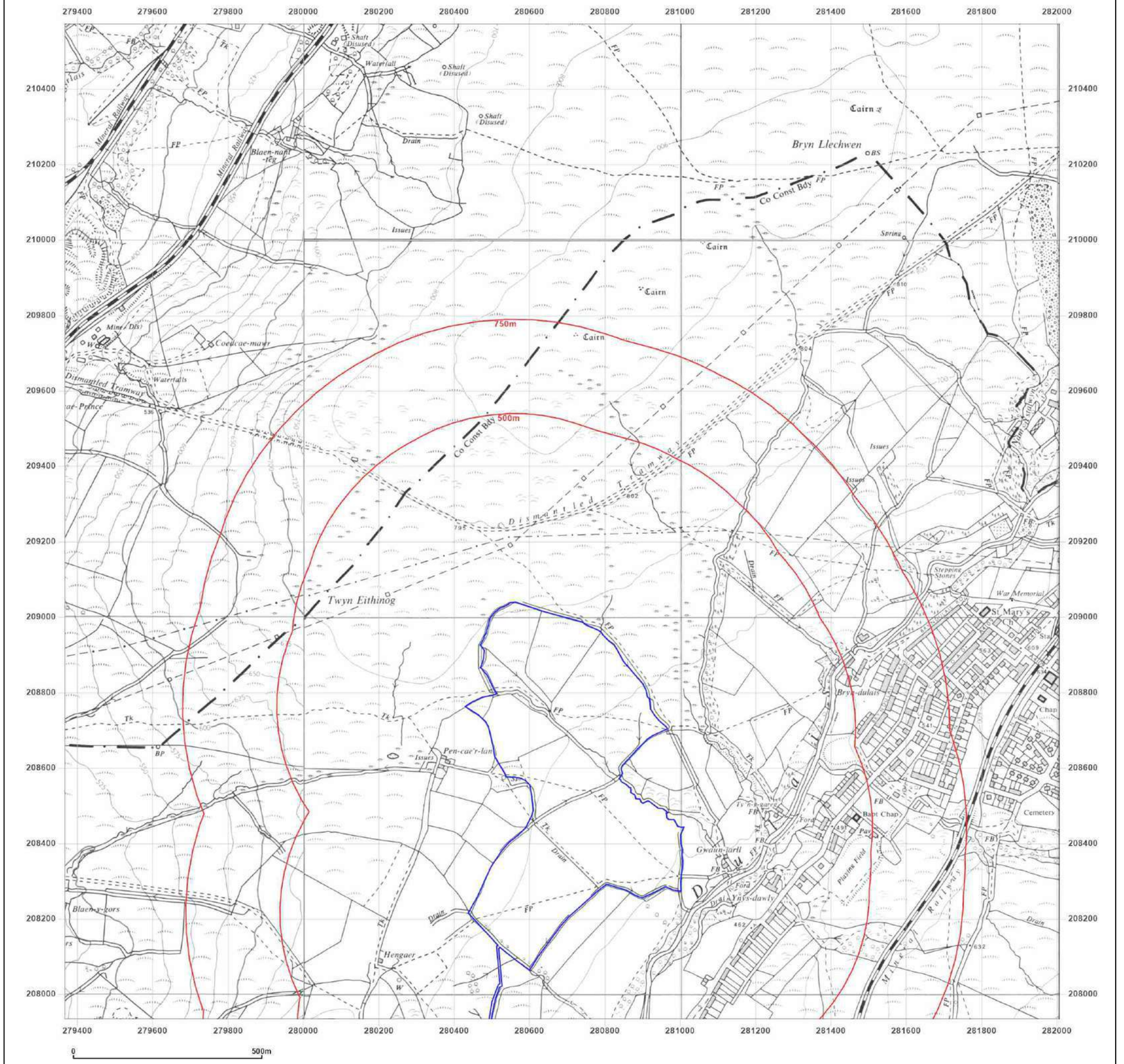

Groundsure INSIGHTS

Site Details:

Seven Sisters

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Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: Provisional
Map date: **1964-1965**
Scale: 1:10,560
Printed at: 1:10,560

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Surveyed 1965
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

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Revised 1964
Edition N/A
Copyright N/A
Levelled N/A

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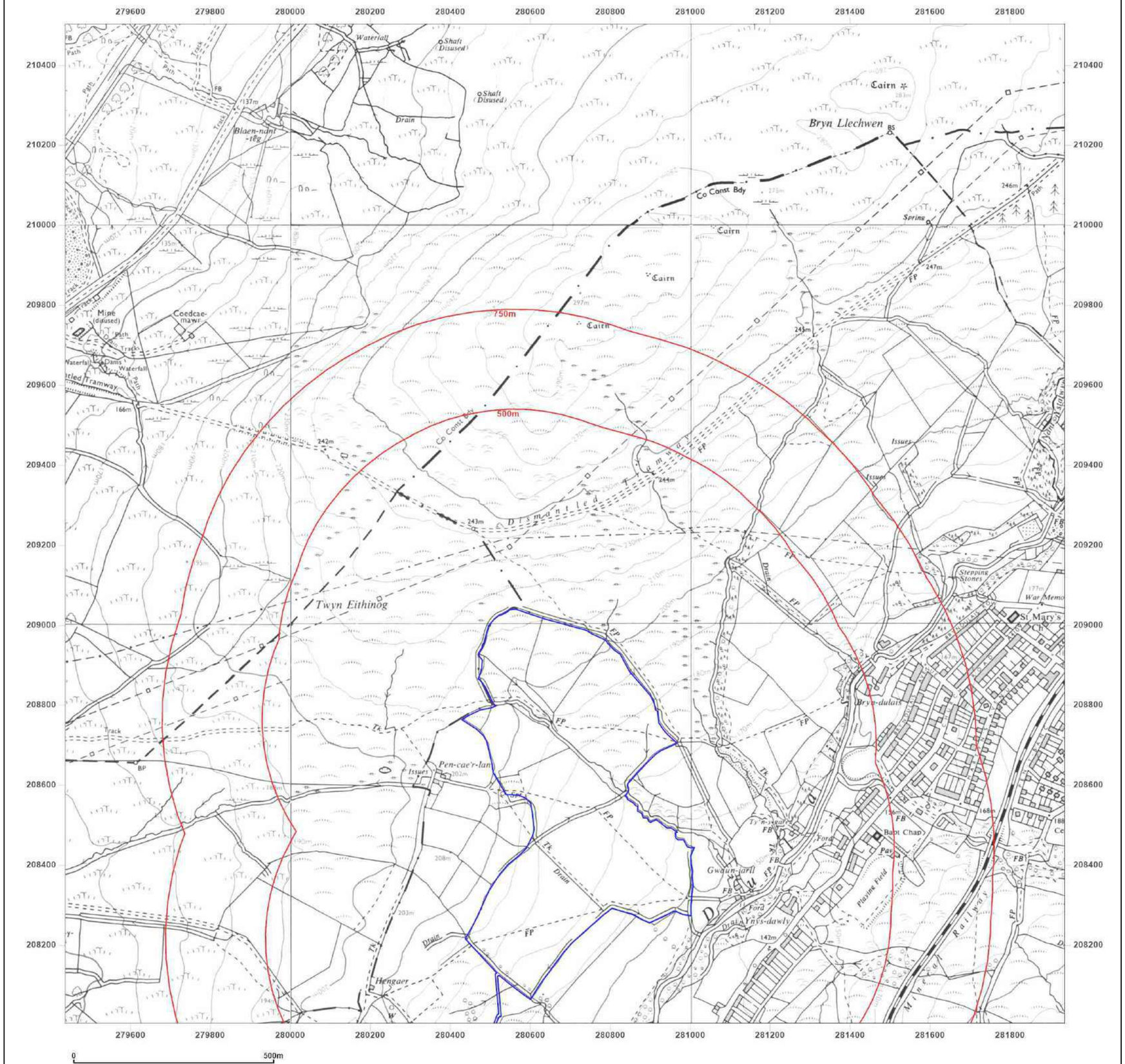
Production date: 24 January 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: National Grid

Map date: **1983-1988**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1985
Revised 1985
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Copyright N/A
Levelled N/A

Surveyed 1985
Revised 1987
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1975
Revised 1983
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1962
Revised 1988
Edition N/A
Copyright N/A
Levelled N/A

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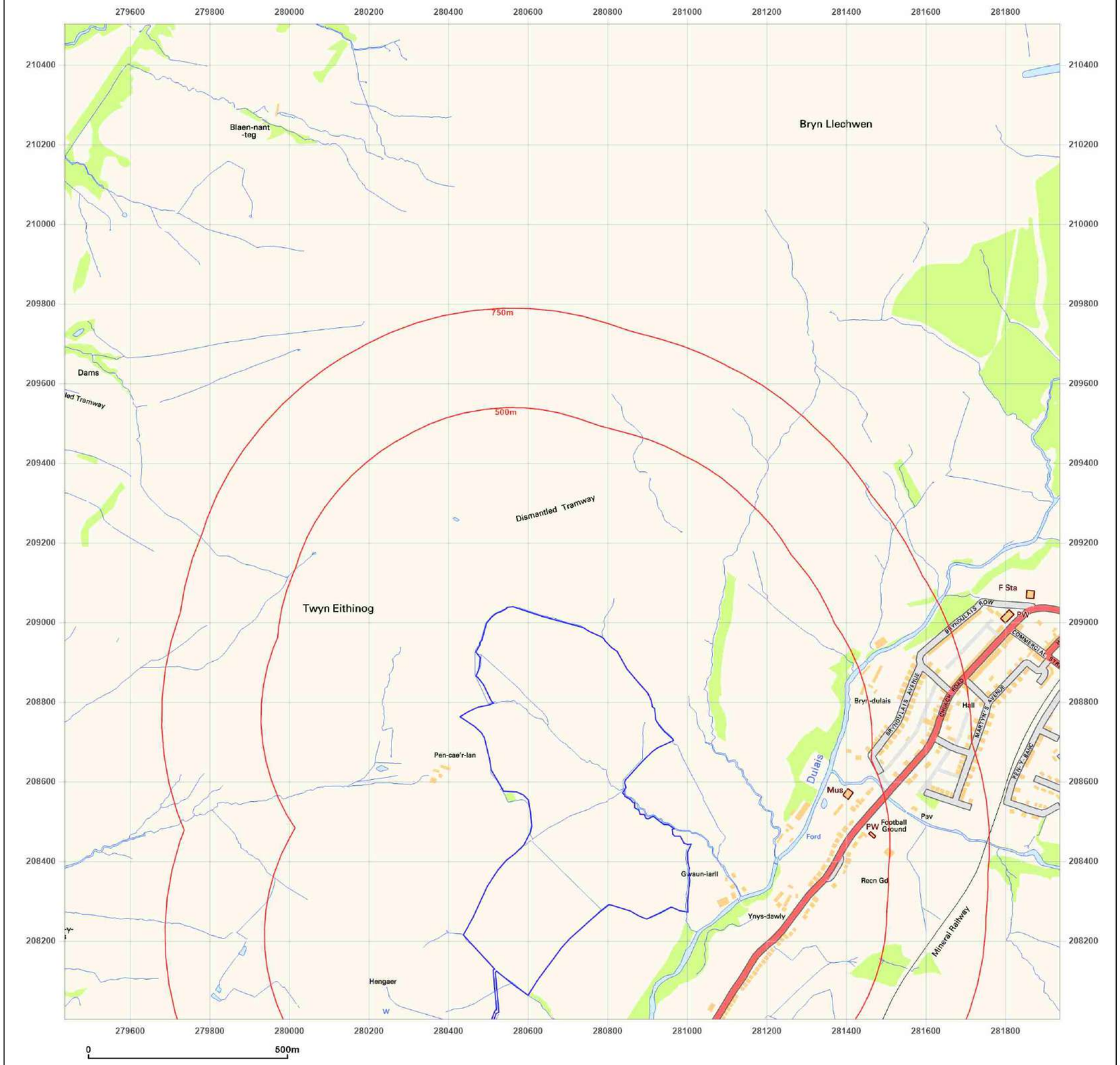
W: www.groundsure.com

Production date: 24 January 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

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2001

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Production date: 24 January 2024

Map legend available at:
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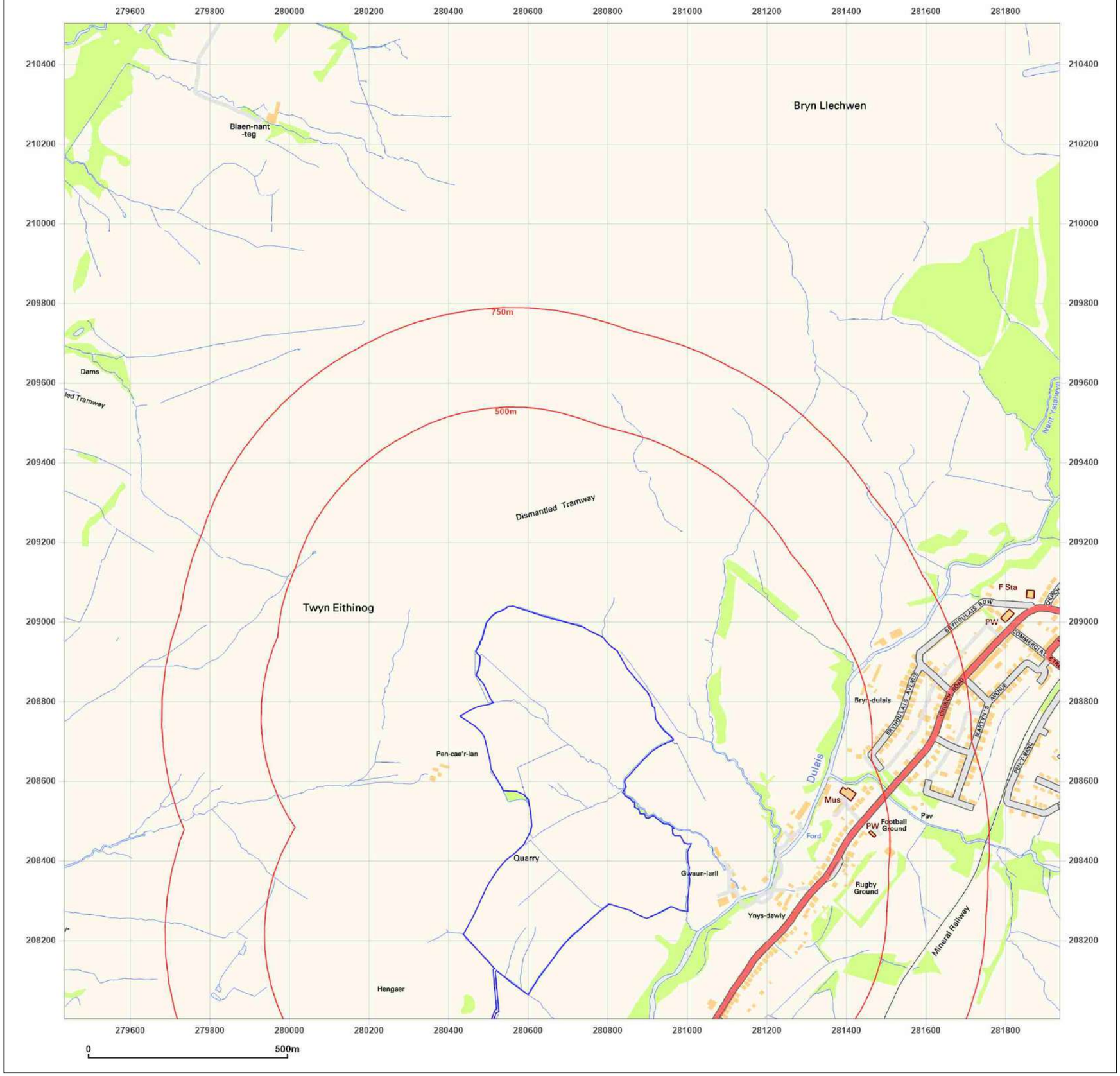

Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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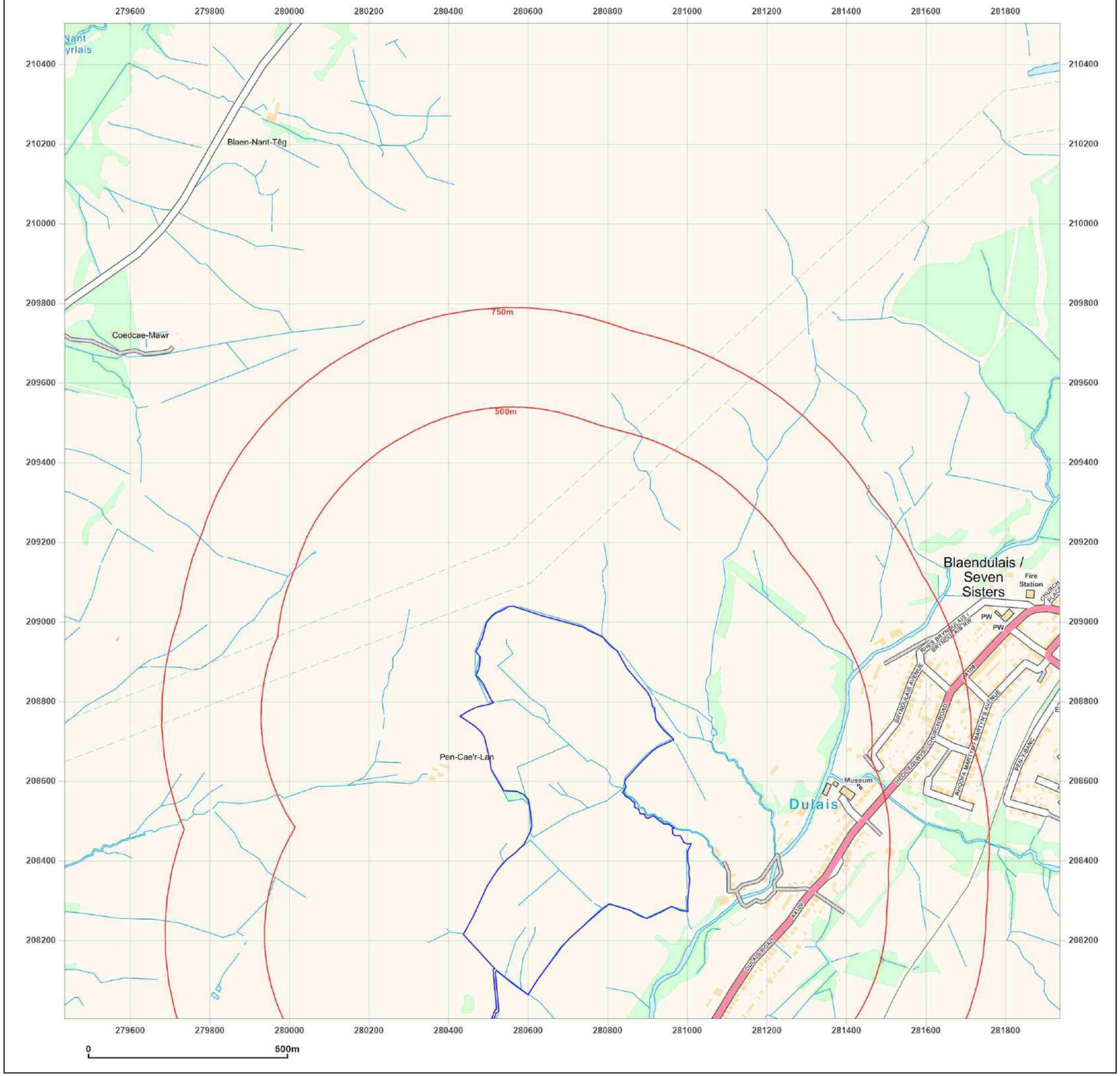
Production date: 24 January 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Site Details:

Seven Sisters

Client Ref: Seven Sisters
Report Ref: GSIP-2024-14480-16921_SS_1_2
Grid Ref: 280686, 209253

Map Name: National Grid

Map date: **2024**

Scale: 1:10,000

Printed at: 1:10,000

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2024

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E: info@groundsure.com
W: www.groundsure.com

Production date: 24 January 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

Appendix II

Copy of The Coal Authority's Mining Report, Reference No. 7100979911 5001

The Enterprise Centre,
Merthyr Industrial Park,
Pentrebach,
Merthyr Tydfil,
South Wales,
CF48 4DR.

BLANDFORD CONSULTING

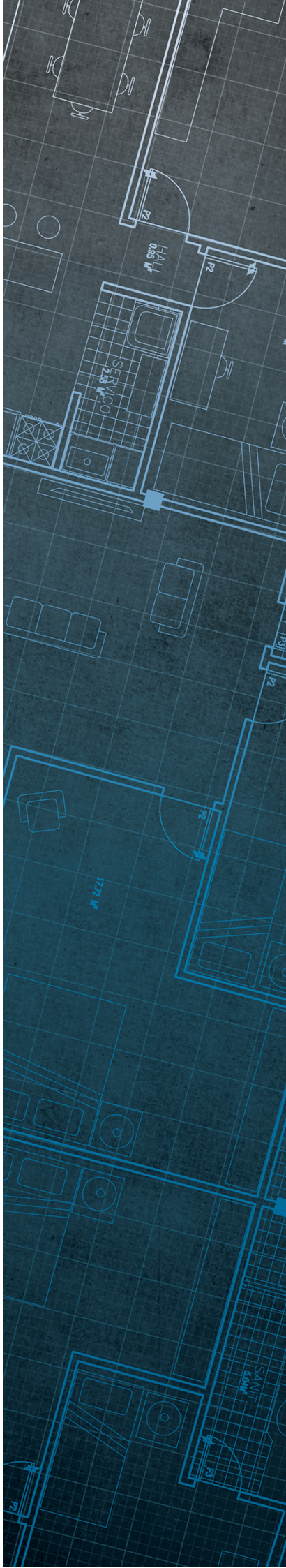
Geologists Working With The Environment....

The Coal Authority

Consultants

Coal Mining Report

Seven Sisters
Site



Date of enquiry:	**15 April 2024**
Date enquiry received:	**15 April 2024**
Issue date:	**15 April 2024**
Our reference:	**71009799115001**
Your reference:	

Consultants
Coal Mining Report

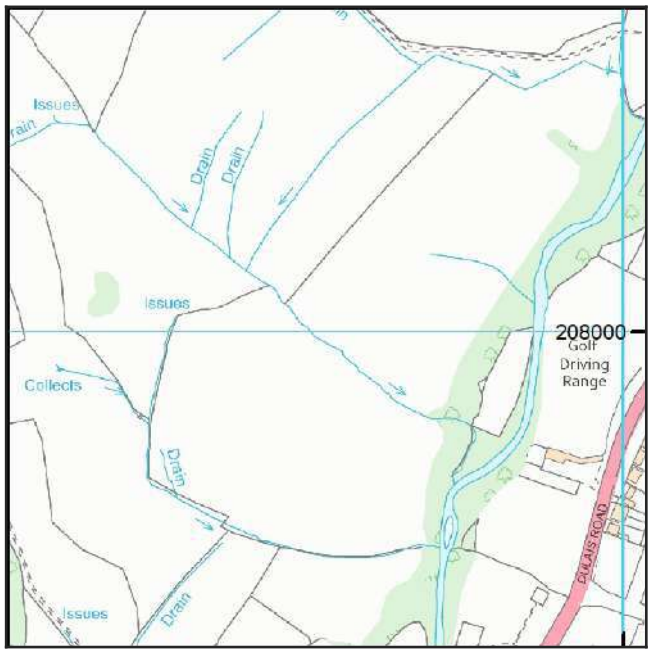
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

Earth Science Partnership

Enquiry address

Seven Sisters
Site



Approximate position of property

Map data

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

@coalauthority
/company/the-coal-authority
/thecoalauthority
/thecoalauthority

Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	ABERGORCHI	Coal	4GRB	32	North-West	6.6	South	100	1932
unnamed	ABERGORCHI	Coal	4I0K	42	South-East	5.2	South	100	1932
SEVEN SISTERS	LOWER SIX FEET	Coal	4T2J	178	Beneath Property	5.5	South	100	1927
unnamed	LOWER FOUR FOOT	Coal	4GHP	200	North	6.3	South-West	100	1968
unnamed	LOWER FOUR FOOT	Coal	4GHQ	207	North-West	6.3	South-East	100	1968
unnamed	LOWER NINE FOOT	Coal	4T2H	215	Beneath Property	5.9	South	190	1954
SEVEN SISTERS	LOWER NINE FOOT	Coal	4T2I	228	East	5.6	South	190	1897
SEVEN SISTERS	BUTE	Coal	4T2E	230	Beneath Property	5.8	South	110	1944
YSTRADGYNLAIS	LOWER NINE FOOT	Coal	4T2G	246	Beneath Property	4.1	North	180	1901
YSTRADGYNLAIS	BUTE	Coal	4T2D	247	Beneath Property	4.4	South-West	100	1938
unnamed	BUTE	Coal	4GHA	254	Beneath Property	5.4	South-West	150	1900
unnamed	LOWER NINE FOOT	Coal	4GHG	255	Beneath Property	3.3	South	200	1900
unnamed	BUTE	Coal	4T2F	255	East	6.0	South-West	110	1916
unnamed	BUTE	Coal	4GH8	267	Beneath Property	1.0	North	150	1900

Probable unrecorded shallow workings

None.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Adit	280206-013	280359 206905		Coal	
Adit	280207-006	280391 207904	This mine entry may have been partially or wholly excavated during past opencast mining	Coal	
Adit	280207-007	280392 207878	This mine entry may have been partially or wholly excavated during past opencast mining	Coal	
Adit	280207-008	280415 207862	This mine entry may have been partially or wholly excavated during past opencast mining	Coal	
Adit	280207-010	280291 207254	This adit was back-filled with clean stone (drainage pipes installed) by the Coal Authority in 2017	Coal	
Adit	280207-011	280542 207144	The adit entrance was permanently secured with a bolted steel mesh panel by the Coal Authority in 2017. The adit is open inbye of the steel panel for at least 30m	Coal	
Shaft	280207-025	280392 207888	This mine entry may have been partially or wholly excavated during past opencast mining	Coal	
Shaft	280207-028	280291 207210		Coal	
Adit	280207-031	280414 207888	This mine entry may have been partially or wholly excavated during past opencast mining	Coal	
Adit	280207-032	280425 207879	This mine entry may have been partially or wholly excavated during past opencast mining	Coal	
Adit	280208-013	280585 208795		Coal	
Adit	280208-014	280606 208769		Coal	
Adit	280208-015	280654 208735		Coal	
Adit	280208-016	280607 208448		Coal	

Abandoned mine plan catalogue numbers

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

SWT4107	SWR4025	SWA2817
SWR3731	12425	SW134
PO0	SWR1554	SWR751

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

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

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
ABERGORCHI	Coal	Yes	30.8	North-West	48
ABERGORCHI	Coal	Yes	Within	N/A	64
ABERGORCHI	Coal	Yes	Within	N/A	167
LOWER PENTRE	Coal	No	Within	N/A	104
LOWER PENTRE	Coal	No	15.3	North-East	160
LOWER PENTRE	Coal	No	Within	N/A	174
PENTRE RIDER	Coal	Yes	Within	N/A	130
PENTRE RIDER	Coal	No	Within	N/A	131
PENTRE RIDER	Coal	Yes	Within	N/A	154
UNNAMED	Coal	No	40.9	North-East	121
UNNAMED	Coal	Yes	Within	N/A	173
UNNAMED	Coal	No	Within	N/A	194
UNNAMED	Coal	No	Within	N/A	207
UPPER PENTRE	Coal	No	Within	N/A	125

Geological faults, fissures and breaklines

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

Faults under or close to the property recorded.

Opencast mines

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

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

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

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

Distance to site remediation (m)	Direction
25.3	North-East

See Section 4 for further information.

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

Status	Licence type	Distance (m)	Direction
Future	Underground	Within	N/A

See Section 4 for further information.

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 in an area where a notice to withdraw support was given in 1979.

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.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

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.

Remediated sites

The site is within an area of previous interest. It is close to where the Coal Authority has investigated and where necessary remediated mine entries and/or shallow coal mine workings following specific reported hazards.

The site requires further investigation and may influence your risk assessment. We recommend that you order the Coal Authority **Surface Hazards Incident Report**, which will include more information about the hazard.

Coal mining licensing

The report has highlighted that the site is close to a Coal Authority license area for coal mining operations. Please contact us if you require further information.

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. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

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

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

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

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

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

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

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

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

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

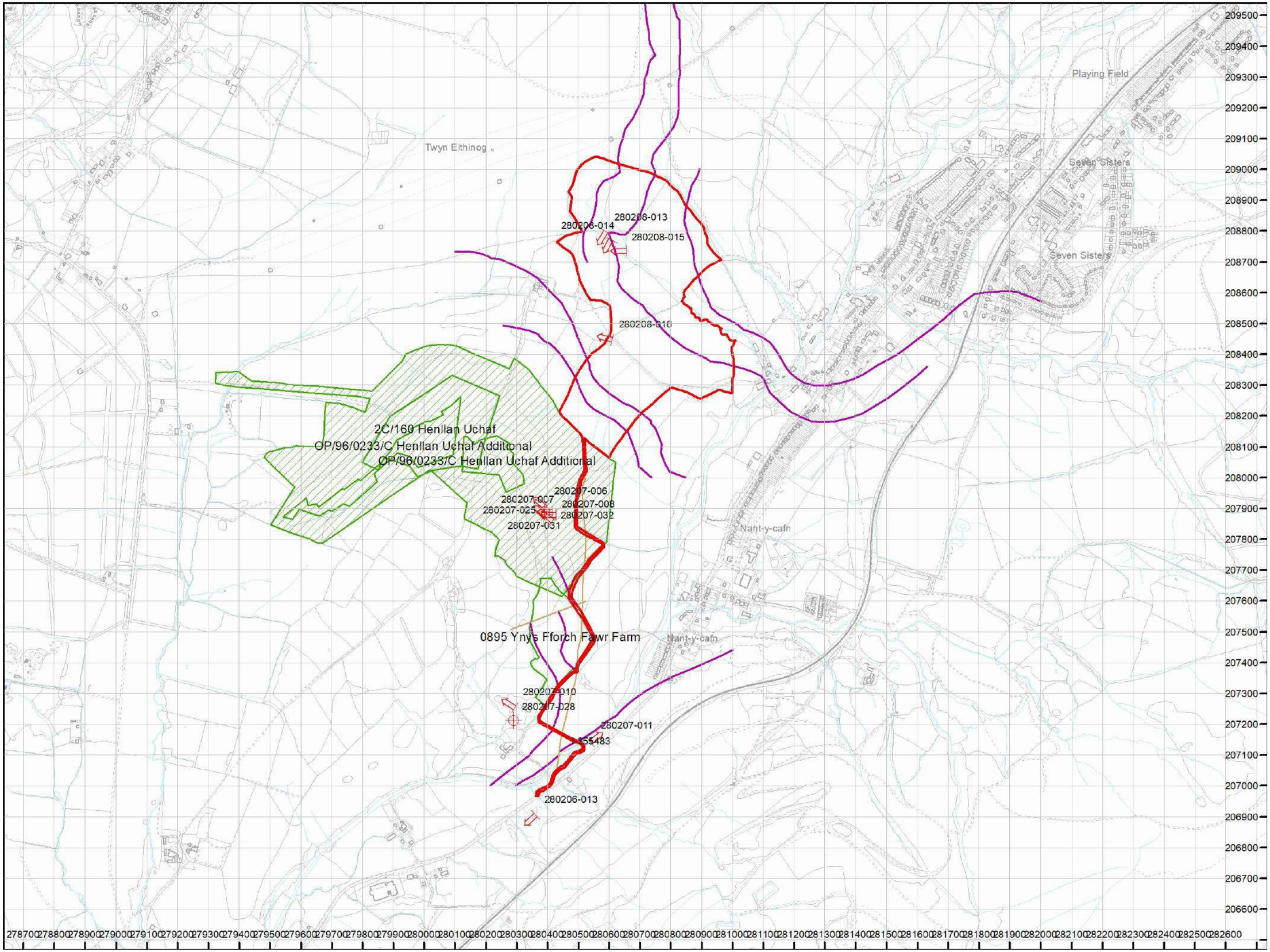
The Coal Authority

Summary of findings

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

Key

- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Disused adit
- Outcrop (Proven)
- Geological faults
- Opencast mine licence area
- Unlicensed opencast site
- Remediated sites



How to contact us
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www.groundstability.com

Appendix III

Copy of Mining Features Plans After Earth Science Partnerhip

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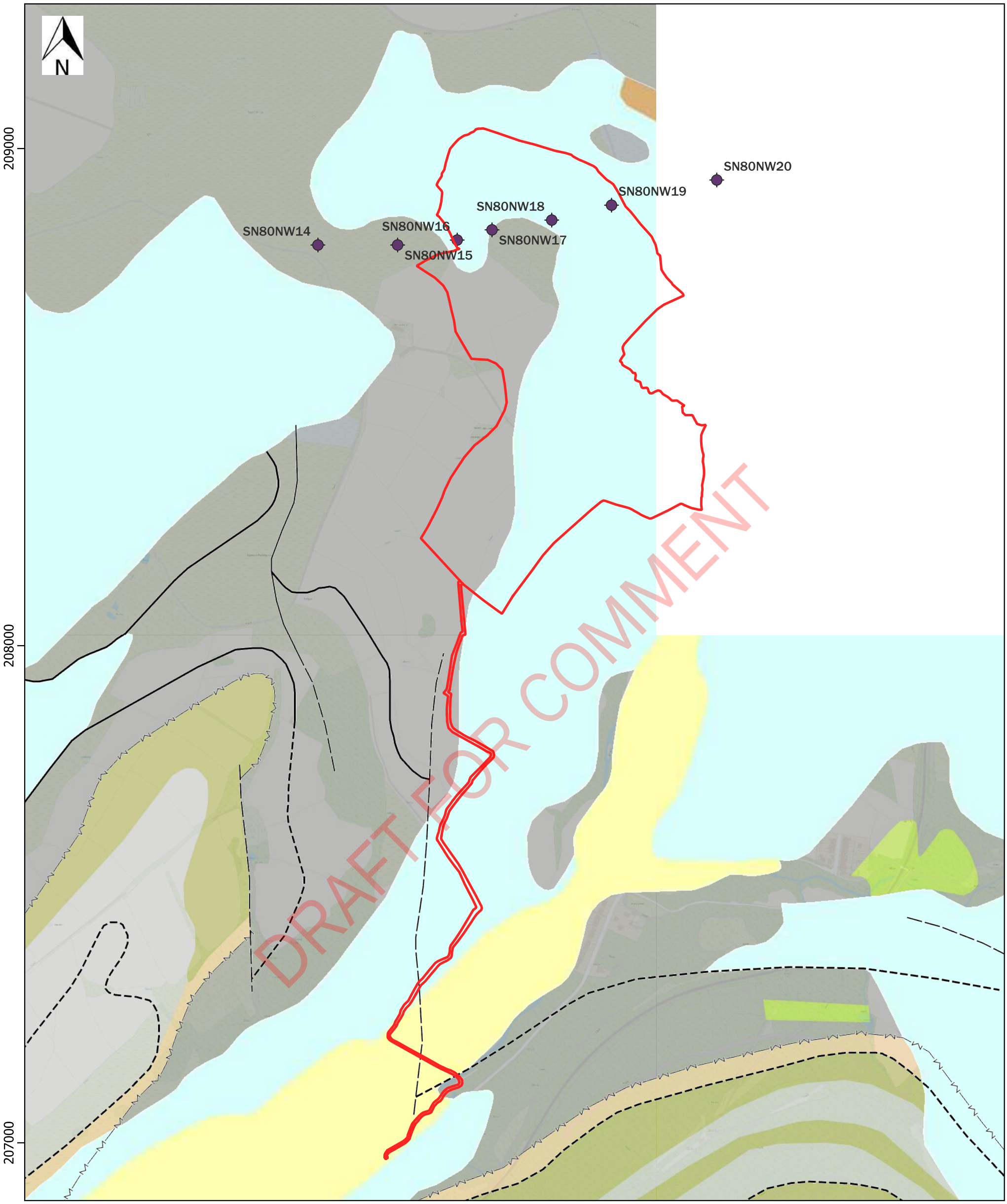
Merthyr Industrial Park,
Pentrebach,
Merthyr Tydfil,
South Wales,
CF48 4DR.

BLANDFORD CONSULTING

Geologists Working With The Environment....



Key:

- Site Boundary
- Coal Outcrop (Conjectural - dashed)
- Fault
- Middle Coal Measures Bedrock
- Glacial Diamicton
- Alluvium
- Peat

NOTES:
1. Do not scale from drawing. This drawing should be read in conjunction with all other associated project information.

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PROJECT NAME:	PROPOSED SOLAR DNS PEN CAER LAN FARM, SEVEN SISTERS		
REPORT REF:	ESP.8713.4045		
CLIENT:	GREENTECK INVEST (UK)		
FIGURE TITLE:	GEOLOGICAL SETTING		
FIGURE NO:	01	REV.:	01
DATE:	26/04/2024	SCALE:	1: 1,500
DRAWN BY:	EK	CHECKED BY:	HD

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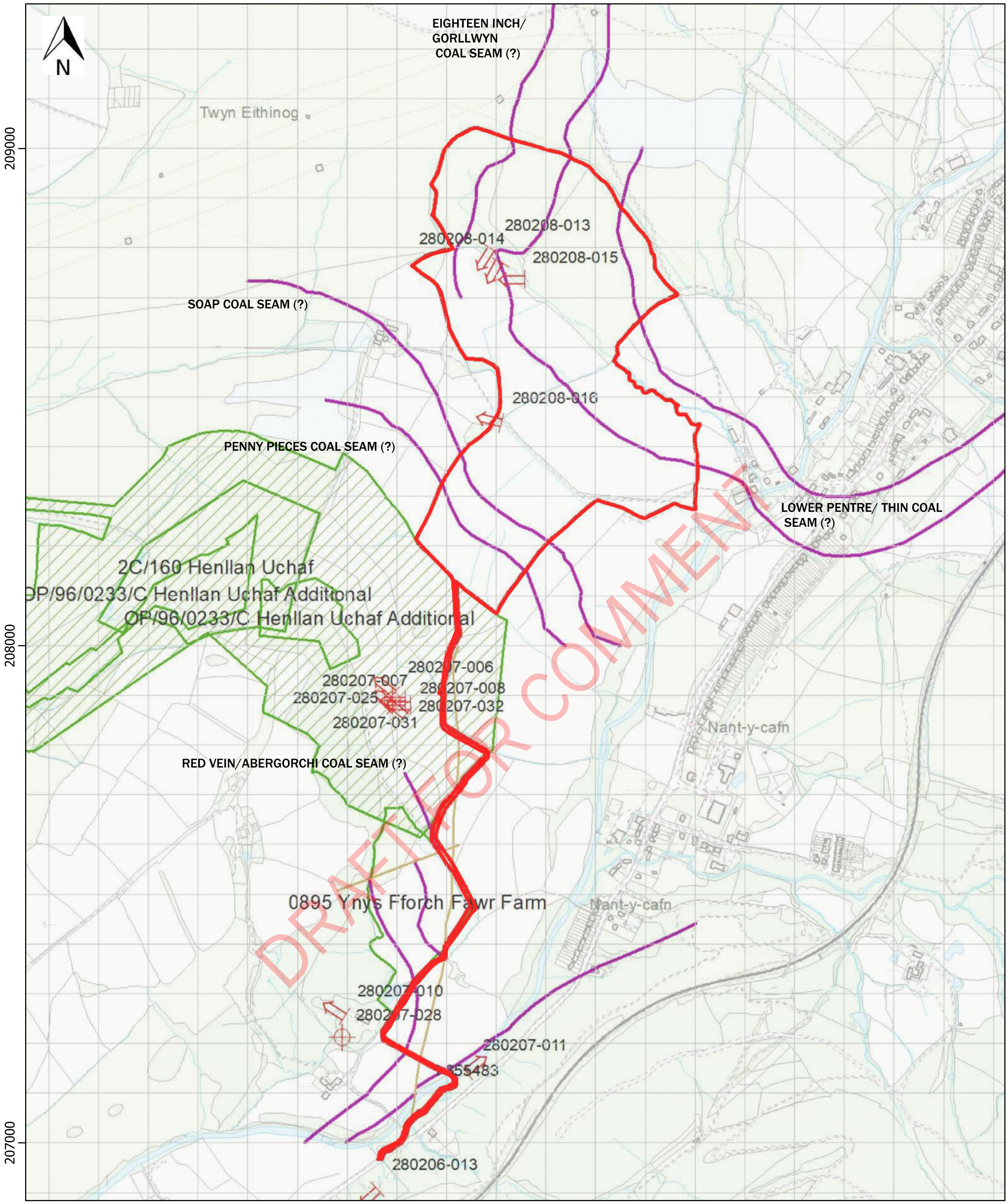
Cardiff CF15 7RB Tel: 029
2081 3385
enquiries@earthsciencepartnership.com



Key

- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Disused adit
- Outcrop (Proven)
- Geological faults
- Opencast mine licence area
- Unlicensed opencast site
- Remediated sites

NOTES:
1. Do not scale from drawing. This drawing should be read in conjunction with all other associated project information.

2. After Coal Authority Summary of Findings (MR-LARGE-PL0T-71009793985001-1705575802489).
Coal seam names provided by the Coal Authority (Jan 2024).

PROJECT NAME:	PROPOSED SOLAR DNS PEN CAER LAN FARM, SEVEN SISTERS		
REPORT REF:	ESP.8713.4045		
CLIENT:	GREENTECK INVEST (UK)		
FIGURE TITLE:	COAL MINING SETTING		
FIGURE NO:	02	REV.:	01
DATE:	26/04/2024	SCALE:	1: 7,500
DRAWN BY:	EK	CHECKED BY:	HD

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209000

N

No significant evidence of mine entry 280208-013 noted during visit. However, areas of collapsed ground were noted along the western river bank.

Possible spoil heaps noted east of the river near adit locations.

280208-014:
ESP observed adit location. Two adjacent adits located. Collapse of surrounding and overlying ground noted. See Plates 16 and 17.
Adit bearing - 275° West

280208-015:
ESP observed adit location. Appoximately 40cm coal band noted in outcrop. Collapse over overlying ground, including tree noted.
Fence on overlying slope fallen, indicating ground movement.
See Plates 12 to 14.

Concrete structures identified in stream.
See Plate 18.

Coal outcrops noted in stream.
See Plate 9.

Old Quarry Exposure:
Superfical deposits (Glacial Diamicton) over siltstone bedrock.
Pond now present in former quarry.
See Plate 8.

Rock Exposure in stream:
Bedrock exposed in steam comprises thinly laminated friable black/dark grey stained orange mudstone with ~10cm band of ironstone.

Possible thrust fault identied, with displacement ~20cm.

See Plate 20

Superifical deposits exposed in stream bank.

280208-013
280208-013
280208-014
280208-015
10°
280208-016
280208-016
10°
15°
280208-006

281000

Key:

- Site Boundary
- Approximate Spoil Heap
- Probable Mine Entries (ESP, 2024)
- Springs
- Bedrock Dip and Dip Direction
- Mine Entries (as reported by Coal Authority)

NOTES:
1. Do not scale from drawing. This drawing should be read in conjunction with all other associated project information.

PROJECT NAME:	PROPOSED SOLAR DNS PEN CAER LAN FARM, SEVEN SISTERS		
REPORT REF:	ESP.8713.4045		
CLIENT:	GREENTECK INVEST (UK)		
FIGURE TITLE:	SITE WALKOVER PLAN SOLAR FARM SITE		
FIGURE NO:	03a	REV.:	00
DATE:	29/04/2024	SCALE:	1: 3000
DRAWN BY:	EK	CHECKED BY:	HD

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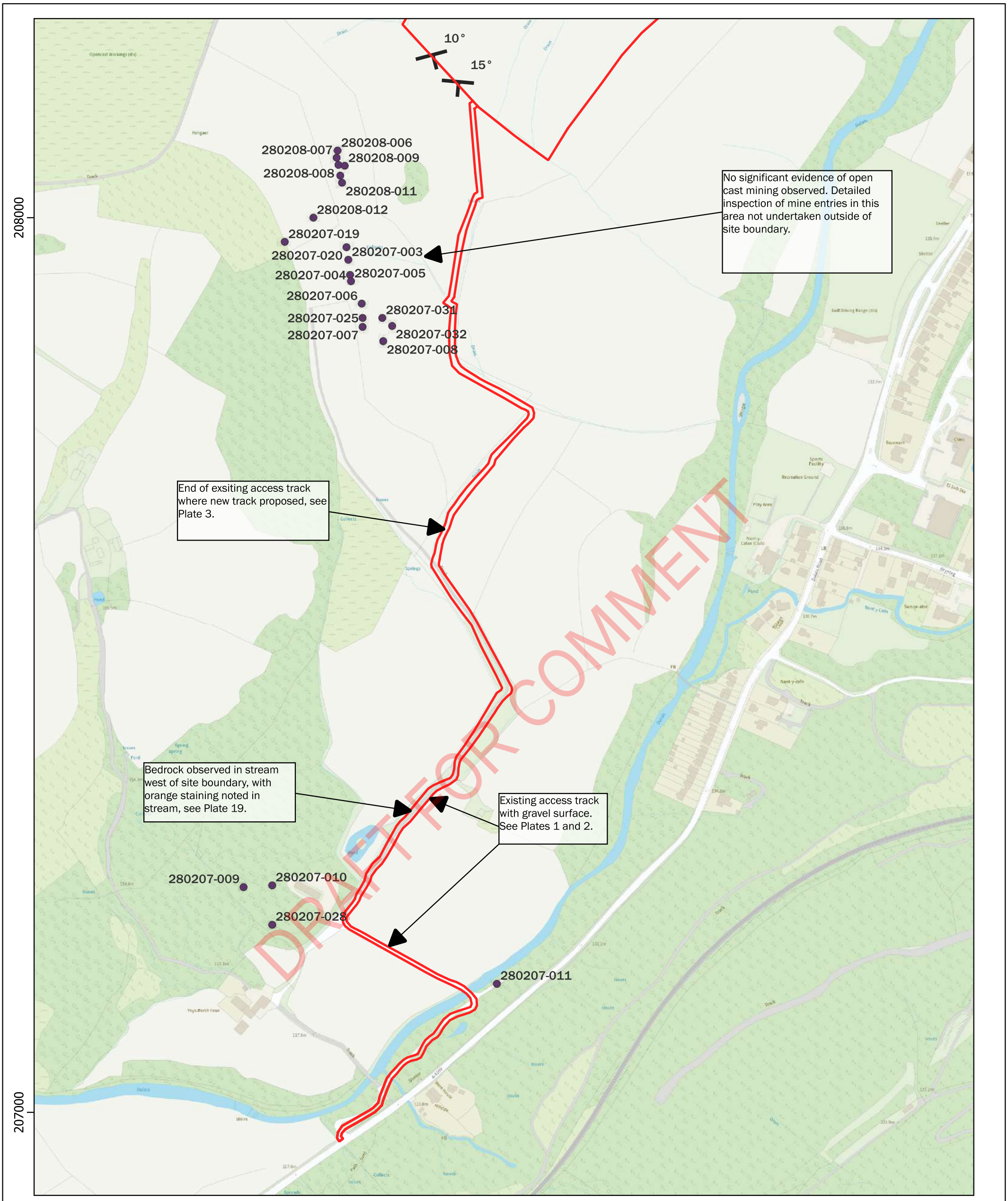

Key:

- Site Boundary
- Approximate Spoil Heap
- Probable Mine Entries (ESP, 2024)
- Springs
- Bedrock Dip and Dip Direction
- Mine Entries (as reported by Coal Authority)

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FIGURE NO:	03a	REV.:	00
DATE:	29/04/2024	SCALE:	1: 3000
DRAWN BY:	EK	CHECKED BY:	HD

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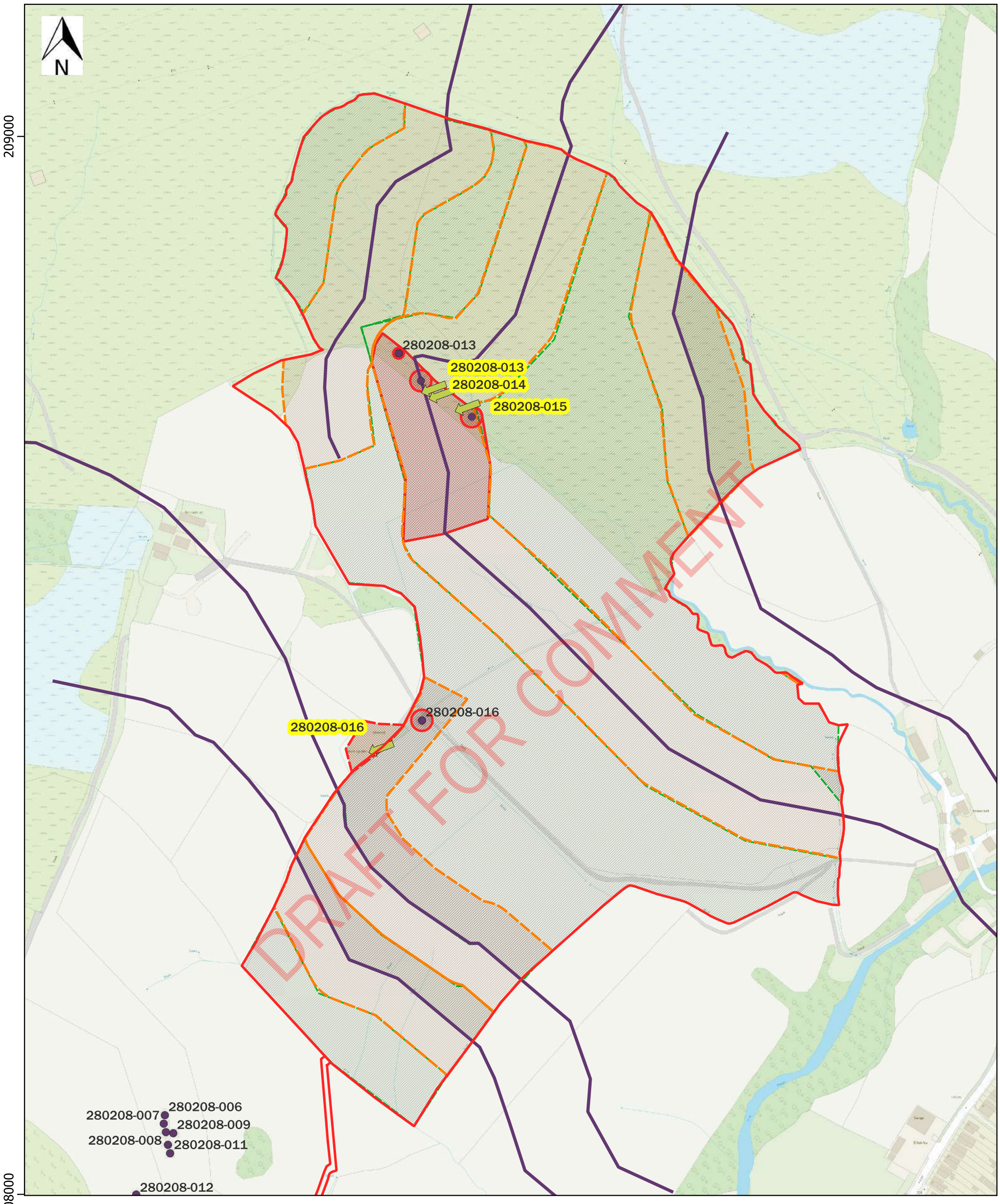

281000

Key:

- Site Boundary
- Coal Outcrop (Coal Authority)
- Mine Entries (Coal Authority)
- Probable Mine Entries (ESP, 2024)

Mining Risk Zones

- Risk Zone A
- Risk Zone B
- Risk Zone C

NOTES:

1. Do not scale from drawing. This drawing should be read in conjunction with all other associated project information.

2. Coal outcrops and mine entries reproduced from Coal Authority Consultants Report. (Appendix C). Adits visually observed by ESP are highlighted in yellow.

3. Preliminary Risk Zones are as desibribed in ESP Updated Coal Mining Risk Assessment report (Ref. ESP.8713.4045). Where Risk Zones are indicated either side of Coal Authority outcrop, this is to account for outcrop location discrepencies between CA plotted outcrops and site walkover observations. Classification and extent of risk zones to be confirmed through ground investigation (rotary drilling).

PROJECT NAME:	PROPOSED SOLAR DNS PEN CAER LAN FARM, SEVEN SISTERS		
REPORT REF:	ESP.8713.4045		
CLIENT:	GREENTECK INVEST (UK)		
FIGURE TITLE:	PRELIMINARY RISK ZONE MAPPING SOLAR FARM SITE		
FIGURE NO:	04a	REV.:	00
DATE:	29/04/2024	SCALE:	1: 3,500
DRAWN BY:	EK	CHECKED BY:	HD

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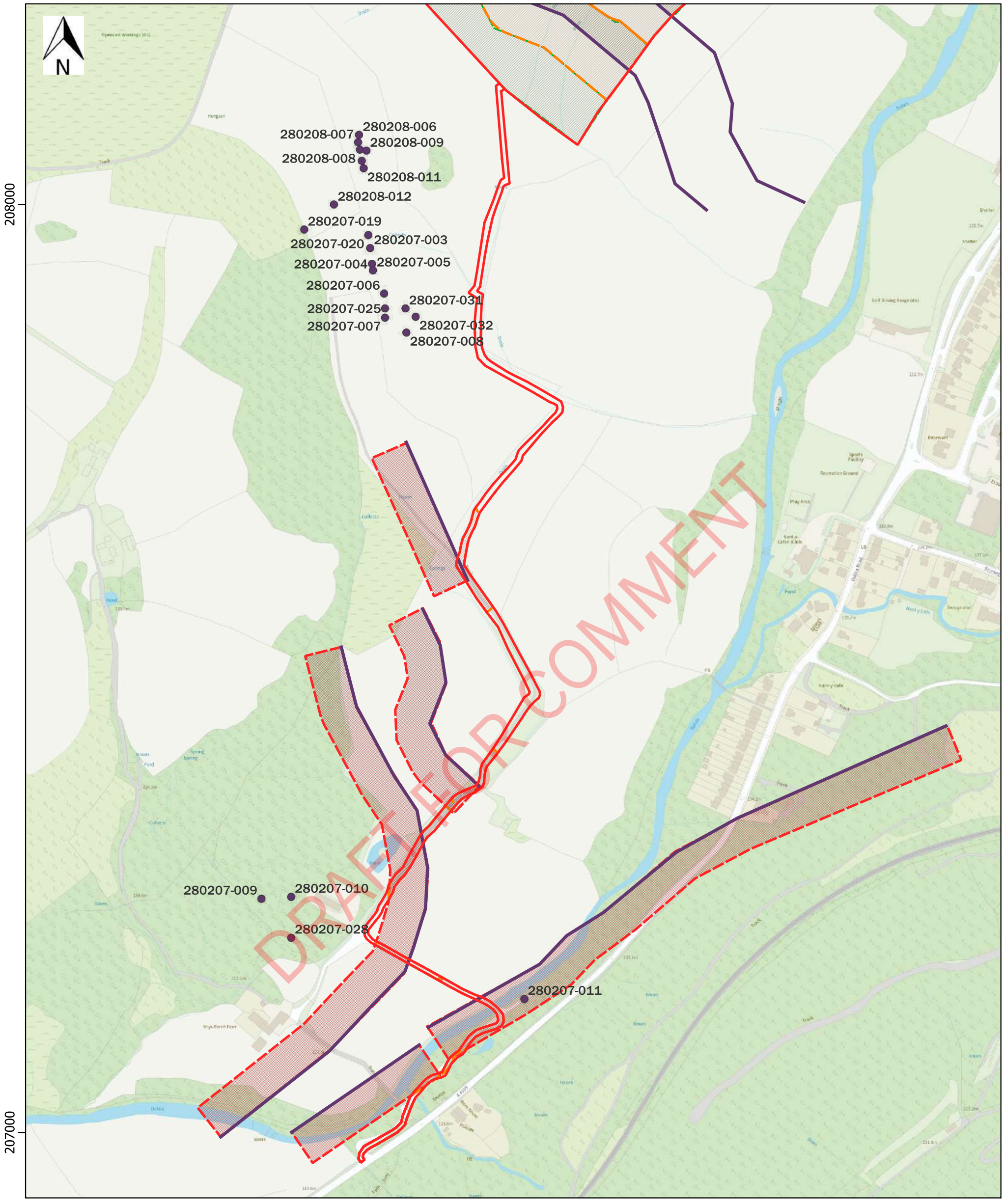

Key:

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- Coal Outcrop (Coal Authority)
- Mine Entries (Coal Authority)
- Probable Mine Entries (ESP, 2024)

Mining Risk Zones

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PROJECT NAME:	PROPOSED SOLAR DNS PEN CAER LAN FARM, SEVEN SISTERS		
REPORT REF:	ESP.8713.4045		
CLIENT:	GREENTECK INVEST (UK)		
FIGURE TITLE:	PRELIMINARY RISK ZONE MAPPING ACCESS ROAD		
FIGURE NO:	04b	REV.:	00
DATE:	29/04/2024	SCALE:	1: 4,000
DRAWN BY:	EK	CHECKED BY:	HD

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