

Ymgynghoriaeth Gwynedd
Consultancy

**Barmouth North Promenade
Outline Business Case**

Geotechnical desk study

Issue | 30 October 2018

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 264326

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4 The site

In addition to the published information which has been used to inform this desk study, a Groundsure Report [1] has been obtained for the site to provide additional information. The report has been included in Appendix D, however, the pertinent information is summarised within this report and the key features shown on Drawing 02.

4.1 Topography

A topographical survey has been completed in October 2018 along the promenade. As anticipated, the levels along the promenade are relatively flat. Typical levels are summarised below:

- Promenade footpath – 5.15mOD
- Top of wave wall – 5.8mOD
- Top of secondary wall – 5.65mOD
- Top of tertiary wall – 6.35mOD

It should be noted that towards the southern end of the site the height of the secondary and tertiary walls start to increase around Hoel Meirion street. Across the width of the promenade there is a gentle fall in gradient towards the coast.

There is no topographical information available for the stone revetment and beach.

Moving away from the coastline, the general topography remains relatively level up to around the location of the railway line. To the east of this the topography rises relatively steeply up a hillside.

4.2 Site history

4.2.1 Previous assessment of site history

A summary of the site history is presented in the 2014 PAR [2]. This is reproduced below as it provides a good summary of the early history of the town and development of the promenade, however, there is no reference to the sources of information used. The photos referred to in the text are reproduced in Appendix B.

“Like many other small seaside towns along the West Wales coastline, Barmouth was, up until the mid 1860’s, a commercially operational and successful port (see Photo 1), however the “face” of Barmouth changed dramatically with the arrival of the railway in 1867 (see Photo 2) and as a consequence the import and export trade together with the ship building trade steadily declined.

Although it is generally accepted that the advent of the railway brought about the end of the harbour trades, it proved a great catalyst in the onset of a new trade for Barmouth in the form of tourism. From a relatively genteel Georgian period, the

influx of tourists (the first train catering for tourism is reported to have had 1200 passengers on board) during the Victorian era generated an impetus to build many of the forms that dominate Barmouth's landscape to this day.

Somewhat differently to the seaside towns of Tywyn to the south and Pwllheli to the north it appears that the Barmouth frontage was never adorned with the grandeur of a Victorian "style" promenade. Although it appears that an informal frontage consisting of a variety of masonry and timber structures was built between the beach and the new seaside hotels and guest houses during the early part of this era (see Photo 3).

Not until the late 1920's did Barmouth Urban District Council, commission works to undertake construction of a new sea defence structure which generally is the predecessor of the existing defences. Storms during the late 1920's and early 1930's had rendered the existing defences almost to the point of dereliction, in particular the area which was developed most shoreward at the time at the Min y Mor Hotel. At this time no formal defences existed either to the north of this location or immediately south until the northern end of Marine Parade (see photos 4 and 5 below).

The contract to undertake the work was commenced in July 1930 by Demolition and Construction Co Ltd from London. The contract began with the construction of the timber groyne fields before progression to the formal concrete stepped and pitched stone revetment.

It may not have been apparent at the time of construction during the early 1930's that due to the volatility associated with the North Promenade area that future works would be inevitable to maintain the integrity of the structure, particularly considering that the new defences were being constructed seaward of the former defences along a length of frontage that was previously mobile. It transpired in the early 1950's that there was a consistent scouring and subsequent lowering of beach level along this section, probably attributable for the most part to the relatively vertical wall at the shoreward extent. This scour led to the undermining of the structure and partial collapse at some locations.

A contract to provide scour protection to the structure was added in 1956 in the form of a sheet pile toe. The exact method of construction is unknown, but it is reasoned that due to the short length of pile used at the time ("6ft to 8ft long") that the toe of the piles may have been cast into a concrete plinth and subsequently encased. The length of wall considered under the new contract spanned between Groyne No.25 in the south to Groyne 34 in the north, a distance of 576m and comparable with the length comprising the study area.

During the late 1960's and early 1970's a number of drowning fatalities occurred, in the area between the Bath House and the then Ynys y Brawd, known locally as the "Bar Bach" channel, due to the fast moving currents and eddying tidal conditions. It was also evident at the time that there was a progressive silting up of the main channel. As a consequence of these conditions and as an aid to general navigation in the harbour area a decision was taken to block off the existing channel by constructing a causeway linking the Ynys y Brawd island to the mainland. It is widely considered that the implementation of the causeway has

had a profound effect over time on the coastal processes along the frontage, with accretion of material being predominant at the southern extents.

The wave return wall that affords the uppermost level of protection along the frontage was constructed between 1972 and 1974, together with major refurbishment works to the timber groyne field and importation of shingle beach nourishment.

Since the major works during the early 1970's the frontage has required the letting of several smaller contracts to undertake remedial works, the main one of which was undertaken in 1984 to encase and restore the seawall profile, unfortunately the majority of the works failed due to a design fault and required further remedial work to rectify the situation which was undertaken in 1990.

Cyngor Gwynedd Council's then Coast Protection Unit, commenced regular inspection regimes along the frontage in 1996 and have utilised the information obtained to undertake a rolling programme of minor repairs to address the ongoing deterioration of the structures.

In March 2010 it was discovered that there was a void beneath the concrete slab at the north end of the promenade which further investigation revealed to be a large void requiring immediate attention. Emergency works were instigated and 208m³ of Easy Flow C3 concrete was placed to fill the void at a cost of £30k."

4.2.2 Historic OS maps

The historic OS maps obtained as part of the Groundsure Report have been reviewed and the site history is summarised below. Maps are available at 1:2,500 and 1:10,000 scale, however, it should be noted that full coverage of the site is not available for all of the dates stated below. The main constraints identified are shown on Drawing 02.

1837 ([3] 1:63360): The site itself is largely unoccupied and the extent of Barmouth to the south is relatively small. There are two watercourses crossing the site flowing from the hillside and discharging into the sea.

1887-89: The site is generally indicated to be beach and grassland. The Cambrian Railway Line is indicated to be present. A sewer pipeline is present and a sewerage tank is present circa 150m from the site. A gas works is present circa 200m to the south east of the site.

1900-01: The northern watercourse is shown to be ponding around the edge of the coastline. The gas works is no longer present, however, a second gas works is now present also approximately 150m to the south east of the site.

1938: The promenade is present. The two watercourses appear to have been culverted through the promenade. To the south of the site some land has been reclaimed by the construction of the promenade. The northern area of the site remains largely undeveloped.

1949: No significant change.

1978-81: The groynes along the beach and breakwater to south of site are indicated to be present (note this contradicts the aerial photographs which indicate the groynes are present on the earliest available photograph dated 1941). The majority of the housing in the southern part of the site is now present. The Mean High Waterline is now further away from the coastline in the south of the site which appears to be associated with the formation of the sand dunes.

1990-95, 2002: No significant change.

4.2.3 Aerial photographs

The aerial photographs for the site have been obtained from the Welsh Government Aerial Photography unit. 21no. aerial photographs have been obtained from 1941 through to 2009. The photographs are of various scale and quality and provide varying coverage of the site. Where review of the aerial photographs has provided additional information, these have been referred to in the relevant sections of this report.

4.2.4 Coastal processes

From review of the historic OS maps and aerial photographs, the following information has been obtained regarding coastal processes:

- Prior to the construction of the promenade, the historic OS maps from 1887 onwards indicate little variation in the alignment of the coast.
- The promenade is first shown on the 1938 historic OS map. As part of the construction of the promenade, some land was reclaimed to the south of the site.
- The groynes are not shown on the OS maps until 1976, however, they can be seen on the 1941 aerial photo and therefore it is anticipated they were constructed at a similar time to the promenade.
- Additional groynes are present on the 1976 aerial photograph. Prior to this date there was a greater spacing between some of the groynes. On the 1978 map the breakwater to the south of the site is present
- The 1976 aerial photograph is the first indication of a greater extent of beach / dunes to the south of the site. The groynes are no longer visible in this area and this may be as a result of them being buried. On the 1978 OS map the Mean High Waterline is further away from the coastline which appears to be associated with the formation of the sand dunes.

4.3 Published geology

The site geology has been determined from the 1:50,000 geological sheet [4]. The digitized version of the 1:50,000 geological map available from the BGS GeoIndex [5] is reproduced on Drawing 03 and Drawing 04. There is no available 1:10,000 geological map for the area.

In regards to the drift geology, along the promenade the superficial deposits are indicated to be Blown Sand. The BGS Lexicon describes these as ‘sand, pale brown, fine grained, uncemented sand’. The beach is indicated to be Coastal Zone Deposits (undifferentiated). The BGS Lexicon describes these as ‘shingle, gravel, sand, silt and clay, locally with peat layers; may be bedded or chaotic; from the coastal zone’. Storm Beach Deposits and Devensian Till are indicated to be present to the north of the site.

In regards to the solid geology, this comprises sandstones, mudstones and turbiditic siltstones, conglomerates and manganese ore beds of the Harlech Grits Group. There are no dip angles indicated on the map but based on the outcropping bedrock geology the bedrock appears to be dipping towards the east in the vicinity of the site. In regards to the component formations of the Harlech Grits Group, beneath the site is indicated to be sandstone and mudstone of the Rhinog Formation. The BGS Lexicon described this as ‘grey to bluish grey, thick bedded turbiditic sandstones, conglomerates and laminated sandstones, with thin siltstone and mudstones intercalations’. To the north of the site are interbedded siltstone and mudstone of the underlying Llanbedr Formation. To the south of the site is mudstone of the overlying Hafotty Formation.

The Mochras Fault is indicated to be present approximately 500m to the north west of the site which trends in an approximately north to south direction. A Manganese ore bed is present near the base of the Hafotty Formation to the south of the site.

In regards to the potential for running sands, the Blown Sand is classified as low potential and the Coastal Zone Deposits as moderate potential by the BGS [1].

There are no recorded landslides or mass movements along the coastal frontage of the site [1].

4.4 Previous ground investigation

Previous ground investigation information has been provided by YGC. Based on the information provided to date, it appears the purpose of the ground investigation was as follows:

- Cores to investigate the thickness of the concrete pavements of the promenade and a dynamic probe test, typically to around 1.5m depth unless shallow obstructions were encountered. Dynamic probe tests are typically undertaken to determine CBR values, however, it is understood the primary purpose of the probing was to investigate potential voiding. No evidence of voiding was identified from the 11no. dynamic probe tests completed.
- Trial pits to investigate the existing sheet pile cut off and obtain measurements of section thickness.
- Particle Size Distribution (PSD) testing of the beach deposits to inform assessment of longshore drift.

This ground investigation was therefore for targeted purposes and does not provide information on the wider ground conditions and engineering properties.

No other historic ground investigation has been identified from the BGS GeoIndex [5] or Arup archives.

4.5 Mining

The site is not within an area impacted by coal mining. There are no mine entries, shallow or surface mine workings, coal outcrops within the vicinity of the site [6]. No coal mining activity was identified by the Groundsure Report within 1000m of site.

In regards to non-coal mining activities, the BGS [1] classifies the site itself as an area ‘unlikely’ to have been subject to historic mining activities. There is an area to the south and east of the site which has been classified as ‘likely’ and ‘highly likely’ to be subject to mining of vein minerals. The assessment of likelihood indicates this is an area where ‘underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered’. The location of this area corresponds with the magnesium vein shown on the geological map (see Section 4.3).

The Arup Review of Mining and Instability in Great Britain [7] indicates a similar area has been subject to metalliferous mining. The Mining Area Schedule entry is included in Appendix C and is summarised below:

- Minerals worked: Carbonates and silicates of manganese, some copper mines.
- Access and working method: Narrow open cut and day levels.
- Dates: 1892 – 1928.
- Output: 40,000 tonnes.
- Geology: Harlech Beds bedded deposit 0.25m-0.5m thick in mudstone and skates.
- General comments: Near surface ores first exploited in 1892 for glass making. Output boosted by the Russo-Japanese war until 1908. No output from 1908-13, after which WWI stimulated demand. The last mine was abandoned in 1928. The country rock is very hard above and below the ore bed and the beds dip at 30-40° which made mining difficult.

From the historic maps there are a number of levels and entrances indicated to be present to the east of the site further up the hillside. The closest being a number of old levels approximately 400m to the east of the southern end of the site.

4.6 Hydrology and hydrogeology

The promenade fronts on to the Irish Sea. Two watercourses are aligned through the site as shown on Drawing 02. Both flow from the hillside to the east of the site and are culverted beneath the site. The northern watercourse discharges directly on to the beach from the promenade structure. The southern watercourse is within an exposed pipeline for a distance of some 35m from the promenade. The Mawddach Estuary is located approximately 800m to the south of the site.

The aquifer designation and groundwater vulnerability classifications for the different geological units has been obtained from the BGS GeoIndex [5] and are summarised below.

Table 1 - Summary of aquifer and vulnerability classifications

Geological Unit	Aquifer Designation	Groundwater Vulnerability
Superficial deposits – Blown Sand	Secondary A	High
Superficial deposits – Coastal Sand Deposits	Secondary Undifferentiated	
Bedrock (all)	Secondary A	High

There are no recorded source protection zones or potable water abstraction licenses within 500m of the site [1].

4.7 Sensitive land uses

The sea and estuary to the south of the site are designated as a Special Area of Conservation known as the Llyn Peninsula and the Sarnau. The estuary is also designated as a Site of Special Scientific Interest [1].

4.8 Potential for contamination

The following historic industrial sites [1] are recorded within 100m of the site as shown on Drawing 02:

- Sewerage pipe
- Electricity substation

The following environmental permits, incidents and registers [1] are recorded within 100m of the site as shown on Drawing 02.

- Pollution incident in 2014 – undefined
- License discharge content for sewerage – Sewerage storm overflow from 2005 to present., however, it should be noted that the sewer pipe is present on the 1887 historic OS maps.

One historic landfill [1] is recorded within 500m of the site as shown on Drawing 02. The historic landfill received industrial and household waste, first recorded 1967 and license surrendered in 1985. There is no definitive evidence of the landfilling on the aerial photographs at the indicated site of the landfill from the Groundsure Report or in the surrounding area. There is potentially an error in the location of the landfill shown from the Groundsure Report as this clashes with the alignment of the Cambrian Railway Line which predates the landfill. On the aerial photographs there is scarring on the landscape to the east of the landfill location on the 1961, 1971 and 1976 photographs. This scarring on the landscape could be indicating earth movements and landfill activities, but no definitive conclusions can be drawn.

No significant current industrial land uses have been identified within 100m of the site from the Groundsure Report.

4.9 Asset inspection and condition

No site inspection has been undertaken by a geotechnical engineer as part of this desk study, however, a site inspection has been undertaken by Arup on 21st September 2018. The findings of the inspection are presented in the Existing Coastal Defences and Structures Review note by Arup. This also includes a review of all of the available drawings and historic inspection records and therefore review of this information is not duplicated as part of this desk study.

5 Engineering considerations

Scheme options have yet to be developed at the time of writing of this report and therefore it is not possible to provide particular geotechnical considerations specific to these options. However, based on the findings of this study, the following general geotechnical considerations are relevant to the project:

- Risk of wash out: The geological map indicates the superficial deposits along the alignment of the promenade comprise Blown Sand. The historic drawing (see Appendix A) indicates that 'sand' fill was placed beneath the Promenade to raise the ground level and this is likely to be locally sourced. Sandy soils are generally highly susceptible to wash out, particularly if they have a low fines content (silt and clay). If there was a failure of any part of the promenade structure which resulted in the exposure of the sand fill, this could result in a rapid progressive failure of the defence during high tide or a storm event.
- Sheet piles: Reference should be made to the Existing Coastal Defences and Structures Review note by Arup for further details on the condition of the sheet piles, however, in summary they are corroded. It is envisaged that their purpose is to act as a cut off measure to prevent undermining and washout of soil beneath the promenade and do not provide foundation support to the structure. Eurocode 3 [8] provides recommendations on loss to sheet pile sections for design purposes. For an intertidal environment, it indicates a loss in section of 2.6mm from both sides after 75 years, which is the approximate age of the sheet piles.
- Reduction in beach level: Based on the inspection by Arup, the beach level was low in certain areas which had resulted in exposure of the sheet piles. Under these conditions, the sheet piles are acting as a retaining structure supporting the soil beneath the promenade. As the beach level in front of the sheet piles reduces, the passive resistance provided by the ground also reduces. There is a risk that should the beach level drop further, the sheet piles and ground supporting the promenade could fail. It should be noted that the tops of the sheet piles are anchored to the revetment structure which will provide additional support to the sheetpiles, however, the connections are corroded.

- Potential for voids: Based on the inspection by Arup, voids were observed in certain areas. In addition, there may be other areas of hidden voids. Should the voids become of sufficient size, this could result in a sudden collapse of the overlying ground and promenade structure. This would pose a health and safety risk and also should the collapse coincide with a storm event further progressive failure could occur as a result of further wash out.
- Variation in ground conditions around historic watercourses: Two historic watercourses, including one with an associated area of ponding water, were present beneath the promenade. The watercourses have been culverted through the promenade and the existing channels backfilled. This could have created a localised variation in the ground condition and the potential for variation in seepage, erodibility, strength and settlement properties.
- Mining: An area to the south east of the site has been identified as being mined historically. Depending on the scheme proposals and its proximity to area of historic mining, the scheme could be impacted by the effects of historic mining.
- Potential for contamination: There is the potential that the soils within the site contain elevated levels of contaminants which have the potential to harm both personnel and the environment. A number of potential sources of contamination have been identified by this desk study as summarised in Section 4.8. Should the contaminated soils be disturbed by any constructions works consideration will need to be given to offsite disposal costs, impact on groundwater, impact on surface water, risk to construction workers and risk to site users.

6 Recommendations

The following recommendations have been made for potential further work, the exact scope and need will be dependent upon the scheme proposals:

- The source of the site history developed as part of the 2014 PAR [2] are clarified with the authors of the report. The original sources of information may of use should the scheme proposals change and to inform any assessment of the existing defences.
- A site walkover is undertaken by a geotechnical engineer. The primary purpose of this would be to review the risks identified by this desk study; inspect the existing defences and surrounding site and inform any required ground investigation proposals.
- Further study, investigation and risk assessments may be required regarding the historic mining in proximity of site. The need for such works will be dependent on the scheme proposals.
- Ground investigation will likely be required to inform the design of any remedial works undertaken. The scope of investigation will be dependent on the preferred option, but the main objectives of the ground could include the following:

- Establish the ground conditions and their engineering properties along the promenade
- Establish the groundwater conditions along the promenade
- Undertaken geo-environmental sampling and subsequent assessment to inform risk to the environment, risk to site users and offsite disposal.
- The potential localised variation in ground conditions around the historic watercourses.
- Investigate potential mining activity within the area.
- In addition to the above, further investigation of the existing promenade structure may be required to confirm its conditions, geometry and any required engineering assessments. Elements which may require investigation are as follows:
 - Investigate the potential for voiding beneath the revetment and promenade which may comprises a combination of geophysical and intrusive techniques
 - Depth, condition and ground conditions for the sheet piles
 - Depth, condition and ground conditions for the precast concrete piles
 - Foundation details of the wave wall, secondary and tertiary walls
 - Structural coring of the walls and revetment

References

- [1] Groundsure (2018) GeoInsight, EnvironInsight and MapInsight Reports, Ref. GS-5539749, 17th October.
- [2] Martin Wright Associates (2015) Project Appraisal Report, Barmouth North Promenade, March
- [3] Vision of Britain, Historical Maps, Accessed October 2018 [<http://www.visionofbritain.org.uk/maps/>]
- [4] British Geological Survey of Great Britain (1982) Harlech, Sheet 135, 1:50,000 series.
- [5] British Geological Survey, Engineering Geology Viewer, Accessed October 2018 [<http://mapapps.bgs.ac.uk/engineeringgeology/home.html>]
- [6] The Coal Authority, Online interactive map viewer, accessed October 2018 [<http://mapapps2.bgs.ac.uk/coalauthority/home.html>]
- [7] Arup (1990) Review of Mining Instability in Great Britain for the Depart of the Environment, Wales Region, July.
- [8] BSI Standards Publication (2012) UK National Annex to Eurocode 3: Design of steel structures, Part 5: Piling, NA+A1:2012 to BS EN 199305:2007

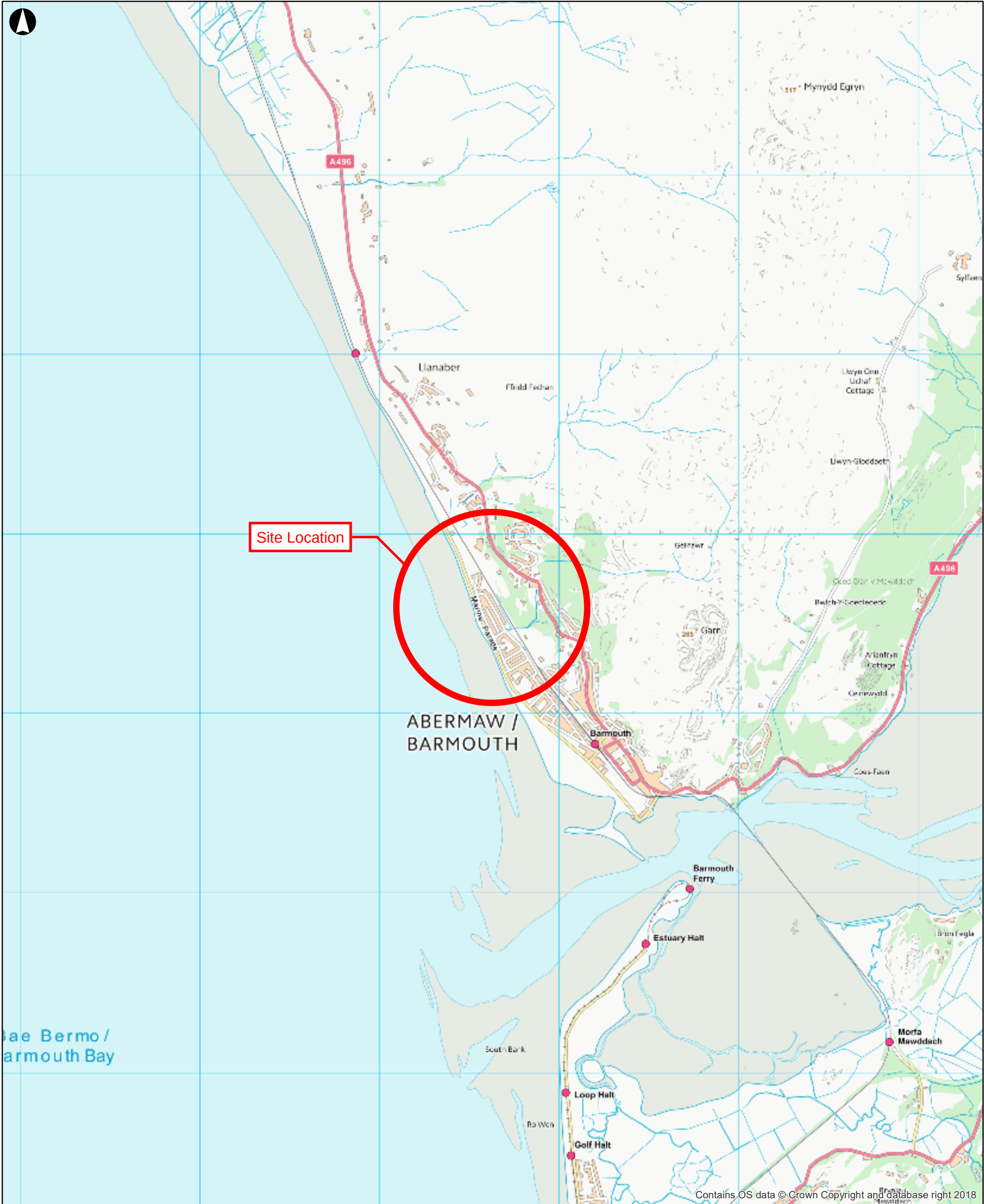
Drawings

Drawing 1 Site location

Drawing 2 Site layout and constraints plan

Drawing 3 Geology – superficial deposits

Drawing 4 Geology – bedrock



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Barmouth Bay

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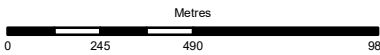
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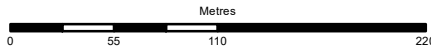
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Site layout and constraints plan

Scale at A3
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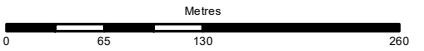
Approximate extent of desk study area

Legend

- Blown Sand
- Coastal Zone Deposits
- Devensian Till
- Storm Beach Deposits
- Site

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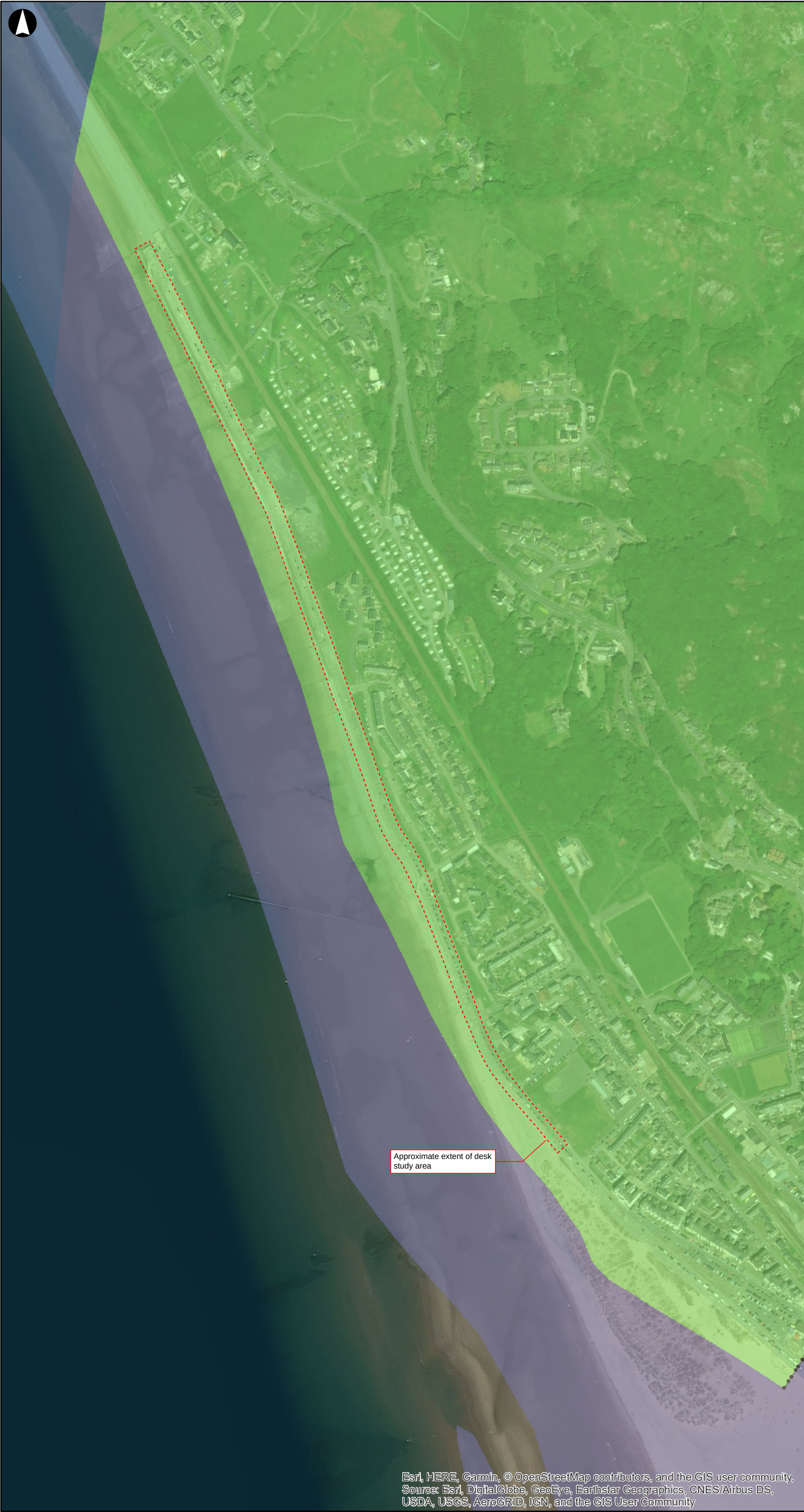
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Geology - superficial deposits

Scale at A3
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Drawing No 02	Issue P1

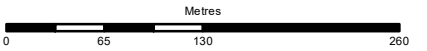
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- Legend**
- Rhinog Formation
 - Llanbedr Formation
 - Hafotty Formation
 - Harlech Grits Group (undifferentiated)
 - Site

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Geology - bedrock

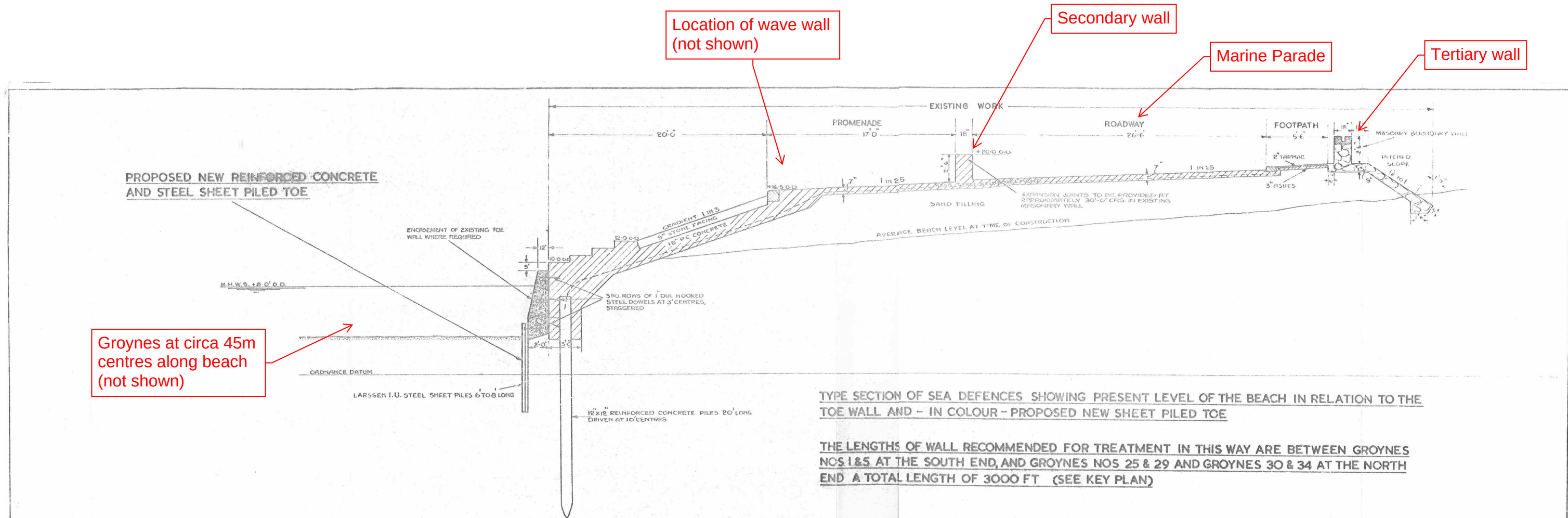
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Appendix A

Historic cross section



BARMOUTH URBAN DISTRICT COUNCIL — SEA DEFENCES

SCALE: 1/4 IN. TO 1 FT.

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122, VICTORIA STREET
WESTMINSTER. S.W.1.

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Appendix B

Historic site photographs from
2014 PAR

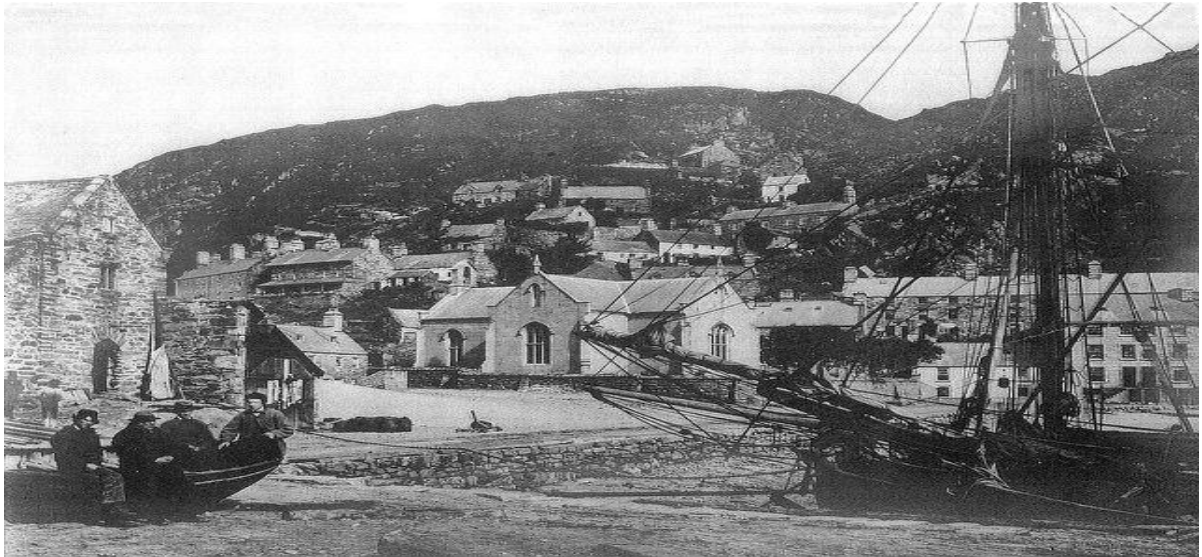


Photo 1. Harbour area circa 1860, note the absence of the railway viaduct in the background.



Photo 2. The arrival of the Aberystwyth and Welsh Coast Railway in 1867.



Photo 3. The "promenade" from the beach Circa 1880.

- 2.2.7 Not until the late 1920's did Barmouth Urban District Council, commission works to undertake construction of a new sea defence structure which generally is the predecessor of the existing defences. Storms during the late 1920's and early 1930's had rendered the existing defences almost to the point of dereliction, in particular the area which was developed most shoreward at the time at the Min y Mor Hotel. At this time no formal defences existed either to the north of this location or immediately south until the northern end of Marine Parade (see photos 4 and 5 below).



Photo 4. Defences extending towards the northern end of Marine Parade.



Photo 5. Showing northernmost defences to Marine Parade.

Appendix C

Mining Entry Schedule

REVIEW OF MINING INSTABILITY IN GREAT BRITAIN
For the Department of the Environment

Mining Area Code	34M41
Region	W
County	34

MINING AREA SCHEDULE

MINING AREA NAME		MEIRIONNYDD MANGANESE BELT
DISTRICT(S) AFFECTED		Meirionnydd
10km GRID SQUARE(S) AFFECTED		SH53, 61, 62, 63
MINING DATA	Minerals worked	Carbonates and silicates of manganese, some copper mines
	Access methods	Levels
	Working methods	Narrow open cut and day levels
	Output and dates	1892 - 1928, total output circa 40,000 tonnes
	Drainage	
	Geology	Scree or Glacial Drift. LOWER CAMBRIAN, Harlech Beds Bedded deposit 0.25m-0.5m thick in mudstones and slates
SUBSIDENCE RECORD	Incidents traced	
	Damage / injury	None Known
	Remedial works	None Known
REFERENCES (Key Reference first)		20042, 20078, 20036

COMMENTS

Ore 29% Mn (low), 25% silica (high). Near the surface the ores have decomposed to pyrolusite which was first exploited for glass making in 1892.

Output boosted by the Russo-Japanese war until 1908. No output from 1908-1913, after which the first World War stimulated demand. The last mine was abandoned in 1928. Interest shown in 1957 but no work done.

The country rock is very hard above and below the ore bed, many areas are overlain by deep deposits of scree or glacial drift and the beds dip at 30°-40°. These factors made mining difficult. Coupled to this the low grade of the ore and inaccessibility of the country make further exploitation of the huge reserves most unlikely in the near future.

Appendix D

Groundsure Report



Ove Arup & Partners International Ltd
4, PIERHEAD STREET,
CAERDYDD, CF10 4QP

Groundsure Reference: GS-5539748

Your Reference: 264326

Report Date 17 Oct 2018

Report Delivery Method: Email - pdf

Enviro Insight

Address: Barmouth Northern Promenade,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Enviro Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
Groundsure Enviroinsight

Address: Barmouth Northern Promenade,
Date: 17 Oct 2018
Reference: GS-5539748
Client: Ove Arup & Partners International Ltd



Aerial Photograph Capture date: 19-Jul-2016
Grid Reference: 260779,316482
Site Size: 63.39ha

Report Reference: GS-5539748
Client Reference: 264326

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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	66	4	30	32
1.2 Additional Information – Historical Tank Database	4	0	0	6
1.3 Additional Information – Historical Energy Features Database	12	6	3	3
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	5	0	2	0
1.6 Historical military sites	0	0	0	0
1.7 Potentially Infilled Land	11	3	36	18
Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	0	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	0	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	0	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	2	5	9	5
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	0
2.2 Records of COMAH and NIHHS sites	0	0	0	0
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	3	0	1	3
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	0

Section 3: Landfill and Other Waste Sites	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	1	0	0	0	0	0
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	0	0	0

Section 4: Current Land Use	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	19	16	9	Not searched
4.2 Records of Petrol and Fuel Sites	1	0	1	0
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology	
5.1 Records of Artificial Ground and Made Ground present beneath the study site	Identified
5.2 Records of Superficial Ground and Drift Geology present beneath the study site	Identified
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology				0-500m		
6.1 Records of Strata Classification in the Superficial Geology within 500m of the study site				Identified		
6.2 Records of Strata Classification in the Bedrock Geology within 500m of the study site				Identified		
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	0
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	1	2
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	1	1
6.6 Source Protection Zones (within 500m of the study site)	0	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	2	0	#250GWV #	#500GWV #	Not searched	Not searched

Section 6: Hydrogeology and Hydrology	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site	No	No	No	No	No	No
6.10 Ordnance Survey MasterMap Water Network entries within 500m of the site	40	6	28	22	Not searched	Not searched
6.11 Surface water features within 250m of the study site	Yes	No	Yes	Not searched	Not searched	Not searched

Section 7: Flooding						
7.1 Environment Agency Zone 2 floodplains within 250m of the study site	Identified					
7.2 Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	Identified					
7.3 Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site	High					
7.4 Flood Defences within 250m of the study site	Identified					
7.5 Areas benefiting from Flood Defences within 250m of the study site	Identified					
7.6 Areas used for Flood Storage within 250m of the study site	None identified					
7.7 Maximum BGS Groundwater Flooding susceptibility within 50m of the study site	Potential at Surface					
7.8 BGS confidence rating for the Groundwater Flooding susceptibility areas	High					

Section 8: Designated Environmentally Sensitive Sites						
	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	1	1	0	0	1	1
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	1	1	2	1	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	4	1	7	5	7	9
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	0	0
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	0

Section 8: Designated Environmentally Sensitive Sites	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	1	0	1
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	0
8.14 Records of Green Belt land	0	0	0	0	0	0

Section 9: Natural Hazards		
9.1 Maximum risk of natural ground subsidence		Moderate
9.1.1 Maximum Shrink-Swell hazard rating identified on the study site		Very Low
9.1.2 Maximum Landslides hazard rating identified on the study site		Low
9.1.3 Maximum Soluble Rocks hazard rating identified on the study site		Negligible
9.1.4 Maximum Compressible Ground hazard rating identified on the study site		Very Low
9.1.5 Maximum Collapsible Rocks hazard rating identified on the study site		Very Low
9.1.6 Maximum Running Sand hazard rating identified on the study site		Moderate
9.2 Radon		
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The site is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.	
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.	

Section 10: Mining		
10.1 Coal mining areas within 75m of the study site		None identified
10.2 Non-Coal Mining areas within 50m of the study site boundary		Identified
10.3 Brine affected areas within 75m of the study site		None identified

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licences, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

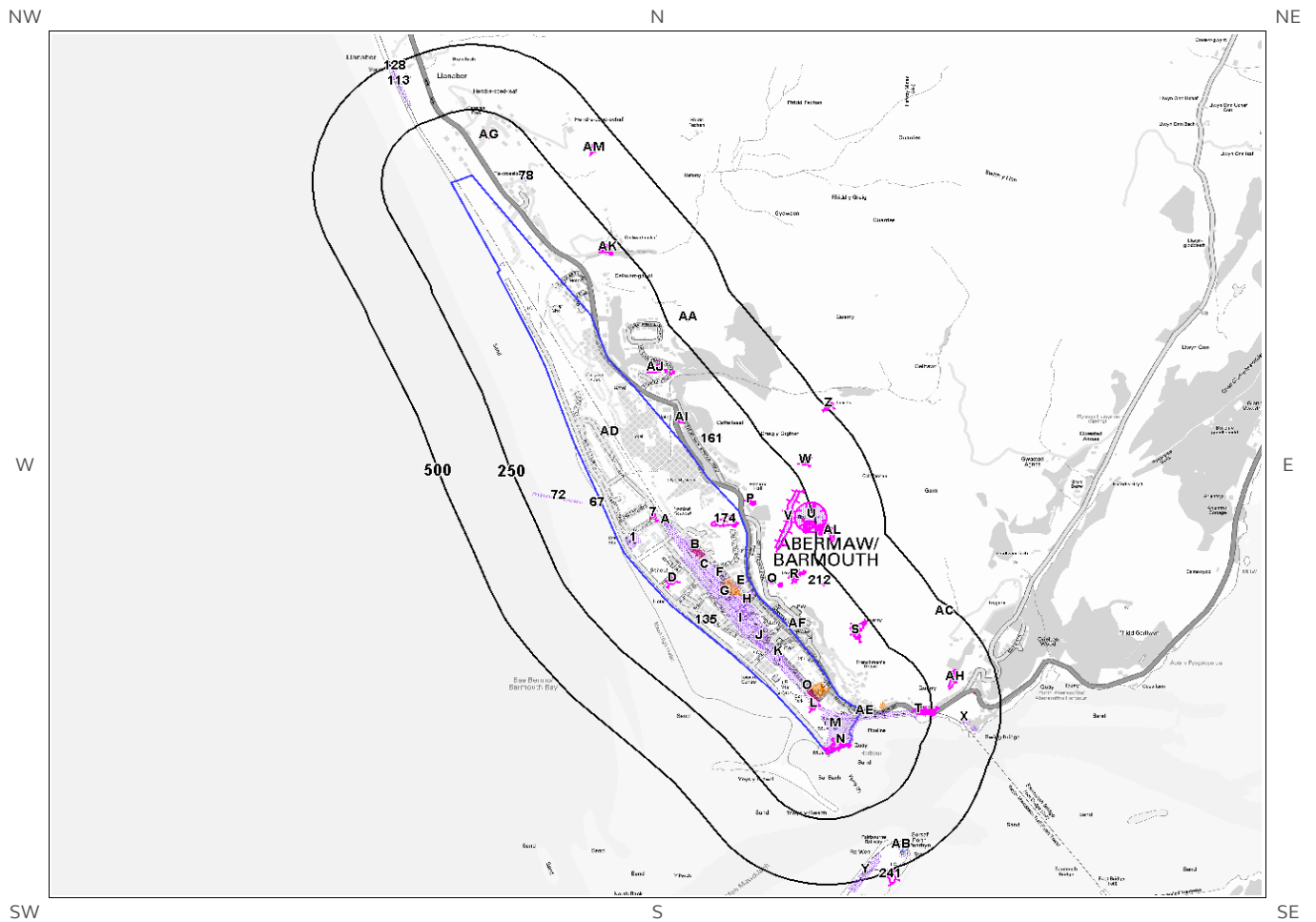
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

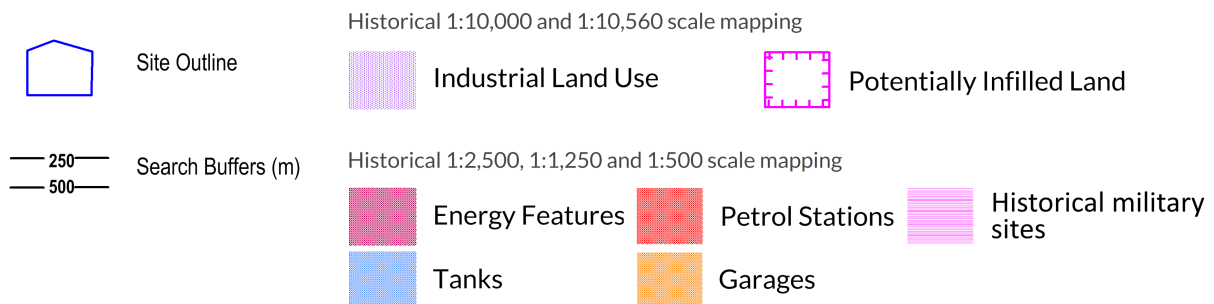
Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 132

ID	Distance [m]	Direction	Use	Date
1	0	On Site	Coastguard Station	1981
2B	0	On Site	Unspecified Tanks	1981
3C	0	On Site	Railway Sidings	1981
4A	0	On Site	Steam Laundry	1900
5A	0	On Site	Steam Laundry	1938
6A	0	On Site	Railway Building	1981
7	0	On Site	Sewage Tanks	1888
8F	0	On Site	Fire Station	1981
9B	0	On Site	Gasometer	1900
10B	0	On Site	Gas Works	1900
11B	0	On Site	Unspecified Tanks	1938
12C	0	On Site	Railway Buildings	1938
13B	0	On Site	Railway Building	1938
14D	0	On Site	Refuse Heap	1938
15D	0	On Site	Refuse Heap	1938
16E	0	On Site	Gasometer	1888
17E	0	On Site	Gas Works	1888
18F	0	On Site	Railway Building	1938
19E	0	On Site	Railway Sidings	1900
20G	0	On Site	Railway Sidings	1938
21E	0	On Site	Police Station	1888
22G	0	On Site	Smithy	1938
23E	0	On Site	Smithy	1900
24G	0	On Site	Railway Sidings	1888
25G	0	On Site	Railway Sidings	1888
26H	0	On Site	Railway Buildings	1938
27H	0	On Site	Railway Sidings	1981
28H	0	On Site	Railway Building	1938
29H	0	On Site	Railway Buildings	1981
30H	0	On Site	Goods Shed	1900
31H	0	On Site	Railway Building	1888
32I	0	On Site	Railway Sidings	1900
33I	0	On Site	Railway Building	1938
34J	0	On Site	Railway Station	1888

35J	0	On Site	Railway Station	1938
36J	0	On Site	Railway Station	1900
37J	0	On Site	Railway Station	1981
38K	0	On Site	Railway Building	1938
39K	0	On Site	Bus Station	1981
40O	0	On Site	Railway Building	1938
41L	0	On Site	Refuse Heap	1938
42L	0	On Site	Refuse Heap	1938
43M	0	On Site	Unspecified Tank	1938
44M	0	On Site	Unspecified Tank	1900
45M	0	On Site	Unspecified Tank	1888
46M	0	On Site	Unspecified Station	1981
47M	0	On Site	Unspecified Quay	1888
48N	0	On Site	Unspecified Quay	1900
49N	0	On Site	Quay	1938
50N	0	On Site	Quay	1938
51J	0	On Site	Railway Sidings	1949
52H	0	On Site	Railway Building	1887
53H	0	On Site	Railway Building	1887
54E	0	On Site	Police Station	1887
55E	0	On Site	Gas Works	1887
56E	0	On Site	Smithy	1949
57E	0	On Site	Gasometer	1887
58B	0	On Site	Unspecified Tank	1949
59A	0	On Site	Sewer Tanks	1887
60J	0	On Site	Railway Station	1949
61J	0	On Site	Railway Station	1887
62K	0	On Site	Railway Sidings	1887
63O	0	On Site	Railway Building	1949
64M	0	On Site	Unspecified Tank	1949
65N	0	On Site	Quay	1887
66N	0	On Site	Quay	1949
67	13	W	Ventilator	1900
68AI	40	NE	Unspecified Quarry	1887
69P	48	NE	Unspecified Quarry	1938
70P	49	NE	Unspecified Quarry	1900
71Q	56	NE	Unspecified Old Level	1887
72	65	SW	Sewage Pipe	1900
73Q	87	NE	Unspecified Disused Levels	1981
74V	107	E	Unspecified Quarry	1949
75R	134	NE	Unspecified Levels	1900
76R	136	NE	Unspecified Levels	1938
77R	136	NE	Unspecified Levels	1938
78	141	NE	Unspecified Tank	1981
79R	146	NE	Unspecified Old Level	1888

80R	151	NE	Unspecified Disused Levels	1981
81R	162	NE	Unspecified Levels	1949
82R	164	NE	Unspecified Levels	1938
83R	164	NE	Unspecified Levels	1938
84R	164	NE	Unspecified Levels	1900
85S	167	NE	Unspecified Heap	1887
86S	171	NE	Unspecified Ground Workings	1888
87R	174	NE	Unspecified Disused Levels	1981
88U	180	E	Unspecified Disused Level	1981
89S	193	NE	Unspecified Disused Quarries	1981
90T	196	E	Railway Building	1938
91T	196	E	Tunnel	1900
92T	198	E	Tunnel	1949
93T	199	E	Tunnel	1938
94U	205	E	Unspecified Levels	1938
95V	205	E	Unspecified Levels	1938
96U	206	E	Unspecified Levels	1949
97U	206	E	Unspecified Levels	1900
98U	211	E	Unspecified Levels	1887
99U	214	E	Unspecified Heap	1888
100U	215	E	Unspecified Disused Tip	1981
101U	256	E	Unspecified Levels	1949
102U	256	E	Unspecified Levels	1938
103U	256	E	Unspecified Levels	1938
104U	258	E	Unspecified Levels	1900
105U	262	E	Unspecified Levels	1887
106U	266	E	Unspecified Ground Workings	1888
107U	278	E	Unspecified Levels	1888
108U	284	E	Unspecified Disused Level	1981
109W	290	NE	Unspecified Heap	1888
110AL	294	E	Unspecified Levels	1887
111W	294	NE	Unspecified Disused Tip	1981
112AH	322	E	Unspecified Disused Quarry	1981
113	328	NW	Railway Sidings	1949
114X	362	E	Lifeboat House	1949
115X	365	E	Lifeboat House	1887
116X	370	E	Lifeboat House	1888
117X	382	E	Lifeboat House	1938
118X	383	E	Lifeboat House	1900
119AM	394	NE	Unspecified Heap	1888
120AB	396	SE	Railway Sidings	1981
121X	397	E	Old Lifeboat House	1887

122X	402	E	Old Lifeboat House	1888
123X	410	E	Old Lifeboat House	1938
124X	411	E	Old Lifeboat House	1900
125Y	421	SE	Tramway Sidings	1949
126Y	433	SE	Tramway Sidings	1938
127Y	440	SE	Tramway Sidings	1900
128	471	NW	Railway Station	1981
129Z	491	NE	Unspecified Old Level	1949
130Z	493	NE	Unspecified Old Level	1938
131Z	493	NE	Unspecified Old Level	1938
132Z	495	NE	Unspecified Old Level	1900

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 10

ID	Distance (m)	Direction	Use	Date
133B	0	On Site	Gasholders	1978
134B	0	On Site	Gas Works	1978
135	0	On Site	Unspecified Tank	1978
136M	0	On Site	Unspecified Tank	1978
137AA	308	NE	Unspecified Tank	1990
138AA	309	NE	Unspecified Tank	1978
139AB	445	SE	Unspecified Tank	1992
140AB	445	SE	Unspecified Tank	1990
141AC	465	NE	Unspecified Tank	1992
142AC	465	NE	Unspecified Tank	1990

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 24

ID	Distance (m)	Direction	Use	Date
143AD	0	On Site	Electricity Substation	1978
144A	0	On Site	Electricity Substation	1978
145B	0	On Site	Gas Works	1978

146B	0	On Site	Gasholders	1978
147H	0	On Site	Electricity Substation	1990
148H	0	On Site	Electricity Substation	1992
149H	0	On Site	Electricity Substation	1978
150L	0	On Site	Electricity Substation	1992
151L	0	On Site	Electricity Substation	1990
152L	0	On Site	Electricity Substation	1978
153AD	0	On Site	Electricity Substation	1996
154A	0	On Site	Electricity Substation	1996
155AE	12	SE	Electricity Substation	1990
156AE	12	SE	Electricity Substation	1992
157AE	14	SE	Electricity Substation	1978
158AF	25	NE	Electricity Substation	1990
159AF	25	NE	Electricity Substation	1992
160AF	28	NE	Electricity Substation	1978
161	85	NE	Electricity Substation	1978
162AG	151	NE	Electricity Substation	1990
163AG	152	NE	Electricity Substation	1978
164AH	407	E	Electricity Substation	1990
165AH	407	E	Electricity Substation	1992
166AH	407	E	Electricity Substation	1978

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 7

ID	Distance (m)	Direction	Use	Date
167E	0	On Site	Garage	1978
168E	0	On Site	Garage	1978
169O	0	On Site	Garage	1992
170O	0	On Site	Garage	1990
171O	0	On Site	Garage	1978

172AE	62	E	Garage	1992
173AE	62	E	Garage	1990

1.6 Historical military sites

Certain military installations were not noted on historic mapping for security reasons. Whilst not all military land is necessarily of concern, Groundsure has researched and digitised a number of Ordnance Factories and other military industrial features (e.g. Ordnance Depots, Munitions Testing Grounds) which may be of contaminative concern. This research was drawn from a number of different sources, and should not be regarded as a definitive or exhaustive database of potentially contaminative military installations. The boundaries of sites within this database have been estimated from the best evidence available to Groundsure at the time of compilation.

Records of historical military sites within 500m of the search boundary: 0

Database searched and no data found.

1.7 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 68

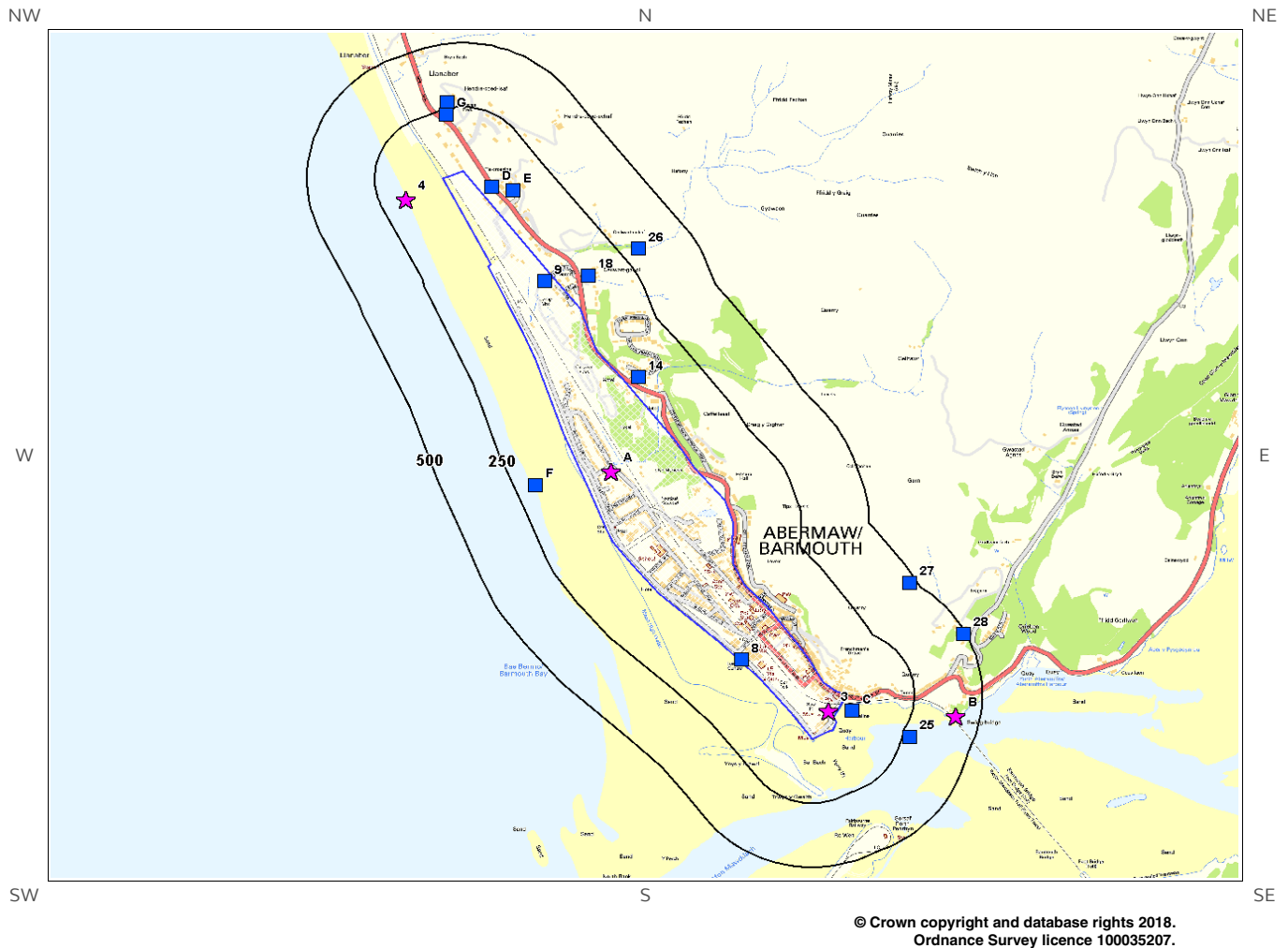
The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
174	0	On Site	Pond	1981
175A	0	On Site	Sewer Tanks	1887
176D	0	On Site	Refuse Heap	1938
177L	0	On Site	Refuse Heap	1938
178N	0	On Site	Quay	1938
179N	0	On Site	Quay	1887
180N	0	On Site	Quay	1949
181D	0	On Site	Refuse Heap	1938
182L	0	On Site	Refuse Heap	1938
183N	0	On Site	Quay	1938
184A	0	On Site	Sewage Tanks	1888
185AI	40	NE	Unspecified Quarry	1887
186P	48	NE	Unspecified Quarry	1938
187P	49	NE	Unspecified Quarry	1900
188Q	56	NE	Unspecified Old Level	1887
189AJ	74	NE	Reservoir	1887
190Q	87	NE	Unspecified Disused Levels	1981
191V	107	E	Unspecified Quarry	1949
192AJ	110	NE	Reservoir	1949
193AJ	132	NE	Reservoir	1938
194R	132	NE	Reservoir	1949
195R	134	NE	Unspecified Levels	1900
196R	136	NE	Unspecified Levels	1938
197R	136	NE	Unspecified Levels	1938

198R	146	NE	Unspecified Old Level	1888
199R	151	NE	Unspecified Disused Levels	1981
200R	162	NE	Unspecified Levels	1949
201R	164	NE	Unspecified Levels	1938
202R	164	NE	Unspecified Levels	1938
203R	164	NE	Unspecified Levels	1900
204S	167	NE	Unspecified Heap	1887
205S	171	NE	Unspecified Ground Workings	1888
206R	174	NE	Unspecified Disused Levels	1981
207U	180	E	Unspecified Disused Level	1981
208AK	187	NE	Covered Reservoir	1887
209AK	190	NE	Reservoir	1938
210AK	190	NE	Covered Reservoir	1981
211AK	190	NE	Reservoir	1949
212	191	NE	Reservoir	1938
213S	193	NE	Unspecified Disused Quarries	1981
214T	196	E	Tunnel	1900
215T	198	E	Tunnel	1949
216T	199	E	Tunnel	1938
217AL	205	E	Unspecified Levels	1938
218AL	205	E	Unspecified Levels	1938
219AL	206	E	Unspecified Levels	1949
220AL	206	E	Unspecified Levels	1900
221AL	211	E	Unspecified Levels	1887
222AL	214	E	Unspecified Heap	1888
223AL	215	E	Unspecified Disused Tip	1981
224AL	256	E	Unspecified Levels	1949
225AL	256	E	Unspecified Levels	1938
226AL	256	E	Unspecified Levels	1938
227AL	258	E	Unspecified Levels	1900
228AL	262	E	Unspecified Levels	1887
229AL	266	E	Unspecified Ground Workings	1888
230AL	278	E	Unspecified Levels	1888
231AL	284	E	Unspecified Disused Level	1981
232W	290	NE	Unspecified Heap	1888
233AL	294	E	Unspecified Levels	1887
234W	294	NE	Unspecified Disused Tip	1981
235AH	322	E	Unspecified Disused Quarry	1981
236AM	394	NE	Unspecified Heap	1888
237Z	491	NE	Unspecified Old Level	1949
238Z	493	NE	Unspecified Old Level	1938
239Z	493	NE	Unspecified Old Level	1938

240Z	495	NE	Unspecified Old Level	1900
241	498	SE	Pond	1888

2. Environmental Permits, Incidents and Registers Map



- | | | | | | |
|---|--------------------|---|-------------------------------|---|--|
|  | Site Outline |  | Recorded Pollution Incident |  | RAS 3 & 4 Authorisations |
|  | Search Buffers (m) |  | Dangerous Substances (List 1) |  | Part A(1) Authorised Processes and Historic IPC Authorisations |
| | |  | Dangerous Substances (List 2) |  | Part A(2) and Part B Authorised Processes |
| | |  | Water Industry Referrals |  | COMAH / NIHHS Sites |
| | |  | Licenced Discharge Consents |  | Sites Determined as Contaminated Land |
| | |  | Red List Discharge Consents |  | Hazardous Substance Consents and Enforcements |

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

0

Database searched and no data found.

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

0

Database searched and no data found.

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

21

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
8	0	On Site	261180 315700	Address: BARMOUTH LEISURE CENTRE, BARMOUTH LEISURE CENTRE, UNKNOWN, UNKNOWN, UNKNOWN, UNKNOWN Effluent Type: TRADE DISCHARGES - SITE DRAINAGE Permit Number: CG0179201 Permit Version: 1 Receiving Water: STREAM Status: LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995 Issue date: 11/10/1989 Effective Date: 11-Oct-1989 Revocation Date:
9	0	On Site	260453 317173	Address: STP SERVING 3 FFRIDD ELIN, LLANABAR, , BARMOUTH, GWYNEDD, LL42 1YA Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: VP3326GM Permit Version: 1 Receiving Water: TRIBUTARY OF BARMOUTH BAY Status: Effective Issue date: 18/07/2012 Effective Date: 18-Jul-2012 Revocation Date:
10D	45	NE	260260 317540	Address: LLANABER - FRONOLEU BRYN GLASFOR ET, LLANABER - FRONOLEU BRYN GLASFOR, BRYN GLASFOR ETC., UNKNOWN, UNKNOWN, UNKNOWN Effluent Type: UNSPECIFIED Permit Number: CG0125601 Permit Version: 1 Receiving Water: TO LAND Status: CONSENT EXPIRED - TIME LIMIT Issue date: 10/03/1986 Effective Date: 10-Mar-1986 Revocation Date:
11C	49	SE	261590 315500	Address: BARMOUTH HARBOUR PUMPING STATION, CHURCH STREET, BARMOUTH, GWYNEDD Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: CG0130001 Permit Version: 2 Receiving Water: MAWDDACH ESTUARY Status: Effective Issue date: 22/02/2005 Effective Date: 31-Mar-2005 Revocation Date:
12C	49	SE	261590 315500	Address: BARMOUTH HARBOUR PUMPING STATION, CHURCH STREET, BARMOUTH, GWYNEDD Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: CG0130001 Permit Version: 2 Receiving Water: MAWDDACH ESTUARY Status: Effective Issue date: 22/02/2005 Effective Date: 31-Mar-2005 Revocation Date:
13C	49	SE	261590	Address: BARMOUTH HARBOUR PUMPING Receiving Water: MAWDDACH ESTUARY

ID	Distance (m)	Direction	NGR	Details
			315500	STATION, CHURCH STREET, BARMOUTH, GWYNEDD Effluent Type: SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY Permit Number: CG0130001 Permit Version: 2 Status: VARIED BY APPLICATION - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 22/02/2005 Effective Date: 31-Mar-2005 Revocation Date:
14	49	NE	260800 316800	Address: MAES CANOL. BARMOUTH, MAES CANOL. BARMOUTH, UNKNOWN, UNKNOWN, UNKNOWN Effluent Type: UNSPECIFIED Permit Number: CG0171101 Permit Version: 1 Receiving Water: TO LAND Status: CONSENT EXPIRED - TIME LIMIT Issue date: 21/03/1989 Effective Date: 21-Mar-1989 Revocation Date:
15D	96	NE	260336 317528	Address: ARGOED BUNGALOW 1 & 2, Llanaber, BARMOUTH, ., GWYNEDD, LL42 1YY Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: WQD000552 Permit Version: 3 Receiving Water: GROUND WATERS Status: Effective Issue date: 26/11/2012 Effective Date: 26-Nov-2012 Revocation Date:
16E	96	NE	260336 317528	Address: ARGOED BUNGALOW 1 & 2, LLANABER, BARMOUTH, GWYNEDD, LL42 1YY Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD000552 Permit Version: 2 Receiving Water: GROUND WATERS Status: VARIED BY APPLICATION - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 22/12/2009 Effective Date: 22-Dec-2009 Revocation Date:
17E	96	NE	260336 317528	Address: ARGOED BUNGALOW 1 & 2, LLANABER, BARMOUTH, GWYNEDD, LL42 1YY Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: NPSWQD000552 Permit Version: 1 Receiving Water: STORM DRAIN Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY Issue date: 18/02/2008 Effective Date: 18-Feb-2008 Revocation Date:
18	103	NE	260615 317195	Address: BARN CONVERSION AT CEILWART GANOL, LLANABER, BARMOUTH, GWYNEDD, LL42 1YS Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: CG0431101 Permit Version: 1 Receiving Water: UN-NAMED WATERCOURSE Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY Issue date: 27/01/2005 Effective Date: 01-Apr-2005 Revocation Date:
19F	177	SW	260420 316380	Address: BARMOUTH WWTW OUTFALL TO MLWS, BARMOUTH, UNKNOWN, UNKNOWN, GWYNEDD, UNKNOWN Effluent Type: SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY Permit Number: CG0129901 Permit Version: 2 Receiving Water: CARDIGAN BAY Status: Effective Issue date: 28/02/2005 Effective Date: 31-Dec-2005 Revocation Date:
20F	177	SW	260420 316380	Address: BARMOUTH WWTW OUTFALL TO MLWS, BARMOUTH, UNKNOWN, UNKNOWN, GWYNEDD, UNKNOWN Effluent Type: SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY Permit Number: CG0129901 Permit Version: 2 Receiving Water: CARDIGAN BAY Status: VARIED BY APPLICATION - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995) Issue date: 28/02/2005 Effective Date: 31-Dec-2005 Revocation Date:
21F	177	SW	260420 316379	Address: BARMOUTH WWTW VIA HEOL IDRIS VALVE, LLANABER ROAD, BARMOUTH, GWYNEDD Effluent Type: SEWAGE DISCHARGES - Receiving Water: CARDIGAN BAY Status: Effective Issue date: 31/03/2005 Effective Date: 31-Mar-2005

ID	Distance (m)	Direction	NGR	Details	
				SEWER STORM OVERFLOW - WATER COMPANY Permit Number: CG0434001 Permit Version: 1	Revocation Date:
22F	177	SW	260420 316379	Address: BARMOUTH WWTW VIA HEOL IDRIS VALVE, LLANABER ROAD, BARMOUTH, GWYNEDD Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: CG0434001 Permit Version: 1	Receiving Water: CARDIGAN BAY Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995) Issue date: 31/03/2005 Effective Date: 31-Mar-2005 Revocation Date:
23G	229	N	260090 317822	Address: HENDRE COED ISAF HOLDIAY PARK, Llanaber, BARMOUTH, GWYNEDD, WALES, LL42 1AJ Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: CG0454501 Permit Version: 2	Receiving Water: GROUNDWATER VIA SOAKAWAY Status: Effective Issue date: 26/11/2012 Effective Date: 26-Nov-2012 Revocation Date:
24G	274	N	260094 317870	Address: HENDRE COED ISAF HOLDIAY PARK, Llanaber, BARMOUTH, GWYNEDD, WALES, LL42 1AJ Effluent Type: SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY Permit Number: CG0454401 Permit Version: 2	Receiving Water: GROUNDWATER VIA SOAKAWAY Status: Effective Issue date: 26/11/2012 Effective Date: 26-Nov-2012 Revocation Date:
25	274	E	261800 315400	Address: BARMOUTH HARBOUR SSO, BARMOUTH HARBOUR SSO, UNKNOWN, UNKNOWN, UNKNOWN Effluent Type: UNSPECIFIED Permit Number: CG0085201 Permit Version: 1	Receiving Water: MAWDDACH Status: NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY Issue date: 01/06/1973 Effective Date: 01-Jun-1973 Revocation Date:
26	313	NE	260800 317300	Address: CEILWART - CHLORINATED O/F, CEILWART - CHLORINATED O/F, UNKNOWN, UNKNOWN, UNKNOWN, UNKNOWN Effluent Type: UNSPECIFIED Permit Number: CG0197501 Permit Version: 1	Receiving Water: GROUND Status: CONSENT EXPIRED - TIME LIMIT Issue date: 02/10/1989 Effective Date: 02-Oct-1989 Revocation Date:
27	474	NE	261800 316000	Address: BRANKSOME BARMOUTH CHLORINATED, BRANKSOME BARMOUTH CHLORINATED, UNKNOWN, UNKNOWN, UNKNOWN, UNKNOWN Effluent Type: UNSPECIFIED Permit Number: CG0195801 Permit Version: 1	Receiving Water: GROUND Status: CONSENT EXPIRED - TIME LIMIT Issue date: 02/10/1989 Effective Date: 02-Oct-1989 Revocation Date:
28	491	NE	262000 315800	Address: PANORAMA - CHLORINATED O/F, PANORAMA - CHLORINATED O/F, UNKNOWN, UNKNOWN, UNKNOWN, UNKNOWN Effluent Type: UNSPECIFIED Permit Number: CG0305901 Permit Version: 1	Receiving Water: GROUND Status: CONSENT EXPIRED - TIME LIMIT Issue date: 02/10/1989 Effective Date: 02-Oct-1989 Revocation Date:

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site:

0

Database searched and no data found.

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

7

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details
1A	0	On Site	260699 316431	Incident Date: 02-Jan-2014 Incident Identification: 1189188 Pollutant: Pollutant Description: Water Impact: Land Impact: Air Impact:
2A	0	On Site	260699 316431	Incident Date: 02-Feb-2014 Incident Identification: 1200822 Pollutant: Pollutant Description: Water Impact: Land Impact: Air Impact:
3	0	On Site	261500 315500	Incident Date: 31-Dec-2002 Incident Identification: 128369 Pollutant: Oils and Fuel Pollutant Description: Diesel Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
4	162	SW	259940 317490	Incident Date: 23-Jun-2001 Incident Identification: 10947 Pollutant: General Biodegradable Materials and Wastes Pollutant Description: Algae Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
5B	409	E	261970	Incident Date: 01-Jan-2014 Water Impact:

ID	Distance (m)	Direction	NGR	Details	
			315480	Incident Identification: 1188528 Pollutant: Pollutant Description:	Land Impact: Air Impact:
6B	409	E	261970 315480	Incident Date: 17-Dec-2013 Incident Identification: 1184296 Pollutant: Pollutant Description:	Water Impact: Land Impact: Air Impact:
7B	409	E	261970 315480	Incident Date: 04-Jan-2014 Incident Identification: 1190228 Pollutant: Pollutant Description:	Water Impact: Land Impact: Air Impact:

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

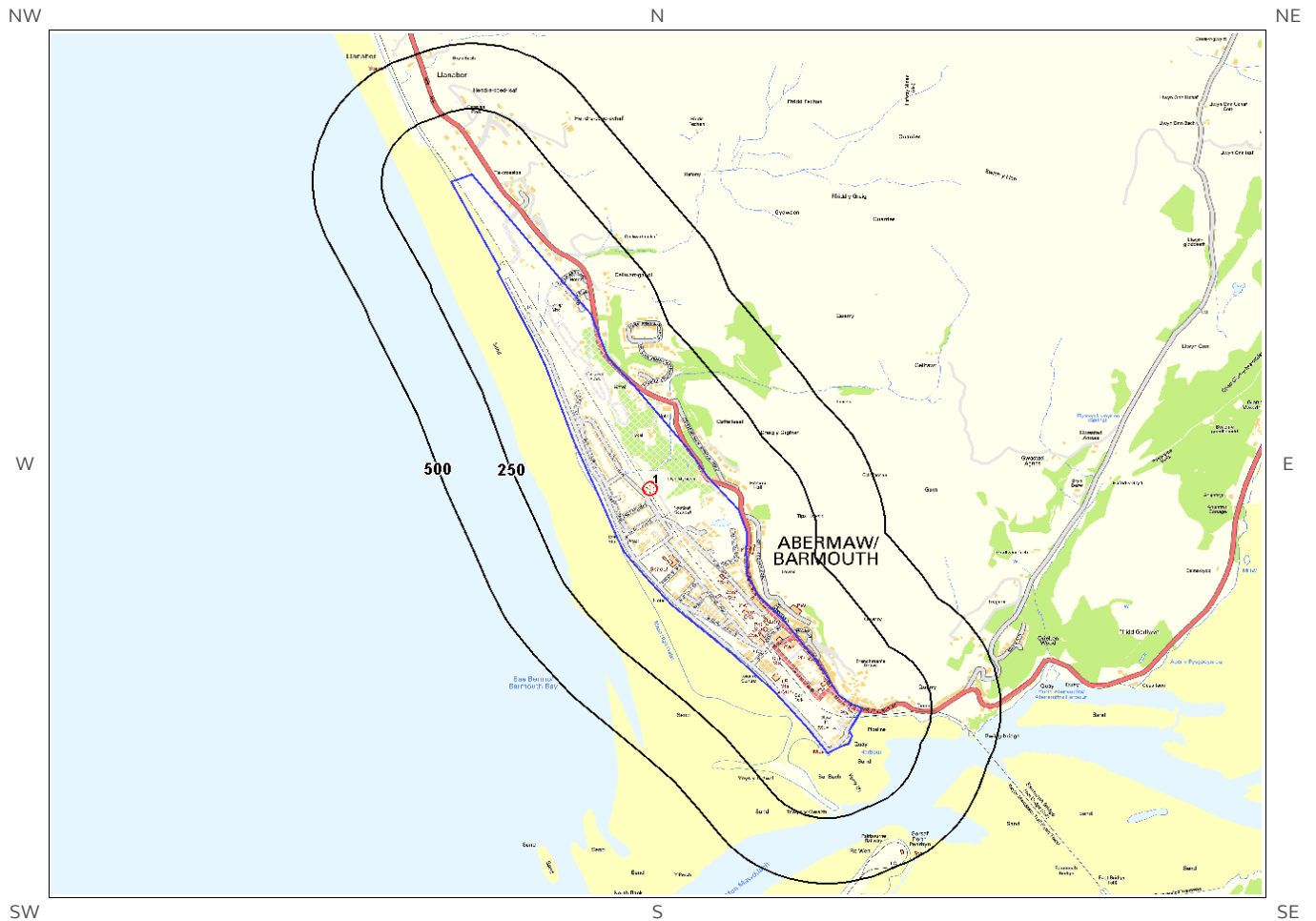
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

Records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site

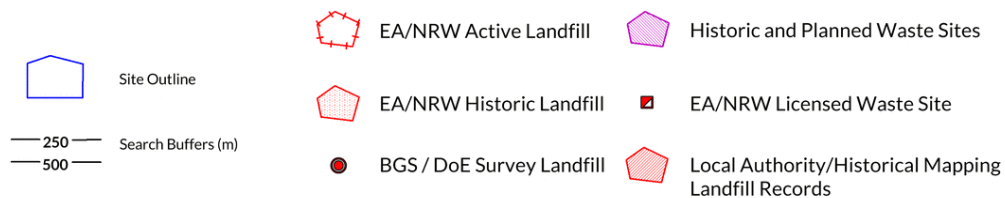
0

Database searched and no data found.

3. Landfill and Other Waste Sites Map



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3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

1

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
1	0	On Site	Site Address: Near Sewage Works, Barmouth, Gwnedd Waste Licence: - Site Reference: - Waste Type: Industrial, Household Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 04-Mar-1983 Licence Surrendered: 04-Mar-1985 Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 31-Dec-1967 Last Recorded: 31-Dec-1970

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

0

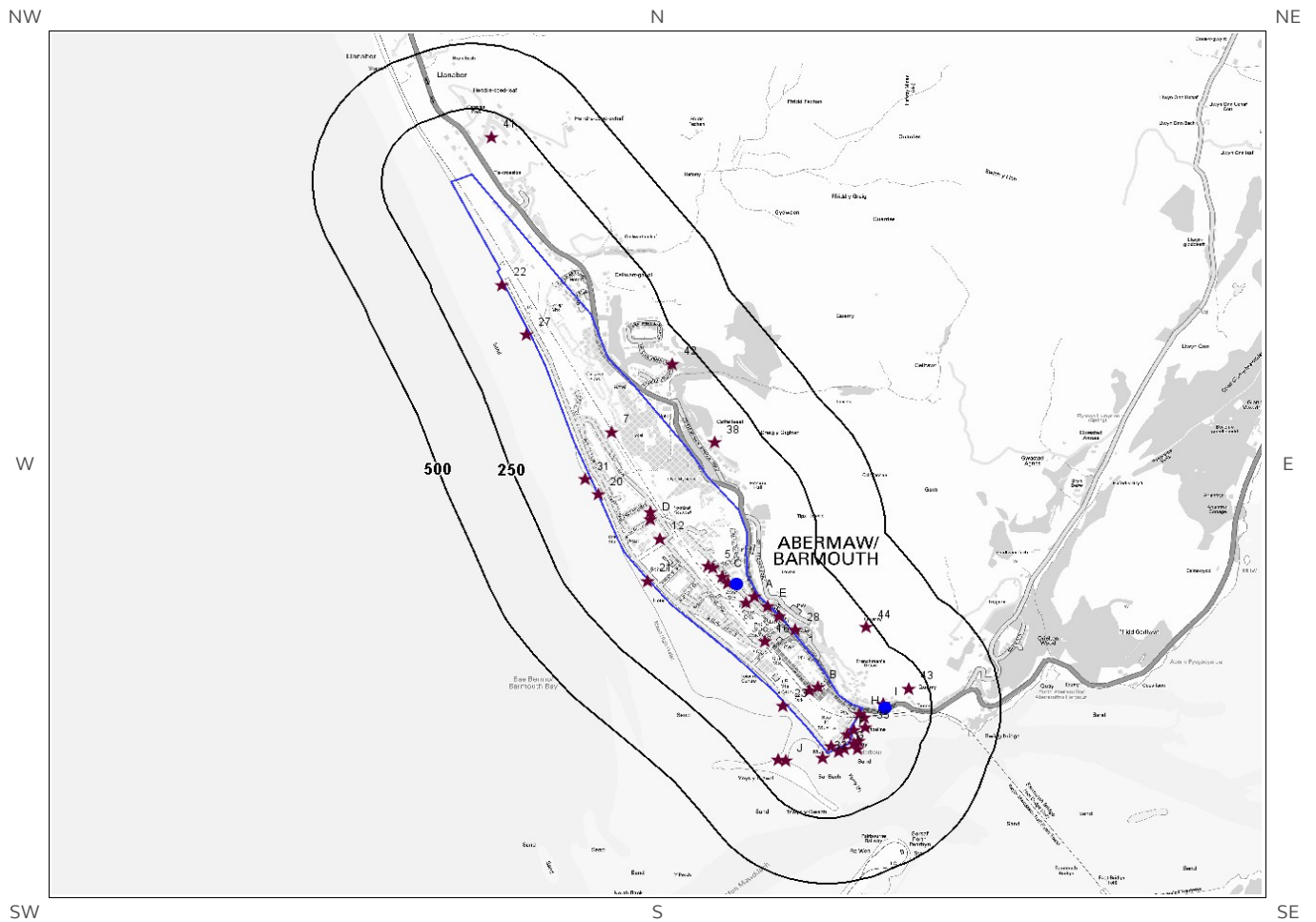
Database searched and no data found.

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

0

Database searched and no data found.

4. Current Land Use Map



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4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

44

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1C	0	On Site	Barmouth Fire Station	261060 316068	Fire Station, Park Road, Barmouth, LL42 1PH	Fire Brigade Stations	Central and Local Government
2B	0	On Site	Coastline Tyres	261405 315643	Tyn y Coed Works, Jubilee Road, Barmouth, LL42 1EF	Vehicle Parts and Accessories	Motoring
3A	0	On Site	Barmouth Printers	261175 315990	Park Road, Barmouth, LL42 1PH	Published Goods	Industrial Products
4A	0	On Site	Electricity Sub Station	261146 315968	LL42	Electrical Features	Infrastructure and Facilities
5	0	On Site	Army Cadet Centre	261027 316102	Park Road, Barmouth, LL42 1PH	Armed Services	Central and Local Government
6D	0	On Site	Electricity Sub Station	260802 316285	LL42	Electrical Features	Infrastructure and Facilities
7	0	On Site	Electricity Sub Station	260659 316619	LL42	Electrical Features	Infrastructure and Facilities
8F	0	On Site	Barmouth Ferry Landing	261513 315465	LL42	Ferries and Ferry Terminals	Water
9B	0	On Site	Electricity Sub Station	261375 315632	LL42	Electrical Features	Infrastructure and Facilities
10E	0	On Site	Big Boys Toys	261227 315955	Berwyn House, King Edward Street, Barmouth, LL42 1AD	Arms and Ammunition	Industrial Products
11C	0	On Site	Bradburys Garage	261081 316044	Park Road, Barmouth, LL42 1PH	Petrol and Fuel Stations	Road and Rail
12	0	On Site	Telephone Exchange	260834 316211	LL42	Telecommunications Features	Infrastructure and Facilities
13C	0	On Site	Electricity Sub Station	261009 316107	LL42	Electrical Features	Infrastructure and Facilities
14D	0	On Site	Depot	260800 316312	LL42	Container and Storage	Transport, Storage and Delivery
15E	0	On Site	Abacus Online	261265 315915	4 The Arches, King Edward Street, Barmouth, LL42 1AD	Office and Shop Equipment	Industrial Products
16	0	On Site	Barmouth Rail Station	261216 315820	LL42	Railway Stations, Junctions and Halts	Public Transport, Stations and Infrastructure
17C	0	On Site	Bradburys Garage	261081 316044	Park Road, Barmouth, LL42 1PH	Secondhand Vehicles	Motoring
18F	0	On Site	Harbourmasters Office	261454 315417	The Quay, Barmouth, LL42 1HB	Moorings and Unloading Facilities	Water
19H	0	SE	Slipway	261559 315544	LL42	Moorings and Unloading Facilities	Water

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
20	2	SW	Slipway	260611 316381	LL42	Moorings and Unloading Facilities	Water
21	4	SW	Slipway	260789 316050	LL42	Moorings and Unloading Facilities	Water
22	9	SW	Slipway	260262 317182	LL42	Moorings and Unloading Facilities	Water
23	11	SW	Slipway	261281 315572	LL42	Moorings and Unloading Facilities	Water
24G	12	S	Slipway	261503 315409	LL42	Moorings and Unloading Facilities	Water
25G	12	SE	Slipway	261483 315399	LL42	Moorings and Unloading Facilities	Water
26F	12	SE	Slipway	261538 315482	LL42	Moorings and Unloading Facilities	Water
27	12	SW	Pipeline	260351 316992	LL42	Pipelines	Industrial Features
28	13	NE	Electricity Sub Station	261325 315863	LL42	Electrical Features	Infrastructure and Facilities
29G	17	SE	Slipway	261539 315430	LL42	Moorings and Unloading Facilities	Water
30H	20	SE	Electricity Sub Station	261574 315529	LL42	Electrical Features	Infrastructure and Facilities
31	21	SW	Pipeline	260564 316439	LL42	Pipelines	Industrial Features
32	25	SW	Slipway	261425 315373	LL42	Moorings and Unloading Facilities	Water
33F	28	SE	Quay	261554 315438	LL42	Moorings and Unloading Facilities	Water
34G	37	SE	Harbour	261551 315408	LL42	Moorings and Unloading Facilities	Water
35	44	SE	Pipeline	261579 315490	LL42	Pipelines	Industrial Features
36I	75	E	Birmingham Garage	261643 315578	Church Street, Barmouth, LL42 1EL	Vehicle Hire and Rental	Hire Services
37I	75	E	Birmingham Road Garage	261643 315578	Church Street, Barmouth, LL42 1EL	Petrol and Fuel Stations	Road and Rail
38	93	NE	Electricity Sub Station	261032 316580	LL42	Electrical Features	Infrastructure and Facilities
39J	137	SW	Slipway	261290 315363	LL42	Moorings and Unloading Facilities	Water
40J	155	SW	Slipway	261264 315367	LL42	Moorings and Unloading Facilities	Water
41	161	NE	Electricity Sub Station	260224 317747	LL42	Electrical Features	Infrastructure and Facilities
42	162	NE	Electricity Sub Station	260880 316880	LL42	Electrical Features	Infrastructure and Facilities
43	181	NE	Quarry (Disused)	261735 315639	LL42	Unspecified Quarries Or Mines	Extractive Industries
44	223	NE	Quarry	261583 315874	LL42	Unspecified Quarries Or Mines	Extractive Industries

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

2

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
45C	0	On Site	261112 316036	UNBRANDED	Park Road, Barmouth, Gwynedd, LL42 1PH	Yes	Open
46I	81	E	261651 315564	UNBRANDED	Church Street, Barmouth, Gwynedd, LL42 1EL	Not Applicable	Obsolete

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site:

0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site:

0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
BSA-S	BLOWN SAND	SAND
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
STOB-V	STORM BEACH DEPOSITS	GRAVEL
CZD-XVSZC	COASTAL ZONE DEPOSITS (UNDIFFERENTIATED)	GRAVEL, SAND, SILT AND CLAY

5.3 Bedrock and Solid Geology

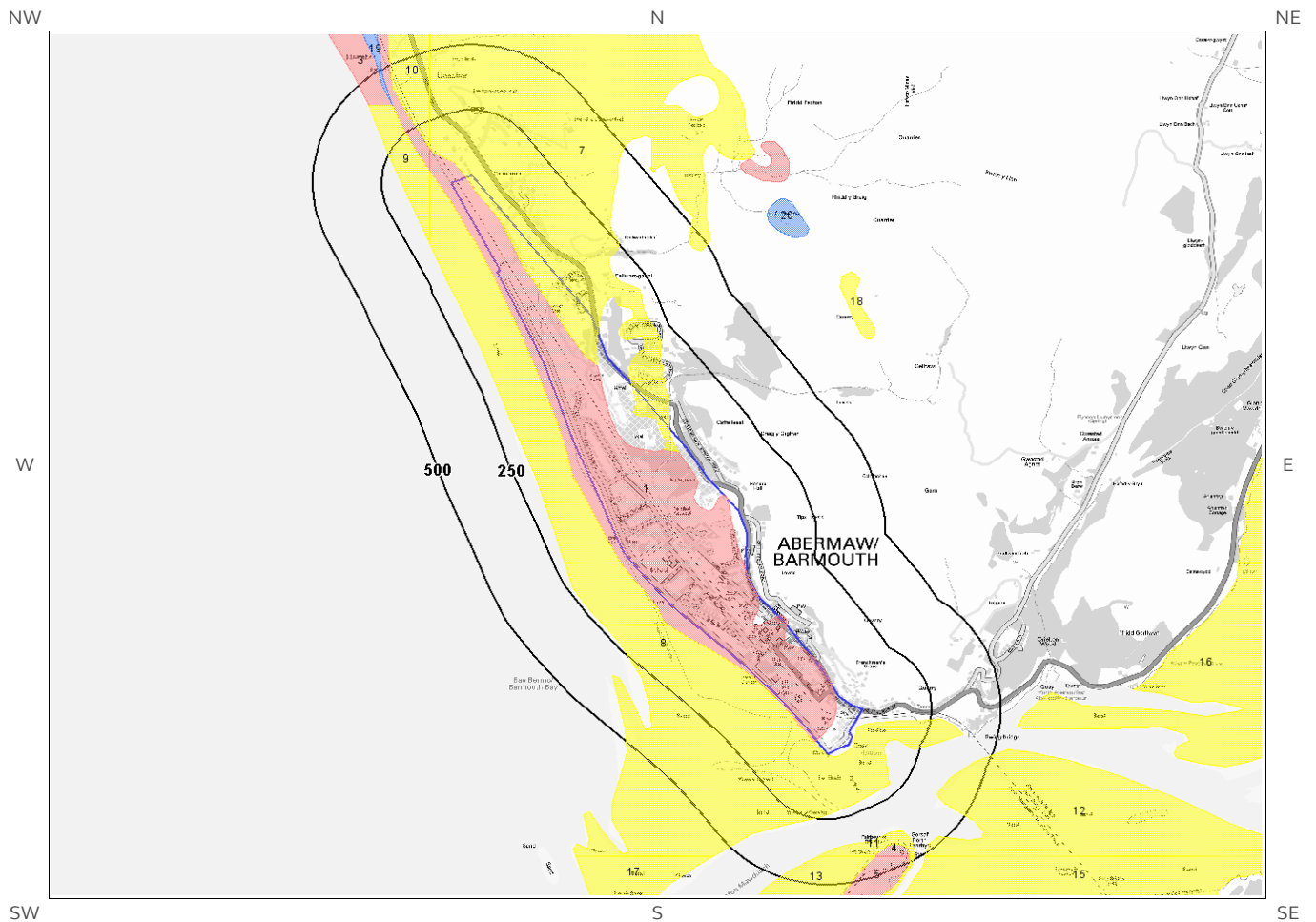
The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
BAG-STMD	BARMOUTH FORMATION	SANDSTONE AND MUDSTONE
HF-MDST	HAFOTTY FORMATION	MUDSTONE
RN-STMD	RHINOG FORMATION	SANDSTONE AND MUDSTONE
LBR-SIMD	LLANBEDR FORMATION	SILTSTONE AND MUDSTONE, INTERBEDDED
HGG-SDSM	HARLECH GRITS GROUP	SANDSTONE, SILTSTONE AND MUDSTONE

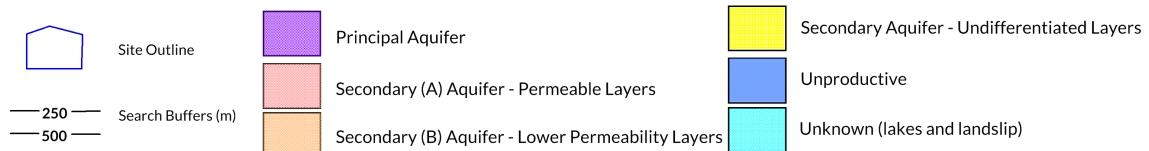
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

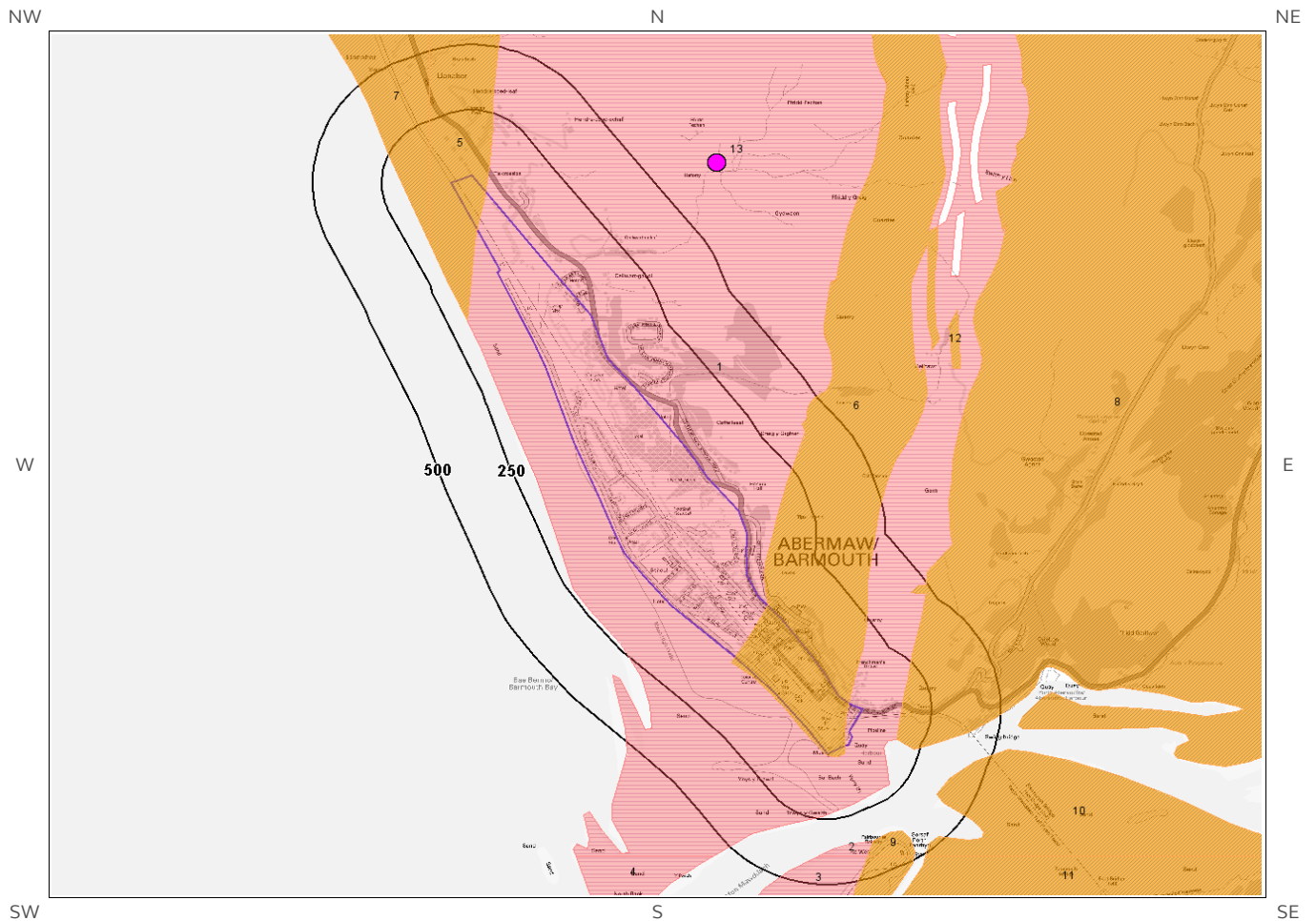
6a. Aquifer Within Superficial Geology



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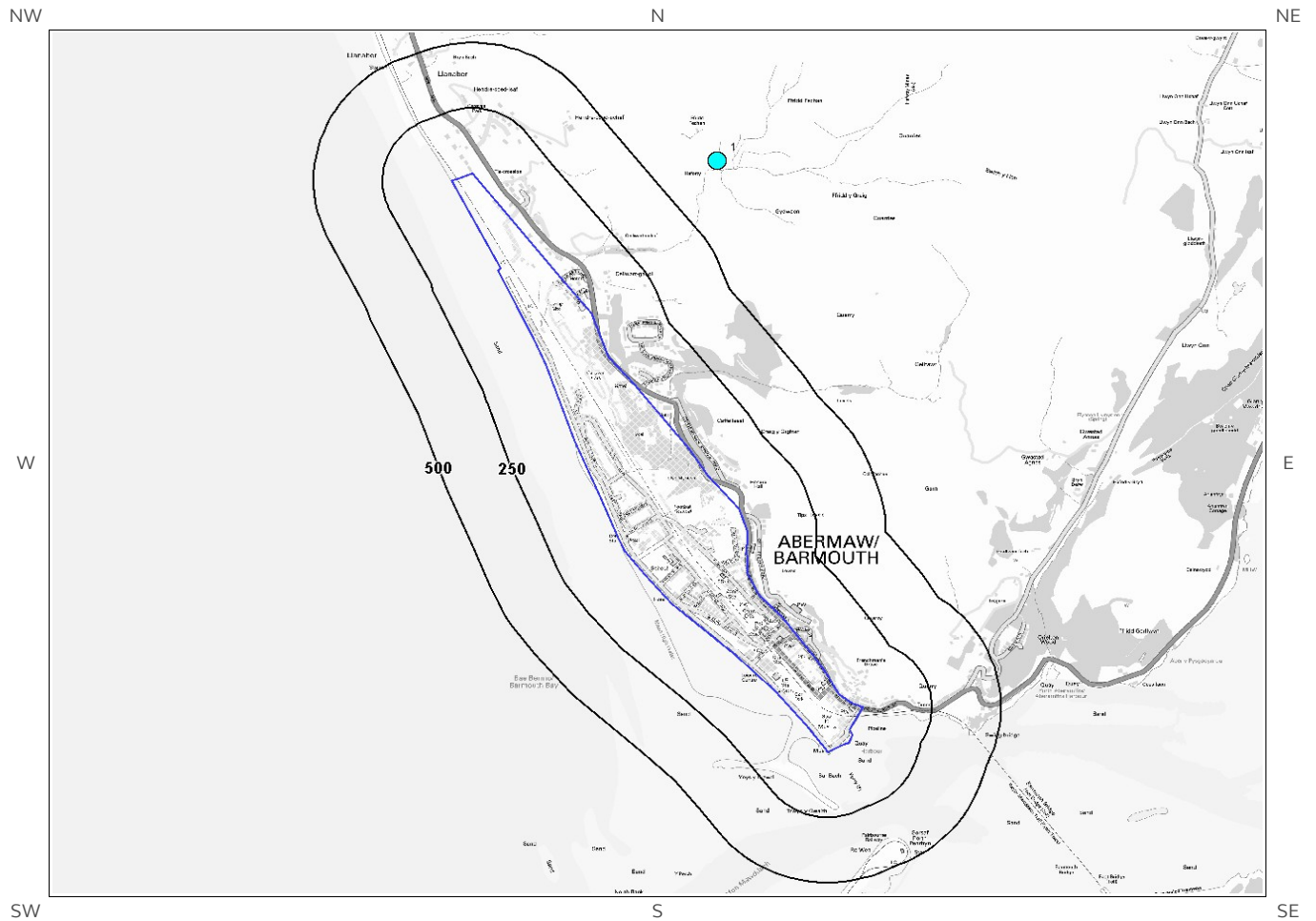


6b. Aquifer Within Bedrock Geology and Abstraction Licences

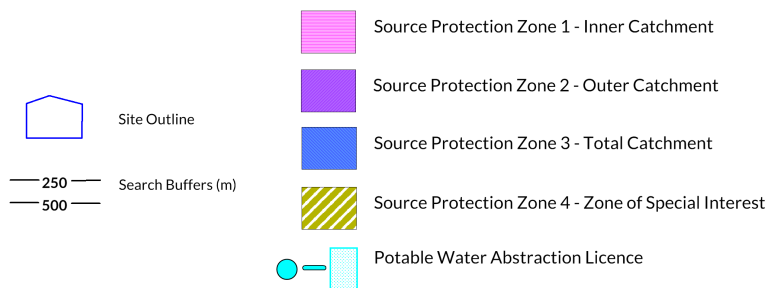


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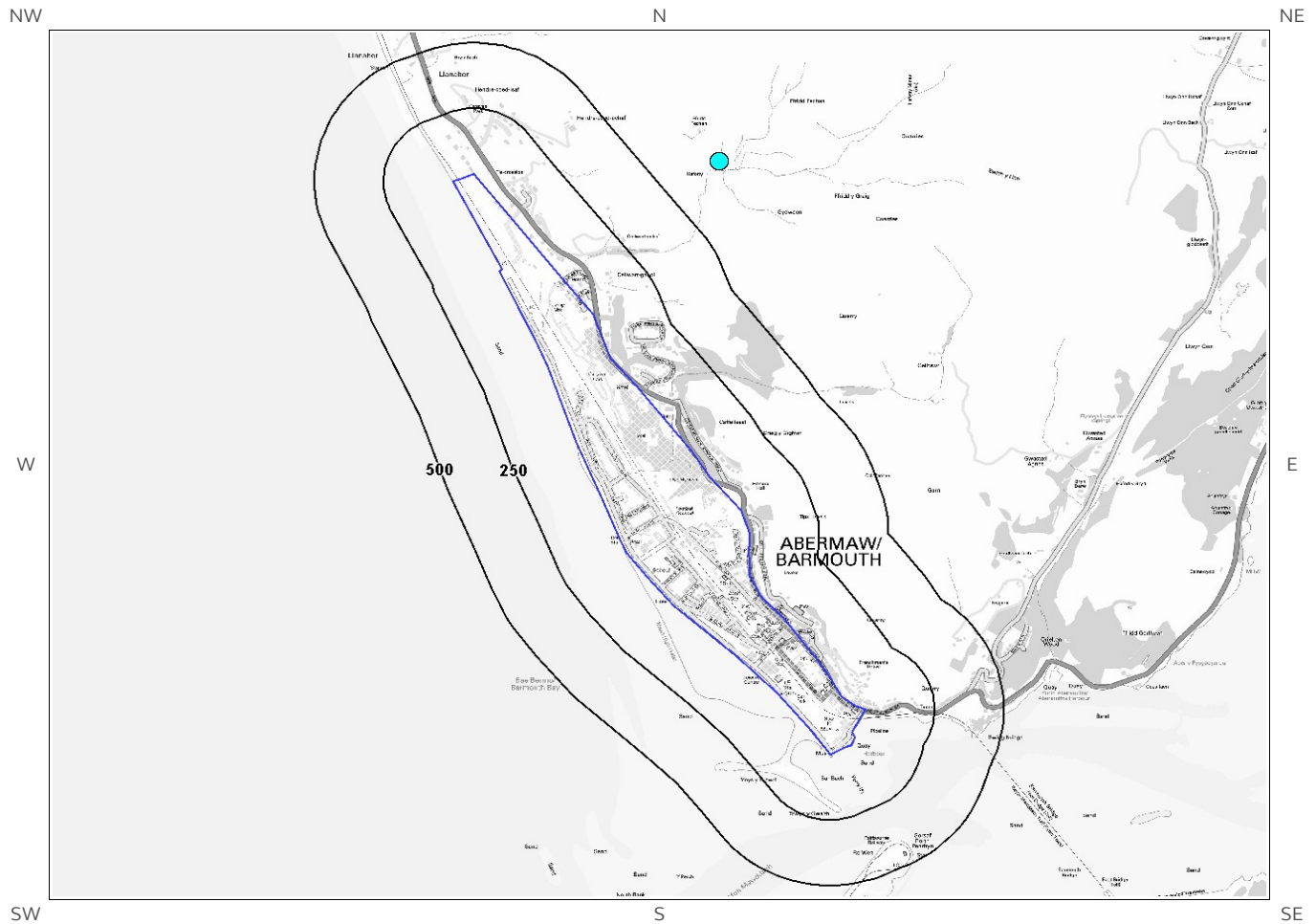
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licences



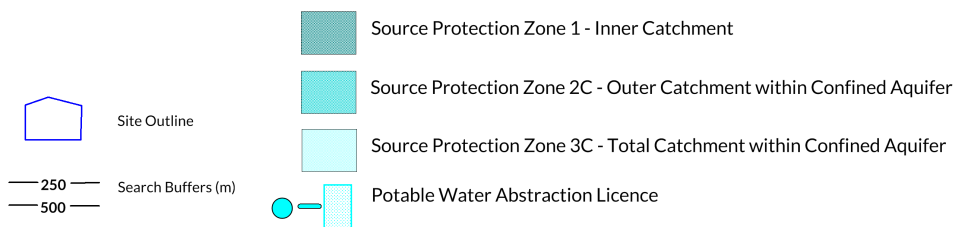
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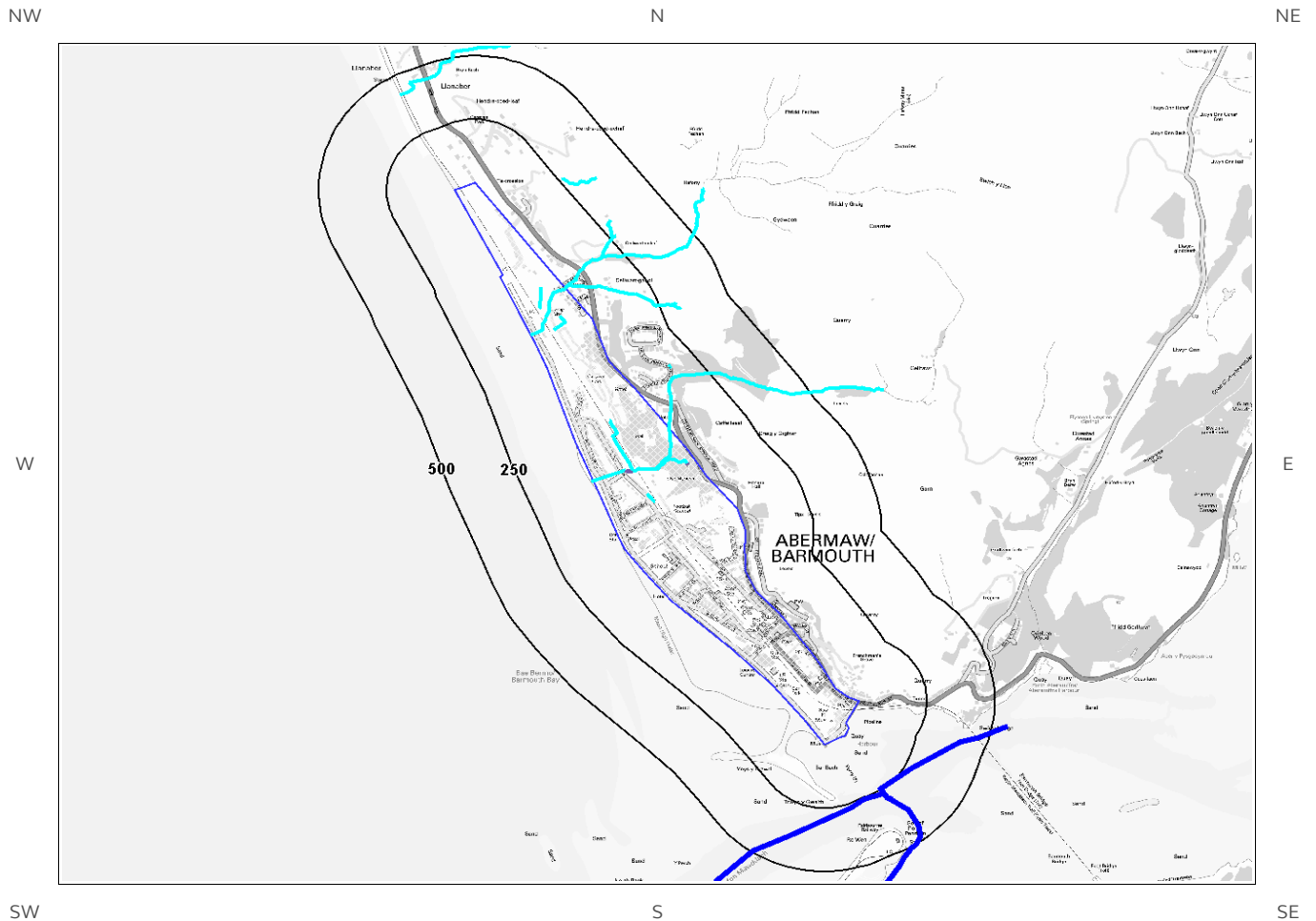
6d. Hydrogeology – Source Protection Zones within confined aquifer



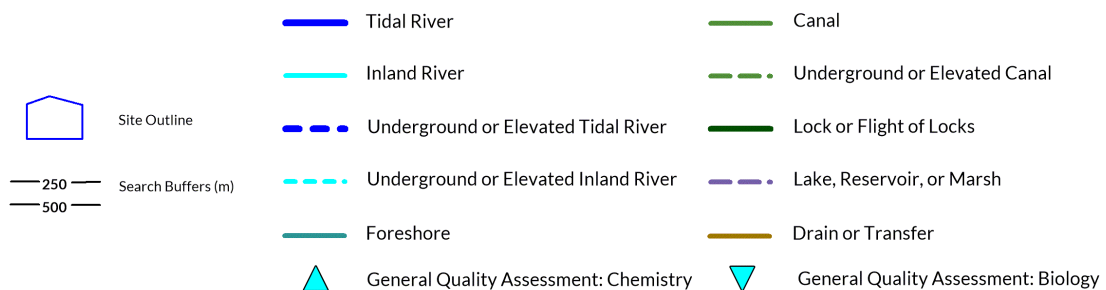
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6e. Hydrology – Watercourse Network and River Quality



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6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Records of strata classification within the superficial geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	0	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
7	0	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
8	4	SW	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
9	79	W	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	91	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
10	156	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
11	356	S	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
3	363	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
19	363	NW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
12	371	SE	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
13	392	S	Secondary (undifferentiated)	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
4	408	S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
5	427	SE	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
14	481	SE	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

ID	Distance (m)	Direction	Designation	Description
in different locations due to the variable characteristics of the rock type				

6.2 Aquifer within Bedrock Deposits

Records of strata classification within the bedrock geology at or in proximity to the property Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	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
5	0	On Site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
6	0	On Site	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
7	79	W	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
8	141	E	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
2	356	S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
9	364	SE	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
10	371	SE	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers
3	392	S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
11	418	S	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers

6.3 Groundwater Abstraction Licences

Groundwater Abstraction Licences within 2000m of the study site None identified

Database searched and no data found.

6.4 Surface Water Abstraction Licences

Surface Water Abstraction Licences within 2000m of the study site

Identified

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details
13	720	NE	261040 317650	Status: Historical Licence No: 23/64/15/0002 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: EAW Surface Water Point: STREAM Data Type: Point Name: Smith Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 25/10/1965 Expiry Date: - Issue No: 100 Version Start Date: 25/10/1965 Version End Date:
Not shown	1377	N	259870 318950	Status: Historical Licence No: 23/64/15/0003 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: EAW Surface Water Point: AFON CAERDDANIEL Data Type: Point Name: Williams Annual Volume (m³): - Max Daily Volume (m³): - Application No: - Original Start Date: 25/10/1965 Expiry Date: - Issue No: 100 Version Start Date: 25/10/1965 Version End Date:
Not shown	1439	N	260400 319020	Status: Historical Licence No: WA/064/0005/004 Details: Hydroelectric Power Generation Direct Source: EAW Surface Water Point: UN-NAMED STREAM TO SEA Data Type: Point Name: Williams Annual Volume (m³): 1.26144e+006 Max Daily Volume (m³): 3466 Application No: - Original Start Date: 23/05/2012 Expiry Date: 31/03/2030 Issue No: 2 Version Start Date: 20/06/2013 Version End Date:

6.5 Potable Water Abstraction Licences

Potable Water Abstraction Licences within 2000m of the study site

Identified

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details
1	720	NE	261040 317650	Status: Historical Licence No: 23/64/15/0002 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: EAW Surface Water Point: STREAM Data Type: Point Name: Smith Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 25/10/1965 Expiry Date: - Issue No: 100 Version Start Date: - Version End Date:
Not shown	1377	N	259870 318950	Status: Historical Licence No: 23/64/15/0003 Details: Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household Direct Source: EAW Surface Water Point: AFON CAERDDANIEL Data Type: Point Name: Williams Annual Volume (m³): - Max Daily Volume (m³): - Original Application No: - Original Start Date: 25/10/1965 Expiry Date: - Issue No: 100 Version Start Date: - Version End Date:

6.6 Source Protection Zones

Source Protection Zones within 500m of the study site

None identified

Database searched and no data found.

6.7 Source Protection Zones within Confined Aquifer

Source Protection Zones within the Confined Aquifer within 500m of the study site

None identified

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site Identified

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Minor Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.
0	On Site	Minor Aquifer/High Leaching Potential	H3	Coarse textured or moderately shallow soils which readily transmit non-adsorbed pollutants and liquid discharges but have some ability to attenuate adsorbed pollutants because of their clay or organic matter content.
95	NE	Minor Aquifer/Intermediate Leaching Potential	I1	Soils which can possibly transmit a wide range of pollutants.
377	NE	Minor Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.
417	S	Minor Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
476	E	Minor Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.

6.9 River Quality

Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site None identified

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Database searched and no data found.

6.10 Ordnance Survey MasterMap Water Network

Ordnance Survey MasterMap Water Network entries within 500m of the study site

This watercourse information is provided by Ordnance Survey MasterMap Water Network. The data provides a detailed centre line following the curve of the waterway precisely, so all distances provided in the report should be understood as measurements to the centreline rather than a measurement to the nearest point of the watercourse. Underground watercourses are inferred from entry and exit points so caution is advised in using these to indicate precise locations of underground watercourses when planning site investigation and development.

The following Ordnance Survey MasterMap Water Network records are represented on the Hydrology Map (6e):

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
1	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Arthro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.6
2	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Arthro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
3	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Arthro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
4	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Arthro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.7
5	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Arthro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
6	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Arthro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
7	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Arthro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
8	0 On Site	Not specified	Lake, loch or reservoir.	Catchment Area: Arthro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.8
9	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Arthro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
10	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
11	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
12	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.3
13	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
14	0 On Site	Not specified	Lake, loch or reservoir.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 5.7
15	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
16	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
17	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
18	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
19	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
20	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
92	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.6
93	0	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	On Site			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
94	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
95	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.7
96	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
97	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
98	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
99	0 On Site	Not specified	Lake, loch or reservoir.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 3.8
100	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 2.0
101	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
102	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
103	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.3
104	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
105	0 On Site	Not specified	Lake, loch or reservoir.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): 5.7
106	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
107	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
108	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
109	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
110	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
111	0 On Site	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
21	15 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
22	15 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
112	15 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
113	15 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
23	39 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
114	39 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
24	73 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.8
115	73 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): 1.8
25	87 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
116	87 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
26	111 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
117	111 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
27	118 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
118	118 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
28	155 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
29	155 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Underground Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
30	155 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
119	155 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
120	155	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Underground

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	NE			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
121	155 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
31	169 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
122	169 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
32	181 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
33	181 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
123	181 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
124	181 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
34	186 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
125	186 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
35	225 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
126	225 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
36	230 E	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions)

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
				Average Width in Watercourse Section (m): Not Provided
127	230 E	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
37	246 SE	Afon Mawddach	Tidal river or stream.	Catchment Area: Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
128	246 SE	Afon Mawddach	Tidal river or stream.	Catchment Area: Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
38	259 SE	Afon Mawddach	Tidal river or stream.	Catchment Area: Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
129	259 SE	Afon Mawddach	Tidal river or stream.	Catchment Area: Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
39	260 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
40	260 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
130	260 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
131	260 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
41	264 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
132	264 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
42	269 SE	Not specified	Tidal river or stream.	Catchment Area: Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
133	269 SE	Not specified	Tidal river or stream.	Catchment Area: Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
43	289 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
134	289 NE	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
44	299 E	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
45	299 E	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
135	299 E	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
136	299 E	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
46	421 NW	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	421 NW	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
47	444 N	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
48	444 NW	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	444 N	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: On ground surface Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided
Not shown	444	Not specified	Inland river not influenced by normal tidal action.	Catchment Area: Artro Relationship to Ground Level: Not provided

ID	Distance/ Direction	Name	Type of Watercourse	Additional Details
	NW			Permanence: Watercourse contains water year round (in normal conditions) Average Width in Watercourse Section (m): Not Provided

6.11 Surface Water Features

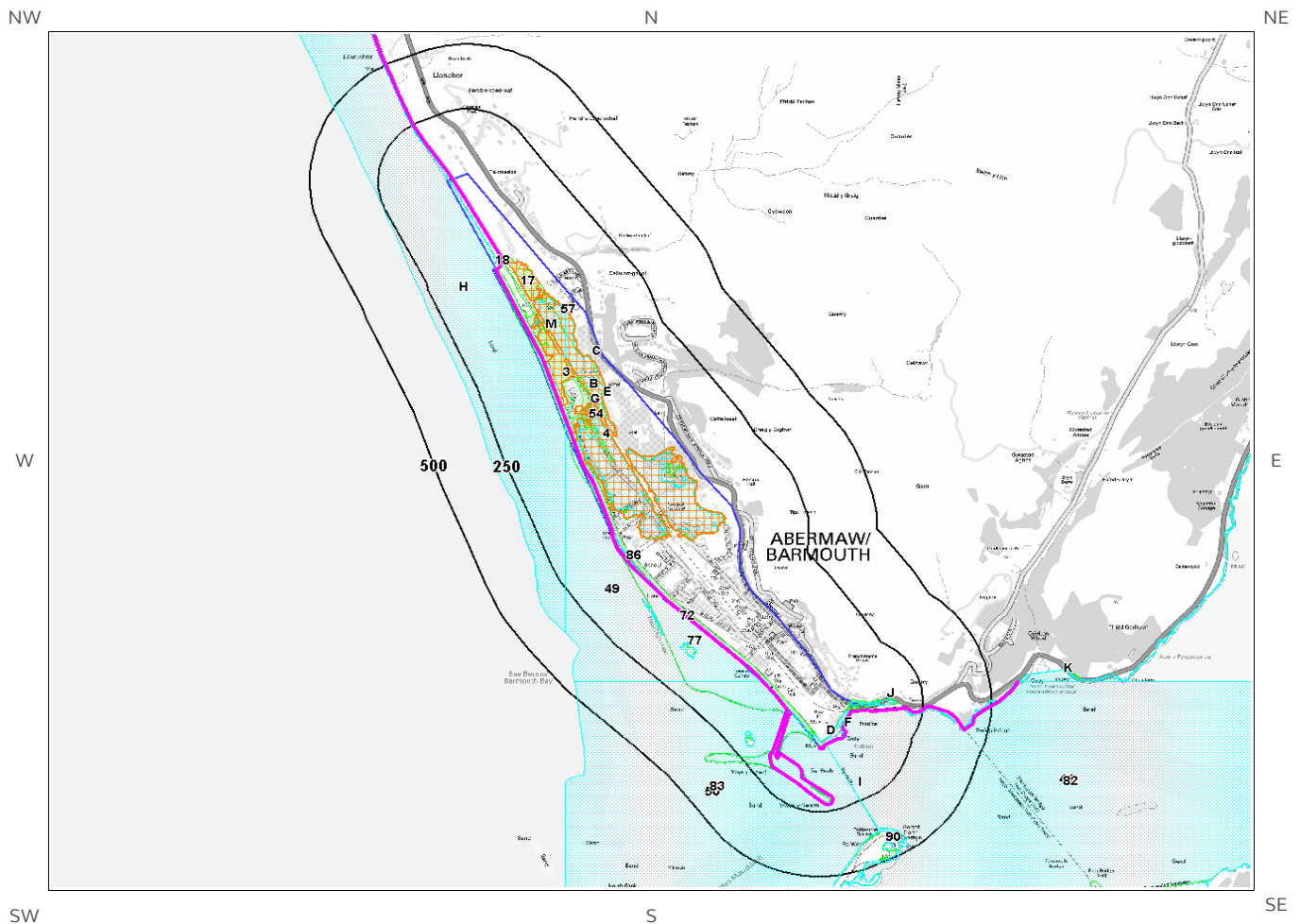
Surface water features within 250m of the study site

Identified

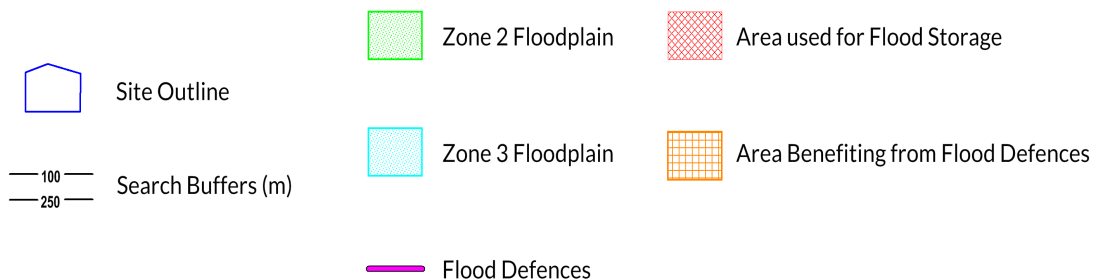
The following surface water records are not represented on mapping:

Distance (m)	Direction
0	On Site
79	W
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
0	On Site
62	NE
87	NE
97	NE
118	NE
169	NE
196	NE
218	NE
225	NE
230	E

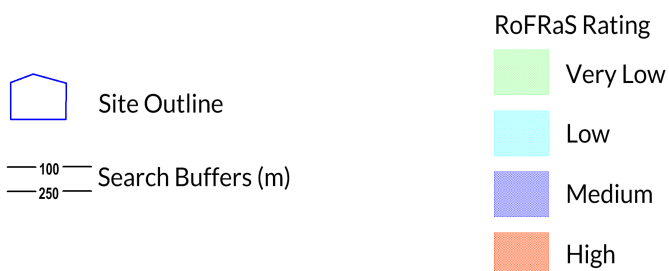
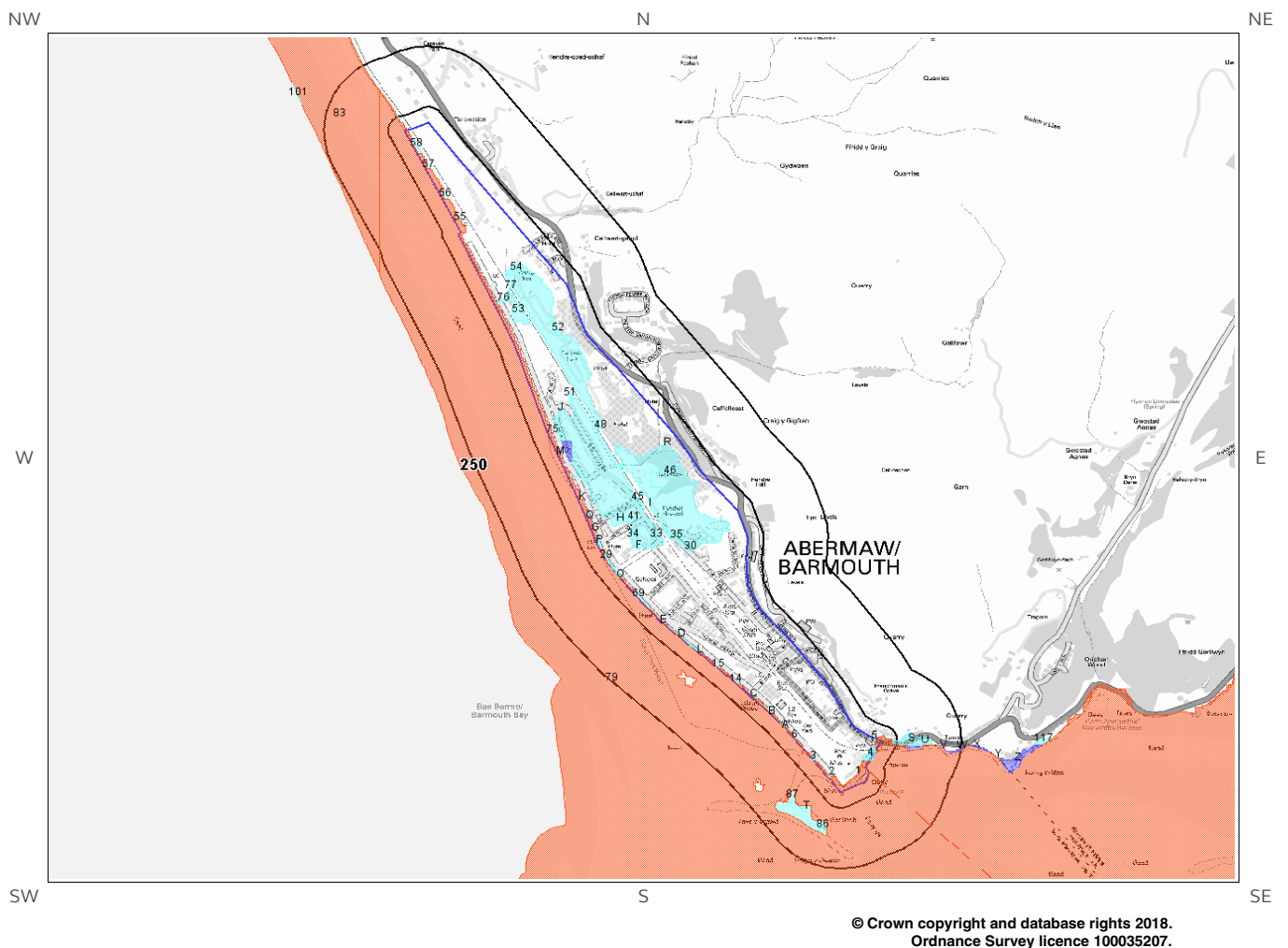
7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)



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7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



7 Flooding

7.1 River and Coastal Zone 2 Flooding

Environment Agency/Natural Resources Wales Zone 2 floodplain within 250m

Identified

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

ID	Distance (m)	Direction	Update	Type
1D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
2A	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
3	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
4	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
5A	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
6B	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
7G	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
8B	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
9E	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
10A	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
11B	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
12C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
13C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
14C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
15C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
16A	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
17	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
18	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
19D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)

20E	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
21D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
22	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
23D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
24A	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
25D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
26C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
27D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
28F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
29C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
30D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
31D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
32D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
33D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
34F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
35F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
36D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
37	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
38F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
39F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
40F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
41D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
42F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
43D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
44	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
45D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
46C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
47	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)

48M	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
49	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
50	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
51D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
52H	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
53G	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
54	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
55E	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
56B	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
57	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
58F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
59C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
60D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
61F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
62C	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
63A	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
64F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
65F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
66F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
67D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
68E	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
69F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
70D	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
71F	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
72	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
73L	0	On Site	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
74F	0	SE	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
75A	63	E	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)

76A	66	E	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
77	69	SW	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
78A	71	E	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)
79J	71	E	15-Oct-2018	Zone 2 - (Fluvial /Tidal Models)

7.2 River and Coastal Zone 3 Flooding

Environment Agency/Natural Resources Wales Zone 3 floodplain within 250m Identified

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

ID	Distance (m)	Direction	Update	Type
1D	0	On Site	15-Oct-2018	Zone 3 - (Fluvial Models)
2A	0	On Site	15-Oct-2018	Zone 3 - (Fluvial Models)
3	0	On Site	15-Oct-2018	Zone 3 - (Fluvial Models)
4	0	On Site	15-Oct-2018	Zone 3 - (Fluvial Models)
5A	0	On Site	15-Oct-2018	Zone 3 - (Fluvial Models)
6B	0	On Site	15-Oct-2018	Zone 3 - (Fluvial Models)
7G	39	SE	15-Oct-2018	Zone 3 - (Fluvial Models)
8B	39	SE	15-Oct-2018	Zone 3 - (Fluvial Models)
9E	71	E	15-Oct-2018	Zone 3 - (Fluvial Models)

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

Highest risk of flooding onsite High

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a High (1 in 30 or greater) chance of flooding in any given year.

Any relevant data within 250m is represented on the RoFRaS Flood map. Data to 50m is reported in the table below.

ID	Distance	Direction	RoFRaS flood Risk
----	----------	-----------	-------------------

	(m)		
1	0.0	On Site	Low
2	0.0	On Site	Low
3	0.0	On Site	Low
4	0.0	On Site	Low
5	0.0	On Site	Low
6	0.0	On Site	Low
7A	0.0	On Site	Low
8A	0.0	On Site	Low
9B	0.0	On Site	Low
10B	0.0	On Site	Low
11B	0.0	On Site	Low
12C	0.0	On Site	Low
13C	0.0	On Site	Low
14	0.0	On Site	Low
15	0.0	On Site	Low
16L	0.0	On Site	Low
17D	0.0	On Site	Low
18D	0.0	On Site	Low
19D	0.0	On Site	Low
20D	0.0	On Site	Low
21E	0.0	On Site	Low
22E	0.0	On Site	Low
23E	0.0	On Site	Low
24E	0.0	On Site	Low
25E	0.0	On Site	Low
26E	0.0	On Site	Low
27N	0.0	On Site	Low
28O	0.0	On Site	Low
29	0.0	On Site	Low
30	0.0	On Site	Low
31F	0.0	On Site	Low
32F	0.0	On Site	Low
33	0.0	On Site	Low
34	0.0	On Site	Low
35	0.0	On Site	Low
36G	0.0	On Site	Low
37G	0.0	On Site	Low
38H	0.0	On Site	Low
39G	0.0	On Site	Low
40H	0.0	On Site	Low
41	0.0	On Site	Low
42Q	0.0	On Site	Low
43I	0.0	On Site	Low
44I	0.0	On Site	Low
45	0.0	On Site	Low

46	0.0	On Site	Low
47R	0.0	On Site	Low
48	0.0	On Site	Low
49J	0.0	On Site	Low
50J	0.0	On Site	Low
51	0.0	On Site	Low
52	0.0	On Site	Low
53	0.0	On Site	Low
54	0.0	On Site	Low
55	0.0	On Site	Low
56	0.0	On Site	Low
57	0.0	On Site	Low
58	0.0	On Site	Low
59K	0.0	On Site	Medium
60K	0.0	On Site	Medium
61K	0.0	On Site	Medium
62M	0.0	On Site	Medium
63L	0.0	On Site	Low
64D	0.0	On Site	Low
65D	0.0	On Site	Low
66M	0.0	On Site	Medium
67N	0.0	On Site	Low
68N	0.0	On Site	Low
69	0.0	On Site	Low
70O	0.0	On Site	Low
71P	0.0	On Site	Low
72P	0.0	On Site	Low
73Q	0.0	On Site	Low
74R	0.0	On Site	Low
75	0.0	On Site	Medium
76	0.0	On Site	Low
77	0.0	On Site	Low
78	0.0	On Site	Low
79	0.0	On Site	High
80	27.0	N	Low
81S	30.0	E	Low

7.4 Flood Defences

Flood Defences within 250m of the study site

Identified

The following flood defence records are represented as lines on the Flood Map:

ID	Distance (m)	Direction	Update
95	0	On Site	08-Oct-2018

ID	Distance (m)	Direction	Update
96	0	On Site	08-Oct-2018
97	0	On Site	08-Oct-2018
98	0	On Site	08-Oct-2018
99	0	On Site	08-Oct-2018
100	59	SE	08-Oct-2018

7.5 Areas benefiting from Flood Defences

Areas benefiting from Flood Defences within 250m of the study site Identified

7.6 Areas benefiting from Flood Storage

Areas used for Flood Storage within 250m of the study site None identified

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site Identified

Clearwater Flooding or Superficial Deposits Flooding Superficial Deposits Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 Highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

7.8 Groundwater Flooding Confidence Areas

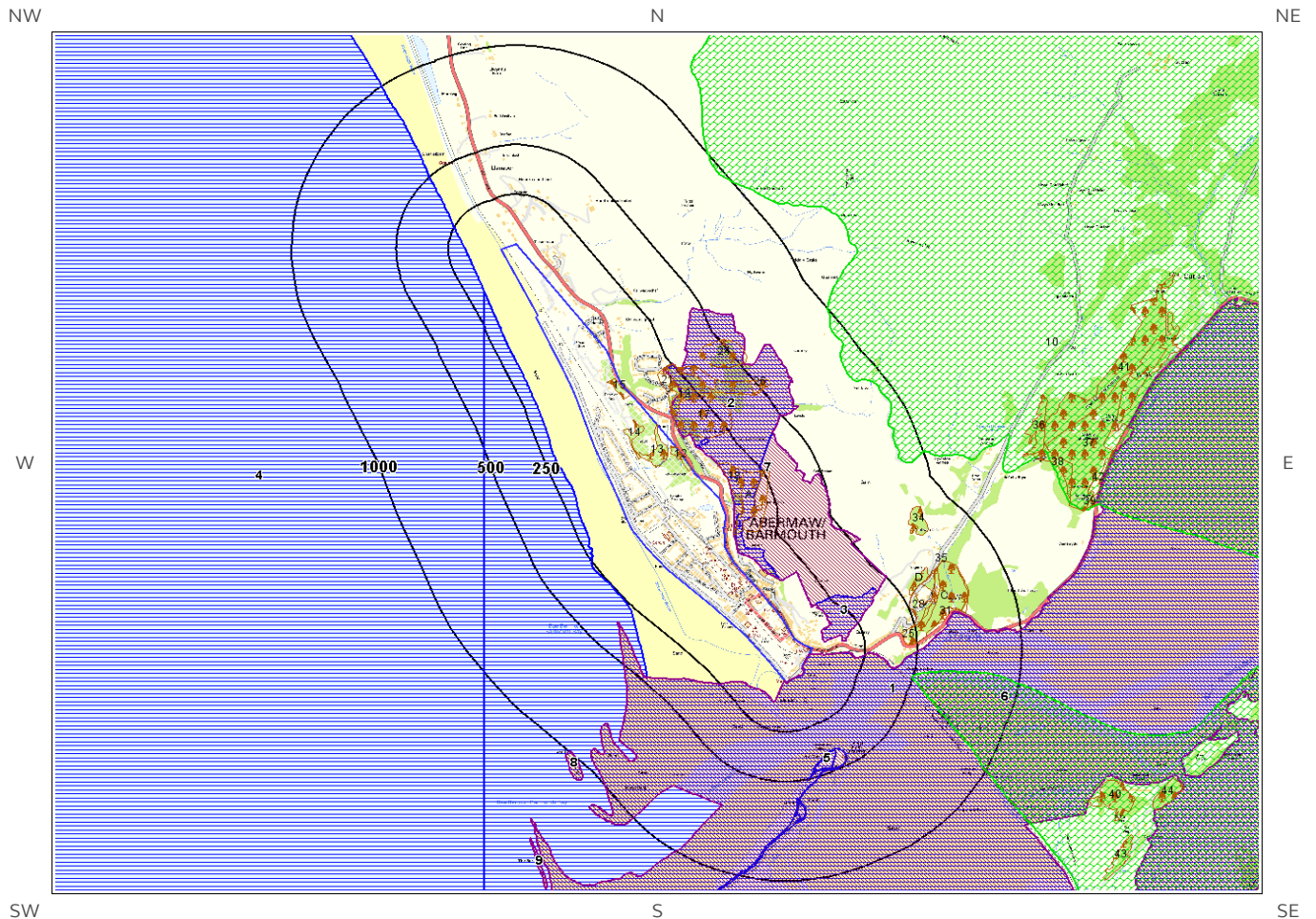
British Geological Survey confidence rating in this result

High

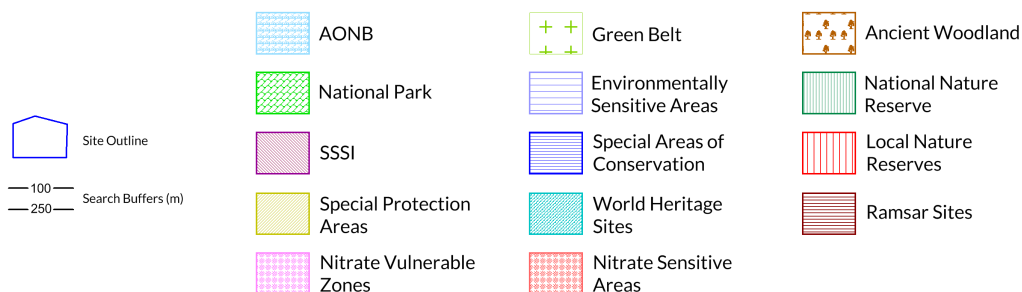
Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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8. Designated Environmentally Sensitive Sites

Designated Environmentally Sensitive Sites within 2000m of the study site

Identified

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

4

The following Site of Special Scientific Interest (SSSI) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SSSI Name	Data Source
6	0	On Site	ABER MAWDDACH/MAWDDACH ESTUARY	Natural Resources Wales
7	42	E	BARMOUTH HILLSIDE	Natural Resources Wales
8	996	SW	ABER MAWDDACH/MAWDDACH ESTUARY	Natural Resources Wales
9	1443	SW	ABER MAWDDACH/MAWDDACH ESTUARY	Natural Resources Wales

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

5

The following Special Area of Conservation (SAC) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	SAC Name	Data Source
1	0	On Site	Pen Llyn a'r Sarnau / Llyn Peninsula and the Sarnau	Natural Resources Wales
2	45	NE	Coedydd Derw a Safleoedd Ystlumod Meirion / Meirionnydd Oakwoods and Bat Sites	Natural Resources Wales
3	65	NE	Coedydd Derw a Safleoedd Ystlumod Meirion / Meirionnydd Oakwoods and Bat Sites	Natural Resources Wales
4	154	SW	Pen Llyn a'r Sarnau / Llyn Peninsula and the Sarnau	Natural Resources Wales
5	407	S	Pen Llyn a'r Sarnau / Llyn Peninsula and the Sarnau	Natural Resources Wales

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

33

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
12	0	On Site	Unknown	Ancient and Semi-Natural Woodland
13	0	On Site	Unknown	Restored Ancient Woodland Site
14	0	On Site	Unknown	Ancient and Semi-Natural Woodland
15	0	On Site	Unknown	Ancient and Semi-Natural Woodland
16A	47	E	Unknown	Ancient and Semi-Natural Woodland
17	65	NE	Unknown	Ancient and Semi-Natural Woodland
18	71	E	Unknown	Ancient and Semi-Natural Woodland
19	78	NE	Unknown	Ancient and Semi-Natural Woodland
20A	85	E	Unknown	Ancient and Semi-Natural Woodland
21	99	NE	Unknown	Ancient and Semi-Natural Woodland
22B	197	NE	Unknown	Ancient and Semi-Natural Woodland
23B	241	NE	Unknown	Ancient and Semi-Natural Woodland
24	375	NE	Unknown	Ancient and Semi-Natural Woodland
25	427	E	FFRIDD GORLLWYN	Ancient and Semi-Natural Woodland
26	463	NE	Unknown	Ancient and Semi-Natural Woodland
27C	469	E	Unknown	Restored Ancient Woodland Site
28	480	E	Unknown	Ancient and Semi-Natural Woodland
29C	523	E	FFRIDD GORLLWYN	Ancient and Semi-Natural Woodland
30D	535	NE	Unknown	Ancient and Semi-Natural Woodland
31	589	E	FFRIDD GORLLWYN	Ancient and Semi-Natural Woodland
32D	612	NE	Unknown	Restored Ancient Woodland Site
33	712	E	Unknown	Ancient Replanted Woodland
34	745	NE	Unknown	Ancient and Semi-Natural Woodland
35	746	NE	FFRIDD GORLLWYN	Ancient and Semi-Natural Woodland
36	1394	NE	Unknown	Ancient and Semi-Natural Woodland
37	1422	NE	Unknown	Restored Ancient Woodland Site
38	1435	NE	COED GLAN-Y-MAWDDACH	Ancient and Semi-Natural Woodland

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
39	1461	NE	COED GLAN-Y-MAWDDACH	Ancient and Semi-Natural Woodland
40	1508	SE	Unknown	Ancient and Semi-Natural Woodland
41	1511	NE	Unknown	Restored Ancient Woodland Site
42	1532	NE	COED GLAN-Y-MAWDDACH	Ancient and Semi-Natural Woodland
43	1750	SE	Unknown	Ancient and Semi-Natural Woodland
44	1791	E	Unknown	Ancient and Semi-Natural Woodland

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

0

Database searched and no data found.

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

2

The following National Park records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	NP Name	Data Source
10	497	E	Snowdonia	Natural Resources Wales
Not shown	1366	N	Snowdonia	Natural Resources Wales

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

0

Database searched and no data found.

8.14 Records of Green Belt land within 2000m of the study site:

0

Database searched and no data found.

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a **Groundsure Geo Insight**, available from our **website**. The following information has been found:

9.1.1 Shrink Swell

Maximum Shrink-Swell** hazard rating identified on the study site Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

9.1.2 Landslides

Maximum Landslide* hazard rating identified on the study site Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property no significant increase in insurance risk due to natural slope instability problems.

9.1.3 Soluble Rocks

Maximum Soluble Rocks* hazard rating identified on the study site Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

Maximum Compressible Ground* hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Very low potential for compressible deposits to be present. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

Maximum Collapsible Rocks* hazard rating identified on the study site

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

Maximum Running Sand** hazard rating identified on the study site

Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Significant potential for running sand problems with relatively small changes in ground conditions. Avoid large amounts of water entering the ground (for example through pipe leakage or soak-aways). Do not dig (deep) holes into saturated ground near the property without technical advice. For new build consider the consequences of soil and groundwater conditions during and after construction. For existing property possible increase in insurance risk from running sand, for example, due to water leakage, high rainfall events or flooding.

* This indicates an automatically generated 50m buffer and site.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The site is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Coal mining areas within 75m of the study site

None identified

Database searched and no data found.

10.2 Non-Coal Mining

Non-Coal Mining areas within 50m of the study site boundary

Identified

The following non-coal mining information is provided by the BGS:

Distance (m)	Direction	Name	Commodity	Assessment of likelihood
0.0	On Site	Not available	Vein Mineral	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
0.0	On Site	Dolgellau	Vein Mineral	Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered
0.0	On Site	Dolgellau	Vein Mineral	Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered
0.0	On Site	Not available	Vein Mineral	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
0.0	On Site	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

These are areas known or suspected to contain past underground mining for minerals and/or other materials where workings are likely to be extensive. In the case of mineral veins these are areas within 200m of mapped mineral veins within which it is likely that mining activities may have occurred. It should be noted, however, that there is always the possibility of the existence of other sub-surface excavations, such as wells, cess pits, follies, air raid shelters/bunkers and other military structures etc. that could affect surface ground stability but which are outside the scope of this dataset. However, if in a coalfield area you should still consider a Coal Authority mining search for the area of interest.

10.3 Brine Affected Areas

Brine affected areas within 75m of the study site
Guidance: No Guidance Required.

None identified

Contact Details

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info@groundsure.com

British Geological Survey Enquiries

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Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:

Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Natural Resources Wales

Ty Cambria
29 Newport Road
Cardiff
CF24 0TP
Tel: 0300 065 3000
Email: enquiries@naturalresourceswales.gov.uk

Public Health England

Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe
Email: enquiries@phe.gov.uk
Main switchboard: 020 7654 8000

The Coal Authority

200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey

Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority

Authority: Gwynedd County Council
Phone: 01766 771 000
Web: <http://www.gwynedd.gov.uk>
Address: Council Offices, Shirehall Street, Caernafon, Gwynedd, LL55



Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
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Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England/Natural Resources Wales who retain the Copyright and Intellectual Property Rights for the data.

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<https://www.groundsure.com/terms-and-conditions-may25-2018>

Ove Arup & Partners International Ltd
4, PIERHEAD STREET,
CAERDYDD, CF10 4QP

Groundsure Reference: GS-5539749

Your Reference: 264326

Report Date 17 Oct 2018

Report Delivery Method: Email - pdf

Geo Insight

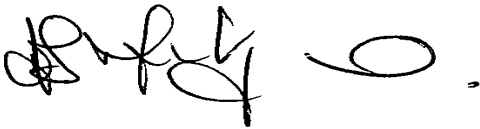
Address: Barmouth Northern Promenade,

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,



Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Address: Barmouth Northern Promenade,
Date: 17 Oct 2018
Reference: GS-5539749
Client: Ove Arup & Partners International Ltd



Aerial Photograph Capture date: 19-Jul-2016
Grid Reference: 260779,316482
Site Size: 63.39ha

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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	Yes
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	No
	1.2.2 Are there any records of landslide within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	No

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	Yes
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	Yes
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslide within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

Yes

2.3.3 Are there any records of linear features within 500m of the study site boundary?

Yes

Section 3: Radon

3. Radon

3.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.

3.2 Radon Protection

No radon protective measures are necessary.

Section 4: Ground Workings

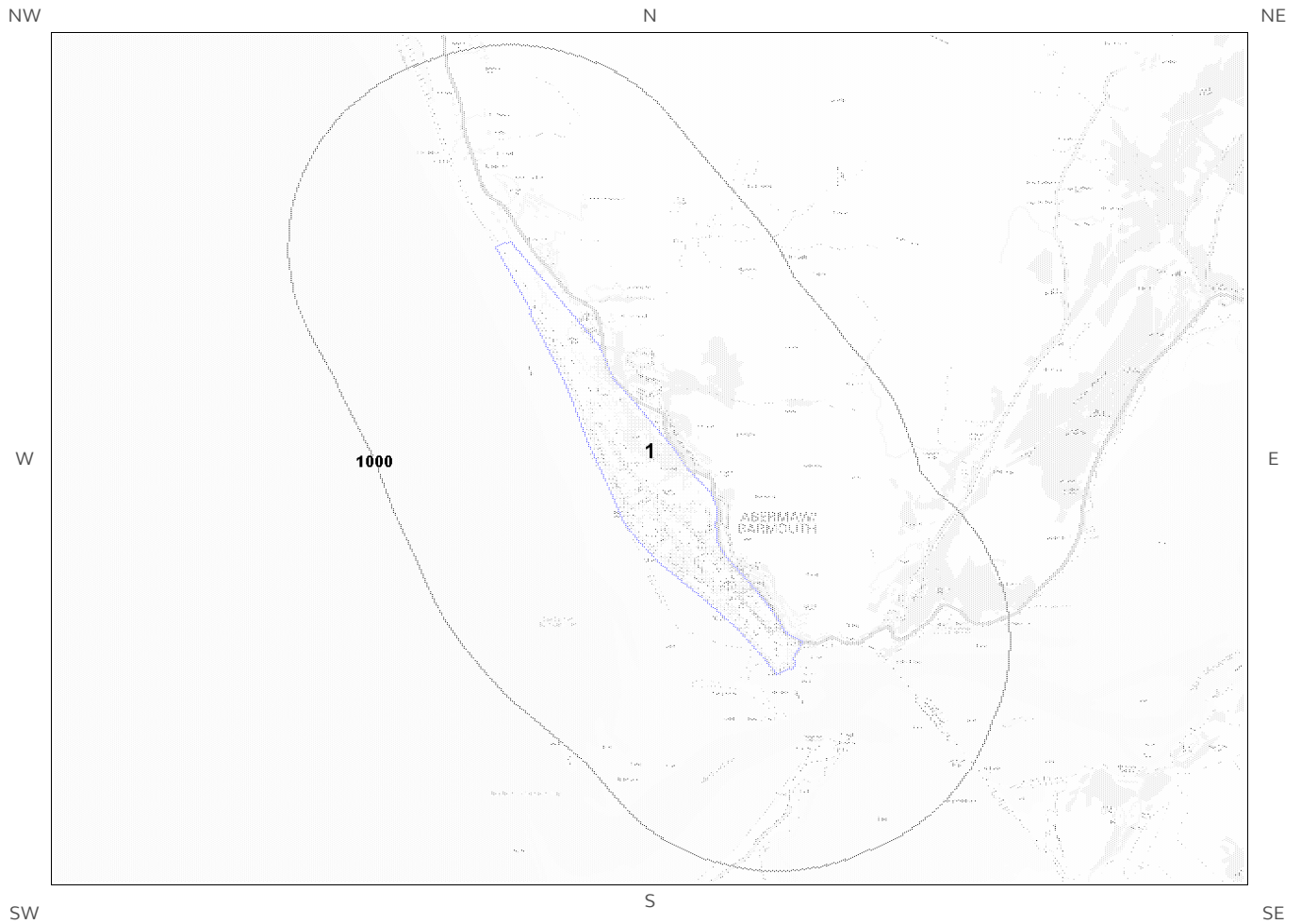
	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	4	1	17	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	8	5	15
4.3 Current Ground Workings	0	0	7	1	7

Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	7	5	15
5.2 Coal Mining	0	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	5	0	4	3	1
5.5 Non-Coal Mining Cavities	0	0	0	1	1
5.5 Natural Cavities	0	0	0	0	0

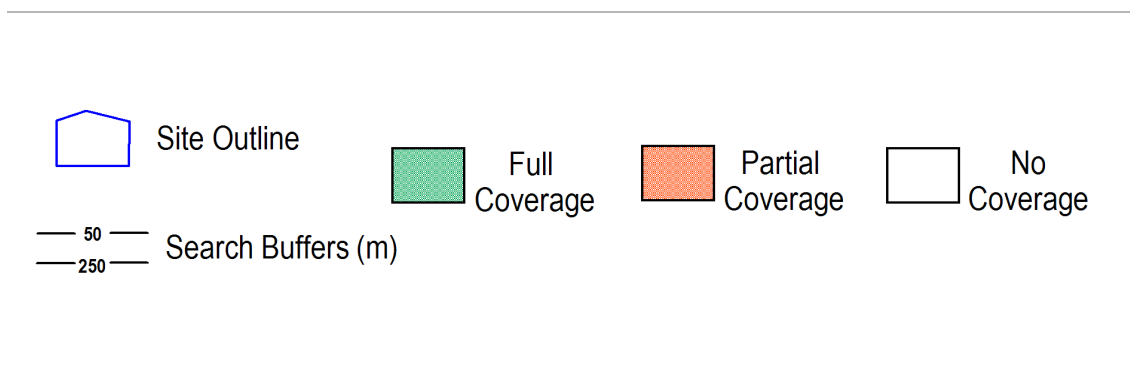
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Tin Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Very Low				
6.2 Landslides	Low				
6.3 Ground Dissolution of Soluble Rocks	Negligible				
6.4 Compressible Deposits	Very Low				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Moderate				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	6	0	0		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	44	19	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	1	Not Searched	
9.2 Historical Railway and Tunnel Features	14	0	6	Not Searched	
9.3 Historical Railways	0	0	0	Not Searched	
9.4 Active Railways	16	0	4	Not Searched	
9.5 Railway Projects	0	0	0	0	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	No deposits are mapped	No coverage	No coverage	No coverage

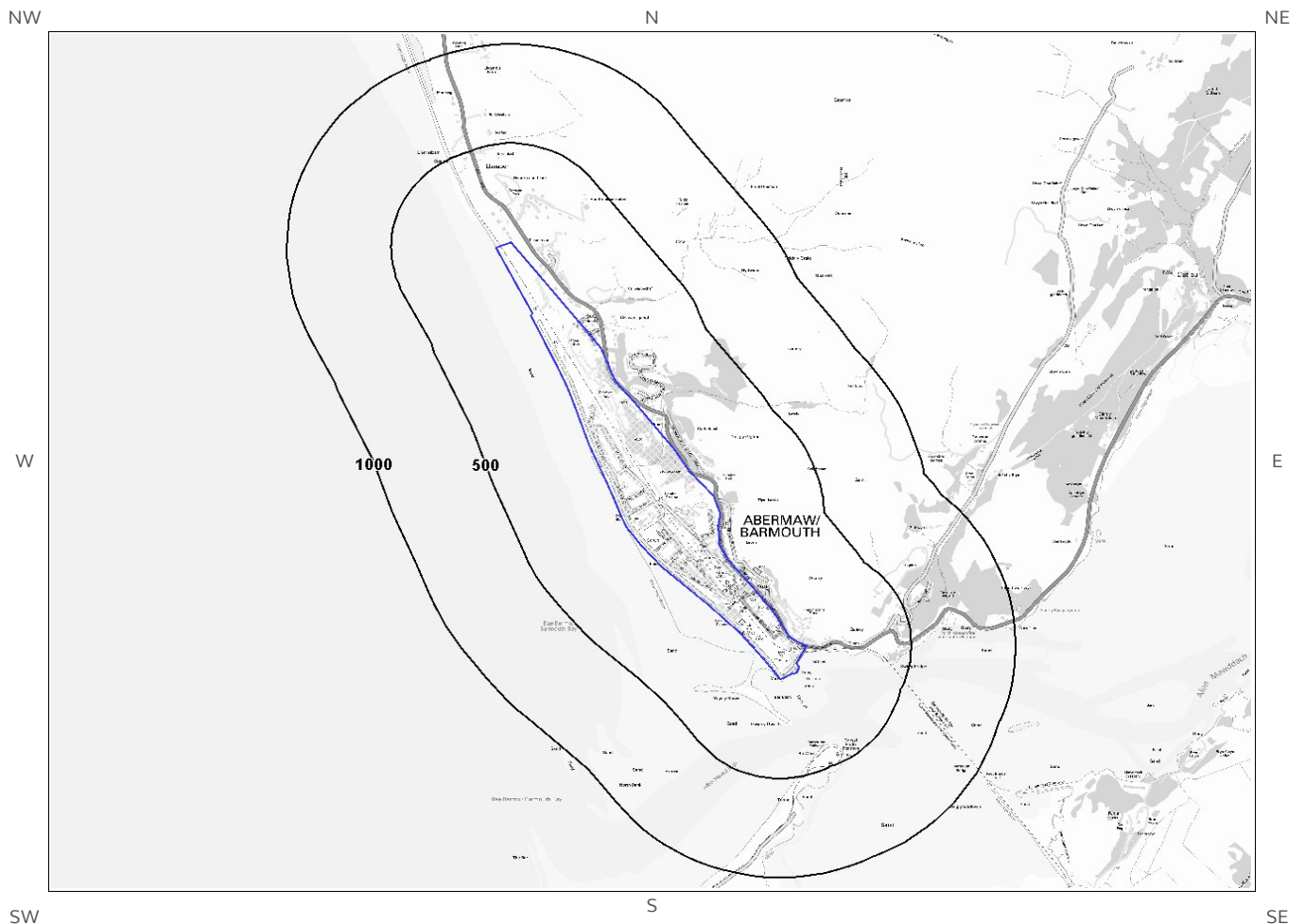
Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

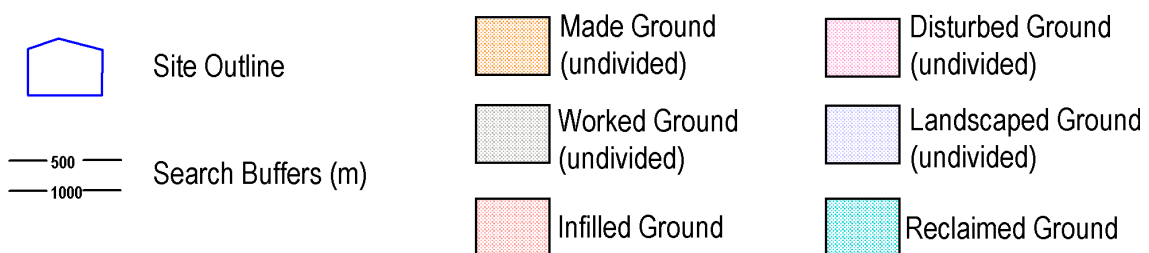
1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

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1. Geology 1:10,000 scale

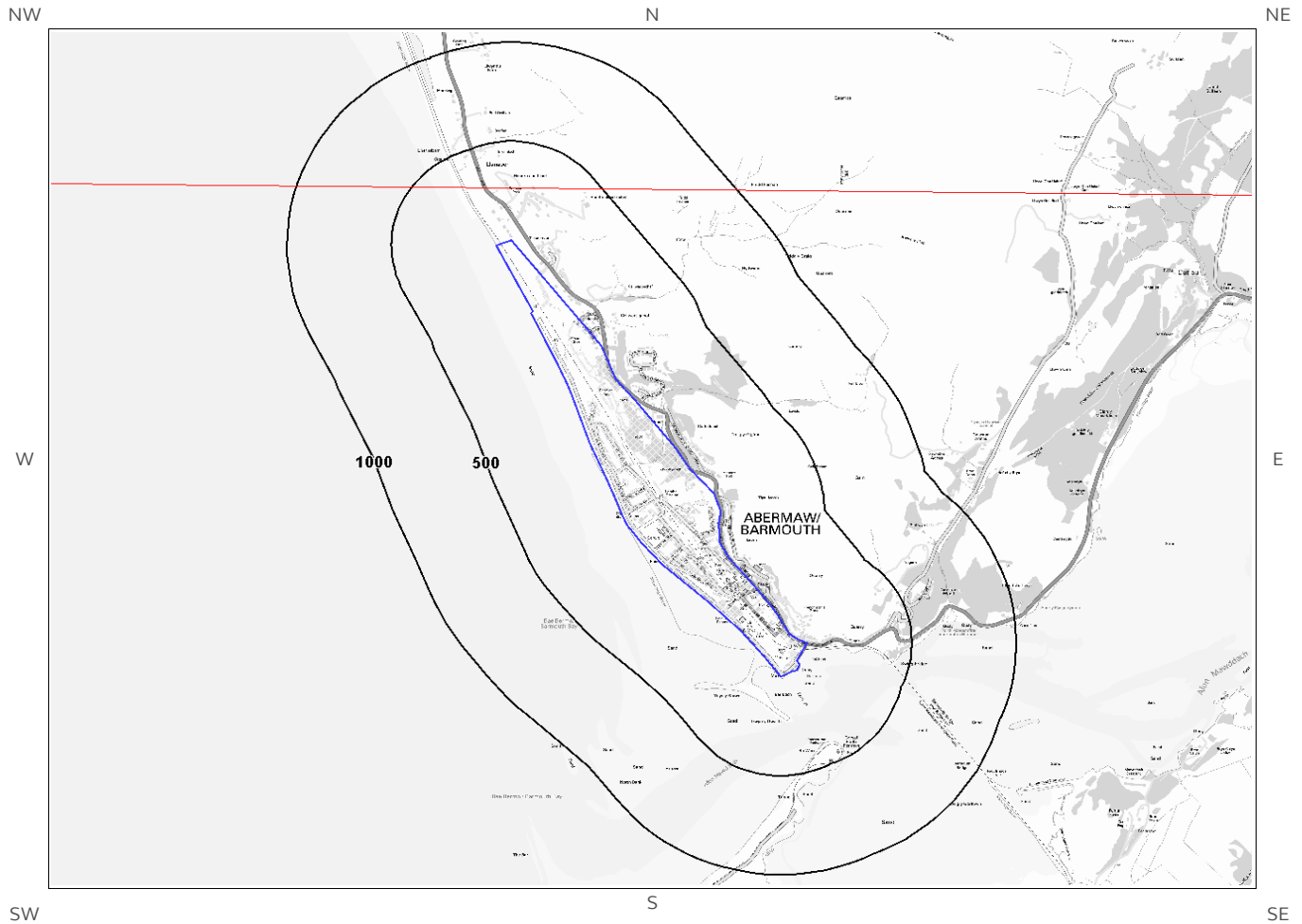
1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? No

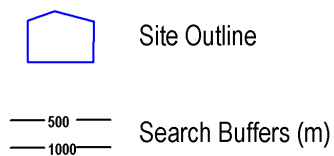
Database searched and no data found.

1.2 Superficial Deposits and Landslips map (1:10,000 scale)



Artificial Ground Legend

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1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

1.2.2 Landslip

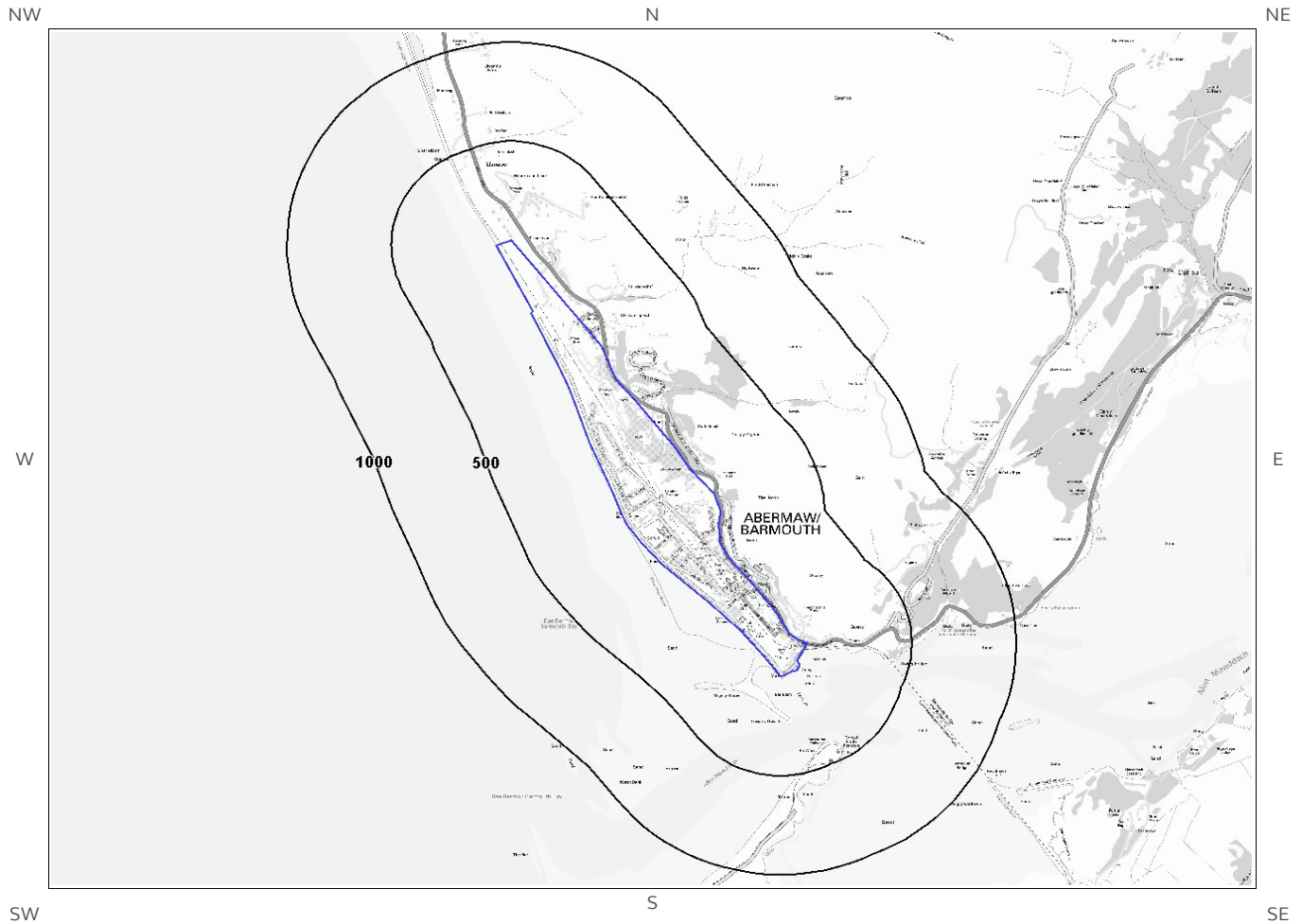
Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

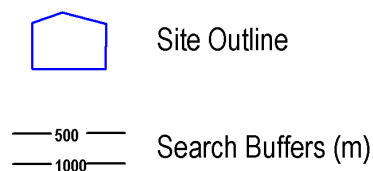
This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

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1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

Database searched and no data found at this scale.

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? No

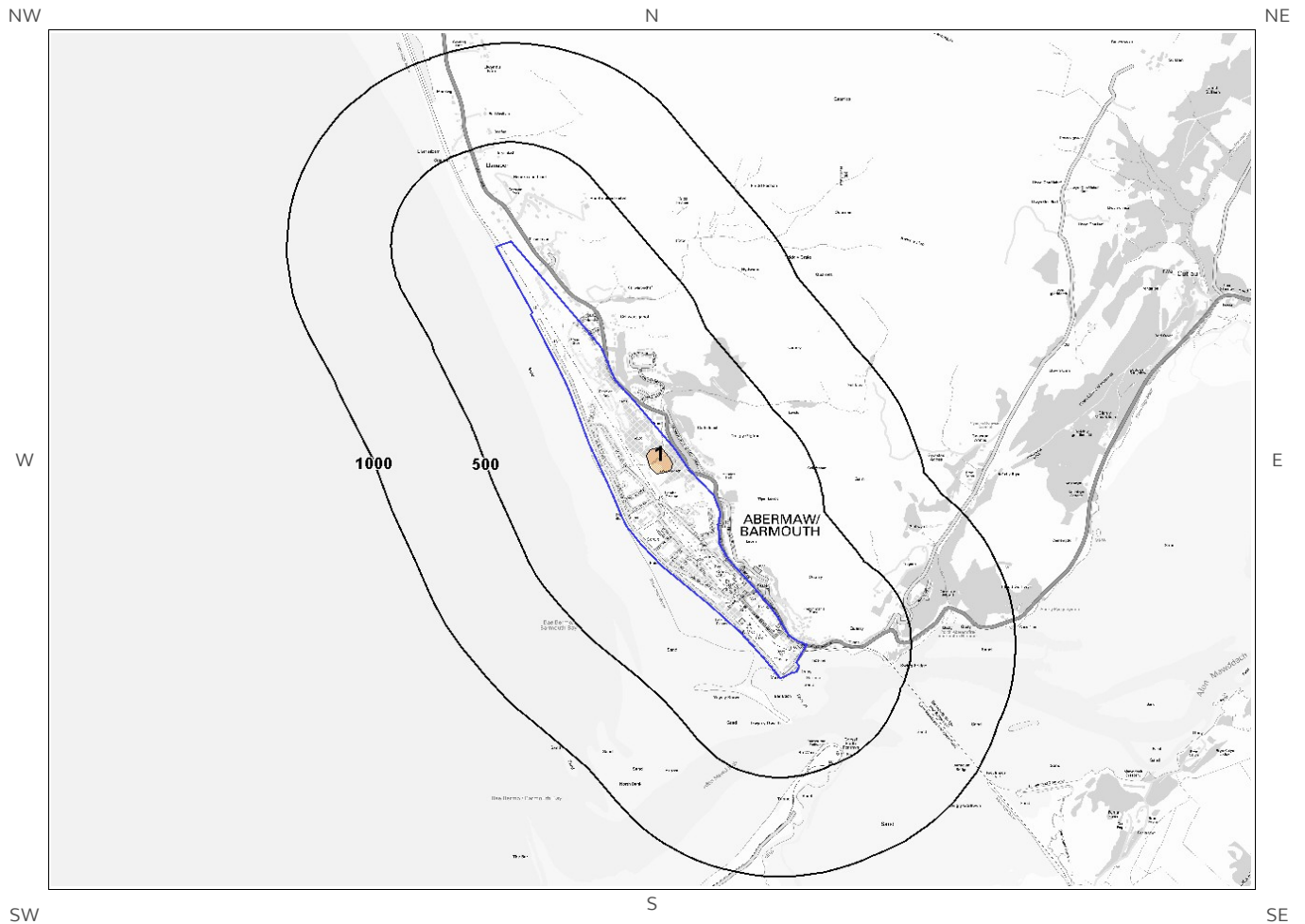
Database searched and no data found at this scale.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

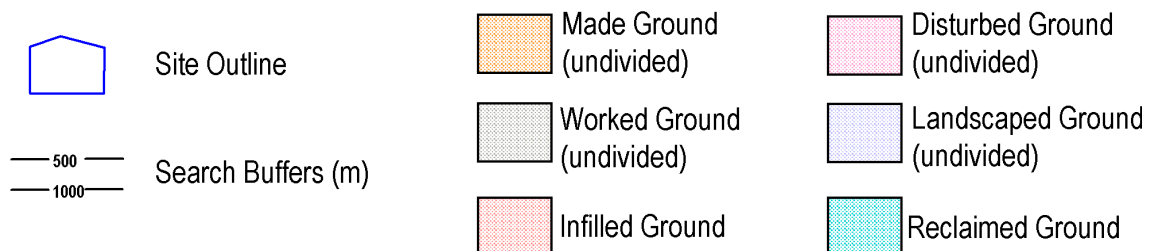
This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 149

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? Yes

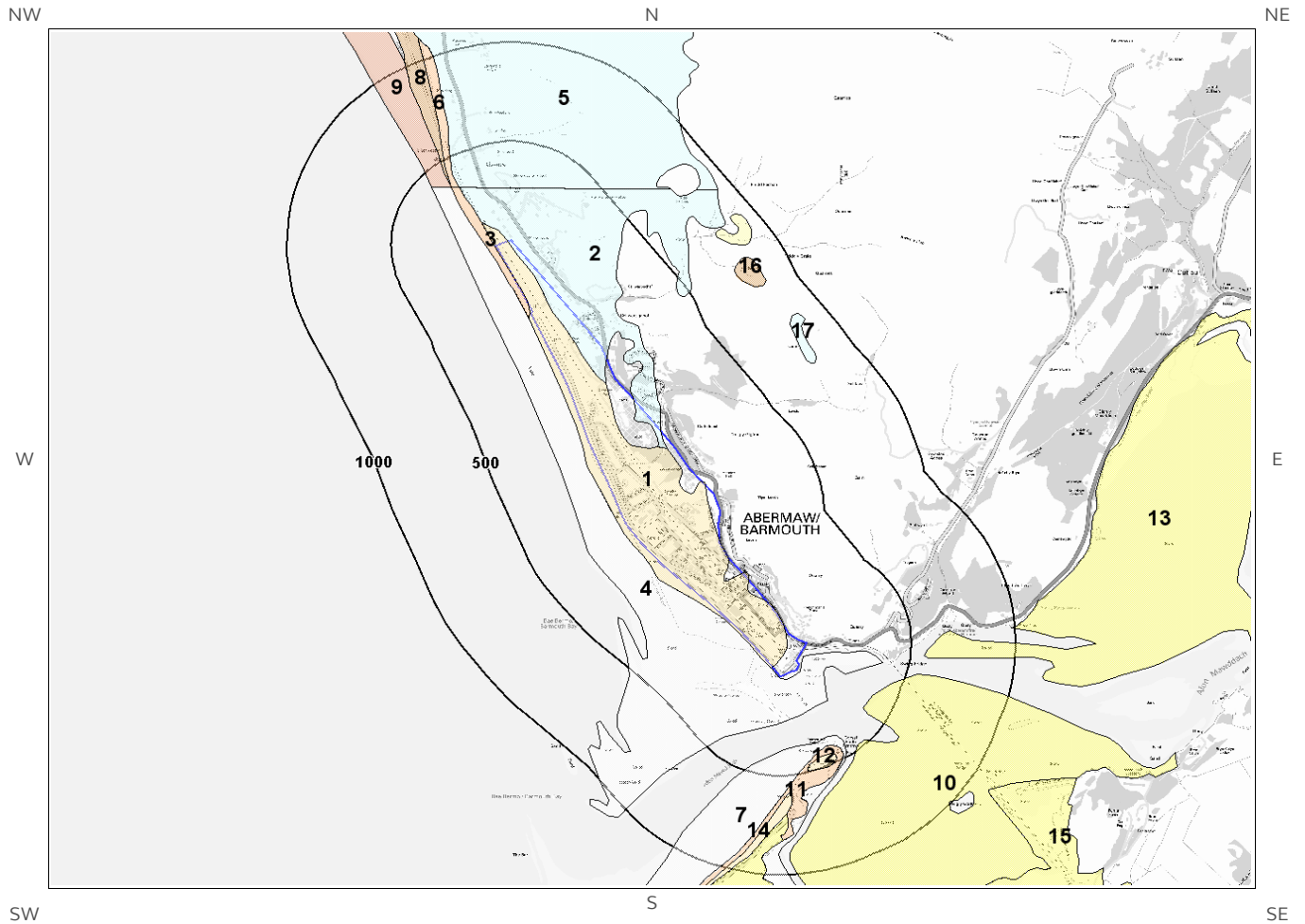
ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	Very High	Low

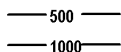
2.2 Superficial Deposits and Landslips map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	BSA-S	BLOWN SAND	SAND
2	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
3	0.0	On Site	STOB-V	STORM BEACH DEPOSITS	GRAVEL
4	4.0	SW	CZD-XVSZC	COASTAL ZONE DEPOSITS (UNDIFFERENTIATED)	GRAVEL, SAND, SILT AND CLAY
5	264.0	N	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
6	341.0	NW	STOB-V	STORM BEACH DEPOSITS	GRAVEL
7	356.0	S	CZD-XVSZC	COASTAL ZONE DEPOSITS (UNDIFFERENTIATED)	GRAVEL, SAND, SILT AND CLAY
8	363.0	NW	PEAT-P	PEAT	PEAT
9	363.0	NW	MBD-S	MARINE BEACH DEPOSITS	SAND
10	371.0	SE	TFD-XCZS	TIDAL FLAT DEPOSITS	CLAY, SILT AND SAND
11	408.0	S	STOB-V	STORM BEACH DEPOSITS	GRAVEL
12	448.0	SE	BSA-S	BLOWN SAND	SAND

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Intergranular	High	High
0.0	On Site	Intergranular	Very High	Very High
0.0	On Site	Mixed	High	Low
4.0	SW	Intergranular	Very High	Low

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary?

No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

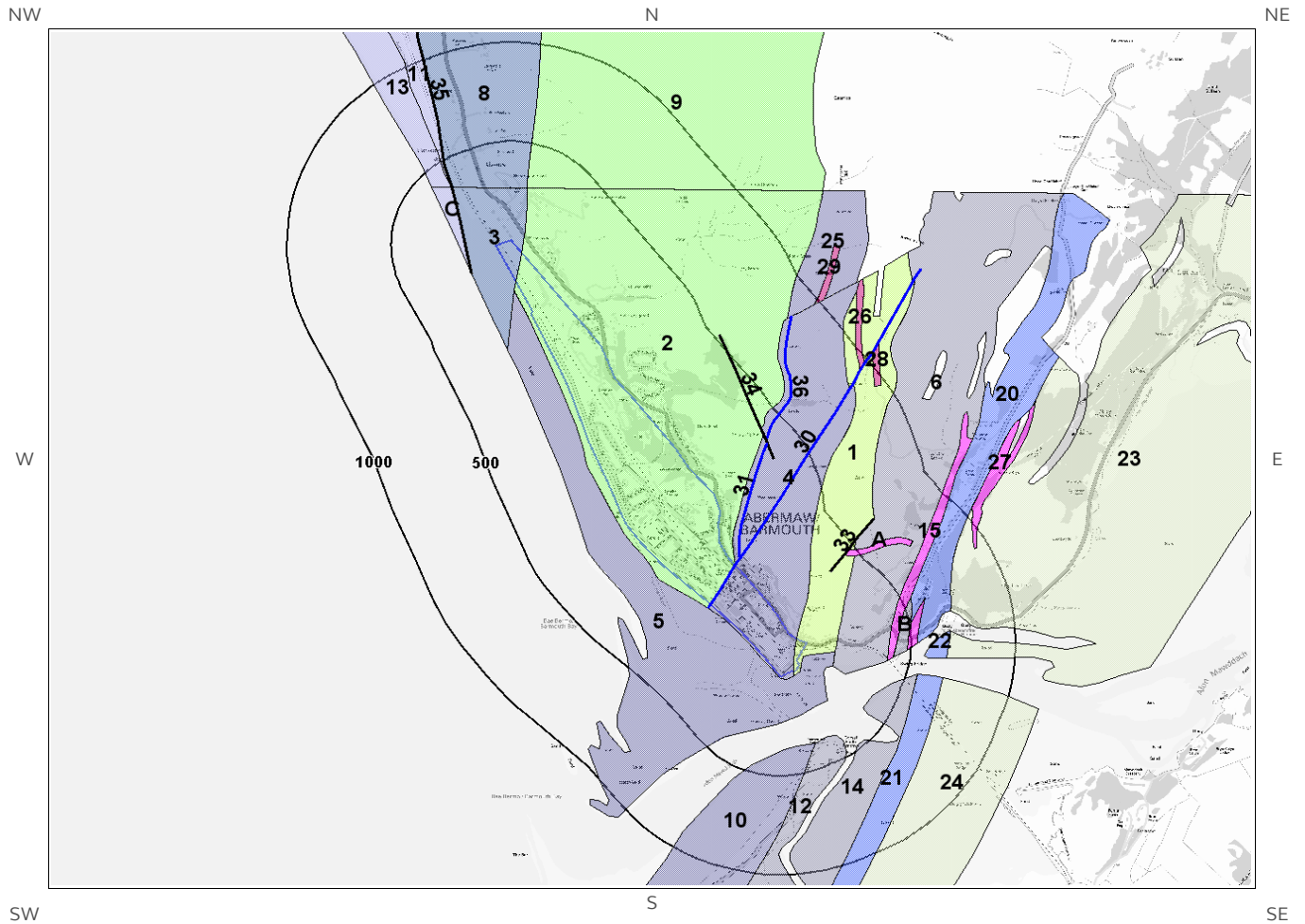
2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary?

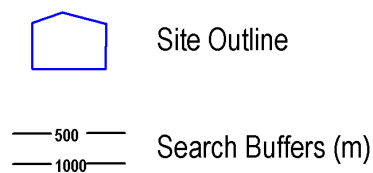
No

Database searched and no data found.

2.3 Bedrock and linear features map (1:50,000 scale)



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2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 149

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	BAG-STMD	BARMOUTH FORMATION - SANDSTONE AND MUDSTONE	-
2	0.0	On Site	RN-STMD	RHINOGE FORMATION - SANDSTONE AND MUDSTONE	-
3	0.0	On Site	LBR-SIMD	LLANBEDR FORMATION - SILTSTONE AND MUDSTONE, INTERBEDDED	-
4	0.0	On Site	HF-MDST	HAFOTTY FORMATION - MUDSTONE	-
5	4.0	SW	HGG-SDSM	HARLECH GRITS GROUP - SANDSTONE, SILTSTONE AND MUDSTONE	-
6	141.0	E	GN-MDSI	GAMLAN FORMATION - MUDSTONE AND SILTSTONE	-
7C	142.0	W	GNU-XZC	PALAEOGENE AND NEOGENE ROCKS (UNDIFFERENTIATED) - SILT AND CLAY	-
8	264.0	N	LBR-SIMD	LLANBEDR FORMATION - SILTSTONE AND MUDSTONE, INTERBEDDED	-
9	274.0	N	RN-STMD	RHINOGE FORMATION - SANDSTONE AND MUDSTONE	-
10	356.0	S	HGG-SDSM	HARLECH GRITS GROUP - SANDSTONE, SILTSTONE AND MUDSTONE	-
11	361.0	NW	GNU-XZC	PALAEOGENE AND NEOGENE ROCKS (UNDIFFERENTIATED) - SILT AND CLAY	-
12	364.0	SE	GN-MDSI	GAMLAN FORMATION - MUDSTONE AND SILTSTONE	-
13	365.0	NW	GNU-XZC	PALAEOGENE AND NEOGENE ROCKS (UNDIFFERENTIATED) - SILT AND CLAY	-
14	371.0	SE	GN-MDSI	GAMLAN FORMATION - MUDSTONE AND SILTSTONE	-
15	391.0	E	UIIO-MCGB	UNNAMED IGNEOUS INTRUSION, ORDOVICIAN - MICROGABBRO	-
16B	420.0	E	GN-MDSI	GAMLAN FORMATION - MUDSTONE AND SILTSTONE	-
17A	435.0	NE	UIIO-MCGB	UNNAMED IGNEOUS INTRUSION, ORDOVICIAN - MICROGABBRO	-
18A	470.0	NE	BAG-STMD	BARMOUTH FORMATION - SANDSTONE AND MUDSTONE	-
19B	480.0	E	UIIO-MCGB	UNNAMED IGNEOUS INTRUSION, ORDOVICIAN - MICROGABBRO	-

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Moderate	Low
0.0	On Site	Fracture	Low	Low
0.0	On Site	Fracture	Low	Low
0.0	On Site	Fracture	Moderate	Low
4.0	SW	Fracture	Moderate	Low

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? Yes

ID	Distance	Direction	Category Description	Feature Description
30	0.0	On Site	MINERAL_VEIN	Mineral vein, observed
31	40.0	NE	MINERAL_VEIN	Mineral vein, inferred
32C	142.0	W	FAULT	Fault, inferred, displacement unknown
33	334.0	NE	FAULT	Fault, inferred, displacement unknown
34	339.0	NE	FAULT	Fault, inferred, displacement unknown
35	361.0	NW	FAULT	Fault, inferred, displacement unknown
36	367.0	NE	MINERAL_VEIN	Mineral vein, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

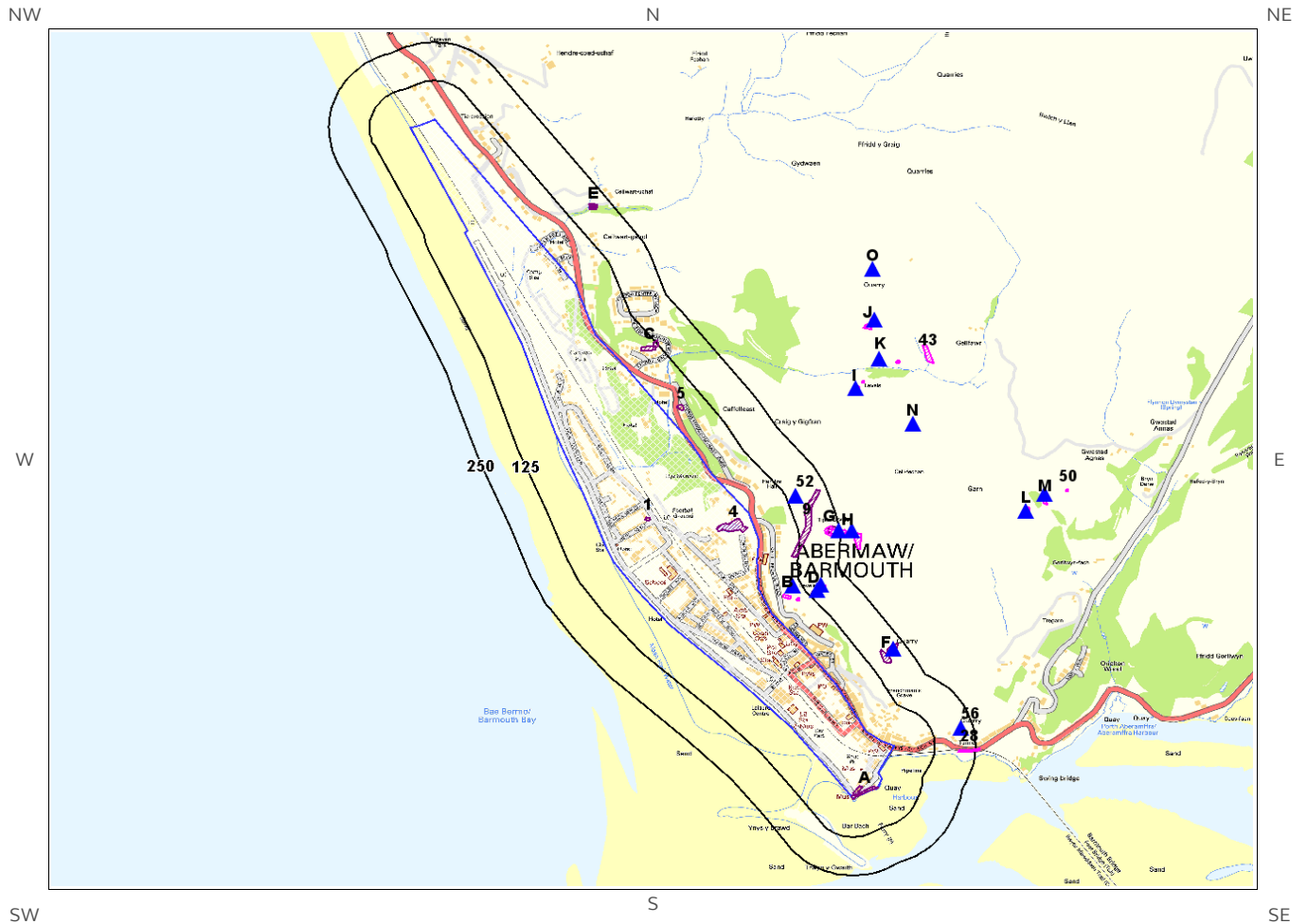
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

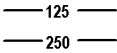
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

4 Ground Workings map



Ground Workings Legend

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-  Site Outline
-  Search Buffers (m)
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1	0.0	On Site	260810 316302	Sewer Tanks	1887
2A	0.0	On Site	261472 315410	Quay	1949
3A	0.0	On Site	261457 315418	Quay	1887
4	0.0	On Site	261071 316282	Pond	1981
5	40.0	NE	260911 316663	Unspecified Quarry	1887
6B	56.0	NE	261240 316048	Unspecified Old Level	1887
7C	74.0	NE	260814 316858	Reservoir	1887
8B	87.0	NE	261273 316040	Unspecified Disused Levels	1981
9	107.0	E	261307 316341	Unspecified Quarry	1949
10C	110.0	NE	260836 316871	Reservoir	1949
11D	132.0	NE	261320 316064	Reservoir	1949
12D	151.0	NE	261333 316072	Unspecified Disused Levels	1981
13D	162.0	NE	261333 316087	Unspecified Levels	1949
14F	167.0	NE	261543 315854	Unspecified Heap	1887
15D	174.0	NE	261354 316081	Unspecified Disused Levels	1981
16E	187.0	NE	260643 317315	Covered Reservoir	1887
17E	190.0	NE	260641 317318	Covered Reservoir	1981
18E	190.0	NE	260638 317321	Reservoir	1949
19F	193.0	NE	261565 315882	Unspecified Disused Quarries	1981
20G	206.0	E	261367 316262	Unspecified Levels	1949
21G	211.0	E	261375 316259	Unspecified Levels	1887

ID	Distance (m)	Direction	NGR	Use	Date
22G	215.0	E	261382 316265	Unspecified Disused Tip	1981

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
23B	56.0	NE	261240 316048	Unspecified Old Level	1887
24D	87.0	NE	261273 316040	Unspecified Disused Levels	1981
25D	151.0	NE	261333 316072	Unspecified Disused Levels	1981
26D	162.0	NE	261333 316087	Unspecified Levels	1949
27D	174.0	NE	261354 316081	Unspecified Disused Levels	1981
28	198.0	E	261784 315548	Tunnel	1949
29G	206.0	E	261367 316262	Unspecified Levels	1949
30G	211.0	E	261375 316259	Unspecified Levels	1887
31G	256.0	E	261414 316255	Unspecified Levels	1949
32H	262.0	E	261427 316251	Unspecified Levels	1887
33H	284.0	E	261441 316265	Unspecified Disused Level	1981
34H	294.0	E	261457 316230	Unspecified Levels	1887
35I	491.0	NE	261448 316719	Unspecified Old Level	1949
36I	544.0	NE	261475 316747	Unspecified Disused Levels	1981
37N	570.0	NE	261626 316608	Unspecified Old Level	1949
38K	632.0	NE	261526 316824	Unspecified Disused Level	1981
39J	651.0	NE	261488 316927	Unspecified Old Level	1887
40J	659.0	NE	261484 316930	Unspecified Disused Level	1981
41K	665.0	NE	261581 316812	Unspecified Old Level	1949

ID	Distance (m)	Direction	NGR	Use	Date
42J	677.0	NE	261505 316941	Unspecified Old Level	1949
43	740.0	NE	261675 316838	Unspecified Old Level	1887
44O	780.0	NE	261502 317113	Unspecified Old Level	1949
45L	806.0	NE	261975 316325	Unspecified Shaft	1887
46L	807.0	NE	261973 316331	Unspecified Shaft	1949
47L	812.0	NE	261981 316332	Unspecified Disused Shafts	1981
48M	871.0	NE	262032 316362	Lead Level	1887
49M	883.0	NE	262032 316379	Unspecified Disused Level	1981
50	948.0	NE	262102 316394	Unspecified Old Level	1949

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

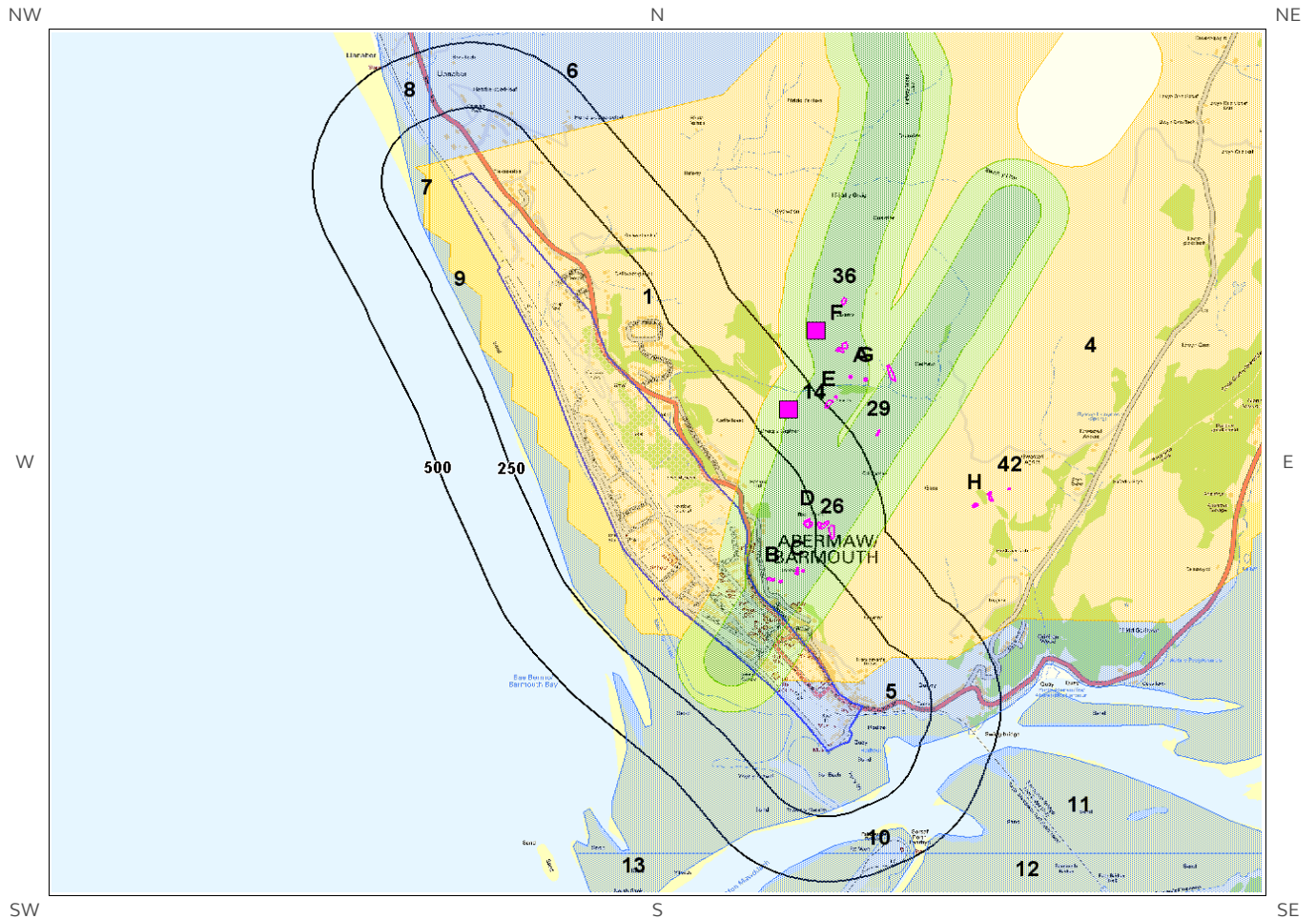
Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
51B	98.0	NE	261257 316082	Manganese	Hendre Villas	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)	Ceased
52	152.0	E	261264 316376	Sandstone	Cil-mynach	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
53D	153.0	NE	261331 316069	Manganese	Hendre Villas	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)	Ceased
54D	173.0	NE	261342 316087	Manganese	Hendre Villas	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)	Ceased
55F	211.0	NE	261564 315879	Slate	Frenchman's Grave	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
56	211.0	E	261773 315620	Slate	Church Street	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased

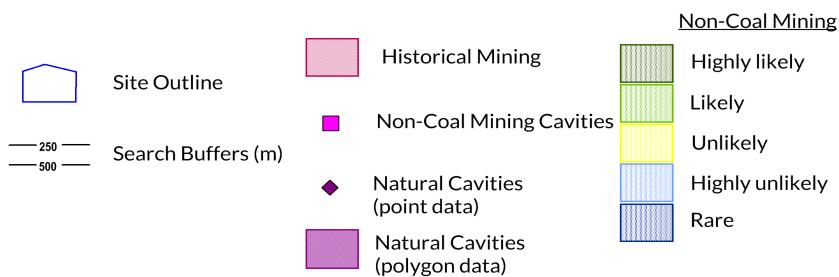
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
57G	246.0	E	261397 316264	Manganese	Garn	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
58H	287.0	E	261439 316262	Manganese	Garn	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)	Ceased
59I	514.0	NE	261449 316725	Manganese	Celli-fechan	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)	Ceased
60N	582.0	NE	261627 316610	Manganese	Celli-fechan	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)	Ceased
61K	632.0	NE	261522 316820	Manganese	Craig y Gigfran	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)	Ceased
62J	693.0	NE	261508 316948	Manganese	Cell-fawr	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)	Ceased
63O	792.0	NE	261503 317114	Manganese	Ffridd y Graig	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
64L	809.0	NE	261974 316327	Lead	Gwastad-Agnes	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)	Ceased
65M	888.0	NE	262031 316381	Lead	Gwastad-Agnes	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)	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and Natural Cavities Legend

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5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? Yes

The following Historical Mining information is provided by Groundsure:

ID	Distance (m)	Direction	NGR	Details	Date
16B	56.0	NE	261240 316048	Unspecified Old Level	1887
17B	87.0	NE	261273 316040	Unspecified Disused Levels	1981
18C	151.0	NE	261333 316072	Unspecified Disused Levels	1981
19C	162.0	NE	261333 316087	Unspecified Levels	1949
20C	174.0	NE	261354 316081	Unspecified Disused Levels	1981
21D	206.0	E	261367 316262	Unspecified Levels	1949
22D	211.0	E	261375 316259	Unspecified Levels	1887
23D	256.0	E	261414 316255	Unspecified Levels	1949
24D	262.0	E	261427 316251	Unspecified Levels	1887
25D	284.0	E	261441 316265	Unspecified Disused Level	1981
26	294.0	E	261457 316230	Unspecified Levels	1887
27E	491.0	NE	261448 316719	Unspecified Old Level	1949
28E	544.0	NE	261475 316747	Unspecified Disused Levels	1981
29	570.0	NE	261626 316608	Unspecified Old Level	1949
30F	632.0	NE	261526 316824	Unspecified Disused Level	1981
31F	651.0	NE	261488 316927	Unspecified Old Level	1887
32F	659.0	NE	261484 316930	Unspecified Disused Level	1981
33G	665.0	NE	261581 316812	Unspecified Old Level	1949
34F	677.0	NE	261505 316941	Unspecified Old Level	1949
35G	740.0	NE	261675 316838	Unspecified Old Level	1887

ID	Distance (m)	Direction	NGR	Details	Date
36	780.0	NE	261502 317113	Unspecified Old Level	1949
37H	806.0	NE	261975 316325	Unspecified Shaft	1887
38H	807.0	NE	261973 316331	Unspecified Shaft	1949
39H	812.0	NE	261981 316332	Unspecified Disused Shafts	1981
40H	871.0	NE	262032 316362	Lead Level	1887
41H	883.0	NE	262032 316379	Unspecified Disused Level	1981
42	948.0	NE	262102 316394	Unspecified Old Level	1949

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Dolgellau	Vein Mineral	Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
2A	0.0	On Site	Not available	Vein Mineral	Underground mining is known to have occurred within or very close to the area. Potential for difficult ground conditions should be investigated. Potential for localised subsidence is at a level where it should be considered
3A	0.0	On Site	Not available	Vein Mineral	Underground mining is known or considered likely to have occurred within or close to the area. Potential for difficult ground conditions are at a level where they should be considered
4	0.0	On Site	Dolgellau	Vein Mineral	Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered
5	0.0	On Site	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
6	71.0	N	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
7	79.0	W	Dolgellau	Vein Mineral	Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. Potential for localised difficult ground conditions are at a level where they should be considered
8	94.0	W	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
9	97.0	SW	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
10	356.0	S	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
11	371.0	SE	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
12	392.0	S	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered
13	571.0	SW	Not available	Vein Mineral	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled “Review of mining instability in Great Britain, 1990” PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? Yes

The following Non-Coal Mining Cavities information provided by Peter Brett Associates:

ID	Distance (m)	Direction	NGR	Address	Superficial Deposits	Bedrock Deposits	Extracted Mineral
14	383.0	NE	261300 316700	BARMOUTH, Gwynedd	-	-	Manganese, Pyrolusite
15F	640.0	NE	261400 317000	CEL FAWR, Gwynedd	-	-	Manganese, Pyrolusite

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Coal Authority issued on behalf of the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level..

Are there any Tin Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

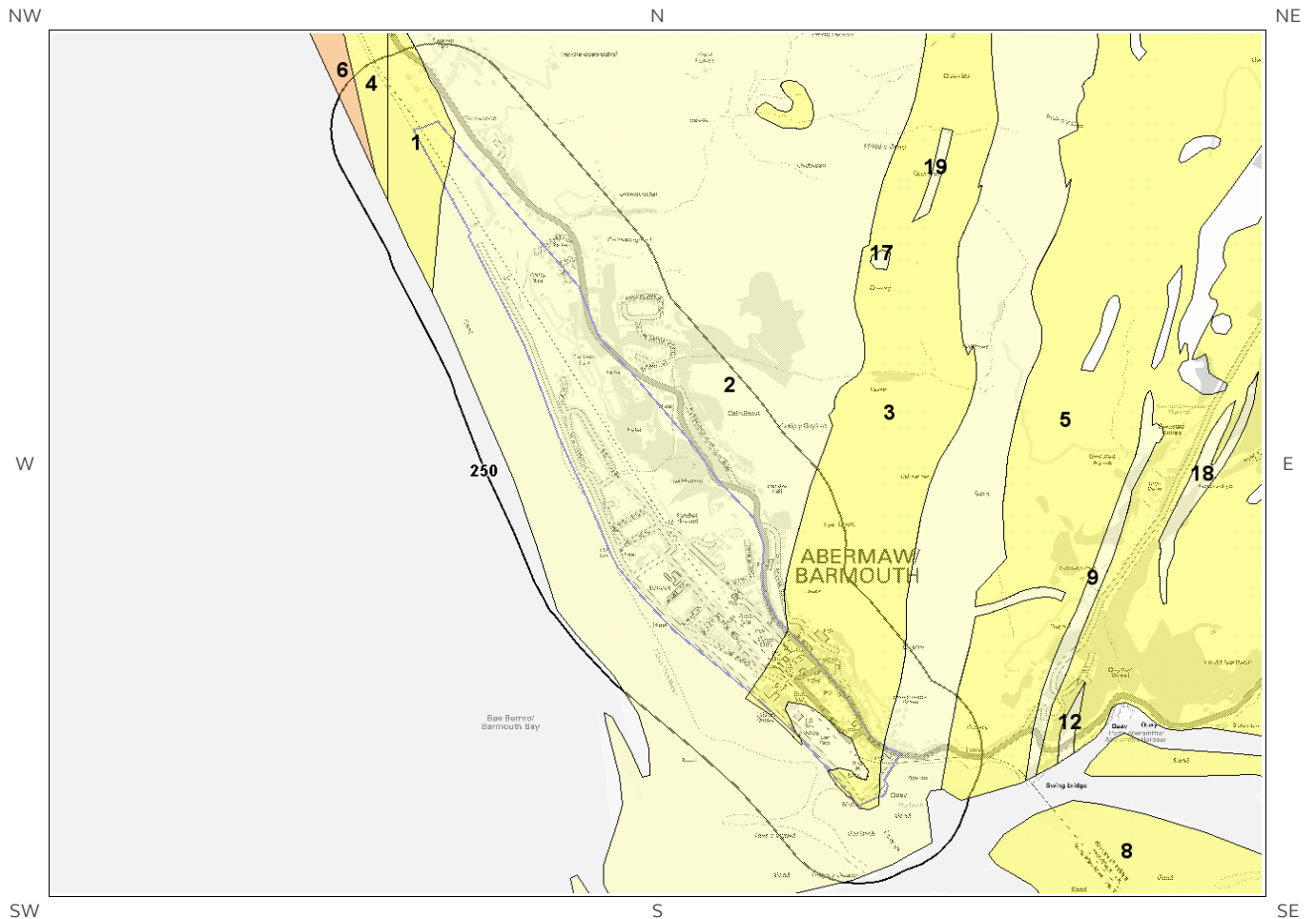
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map

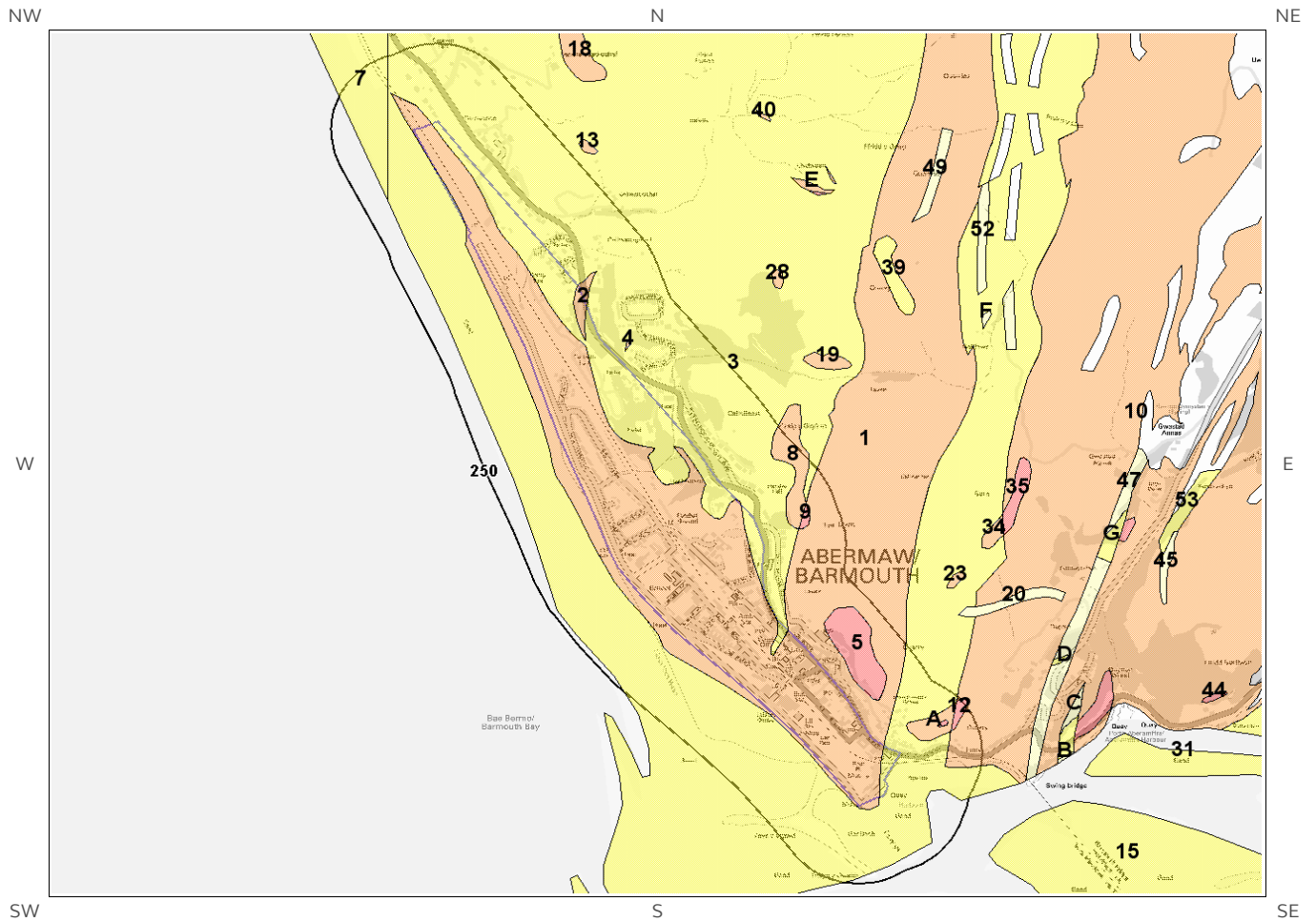


Shrink Swell Clay Legend

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6.2 Landslides map

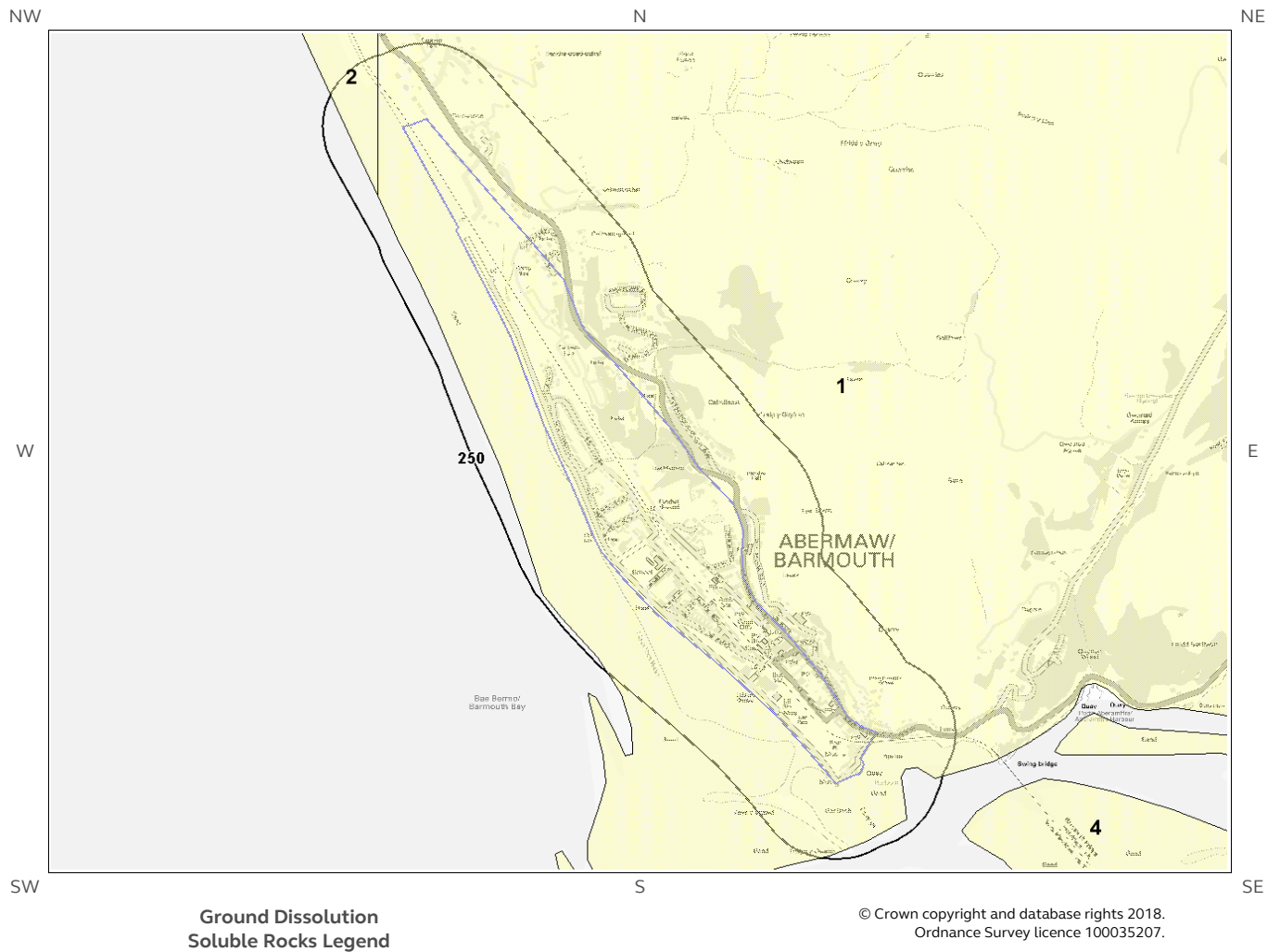


Landslides Legend

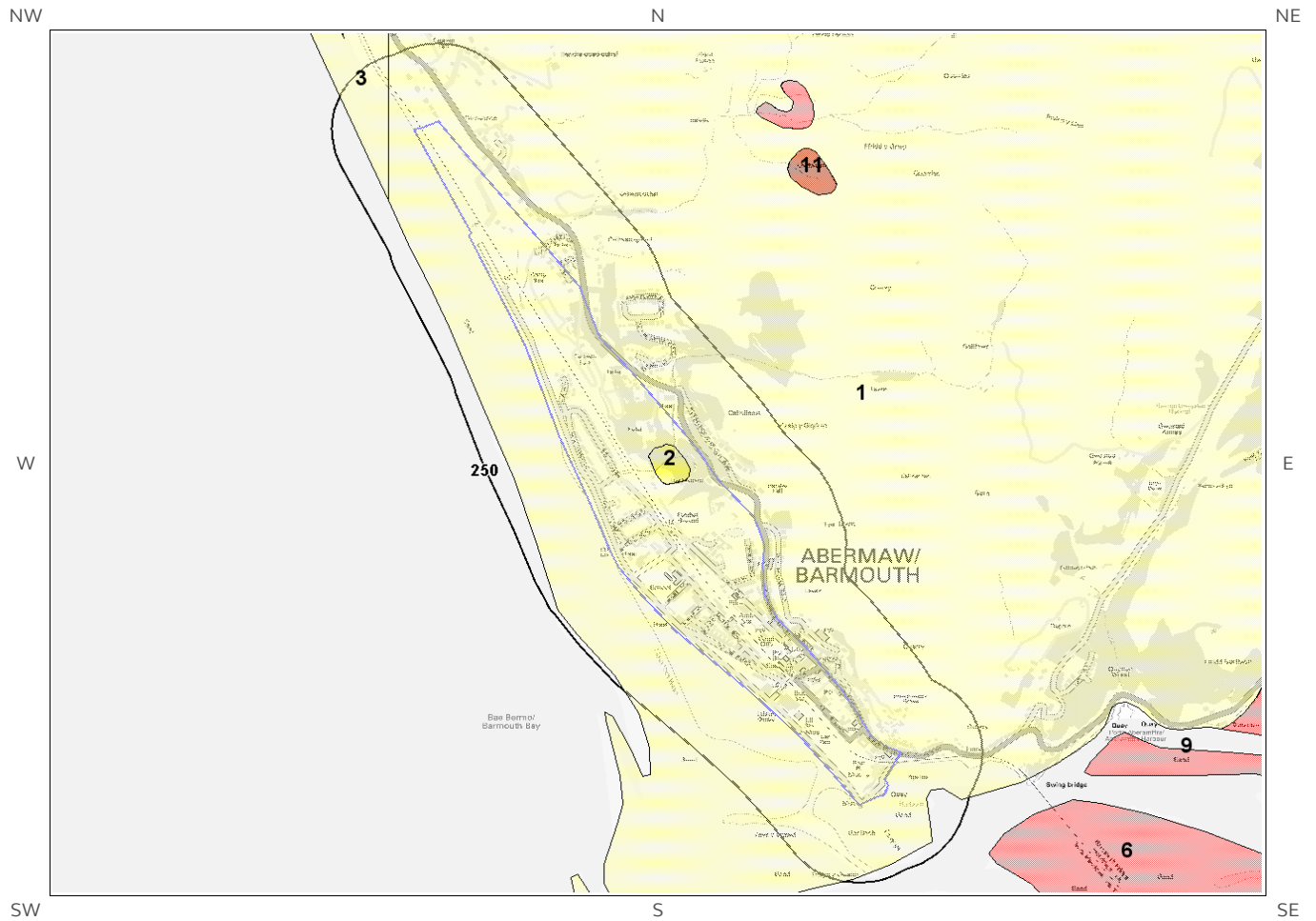
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6.3 Ground Dissolution of Soluble Rocks map



6.4 Compressible Deposits map

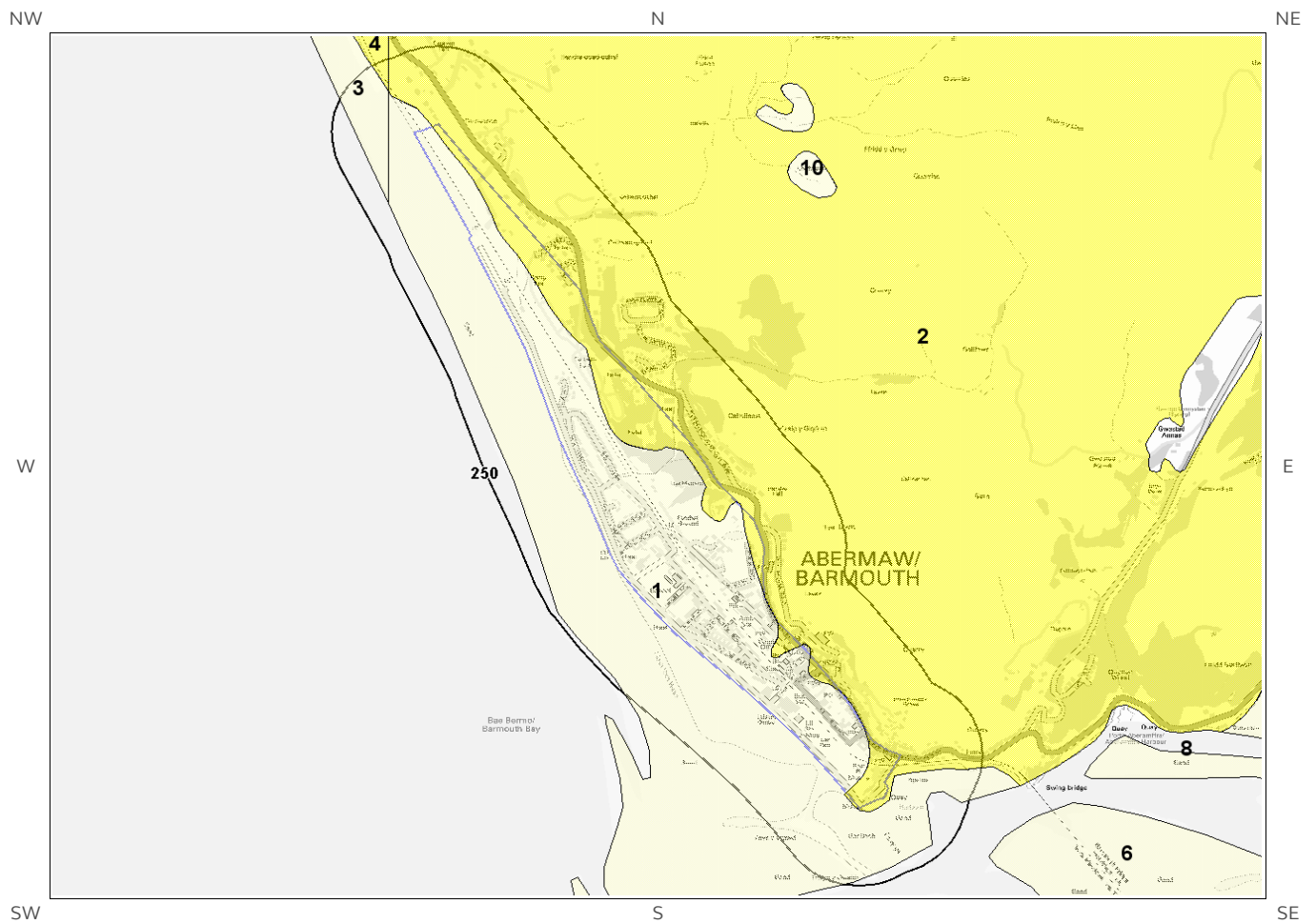


Compressible Deposits Legend

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6.5 Collapsible Deposits map

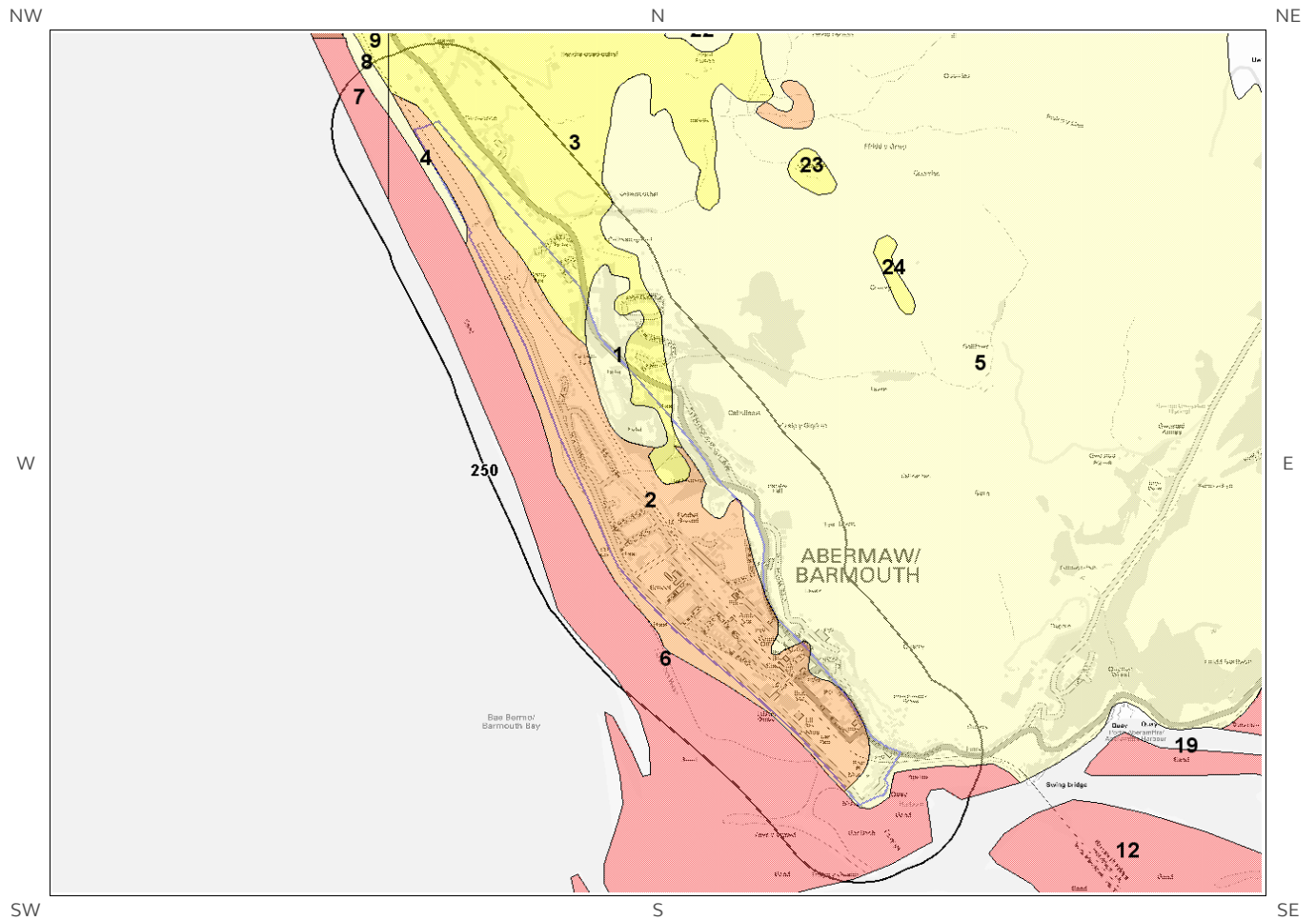


Collapsible Deposits Legend

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6.6 Running Sand map



Running Sand Legend

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6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary? **Moderate**

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.
2	0.0	On Site	Negligible	Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.
3	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.

* This includes an automatically generated 50m buffer zone around the site

ID	Distance (m)	Direction	Hazard Rating	Details
2	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.
3	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
4	31.0	NE	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.
2	0.0	On Site	Very Low	Very low potential for compressible deposits to be present. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

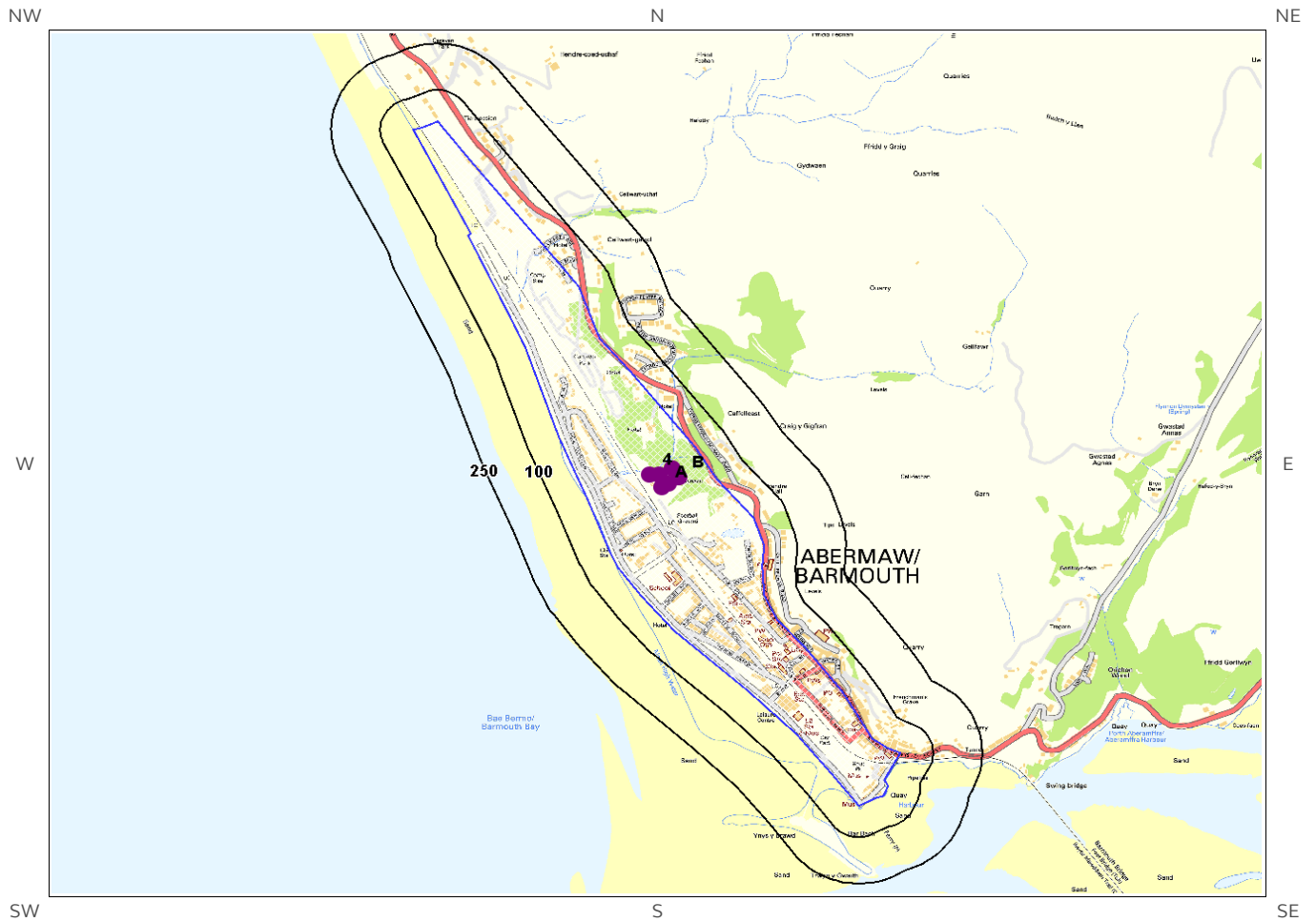
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for collapsible deposits identified. No actions required to avoid problems due to collapsible deposits. No special ground investigation required, or increased construction costs or increased financial risk due to potential problems with collapsible deposits.
2	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

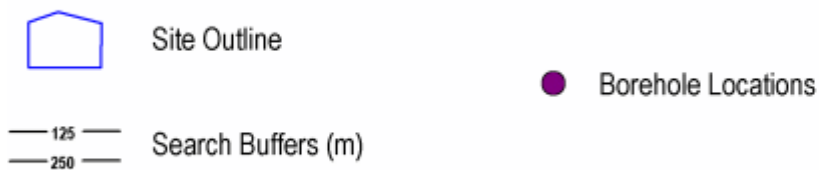
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build - consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property - no significant increase in insurance risk due to running sand problems is likely.
3	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
4	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
5	0.0	On Site	Negligible	No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
6	4.0	SW	Moderate	Significant potential for running sand problems with relatively small changes in ground conditions. Avoid large amounts of water entering the ground (for example through pipe leakage or soak-aways). Do not dig (deep) holes into saturated ground near the property without technical advice. For new build - consider the consequences of soil and groundwater conditions during and after construction. For existing property - possible increase in insurance risk from running sand, for example, due to water leakage, high rainfall events or flooding.

7 Borehole Records map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

6

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1A	0.0	On Site	260840 316420	SH61NW6	-1.0	BARMOUTH WWTW 05
2A	0.0	On Site	260860 316430	SH61NW5	-1.0	BARMOUTH WWTW 04
3B	0.0	On Site	260890 316450	SH61NW3	-1.0	BARMOUTH WWTW 02
4	0.0	On Site	260800 316460	SH61NW7	-1.0	BARMOUTH WWTW 06
5A	0.0	On Site	260830 316460	SH61NW4	-1.0	BARMOUTH WWTW 03
6B	0.0	On Site	260870 316480	SH61NW2	-1.0	BARMOUTH WWTW 01

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

63

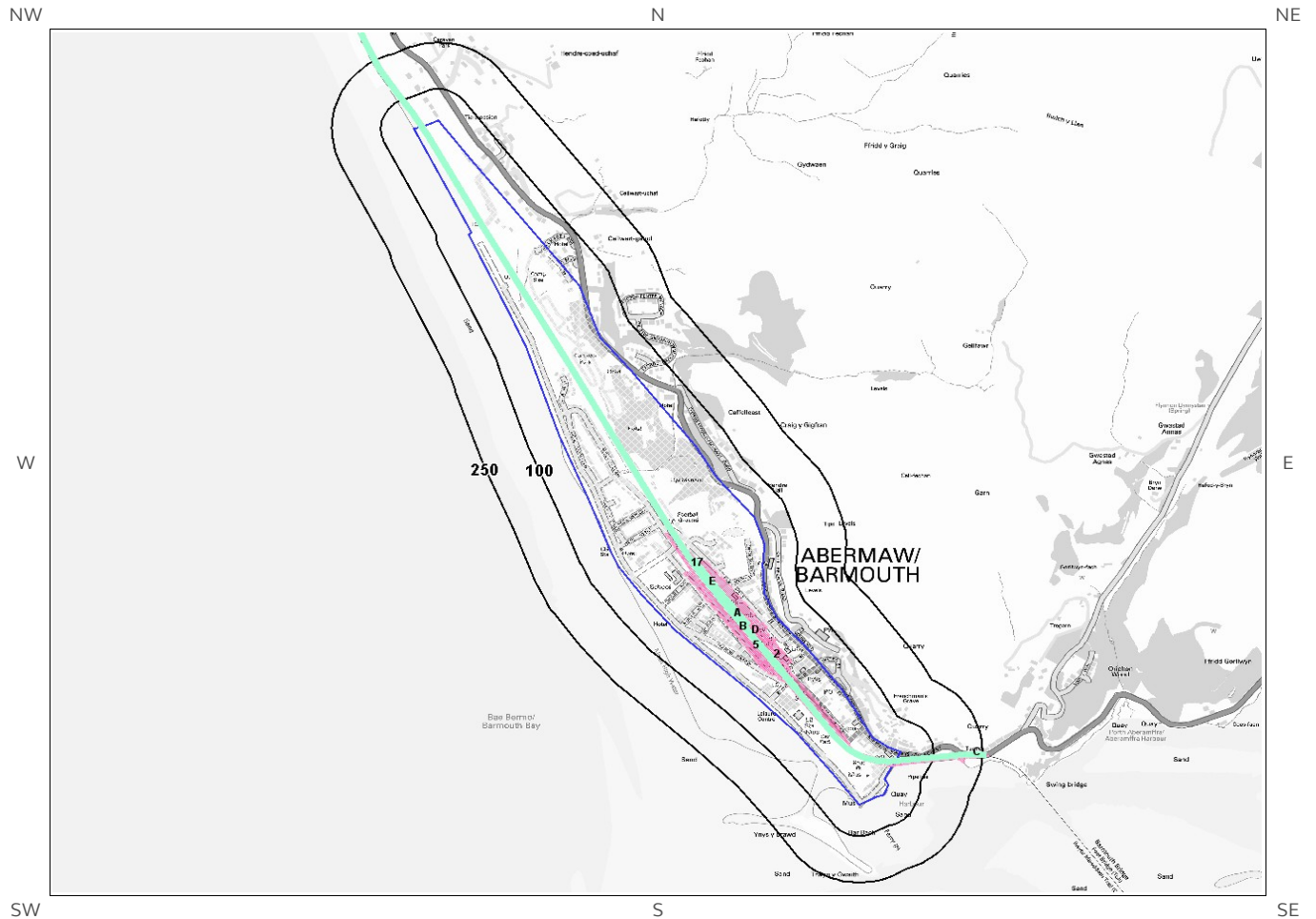
For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
0.0	On Site	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
2.0	SW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
4.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
9.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
10.0	E	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
22.0	SW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
23.0	NE	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
23.0	NE	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
25.0	NE	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
25.0	NE	Sediment	45 - 60 mg/kg	<1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	<100 mg/kg
27.0	SE	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
29.0	SW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
30.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
30.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
32.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
36.0	SW	Sediment	15 - 25 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
38.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
38.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
40.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
45.0	SW	Sediment	25 - 35 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

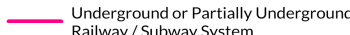
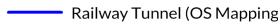
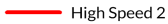
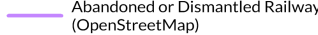
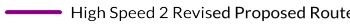
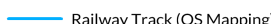
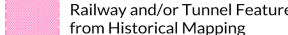
*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

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	Site Outline		Underground or Partially Underground Railway / Subway System		Railway Track (OpenStreetMap)
	Search Buffers (m)		Railway Tunnel (OS Mapping)		High Speed 2
			Abandoned or Dismantled Railway (OpenStreetMap)		High Speed 2 Revised Proposed Route
			Railway Track (OS Mapping)		Crossrail 1
					Railway and/or Tunnel Feature from Historical Mapping

9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? Yes

Distance (m)	Direction	Detail
197	E	Railway Tunnel

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? Yes

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	0	On Site	261200 315823	Railway Sidings	1887
2	0	On Site	261132 315901	Railway Sidings	1949
3A	0	On Site	261060 316013	Railway Sidings	1938
4A	0	On Site	261066 316014	Railway Sidings	1900

ID	Distance (m)	Direction	NGR	Details	Date
5	0	On Site	261116 315912	Railway Sidings	1900
6B	0	On Site	261085 315968	Railway Sidings	1888
7B	0	On Site	261102 315978	Railway Sidings	1888
8D	0	On Site	261123 315951	Railway Sidings	1981
9E	0	On Site	260996 316102	Railway Sidings	1981
13D	0	On Site	261134 315939	Railway Sidings	1978
14D	0	On Site	261128 315940	Railway Sidings	1990
15A	0	On Site	261087 315986	Railway Sidings	1992
16E	0	On Site	260992 316118	Railway Sidings	1978
17	0	On Site	260944 316167	Railway Sidings	1996
18C	196	E	261800 315556	Tunnel	1900
19C	198	E	261784 315548	Tunnel	1949
20C	199	E	261801 315557	Tunnel	1938
10C	200	E	261802 315554	Tunnel	1990
11C	200	E	261802 315554	Tunnel	1992
12C	202	E	261805 315554	Tunnel	1978

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? Yes

Have any active railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Name	Type
0	On Site	Cambrian Line	Rail
0	On Site	Cambrian Line	Rail
0	On Site	Cambrian Line	Rail
0	On Site	Cambrian Line	Rail
0	On Site	Cambrian Line	Rail
0	On Site	Not given	Rail
0	On Site	Not given	Rail
0	On Site	Not given	Multi Track
0	On Site	Not given	Multi Track
0	On Site	Cambrian Line	Rail
0	On Site	Cambrian Line	Rail
0	On Site	Cambrian Line	Rail
0	On Site	Cambrian Line	Rail
0	On Site	Cambrian Line	Rail
0	On Site	Not given	Rail
0	On Site	Not given	Rail
57	SE	Cambrian Line	Rail
57	SE	Cambrian Line	Rail
197	E	Cambrian Line	Rail
197	E	Cambrian Line	Rail

Multiple sections of the same track may be listed in the detail above
Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a Groundsure HS2 and Crossrail 1 Report.

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

Contact Details

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The Coal Authority

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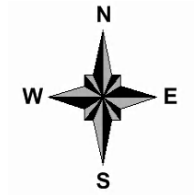
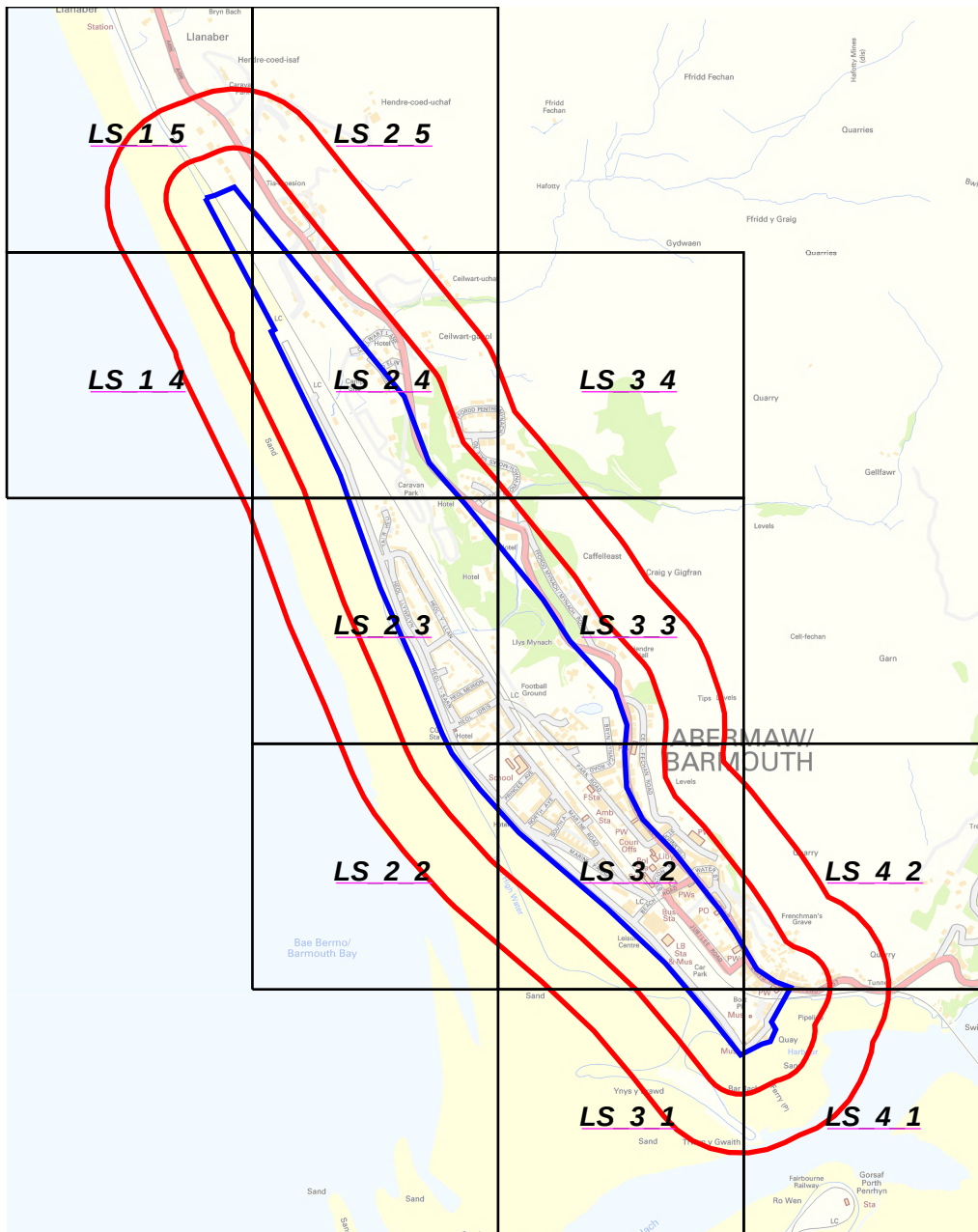
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1:2500 Scale Grid Index

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Report Ref: GS-5539750_LS_1_4
Grid Ref: 259886, 317122

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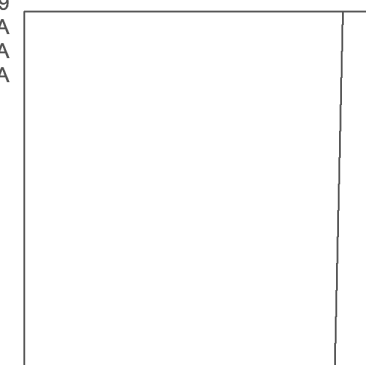
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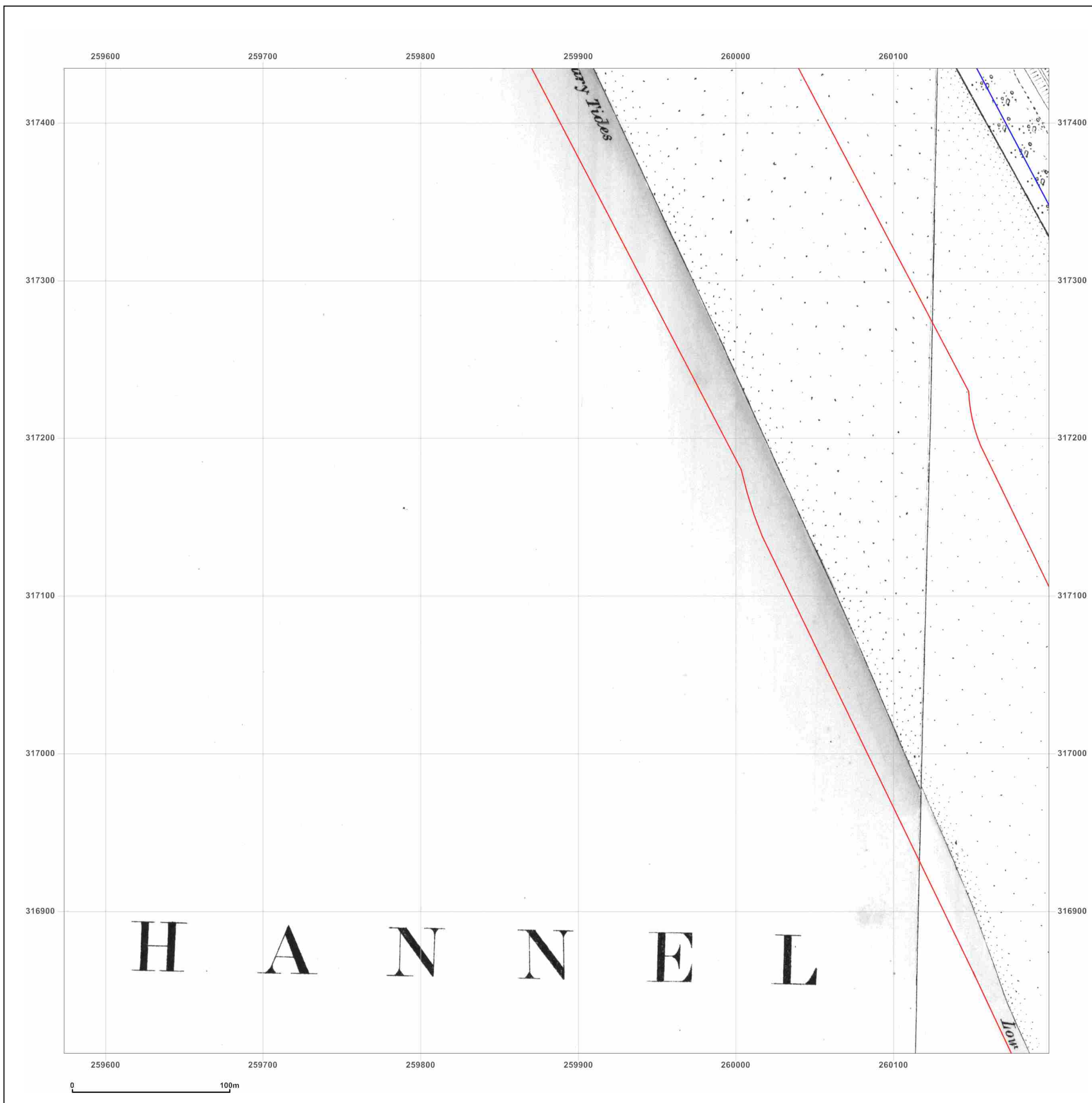


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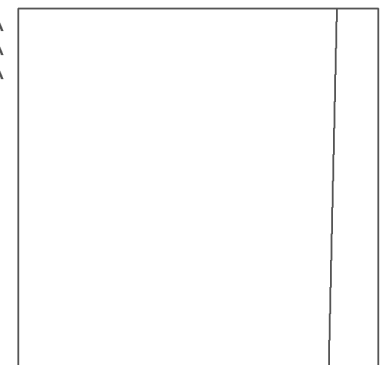
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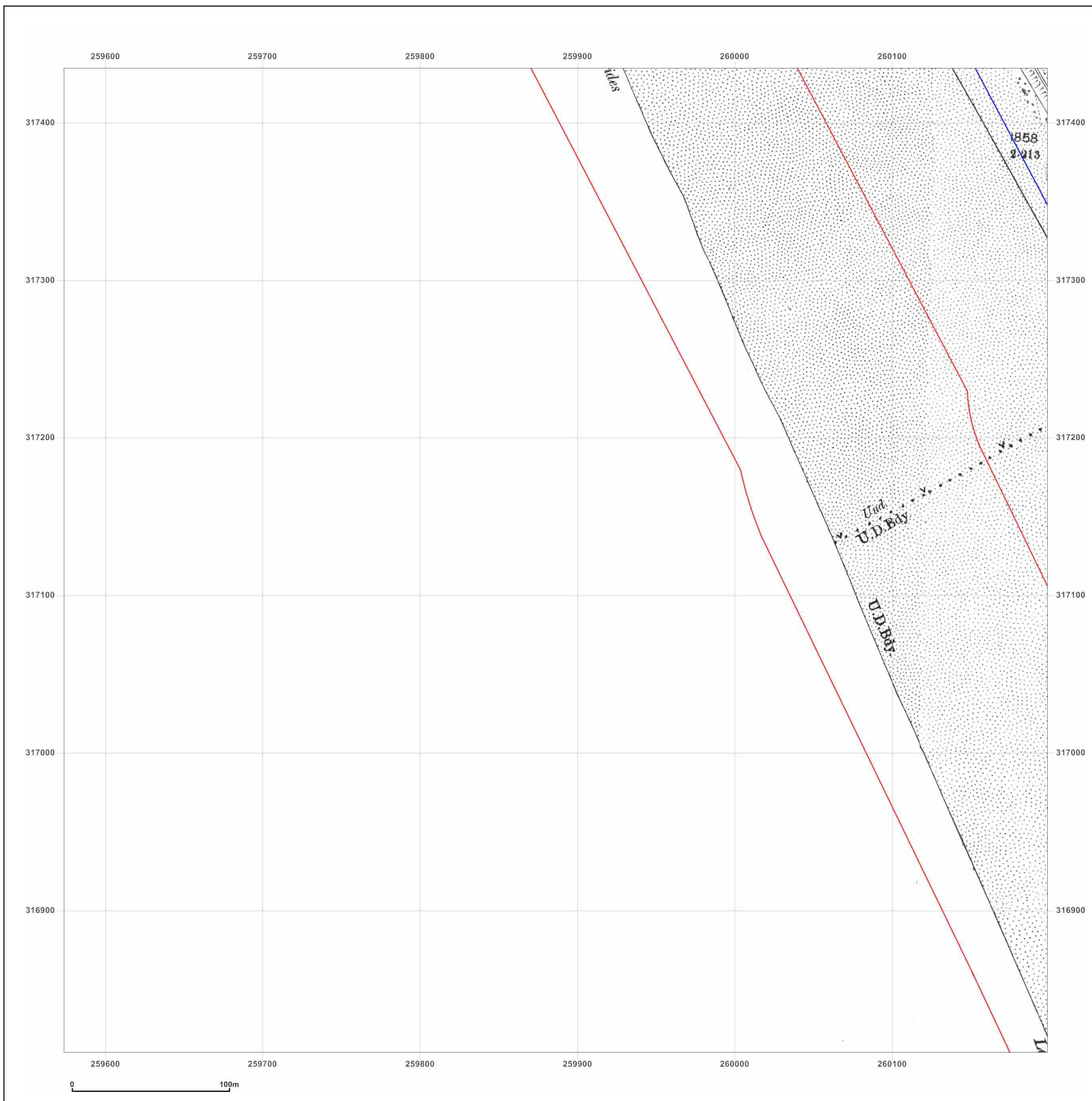


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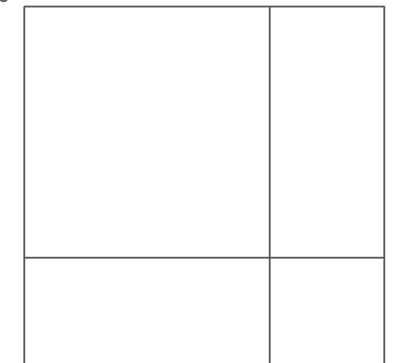
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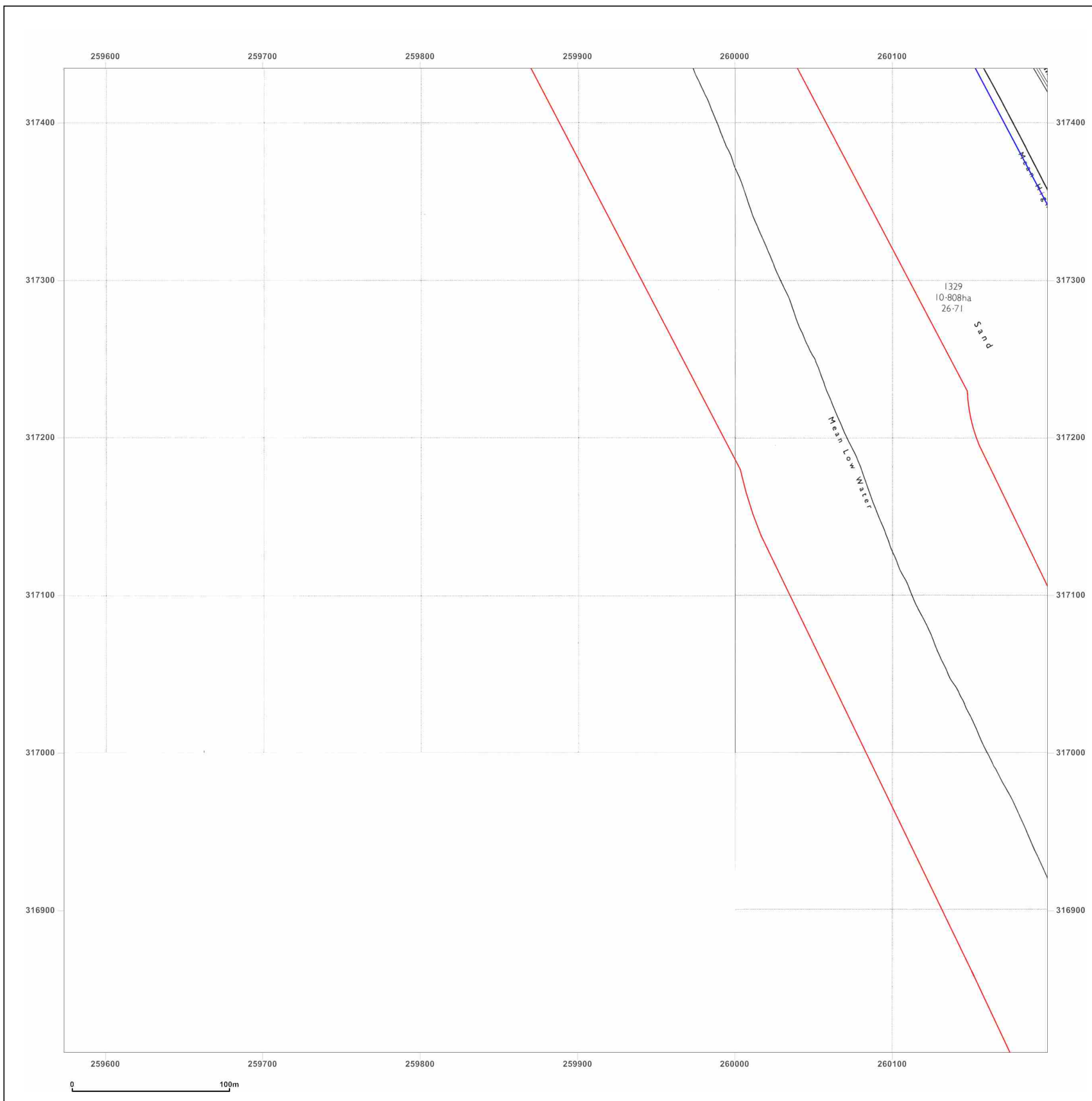


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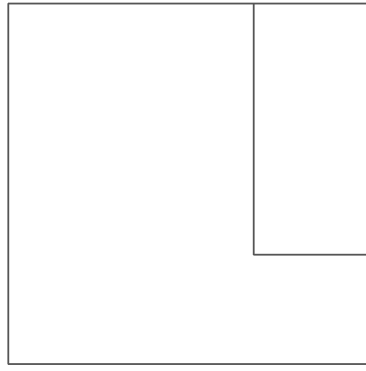
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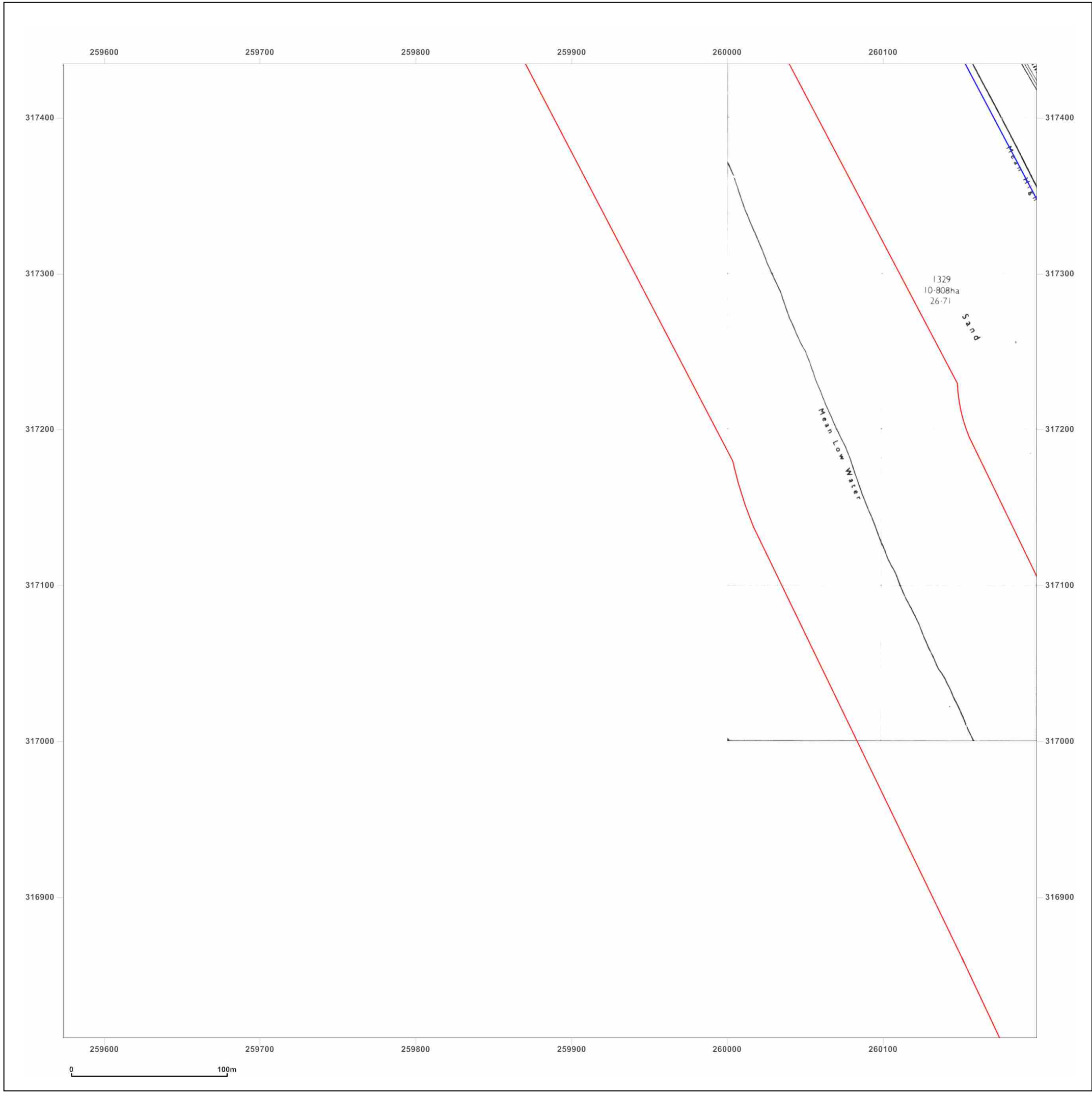
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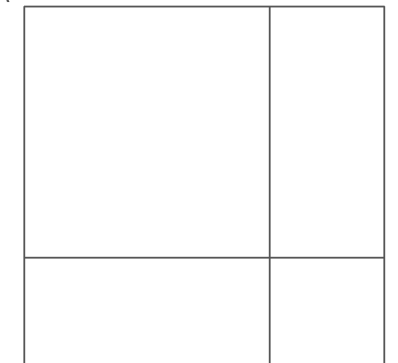
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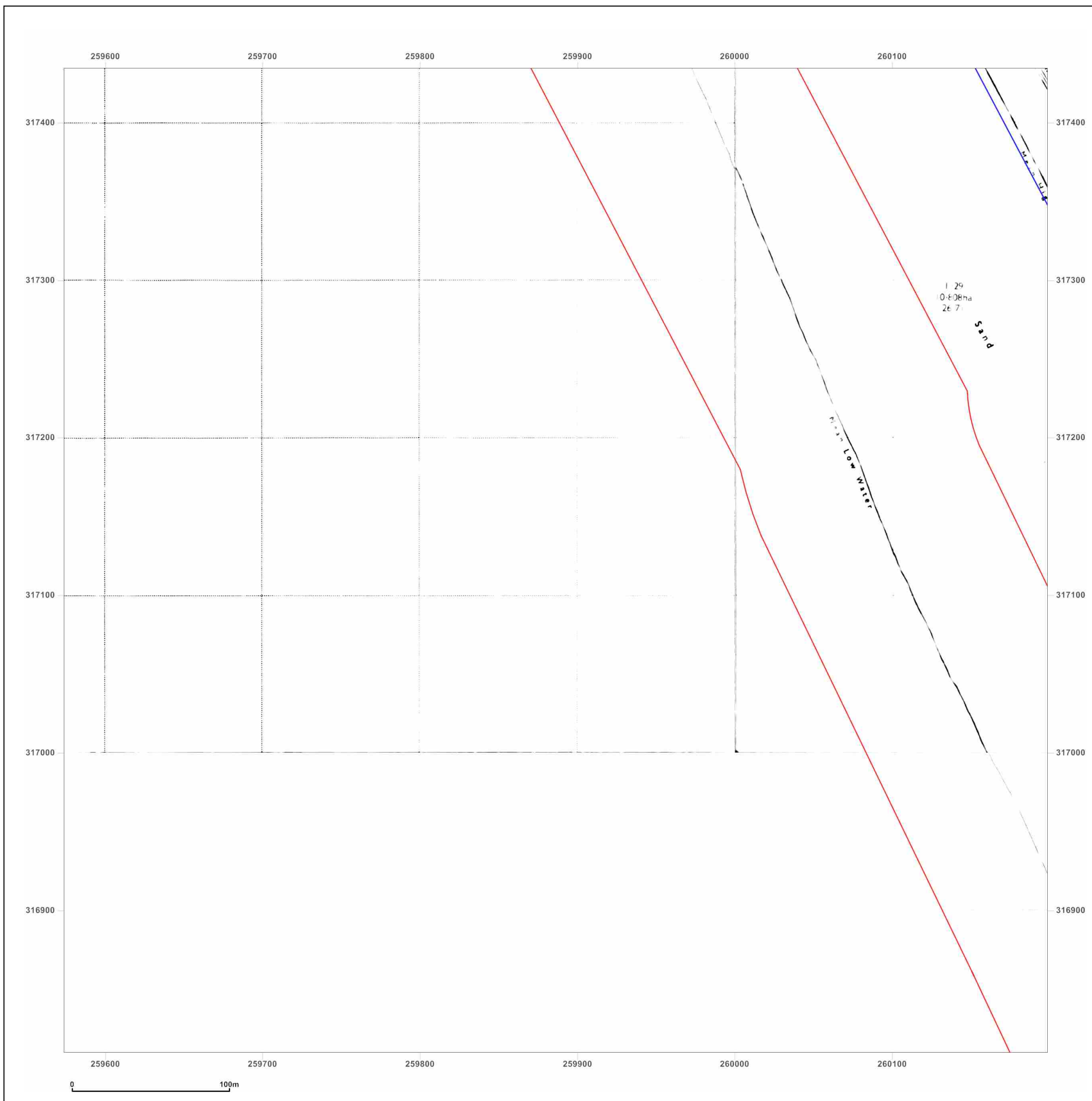


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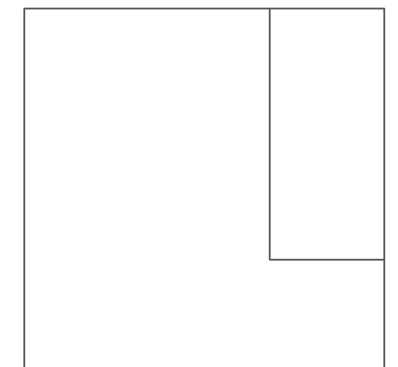
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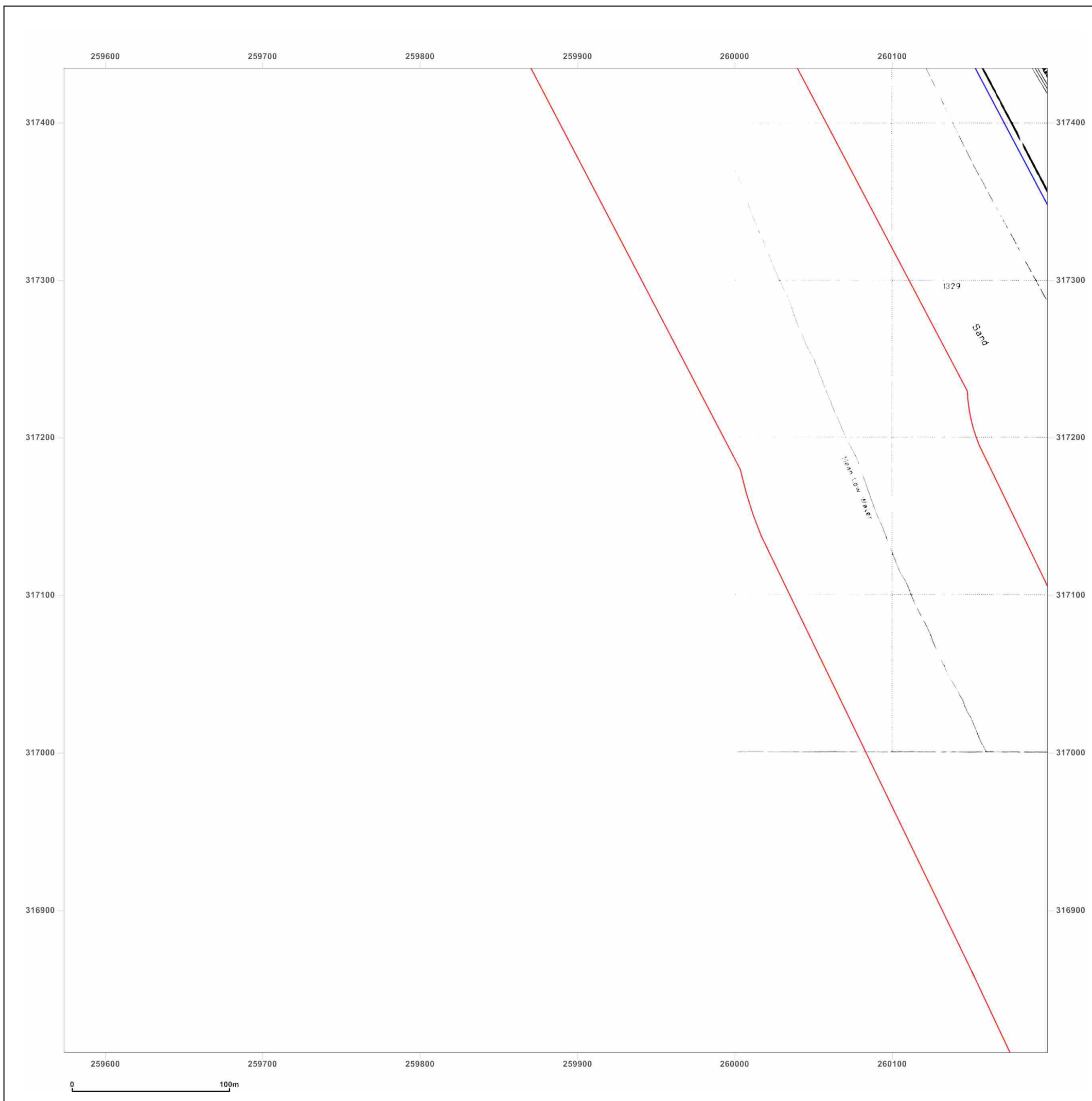


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Grid Ref: 259886, 317748

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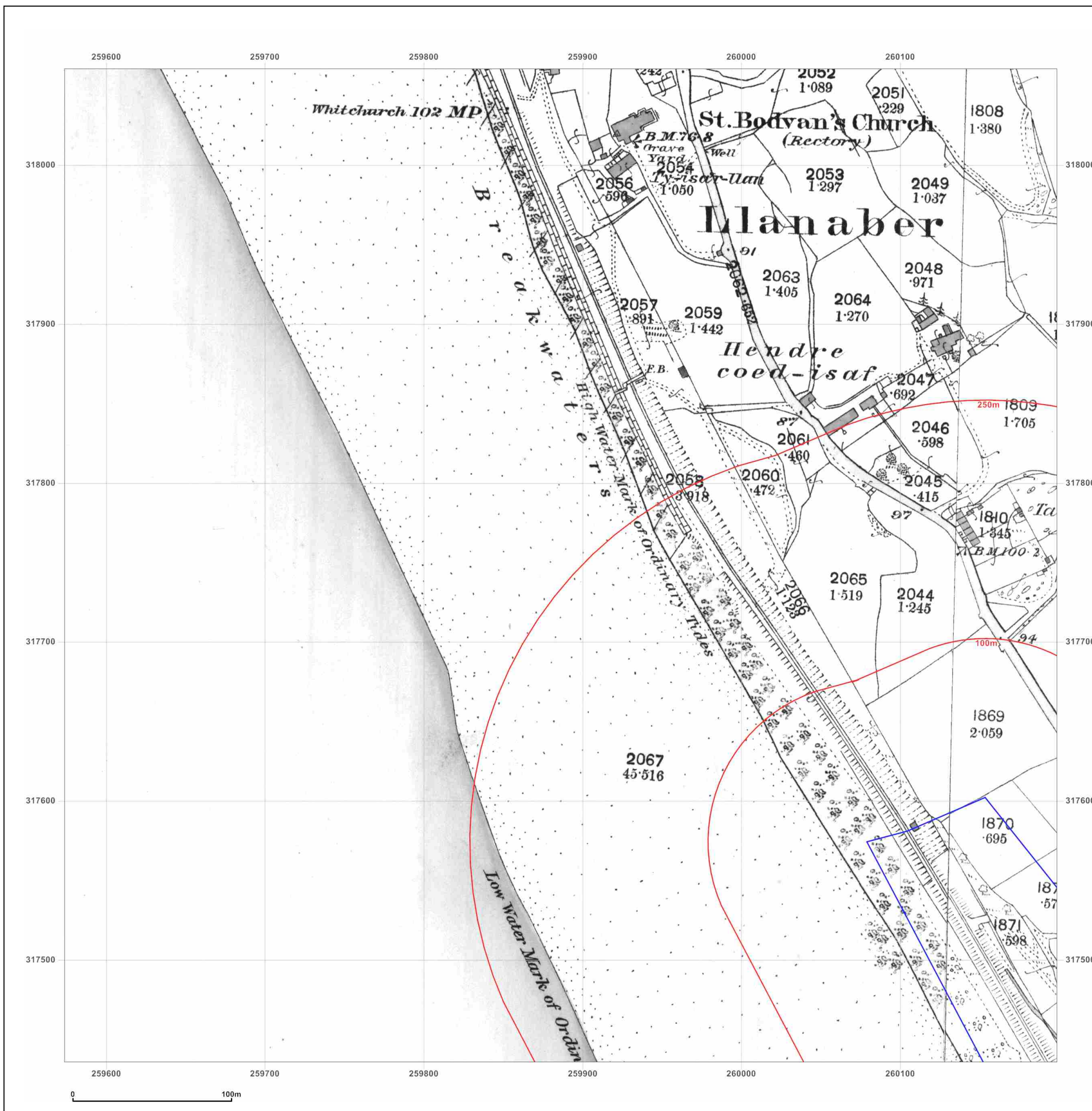


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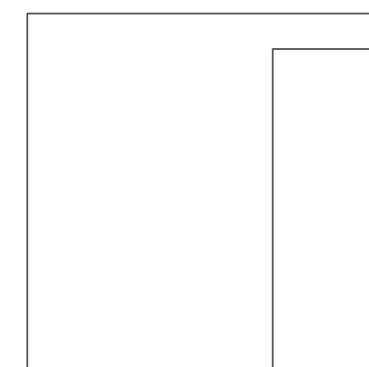
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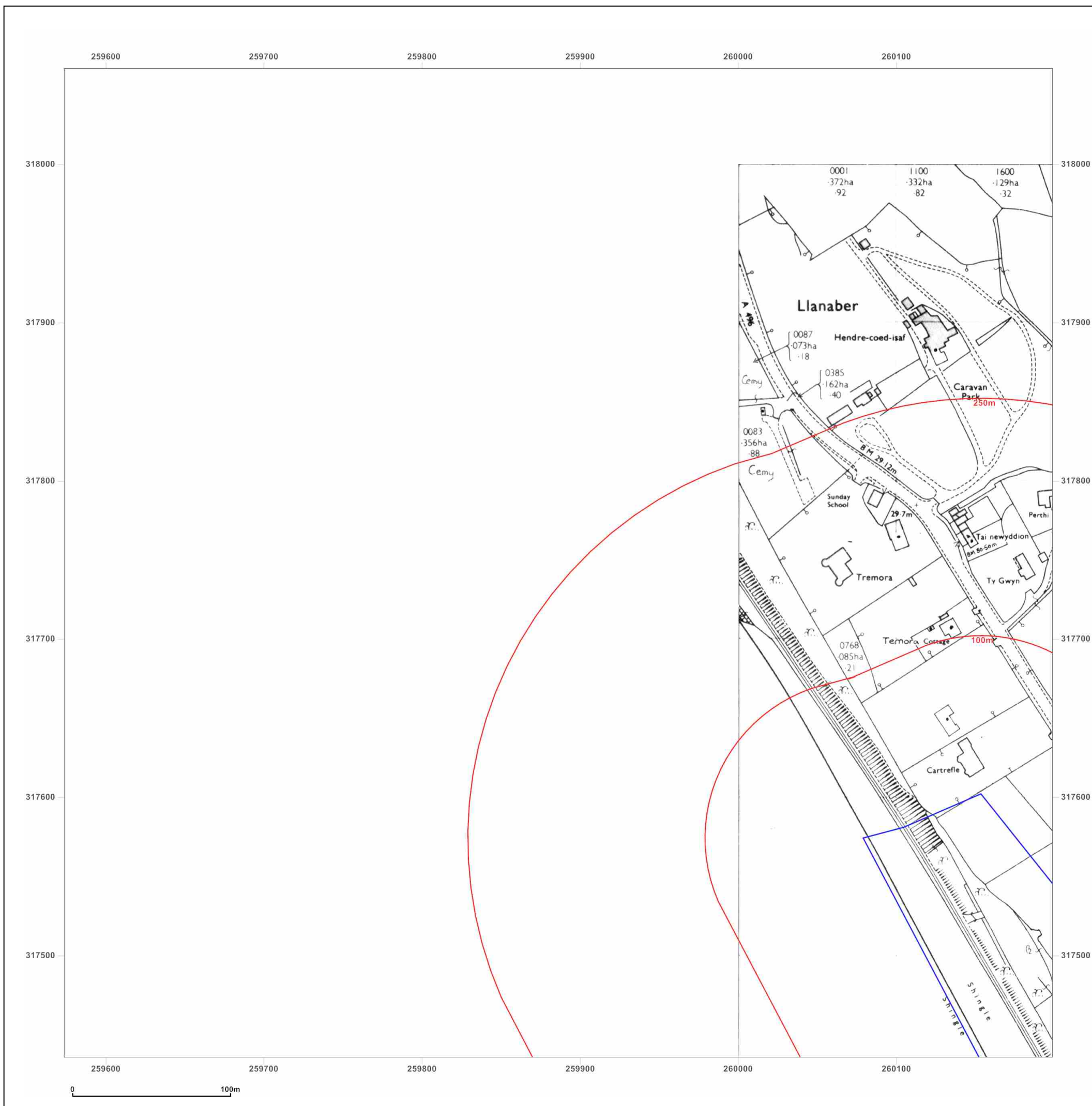


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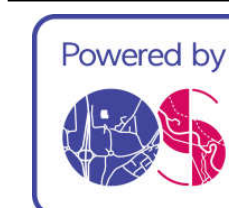


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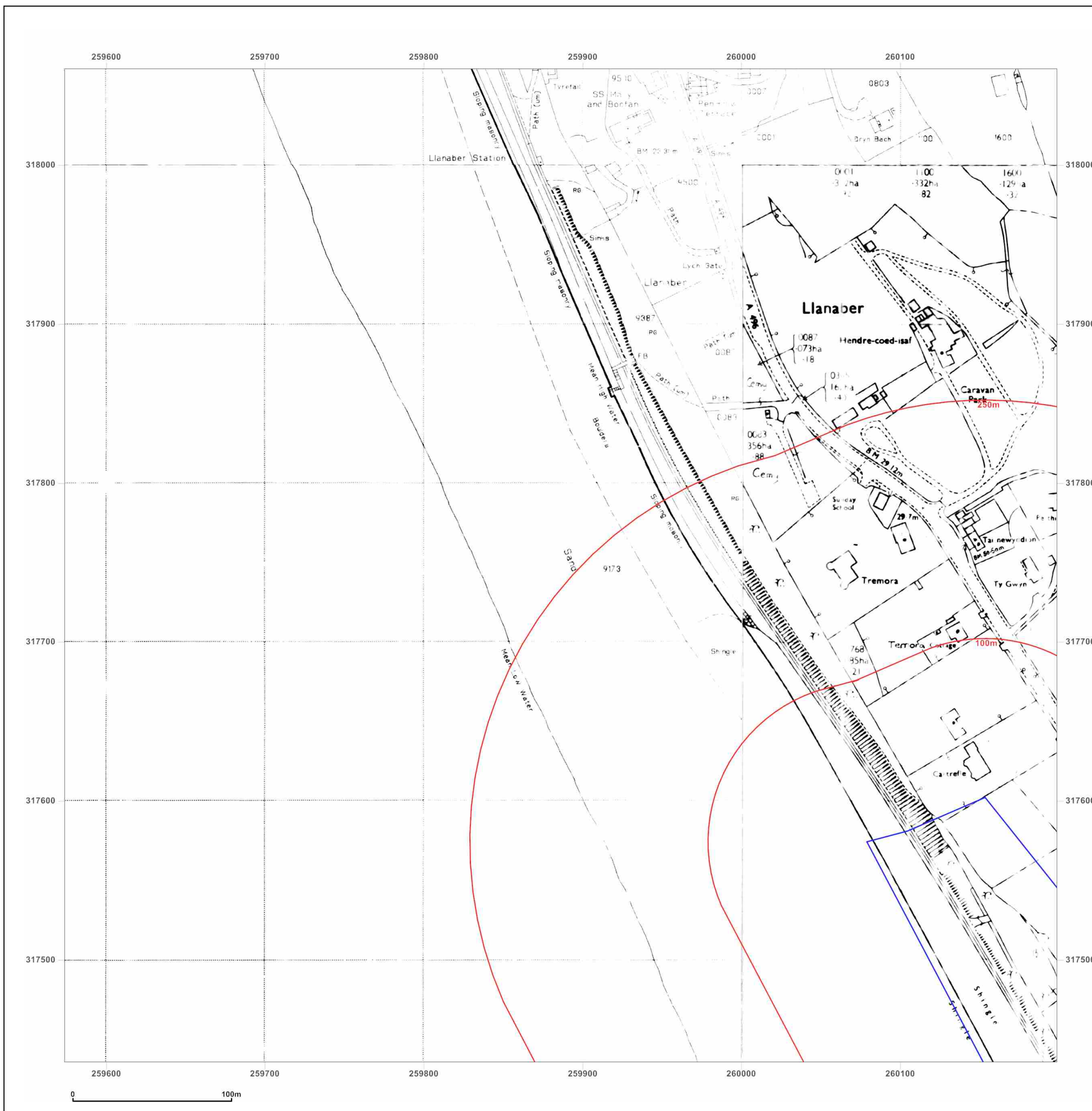


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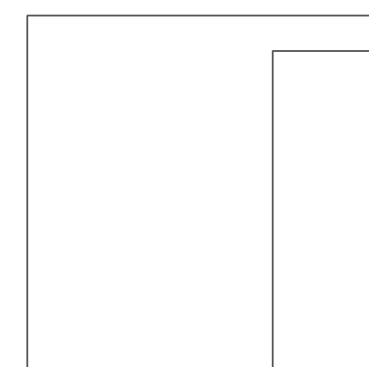
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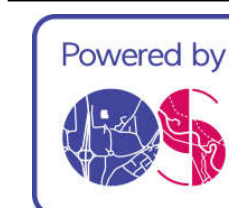
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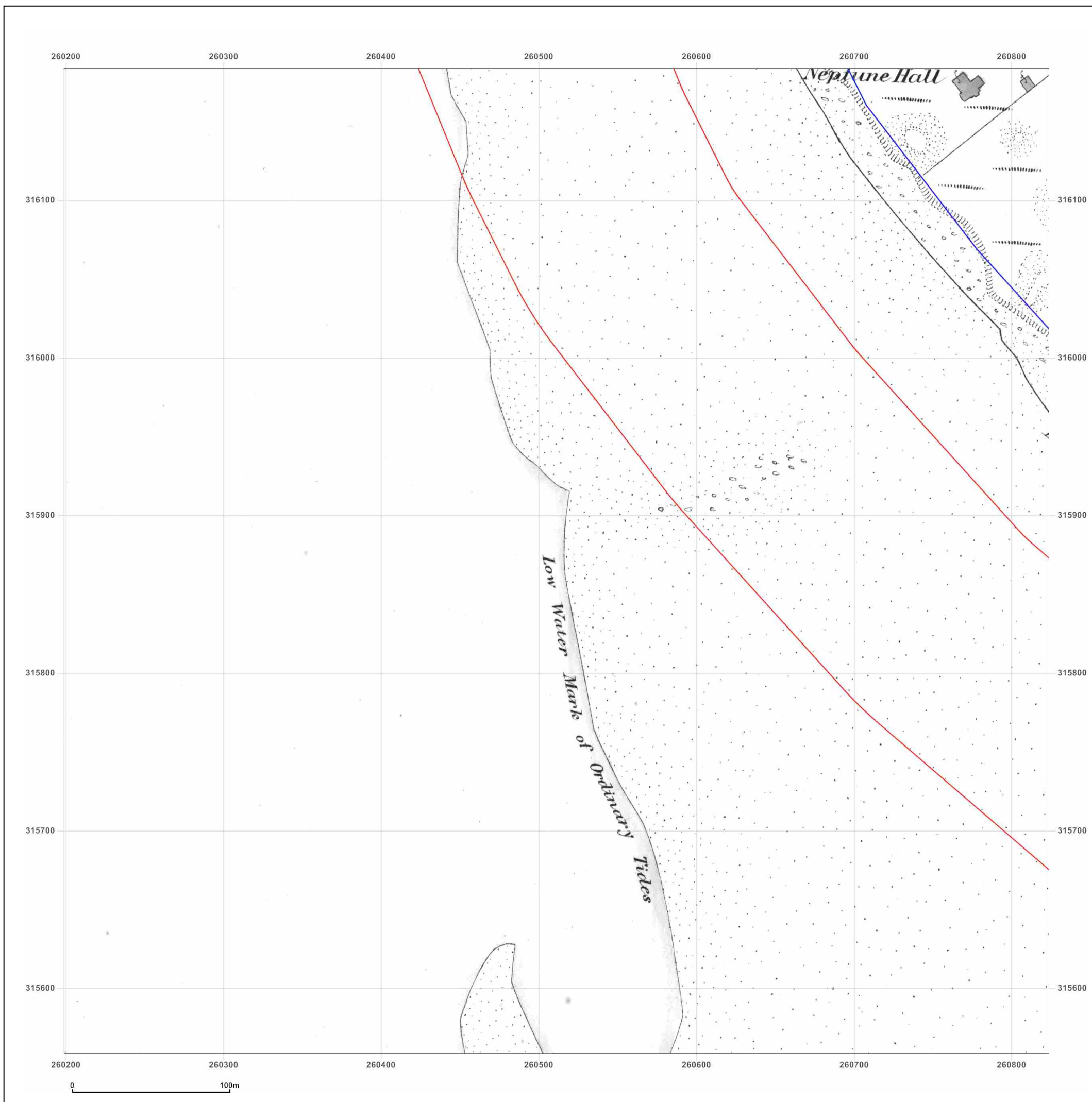


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_2
Grid Ref: 260511, 315871

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
 Revised 1901
 Edition N/A
 Copyright N/A
 Levelled N/A

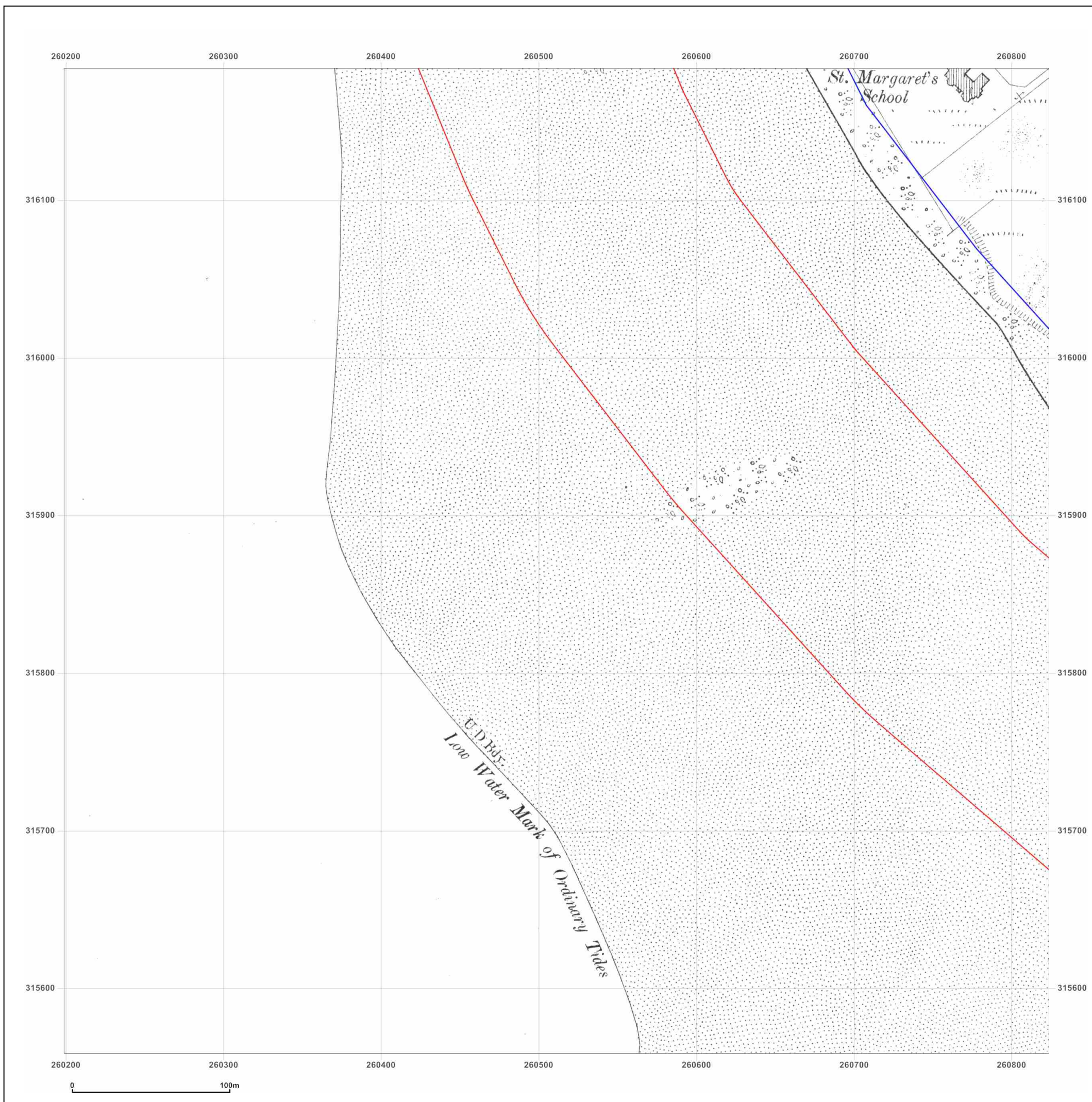


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_2
Grid Ref: 260511, 315871

Map Name: National Grid

Map date: 1978-1981

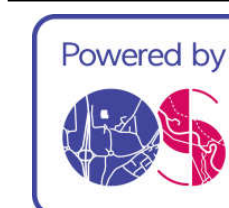
Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973

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

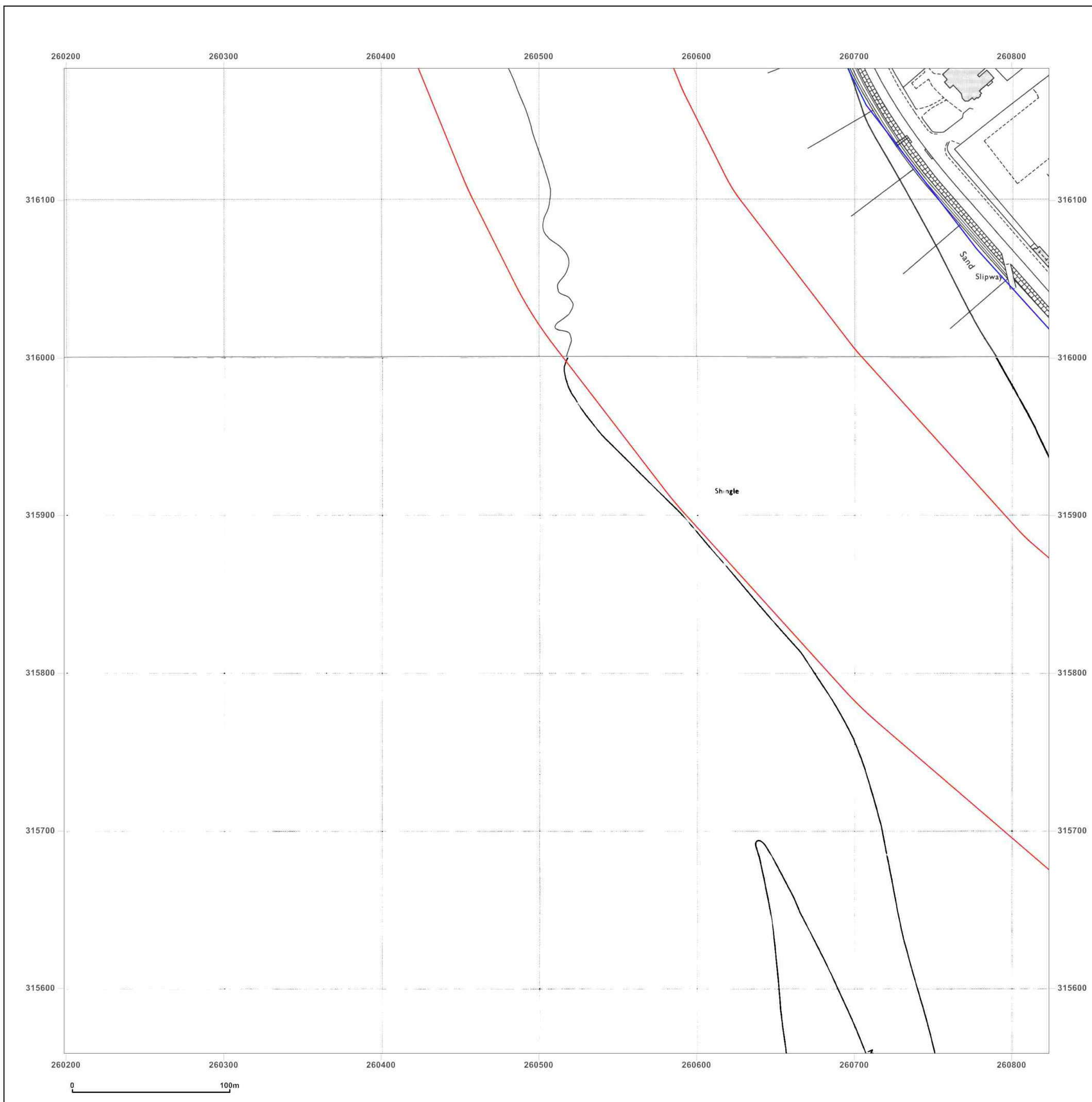


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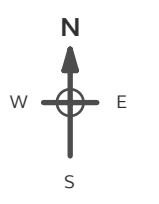
Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



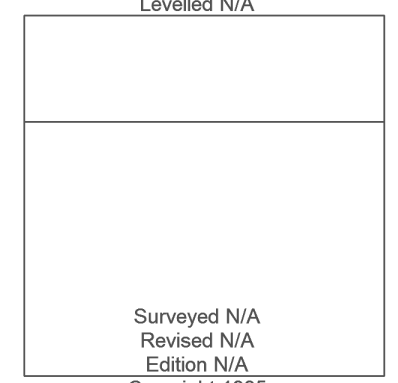
Site Details:
Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_2
Grid Ref: 260511, 315871

Map Name: National Grid
Map date: 1995
Scale: 1:2,500
Printed at: 1:2,500



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A



Surveyed N/A
Revised N/A
Edition N/A
Copyright 1995
Levelled N/A

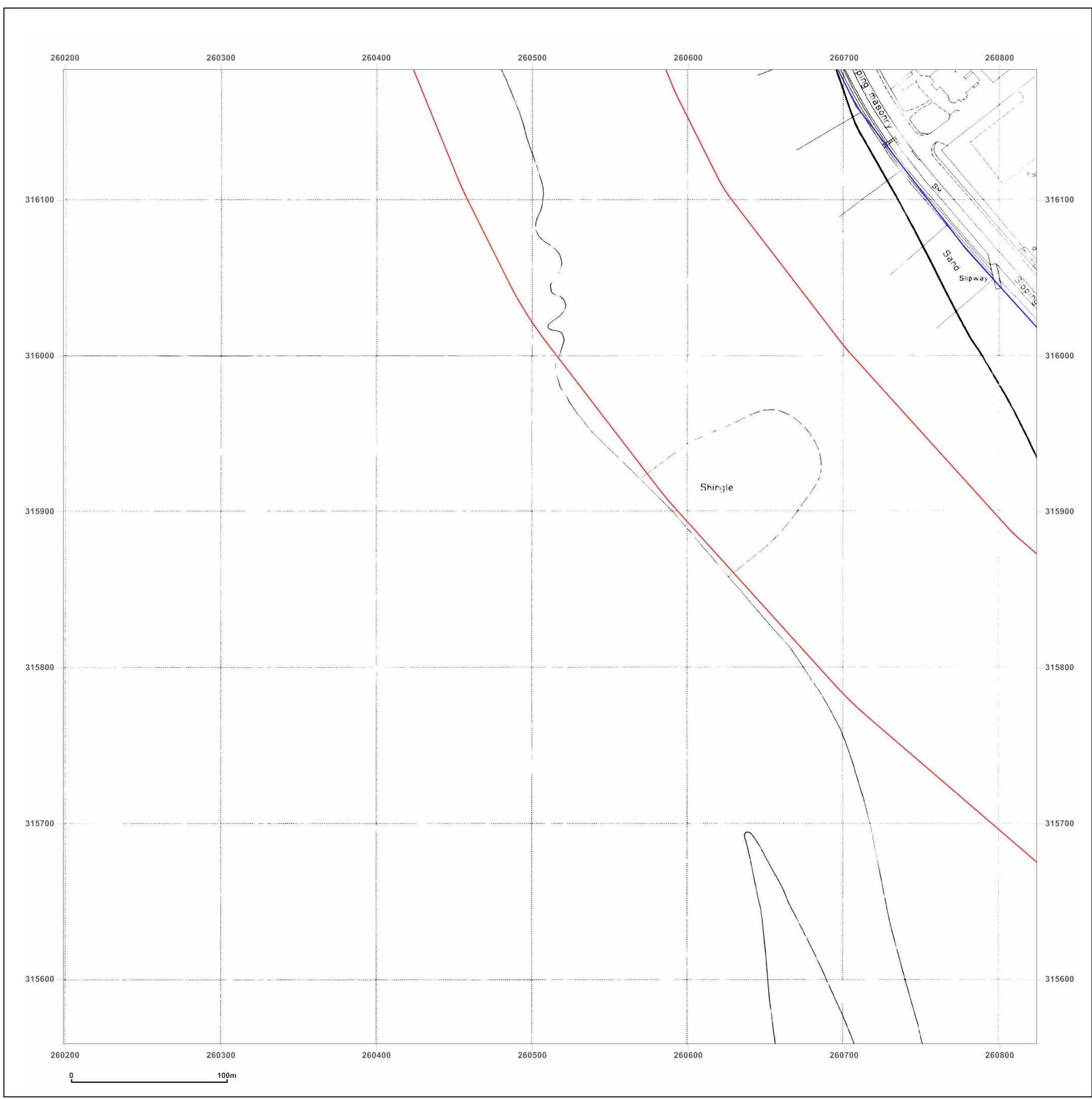


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_3
Grid Ref: 260511, 316497

Map Name: County Series

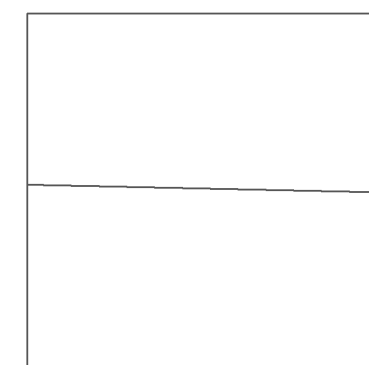
Map date: 1889

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

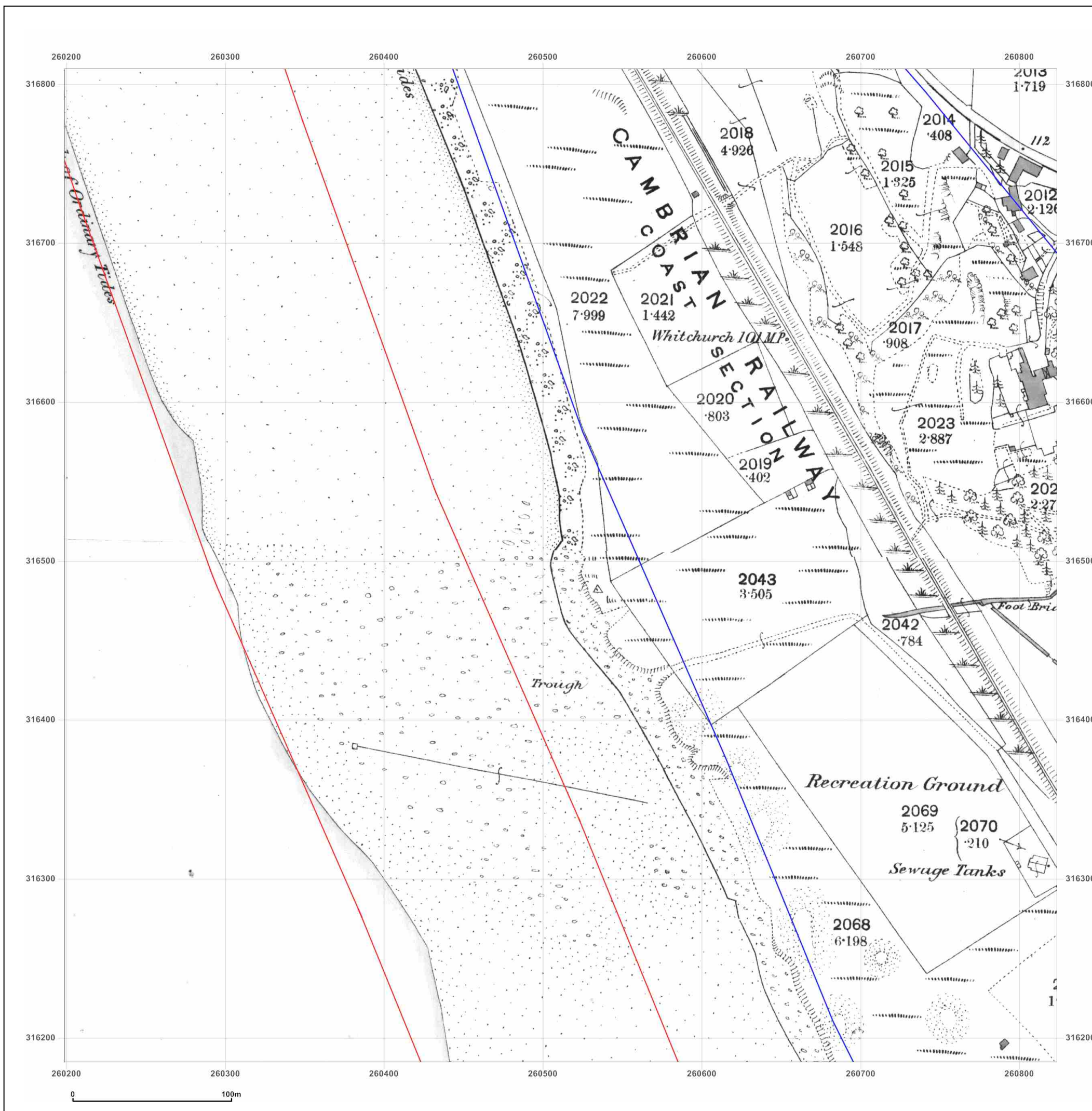


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_3
Grid Ref: 260511, 316497

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
 Revised 1901
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1901
 Revised 1901
 Edition N/A
 Copyright N/A
 Levelled N/A

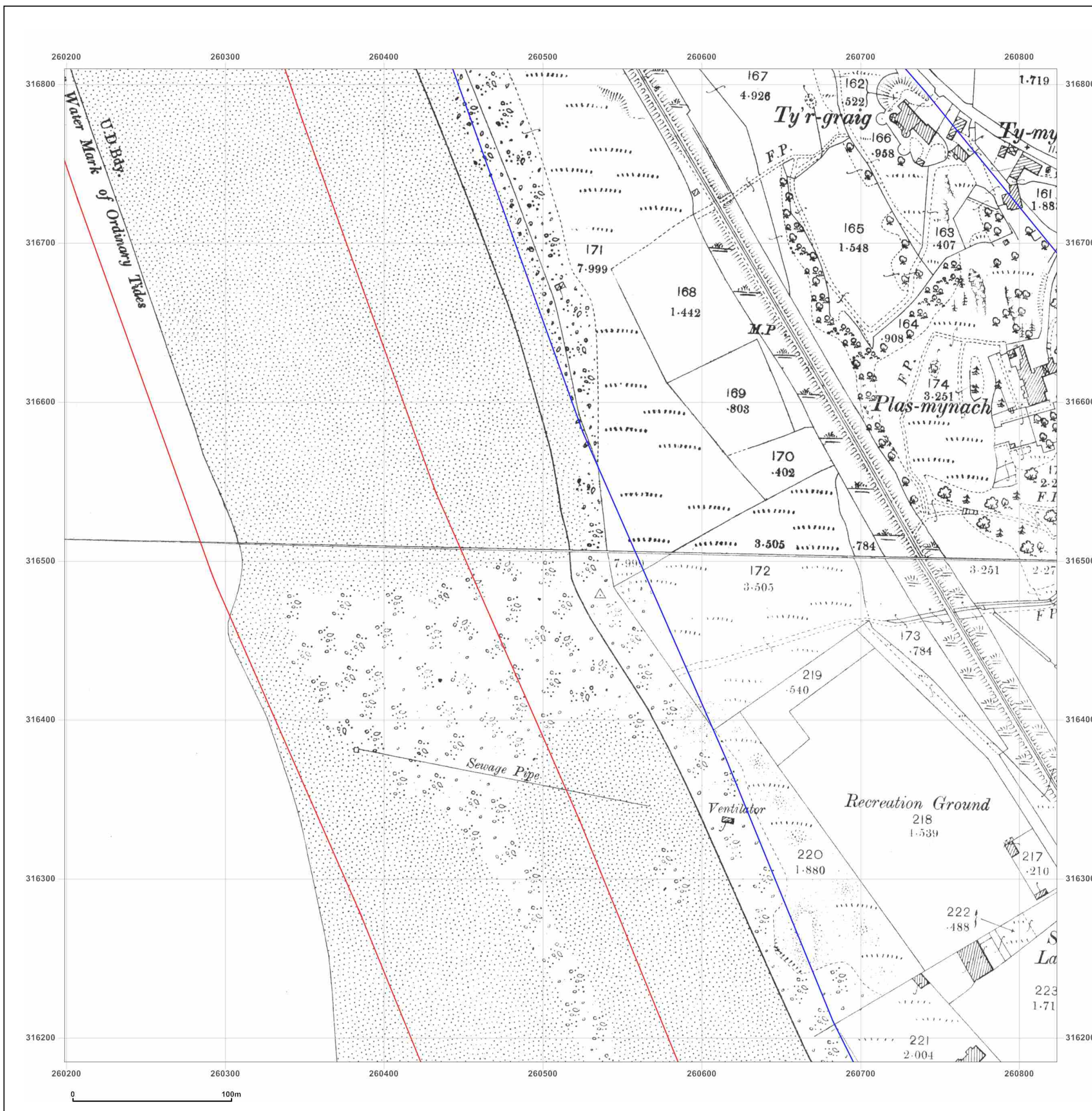


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_4
Grid Ref: 260511, 317122

Map Name: County Series

Map date: 1889

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

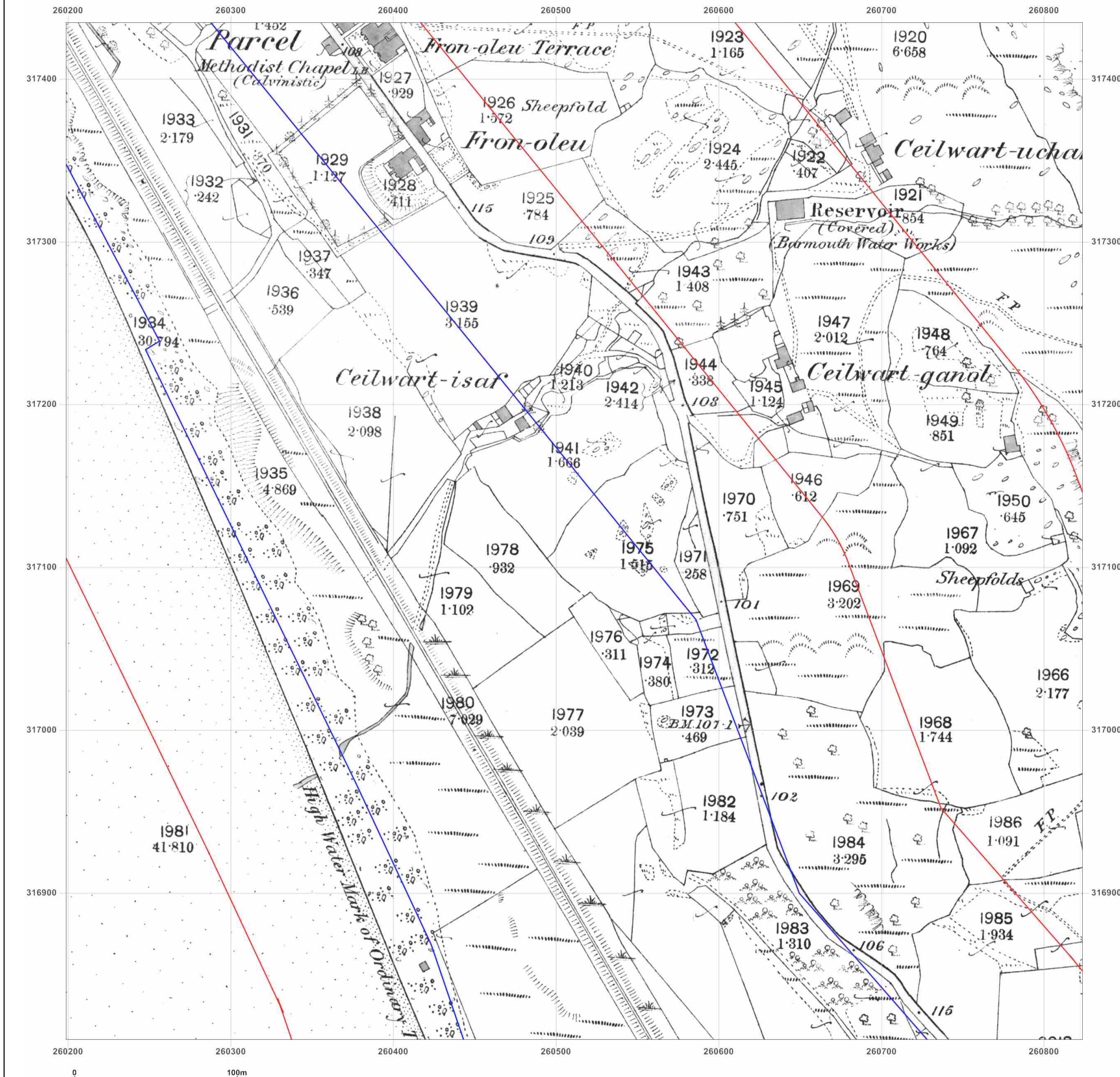


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_4
Grid Ref: 260511, 317122

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

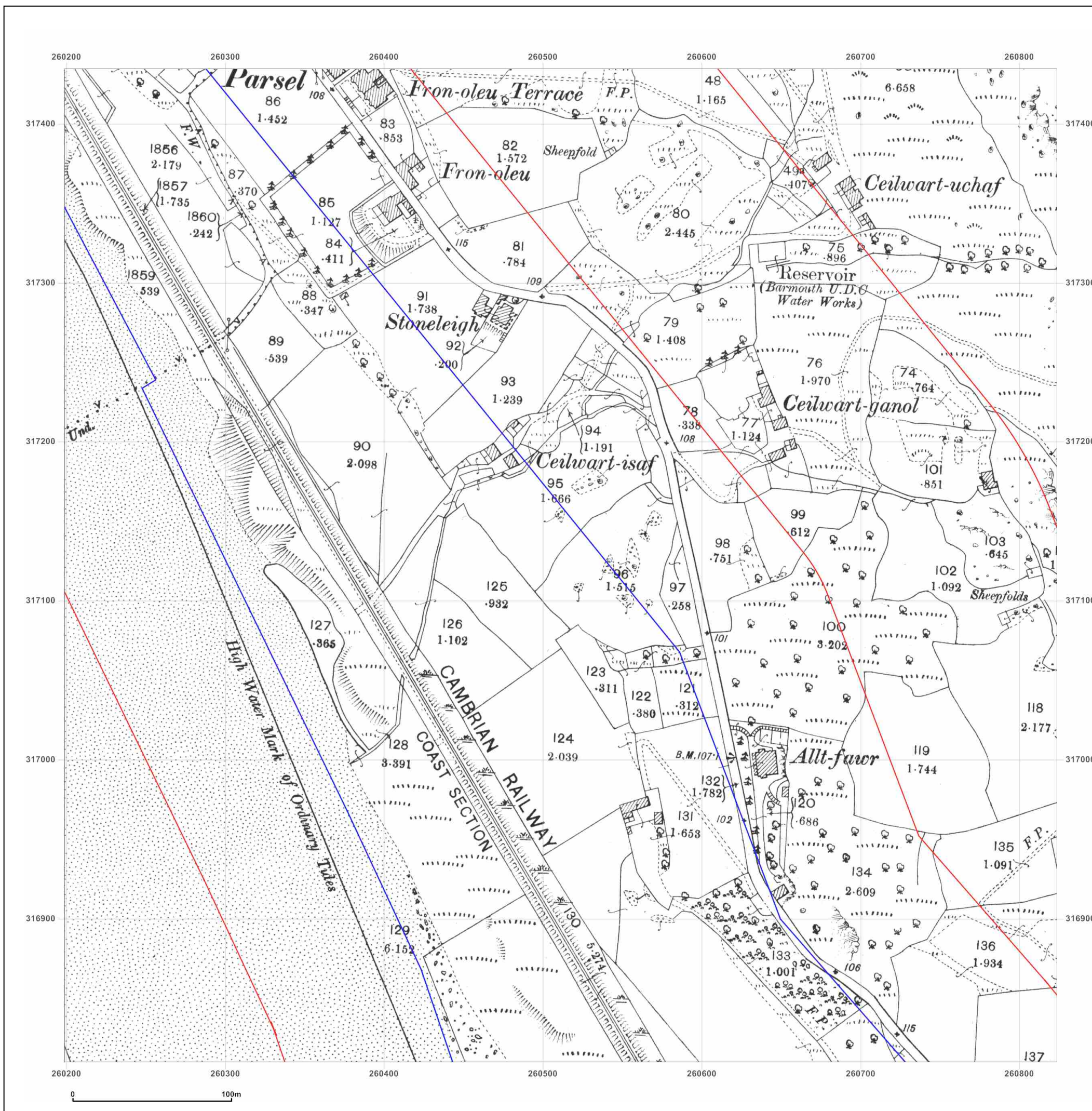


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_4
Grid Ref: 260511, 317122

Map Name: National Grid

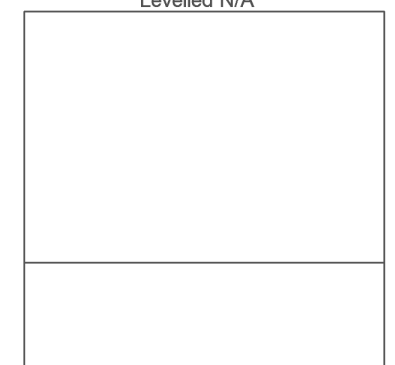
Map date: 1990

Scale: 1:2,500

Printed at: 1:2,500



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



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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_4
Grid Ref: 260511, 317122

Map Name: National Grid

Map date: 1990-1995

Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A



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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_5
Grid Ref: 260511, 317748

Map Name: County Series

Map date: 1889

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

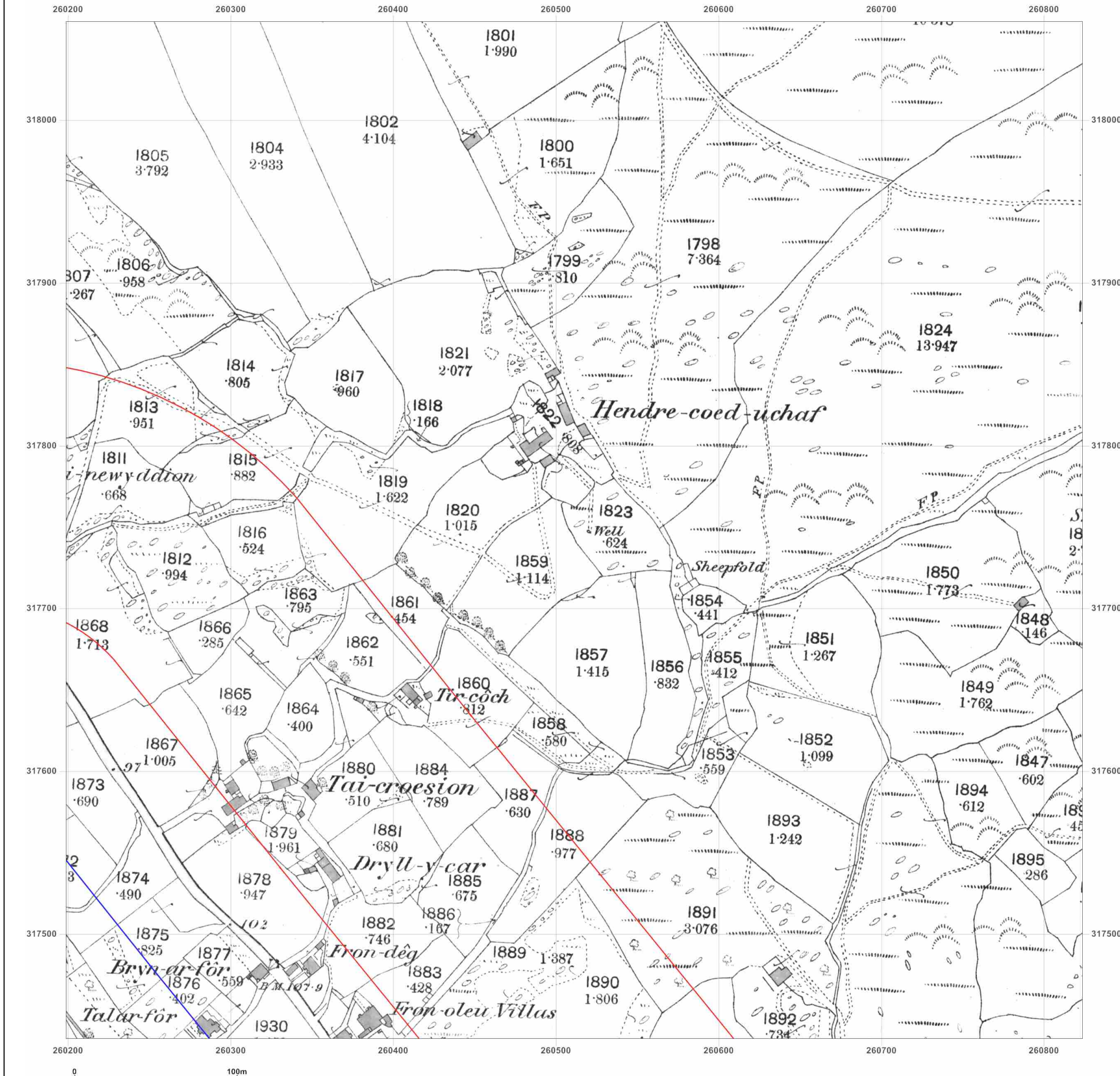


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_5
Grid Ref: 260511, 317748

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

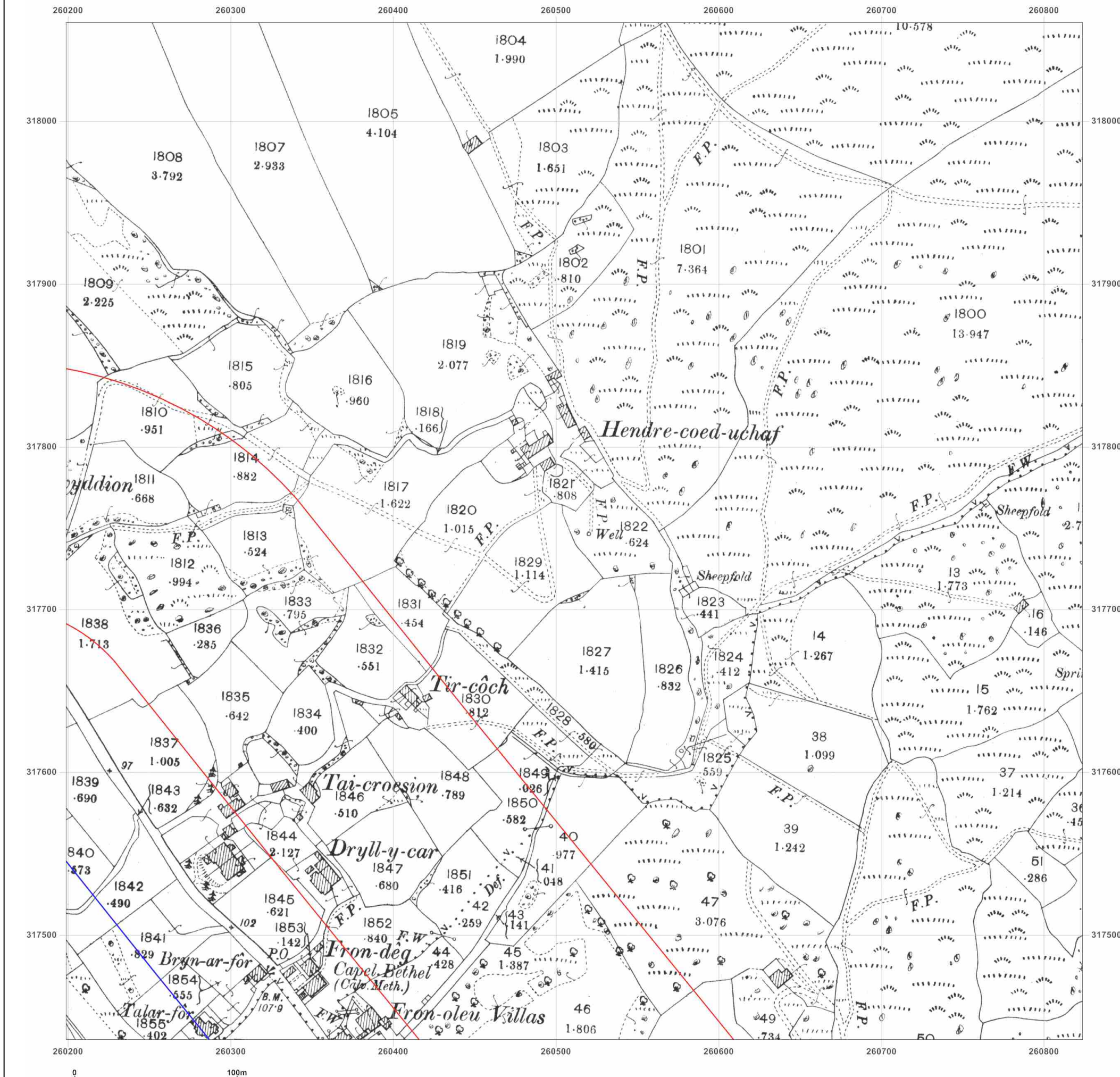


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_5
Grid Ref: 260511, 317748

Map Name: National Grid

Map date: 1978

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973

Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973

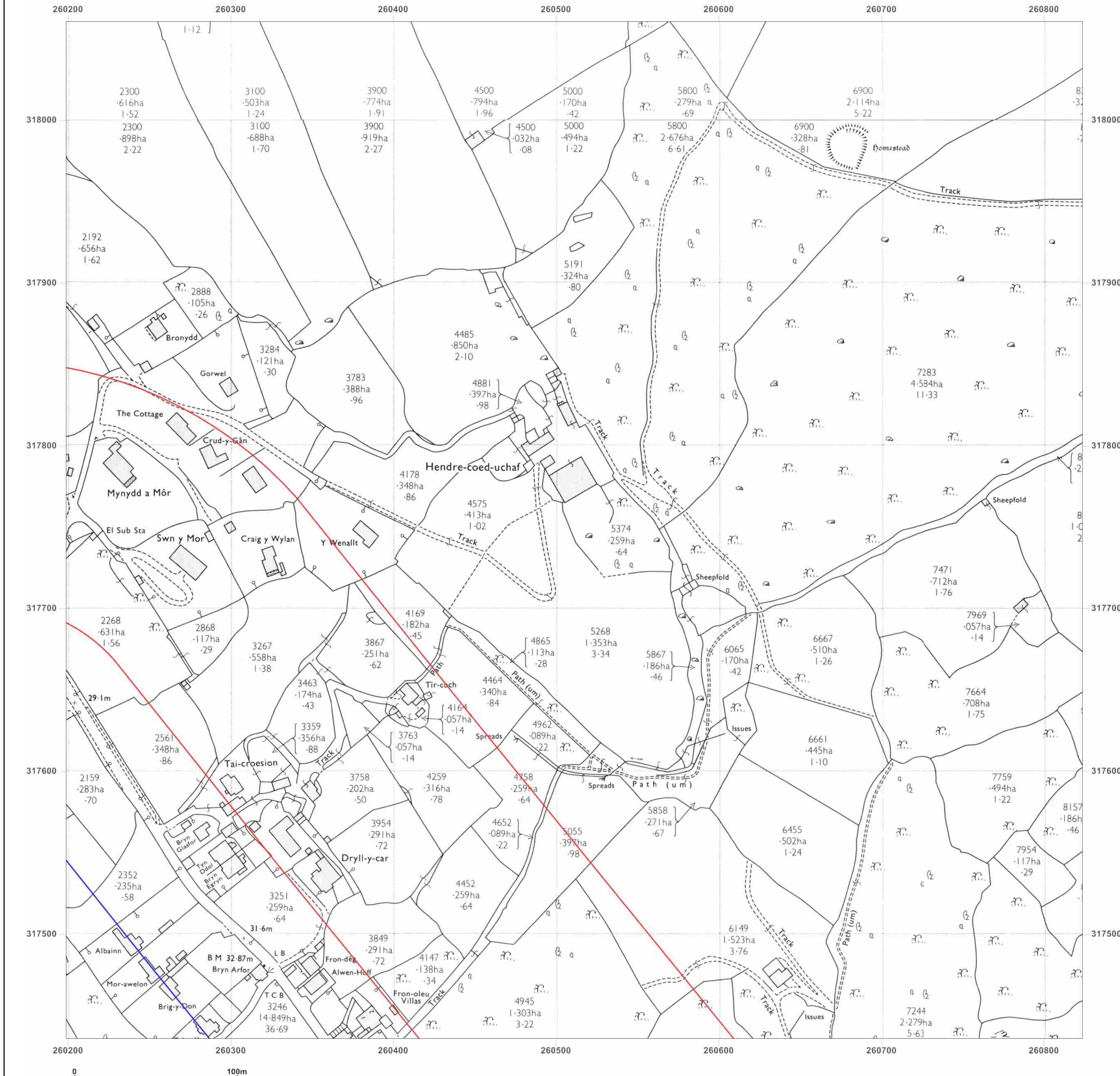


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_2_5
Grid Ref: 260511, 317748

Map Name: National Grid

Map date: 1990-1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

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

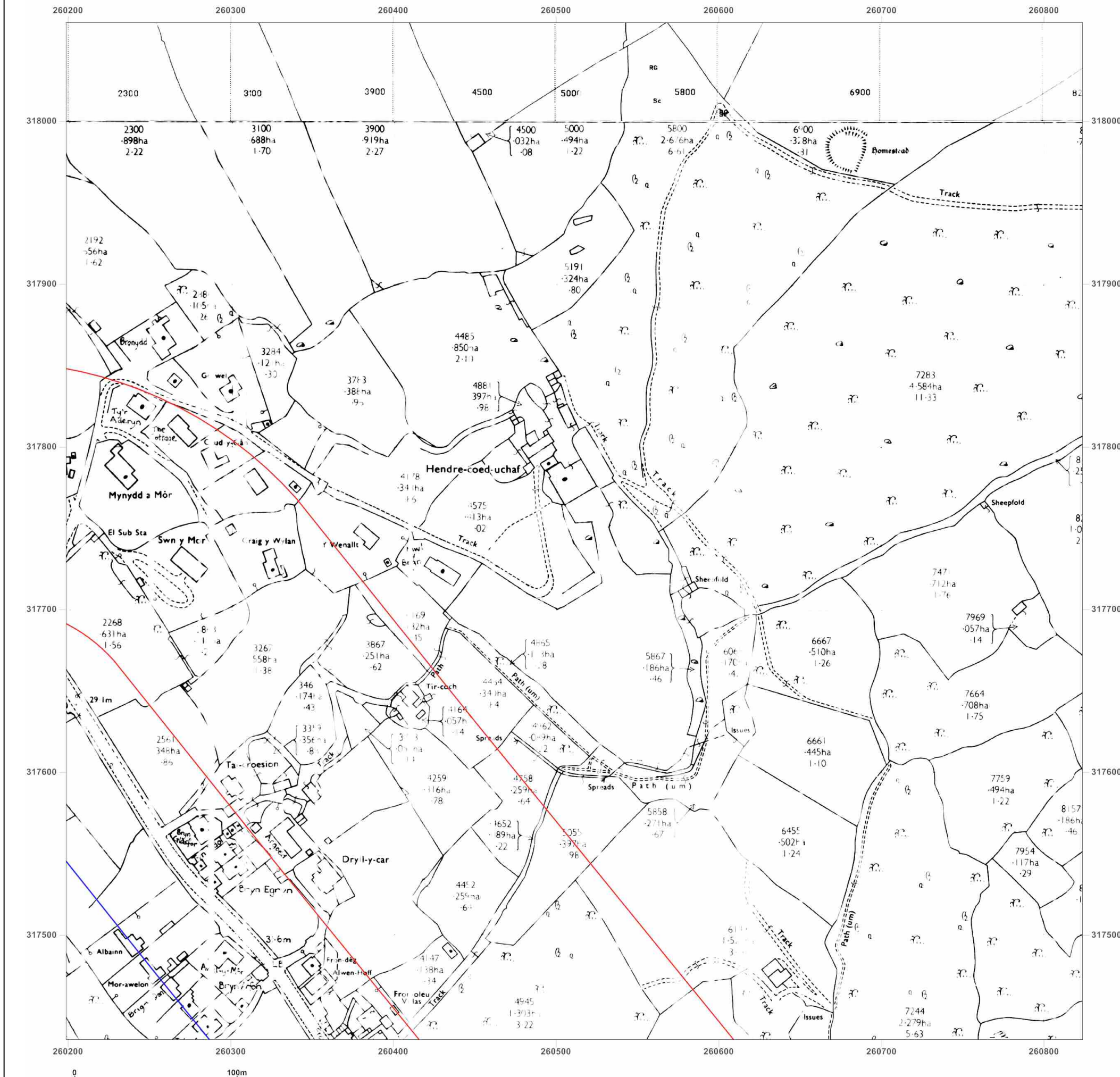


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Site Details:

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Client Ref: 264326
Report Ref: GS-5539750_LS_2_5
Grid Ref: 260511, 317748

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

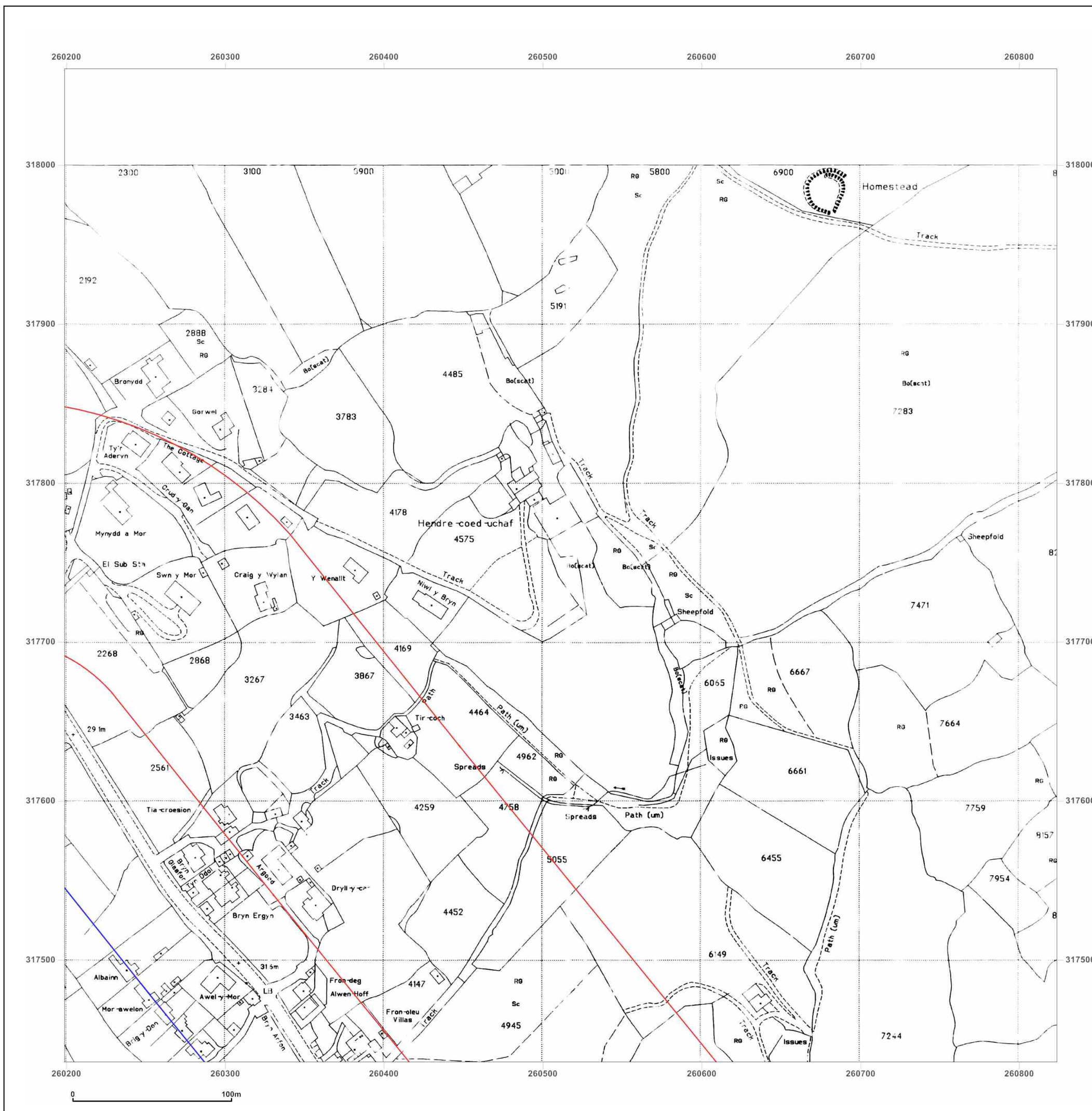


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_1
Grid Ref: 261137, 315246

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
 Revised 1901
 Edition N/A
 Copyright N/A
 Levelled N/A

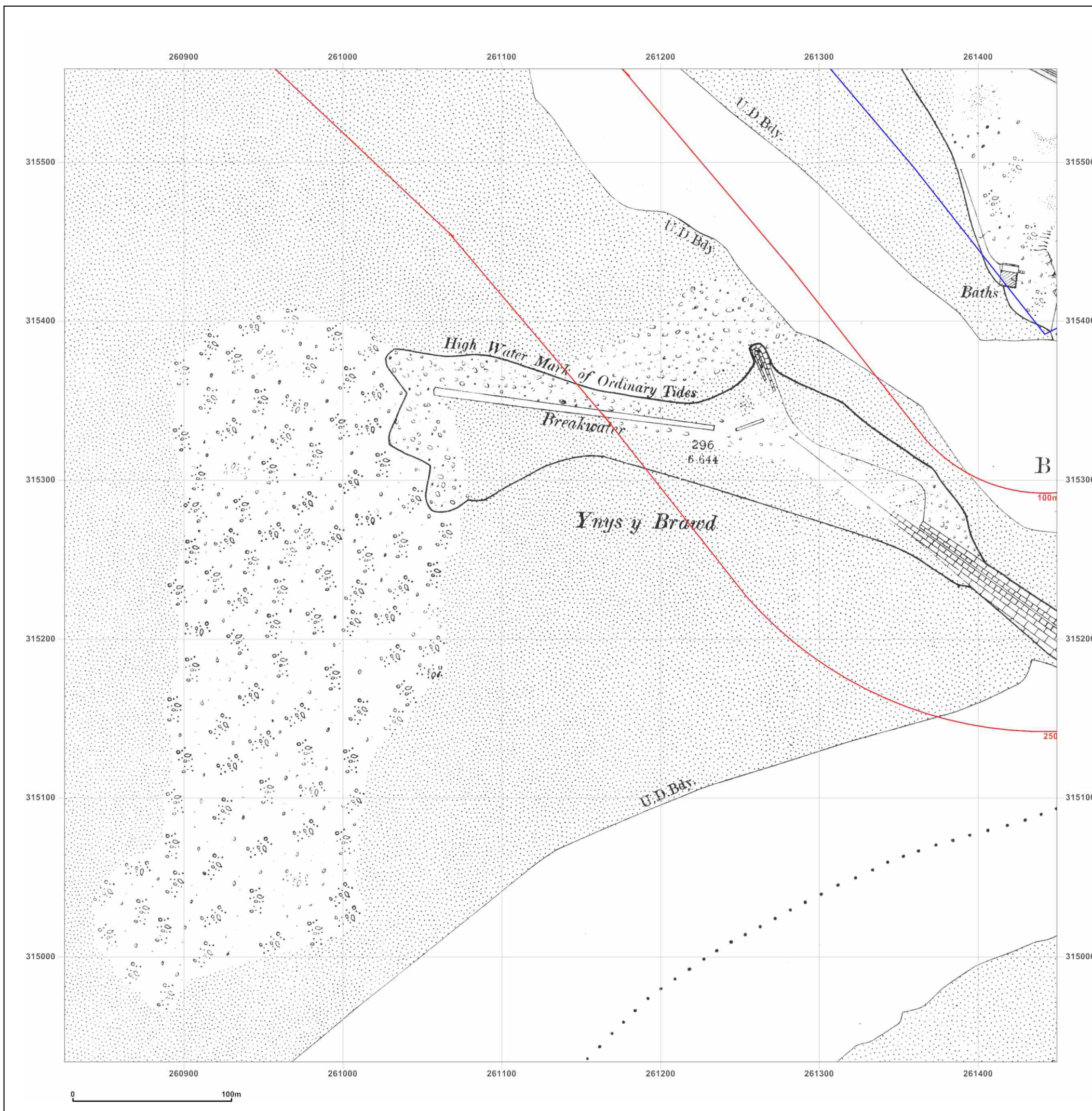


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_1
Grid Ref: 261137, 315246

Map Name: National Grid

Map date: 1978-1980

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1981
 Levelled 1973

Surveyed 1980
 Revised 1980
 Edition N/A
 Copyright 1981
 Levelled 1973

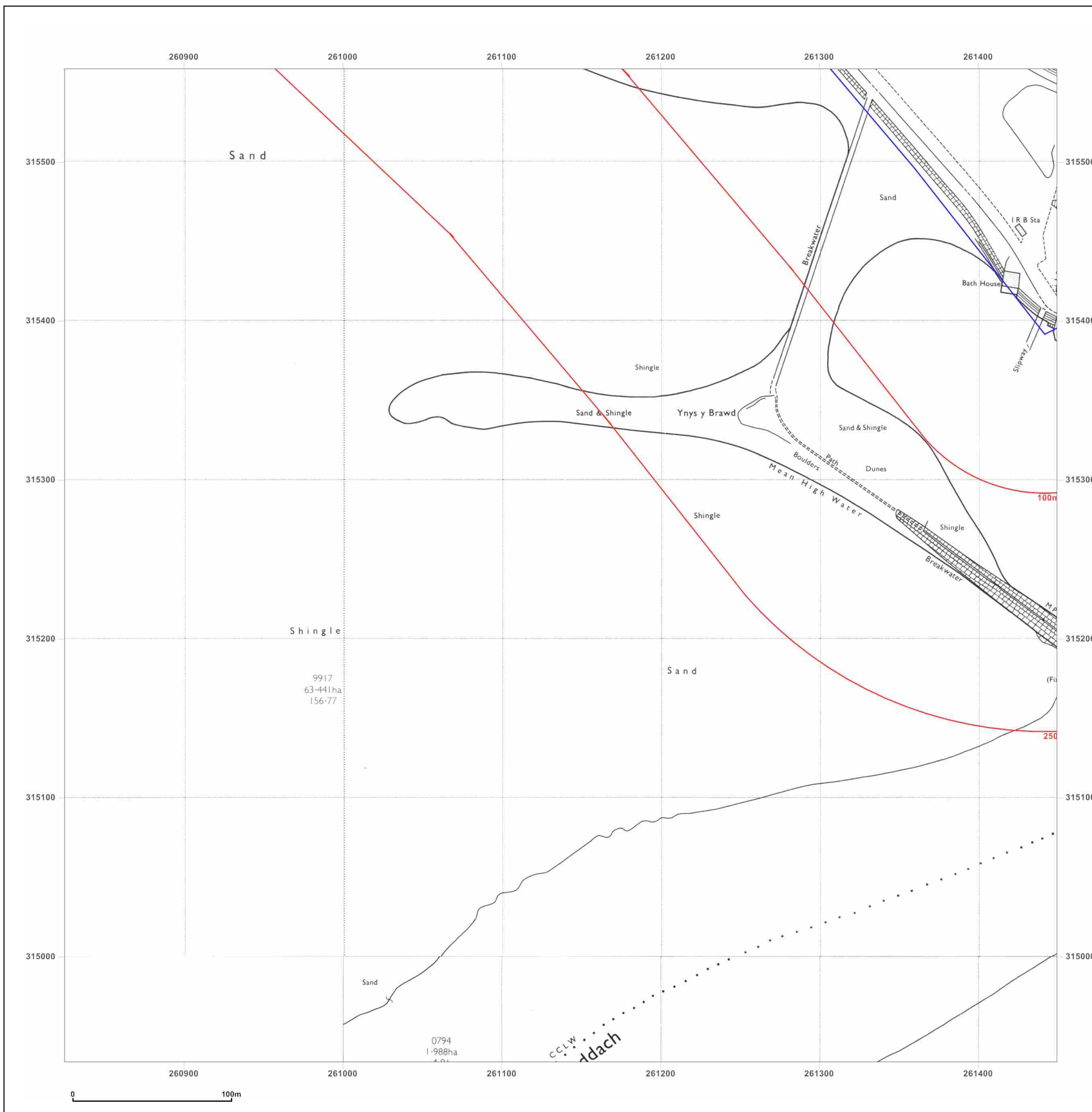


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_1
Grid Ref: 261137, 315246

Map Name: National Grid

Map date: 1981

Scale: 1:2,500

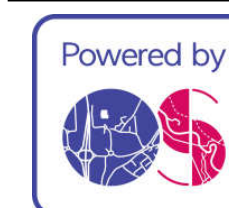
Printed at: 1:2,500



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

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

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

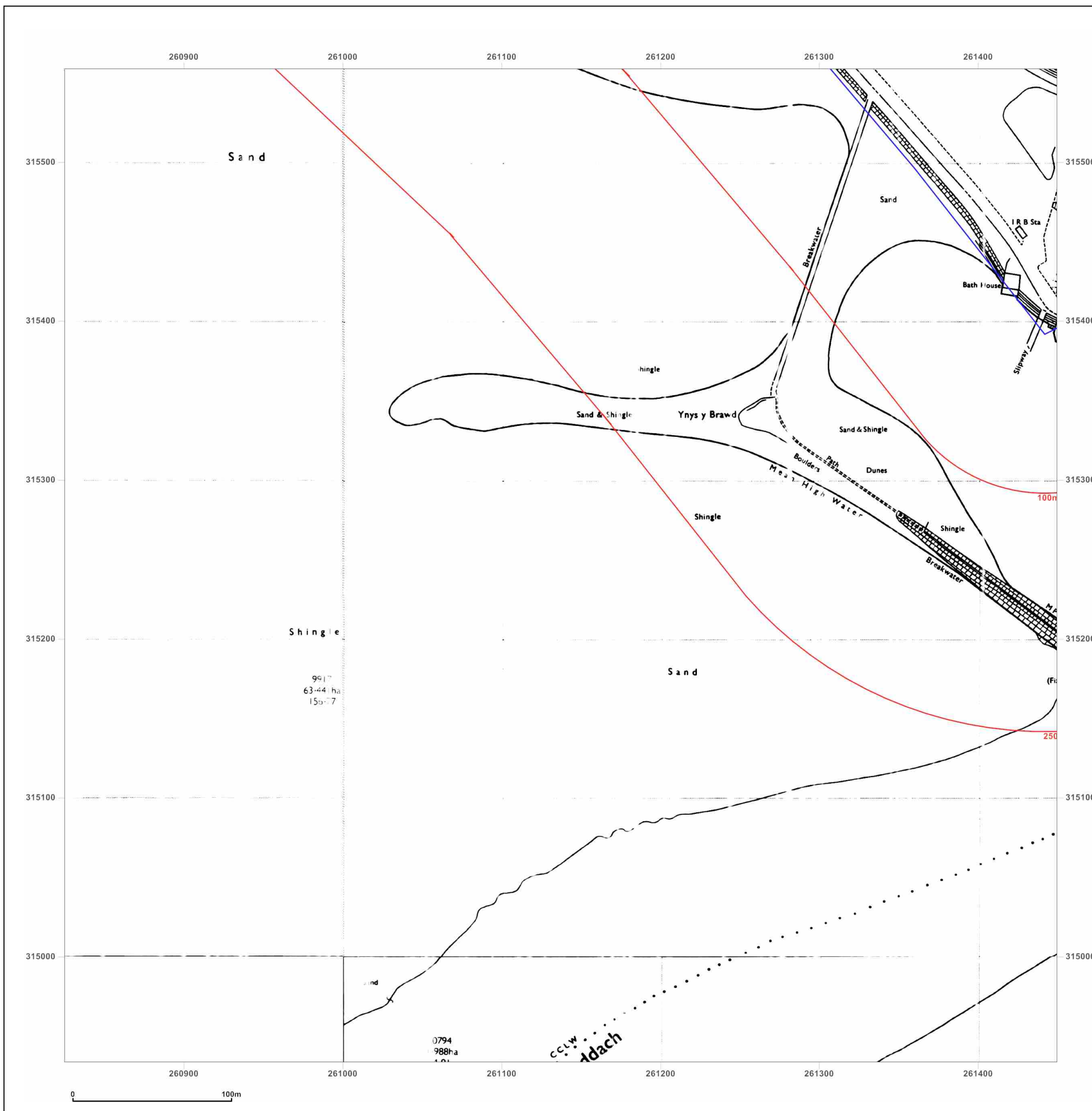


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_1
Grid Ref: 261137, 315246

Map Name: National Grid

Map date: 1990

Scale: 1:2,500

Printed at: 1:2,500



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

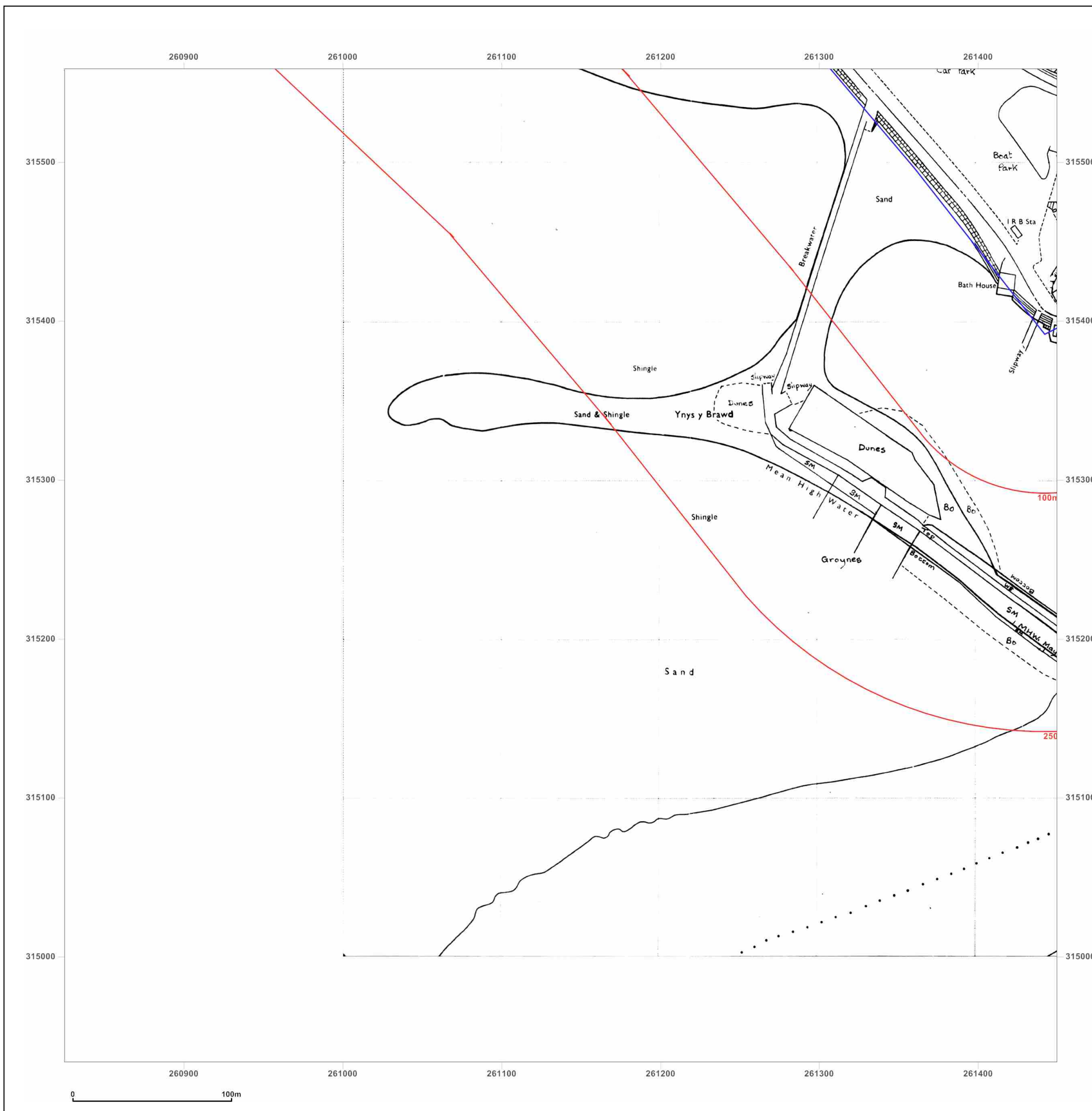


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_1
Grid Ref: 261137, 315246

Map Name: National Grid

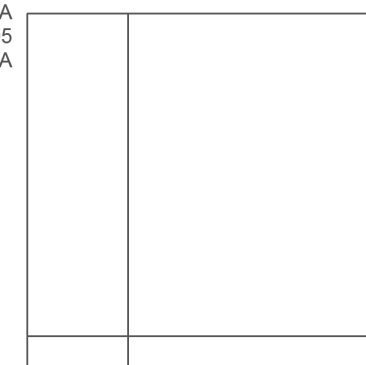
Map date: 1992-1995

Scale: 1:2,500

Printed at: 1:2,500

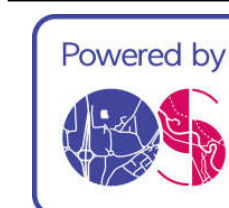


Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A



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

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

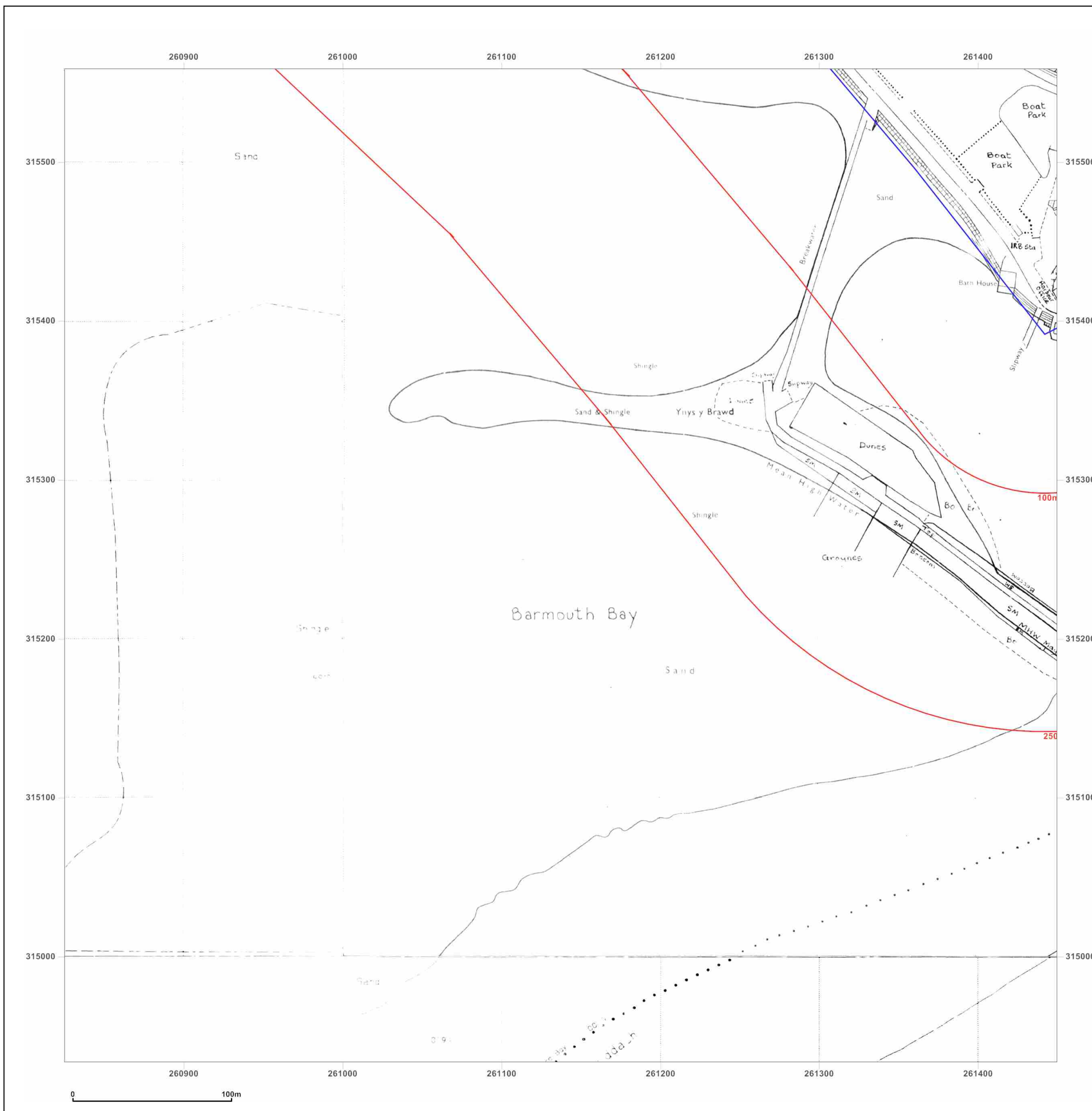


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_1
Grid Ref: 261137, 315246

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

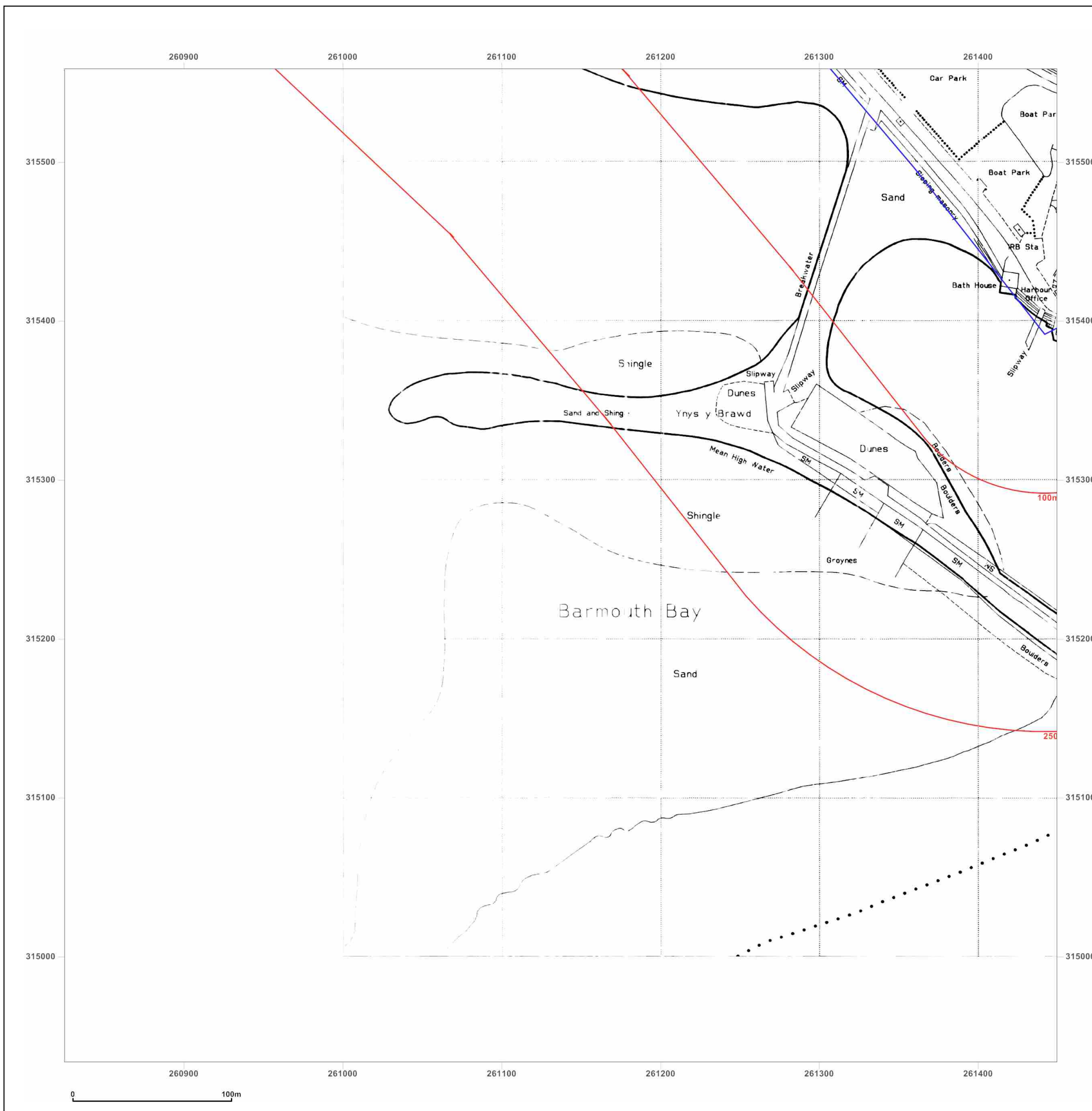


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_2
Grid Ref: 261137, 315871

Map Name: County Series

Map date: 1889

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

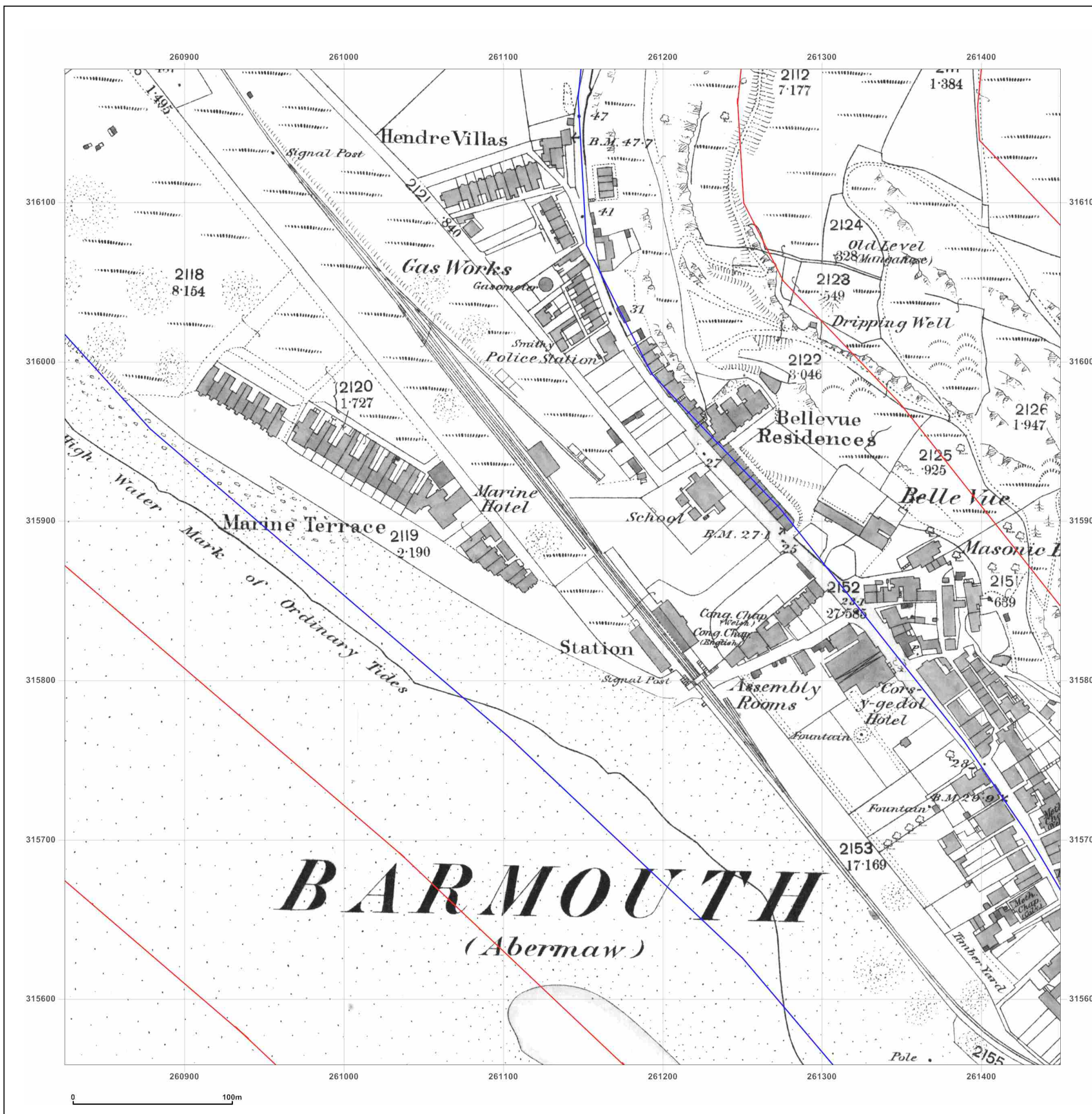


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_2
Grid Ref: 261137, 315871

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
 Revised 1901
 Edition N/A
 Copyright N/A
 Levelled N/A

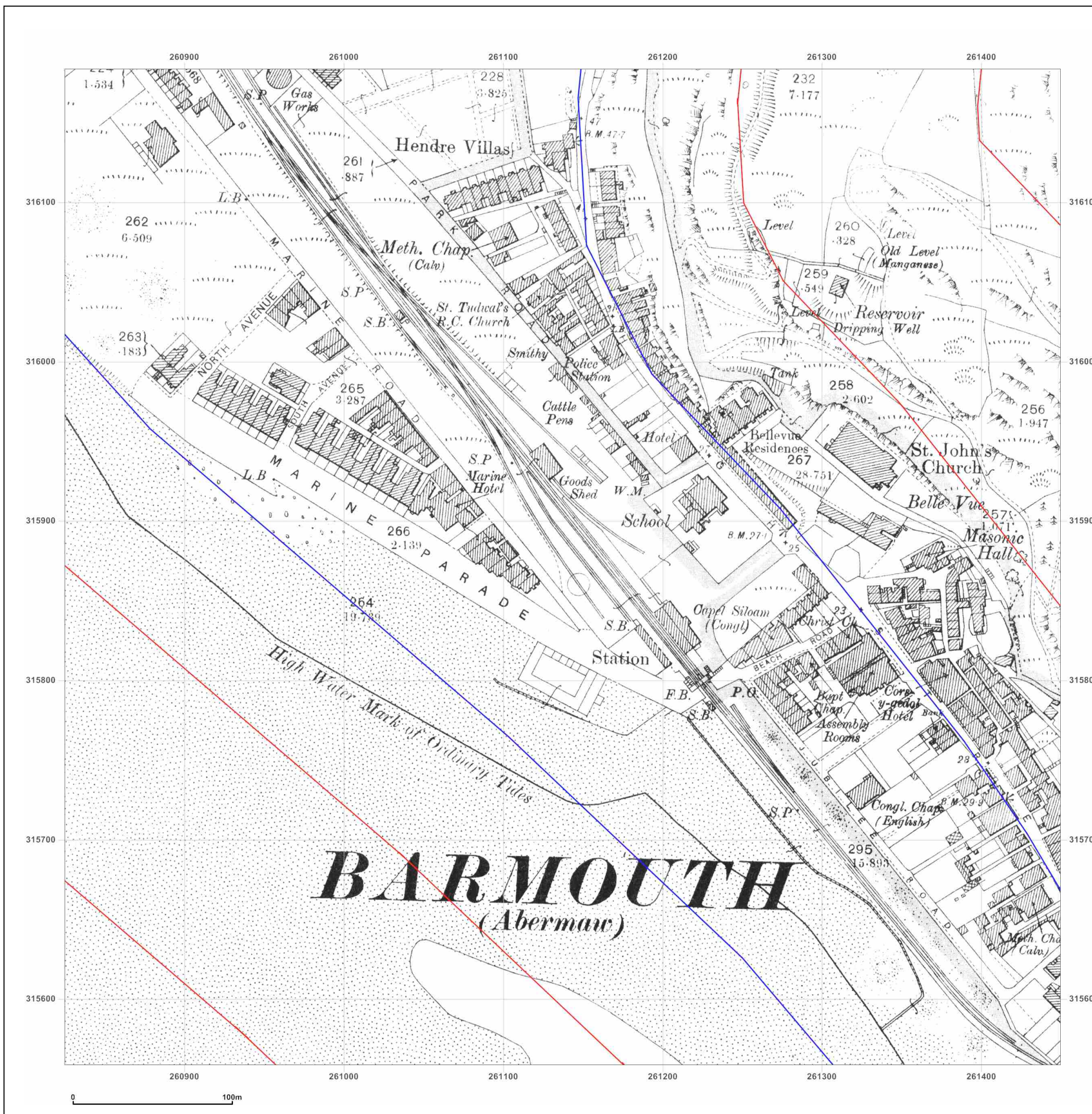


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_2
Grid Ref: 261137, 315871

Map Name: National Grid

Map date: 1978

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973

Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1981
 Levelled 1973

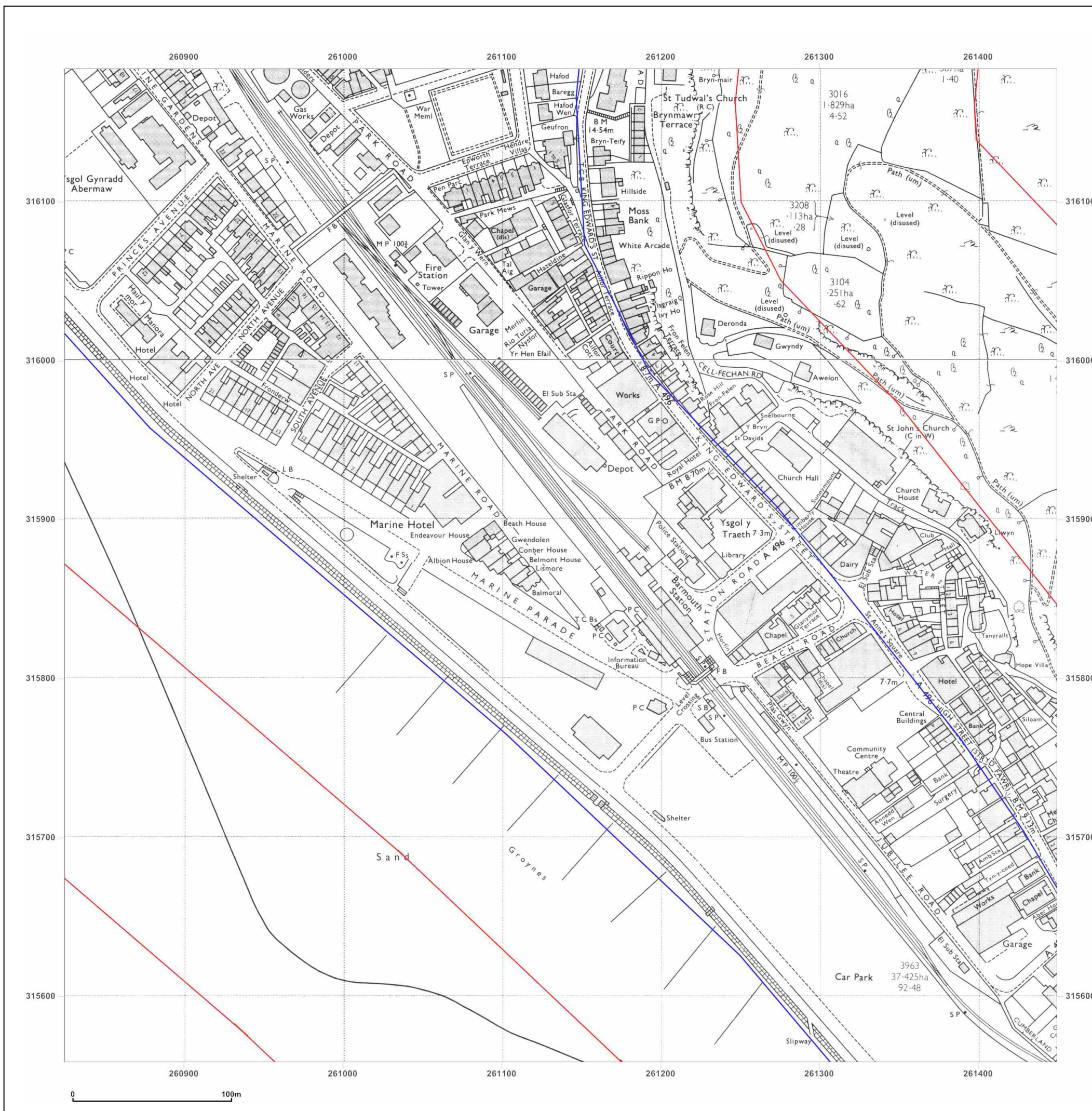


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_2
Grid Ref: 261137, 315871

Map Name: National Grid

Map date: 1980-1981

Scale: 1:2,500

Printed at: 1:2,500



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

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

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

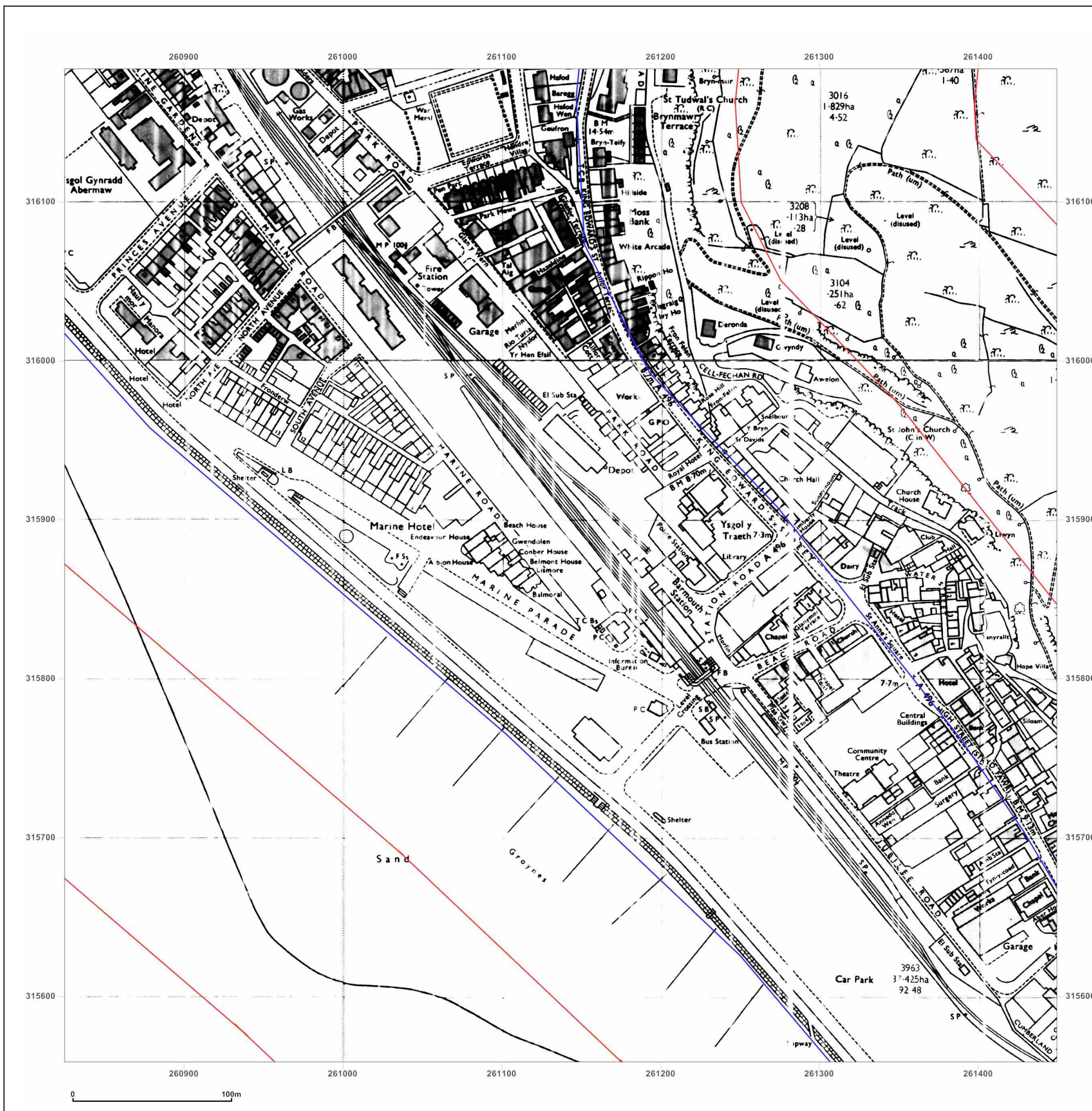


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Site Details:

Barmouth Northern Promenade

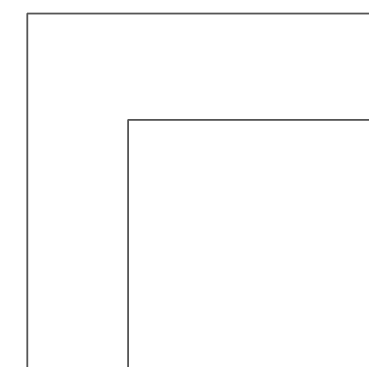
Client Ref: 264326
Report Ref: GS-5539750_LS_3_2
Grid Ref: 261137, 315871

Map Name: National Grid

Map date: 1990

Scale: 1:2,500

Printed at: 1:2,500



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

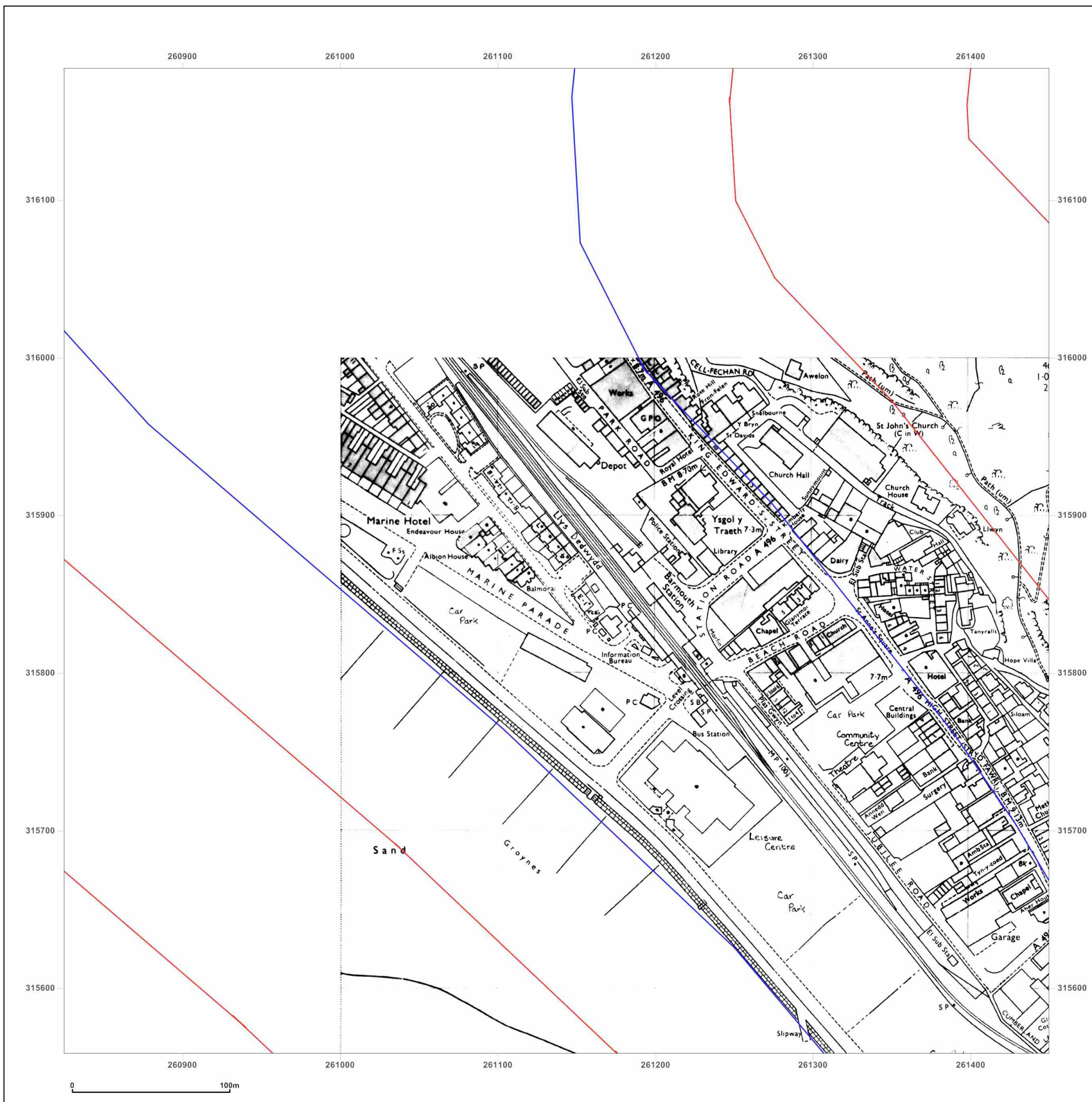


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_2
Grid Ref: 261137, 315871

Map Name: National Grid

Map date: 1992-1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

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

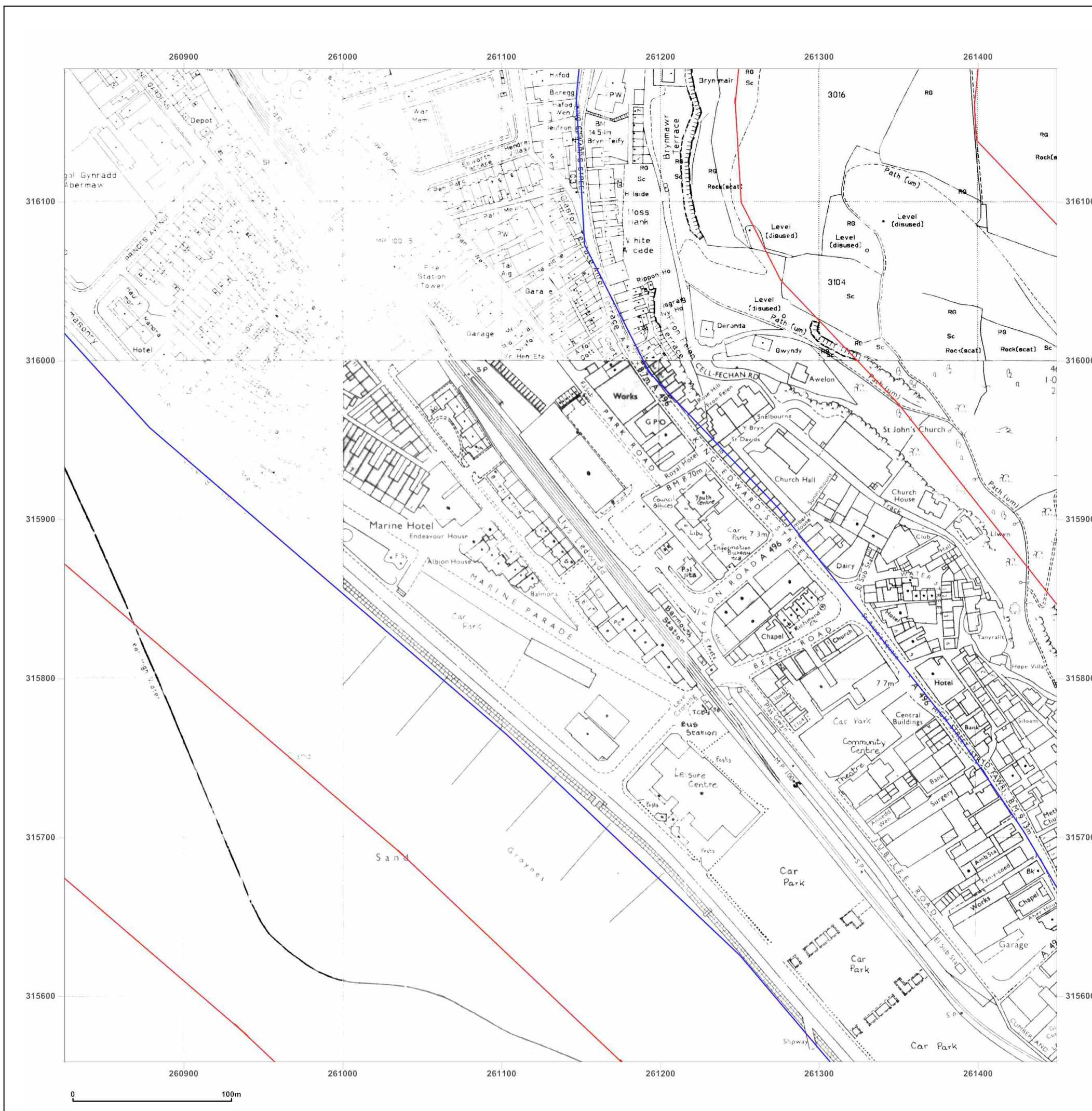


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Site Details:

Barmouth Northern Promenade

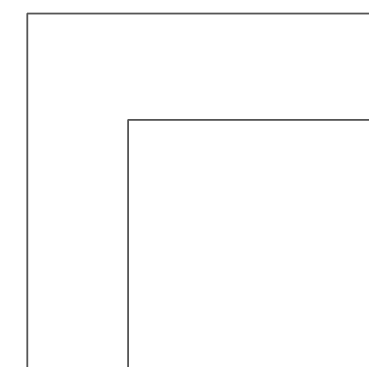
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Report Ref: GS-5539750_LS_3_2
Grid Ref: 261137, 315871

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

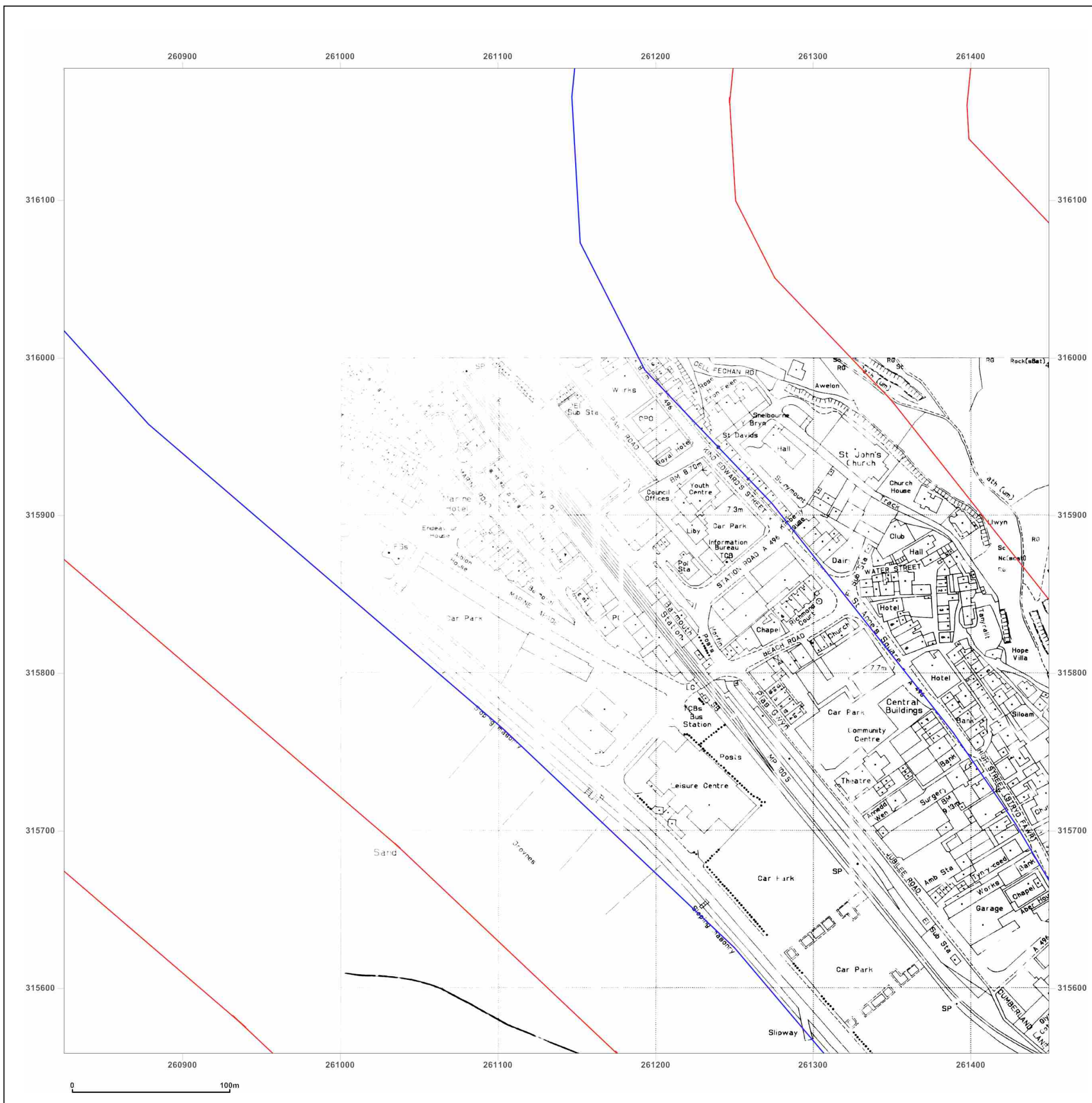


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_3
Grid Ref: 261137, 316497

Map Name: County Series

Map date: 1889

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

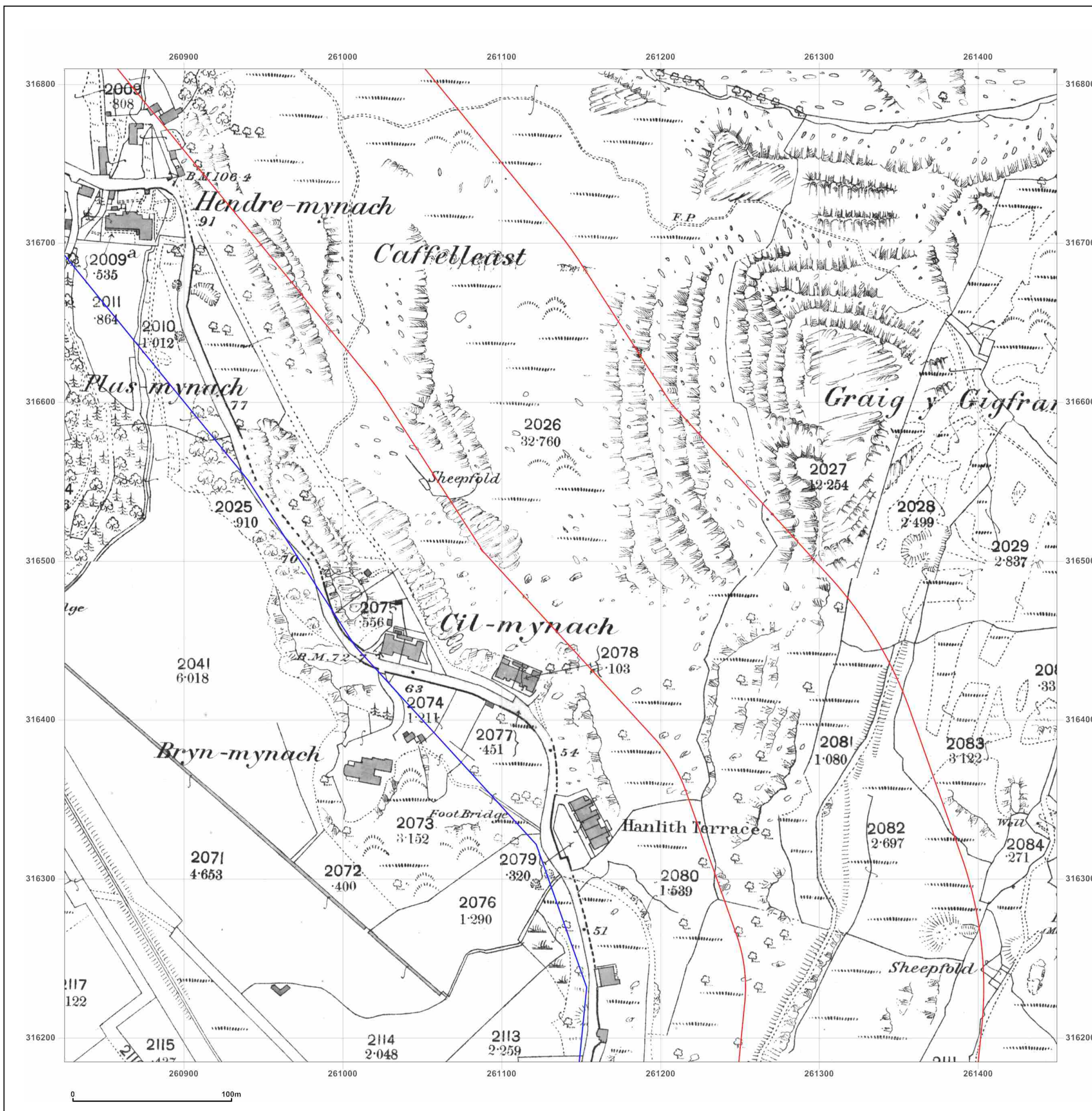


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_3
Grid Ref: 261137, 316497

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1901
Revised 1901
Edition N/A
Copyright N/A
Levelled N/A

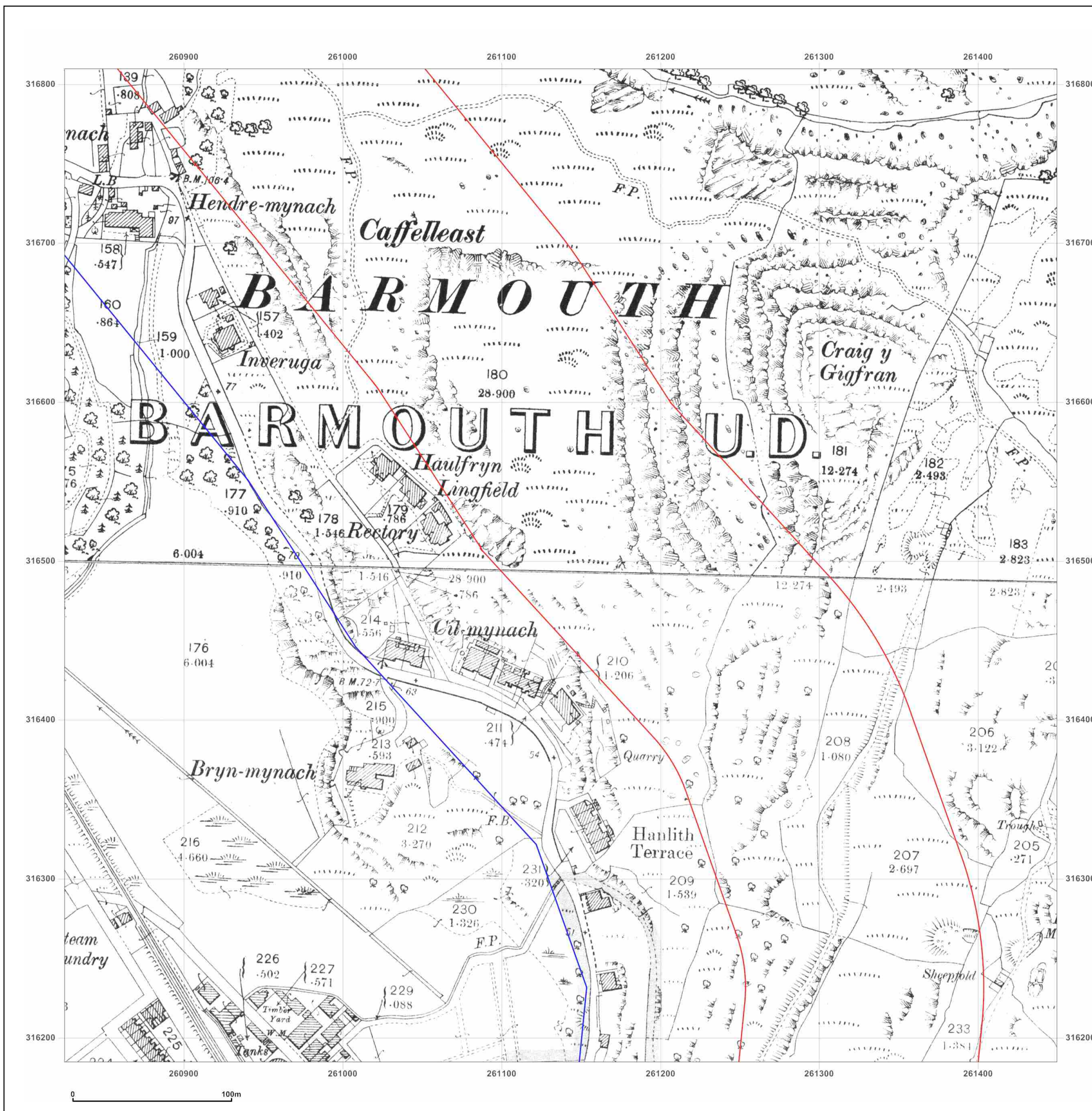


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_3
Grid Ref: 261137, 316497

Map Name: National Grid

Map date: 1978

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973

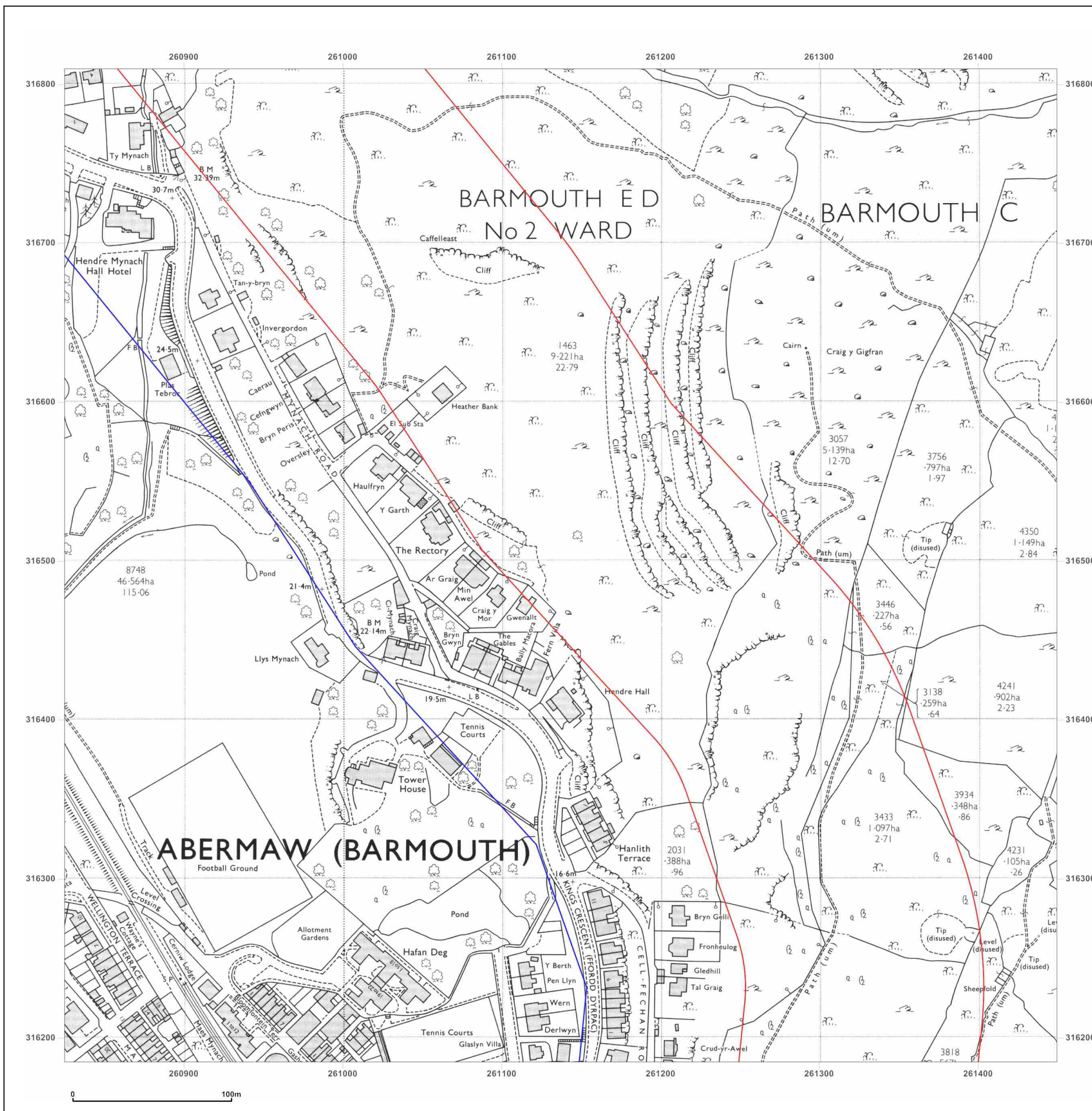


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_3
Grid Ref: 261137, 316497

Map Name: National Grid

Map date: 1980

Scale: 1:2,500

Printed at: 1:2,500



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

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

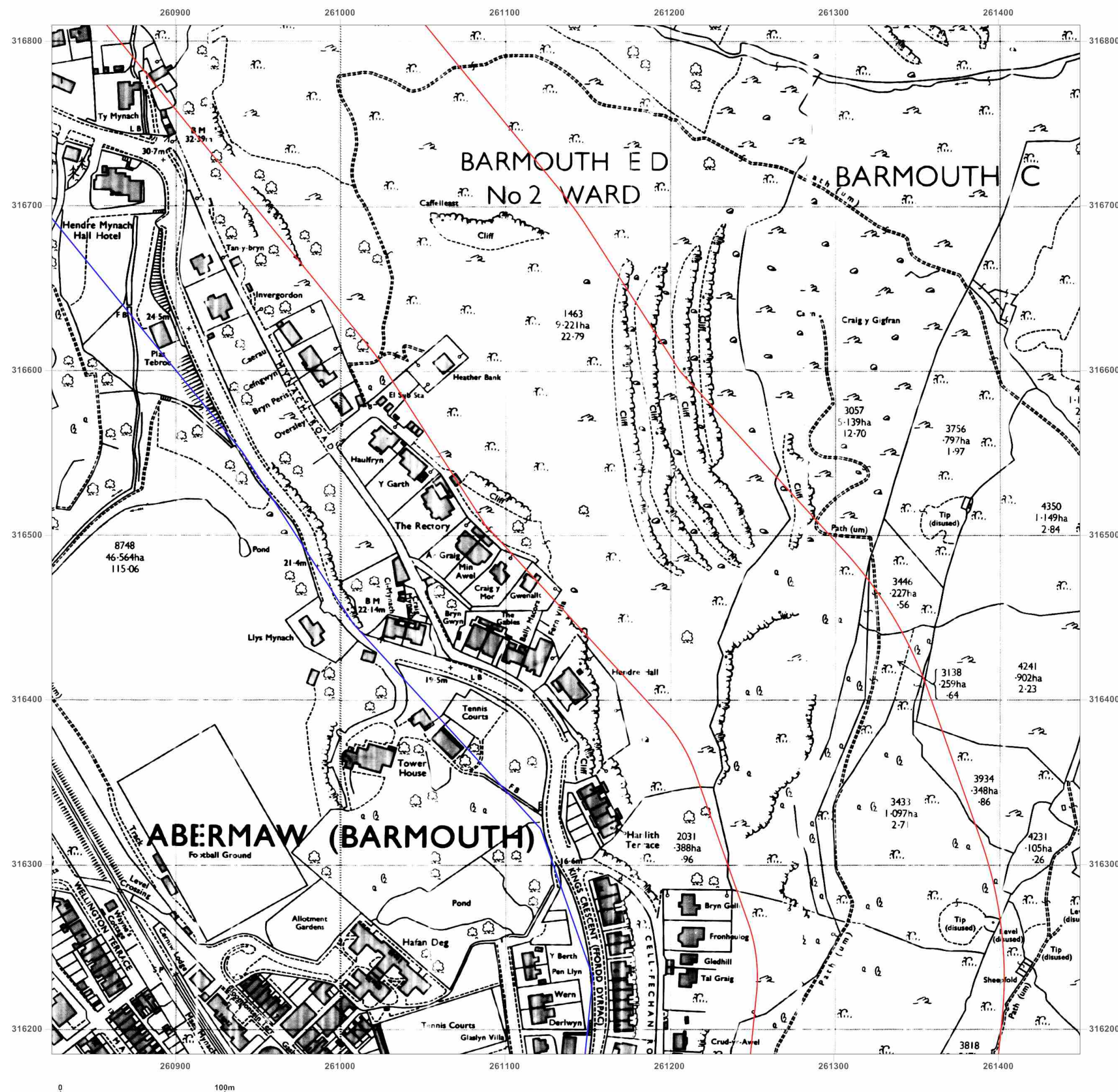


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_4
Grid Ref: 261137, 317122

Map Name: County Series

Map date: 1889

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A



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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_4
Grid Ref: 261137, 317122

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
 Revised 1901
 Edition N/A
 Copyright N/A
 Levelled N/A

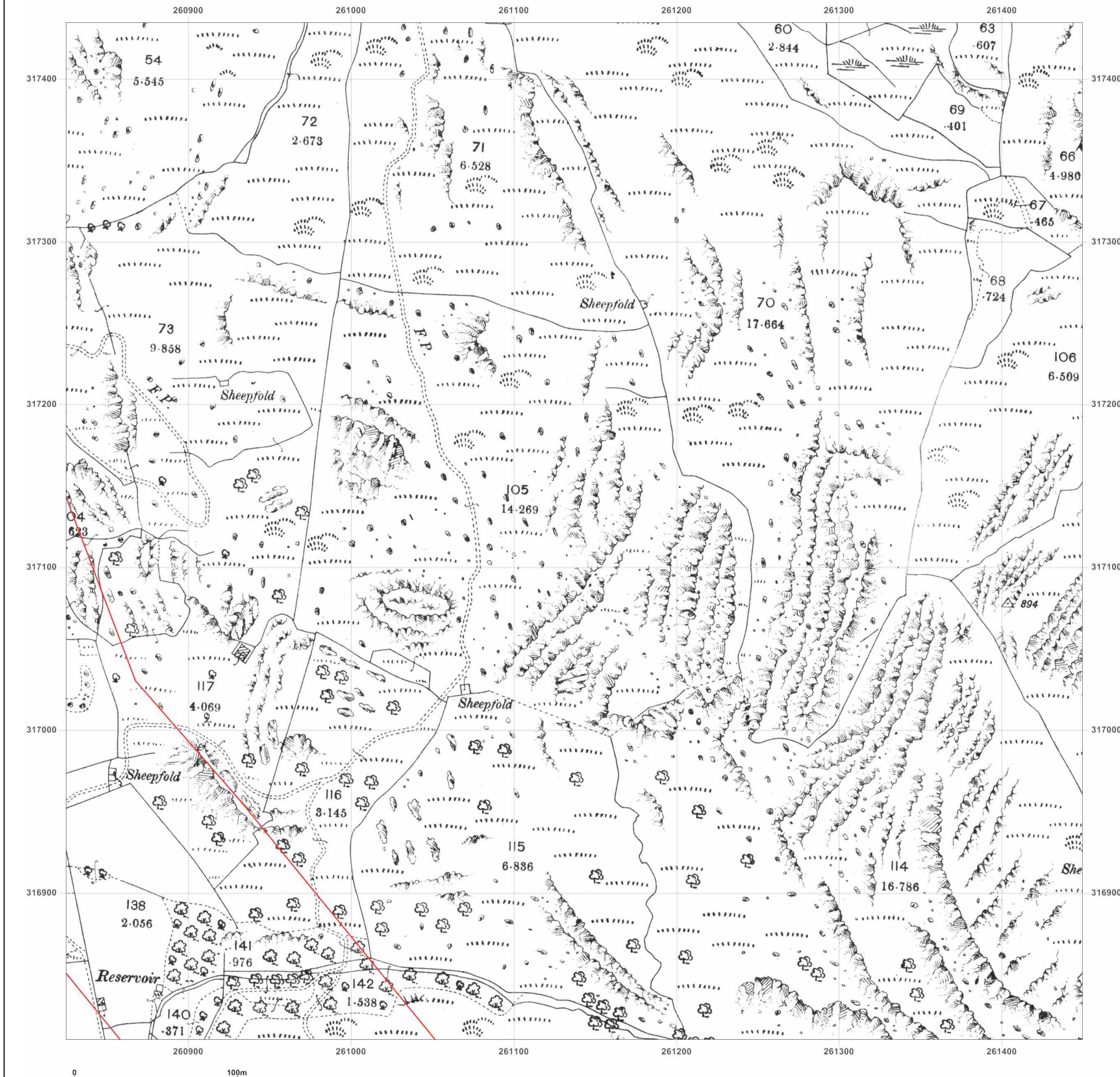


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_4
Grid Ref: 261137, 317122

Map Name: National Grid

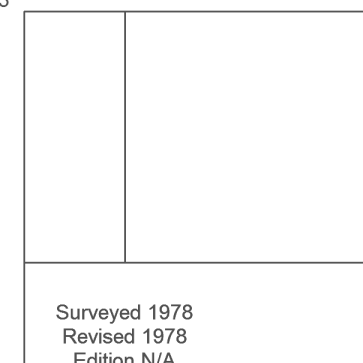
Map date: 1978

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973



Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973

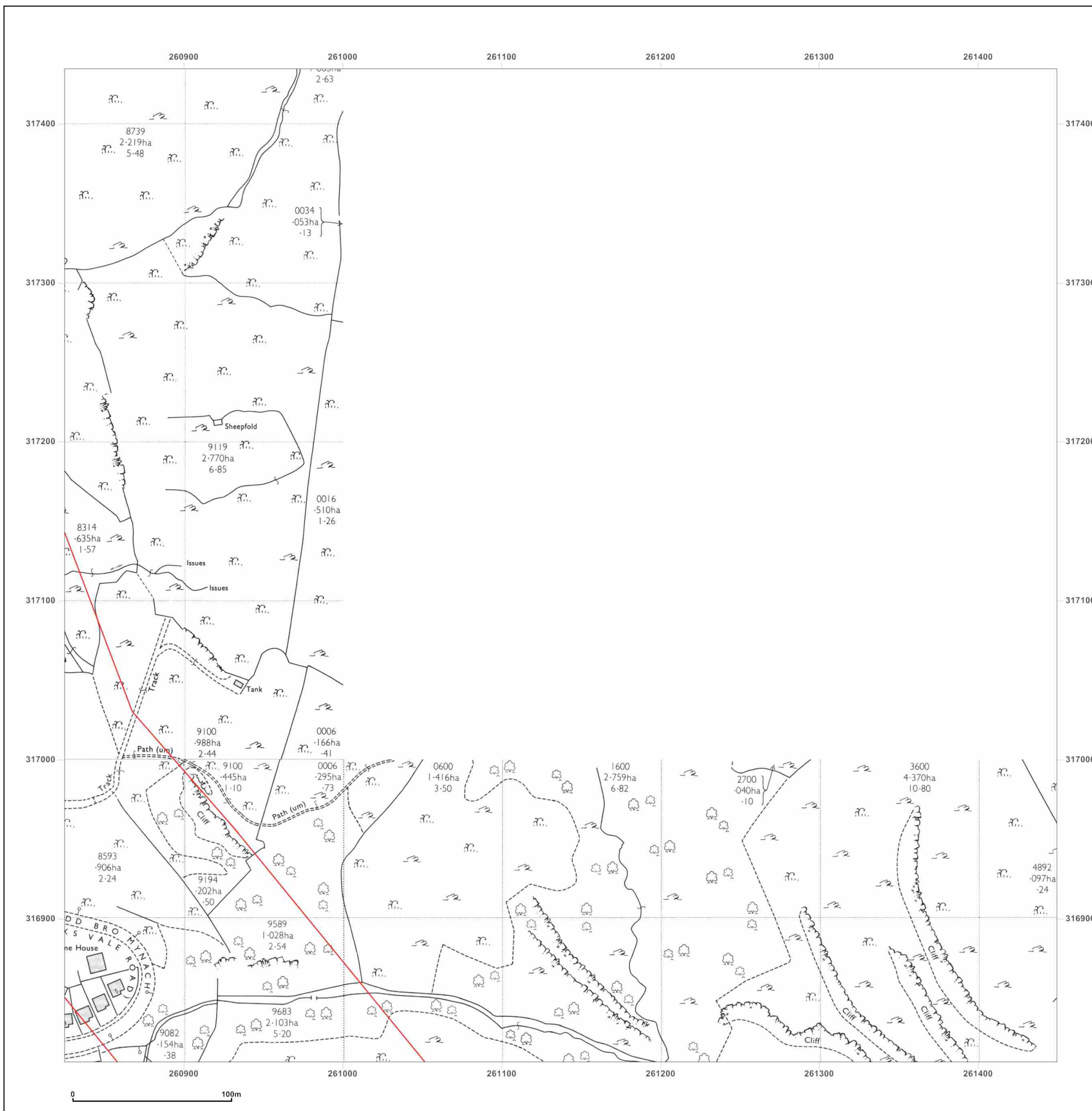


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Site Details:

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Client Ref: 264326
Report Ref: GS-5539750_LS_3_4
Grid Ref: 261137, 317122

Map Name: National Grid

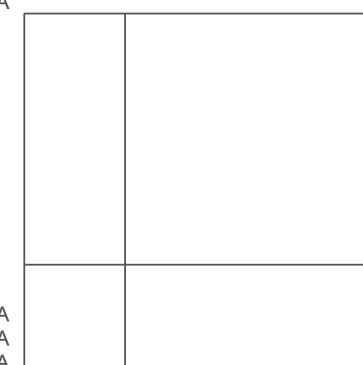
Map date: 1980

Scale: 1:2,500

Printed at: 1:2,500



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



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

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

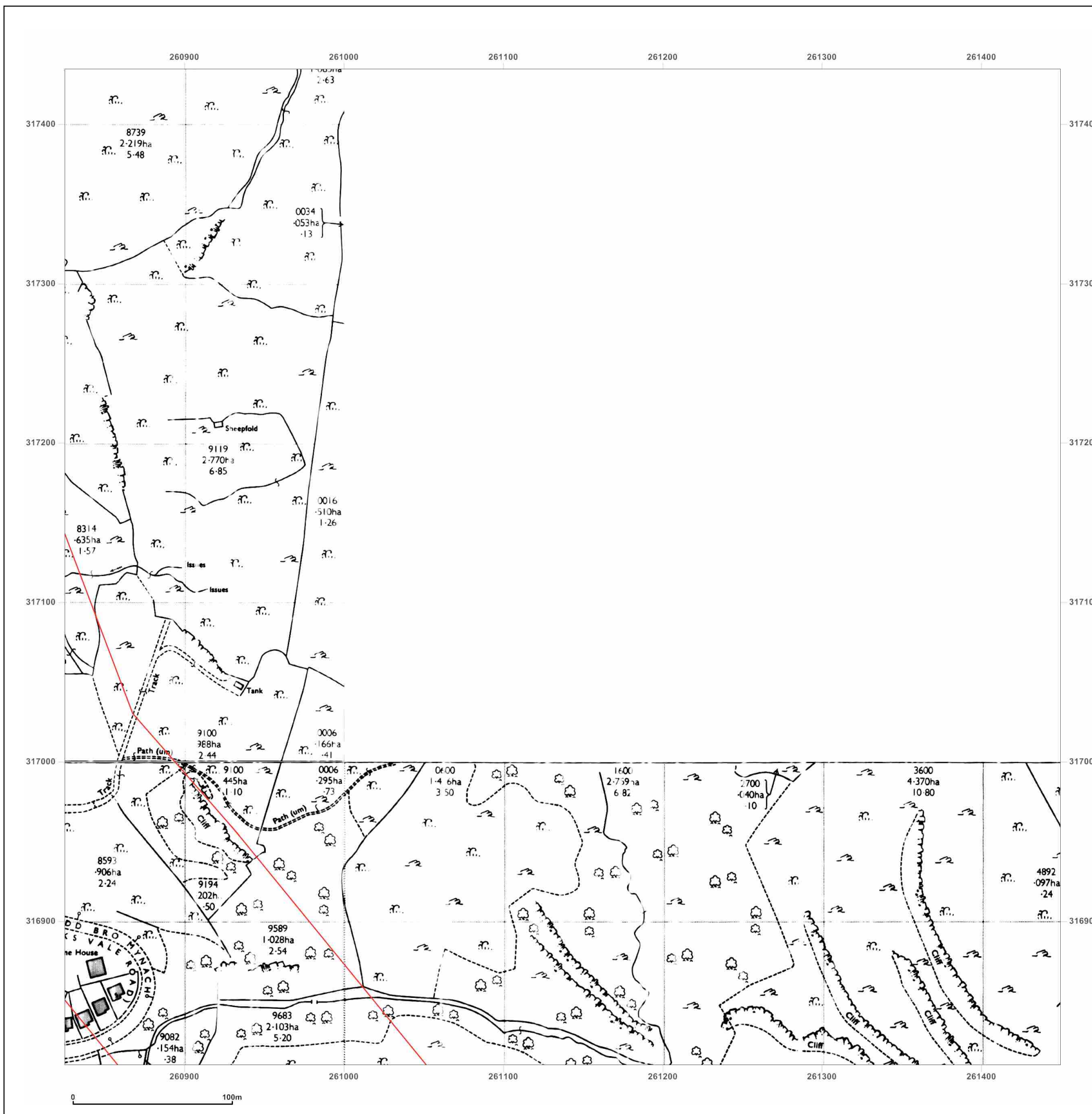


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_4
Grid Ref: 261137, 317122

Map Name: National Grid

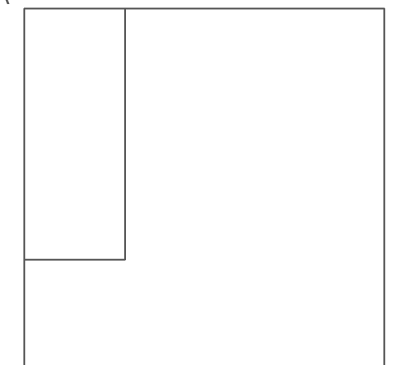
Map date: 1990

Scale: 1:2,500

Printed at: 1:2,500



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

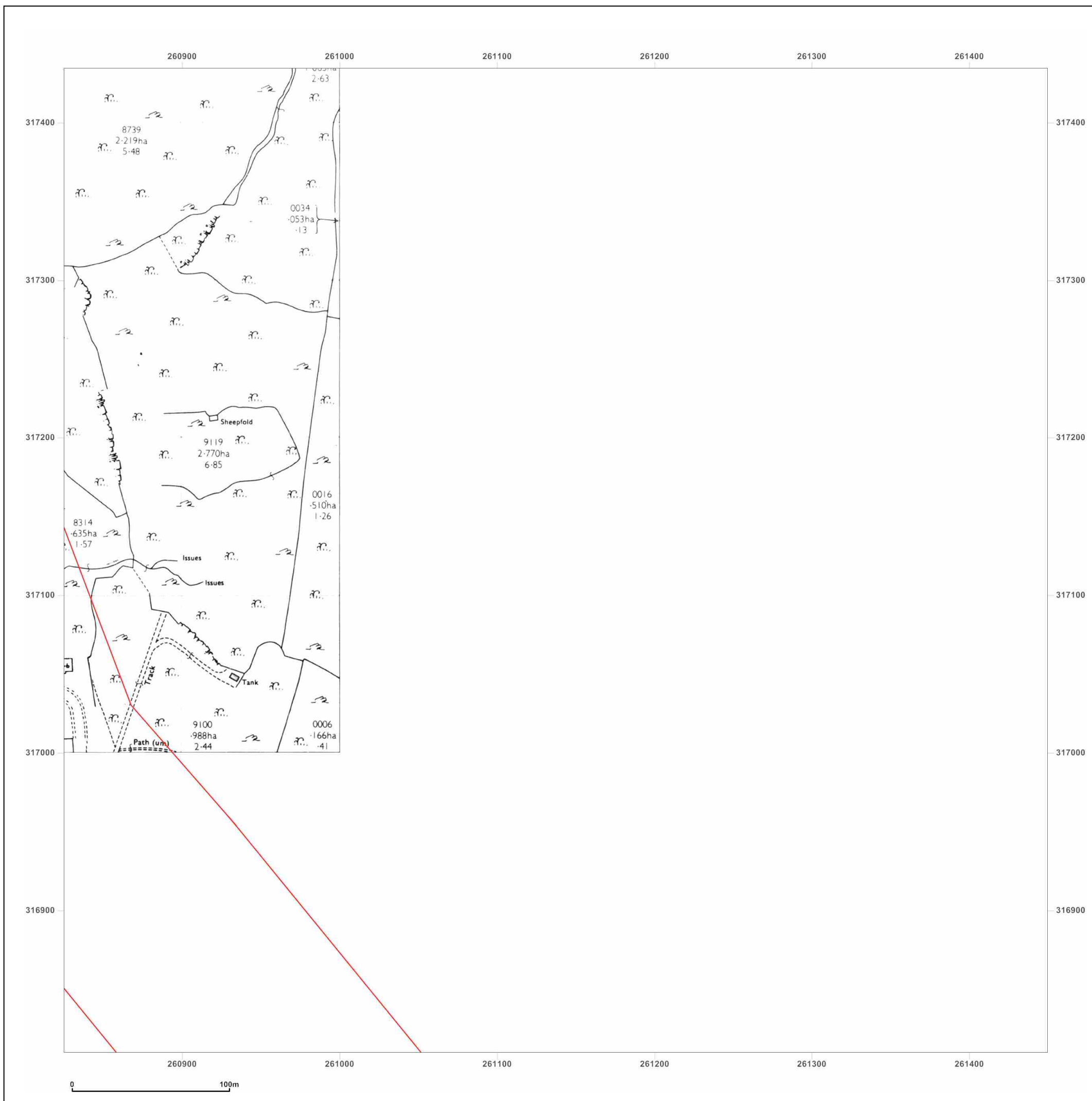


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_4
Grid Ref: 261137, 317122

Map Name: National Grid

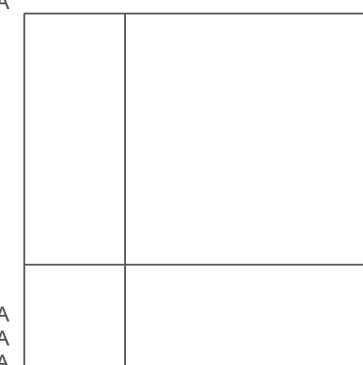
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Scale: 1:2,500

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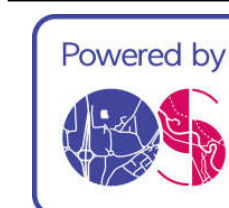


Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

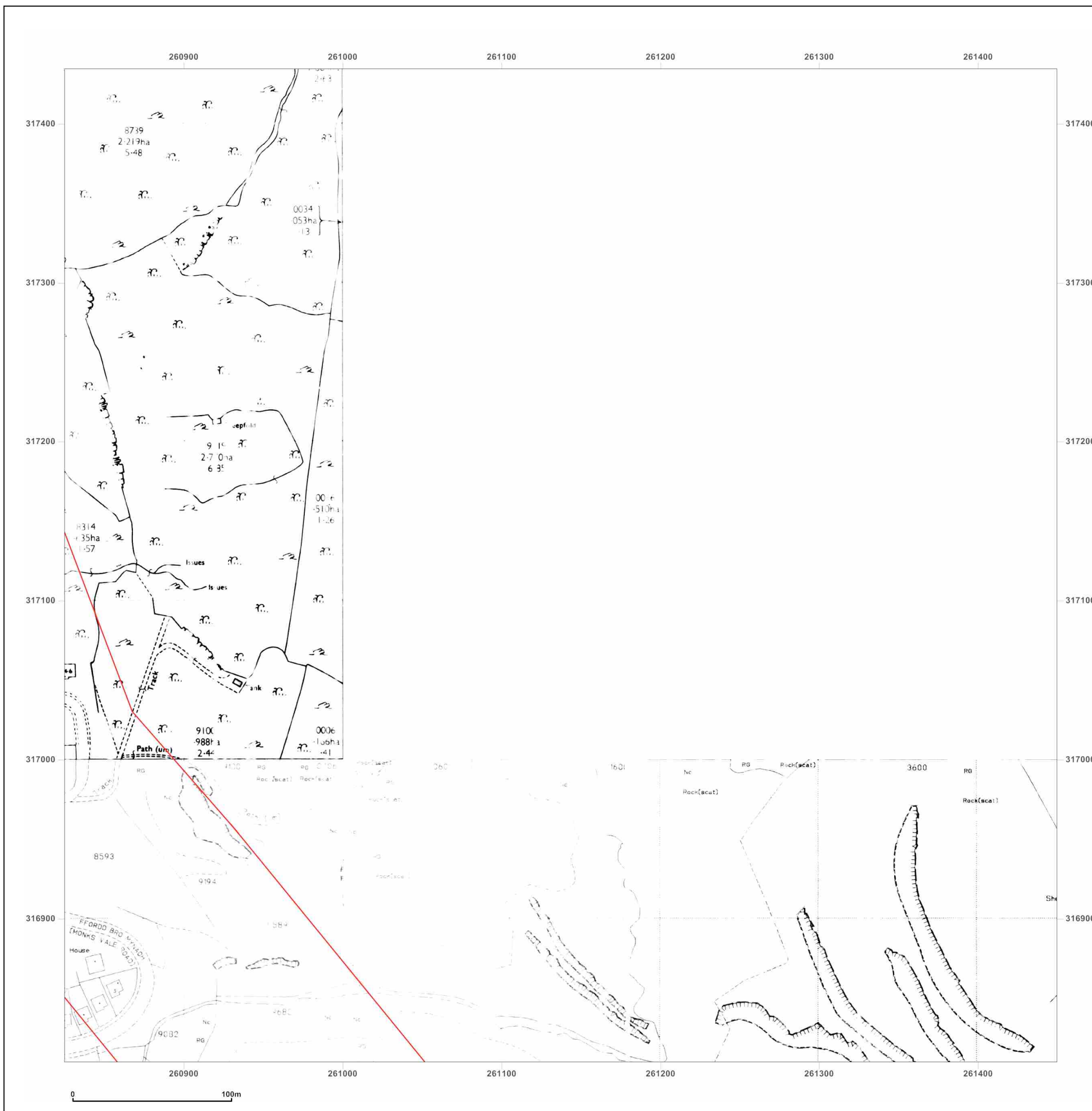


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_3_4
Grid Ref: 261137, 317122

Map Name: National Grid

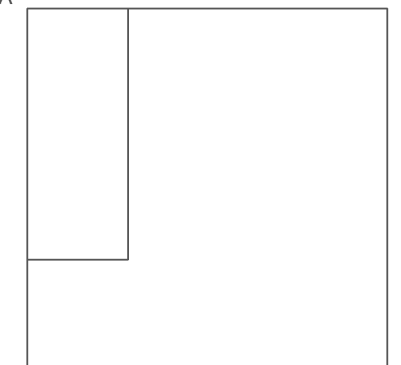
Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

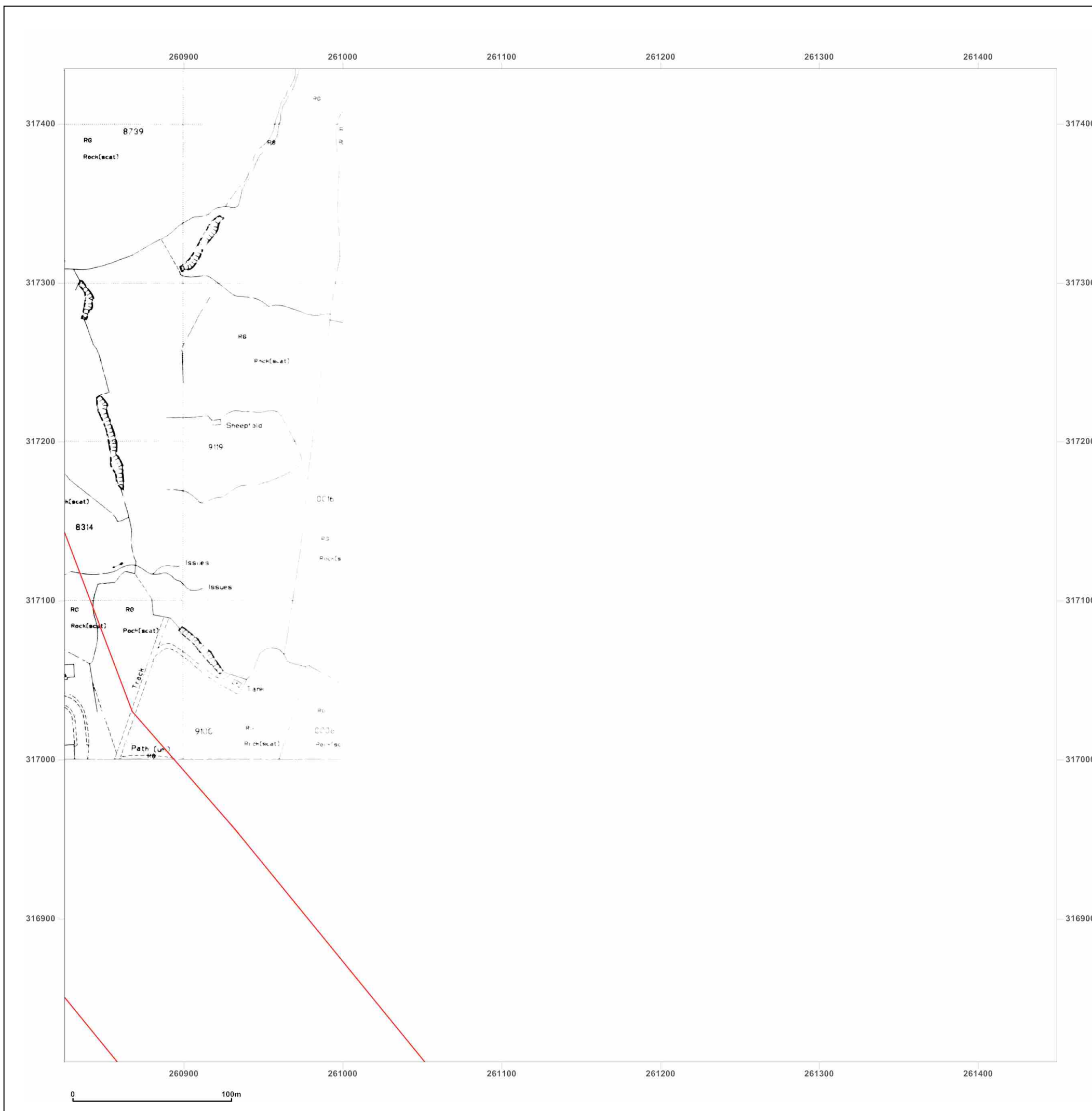


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_1
Grid Ref: 261762, 315246

Map Name: County Series

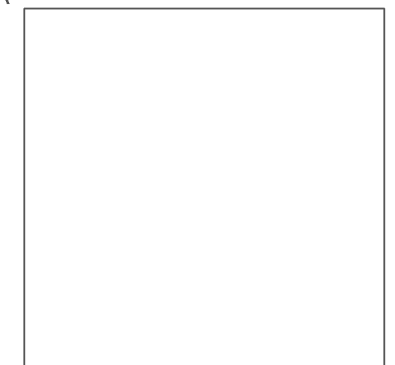
Map date: 1889

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1889
 Revised 1889
 Edition N/A
 Copyright N/A
 Levelled N/A

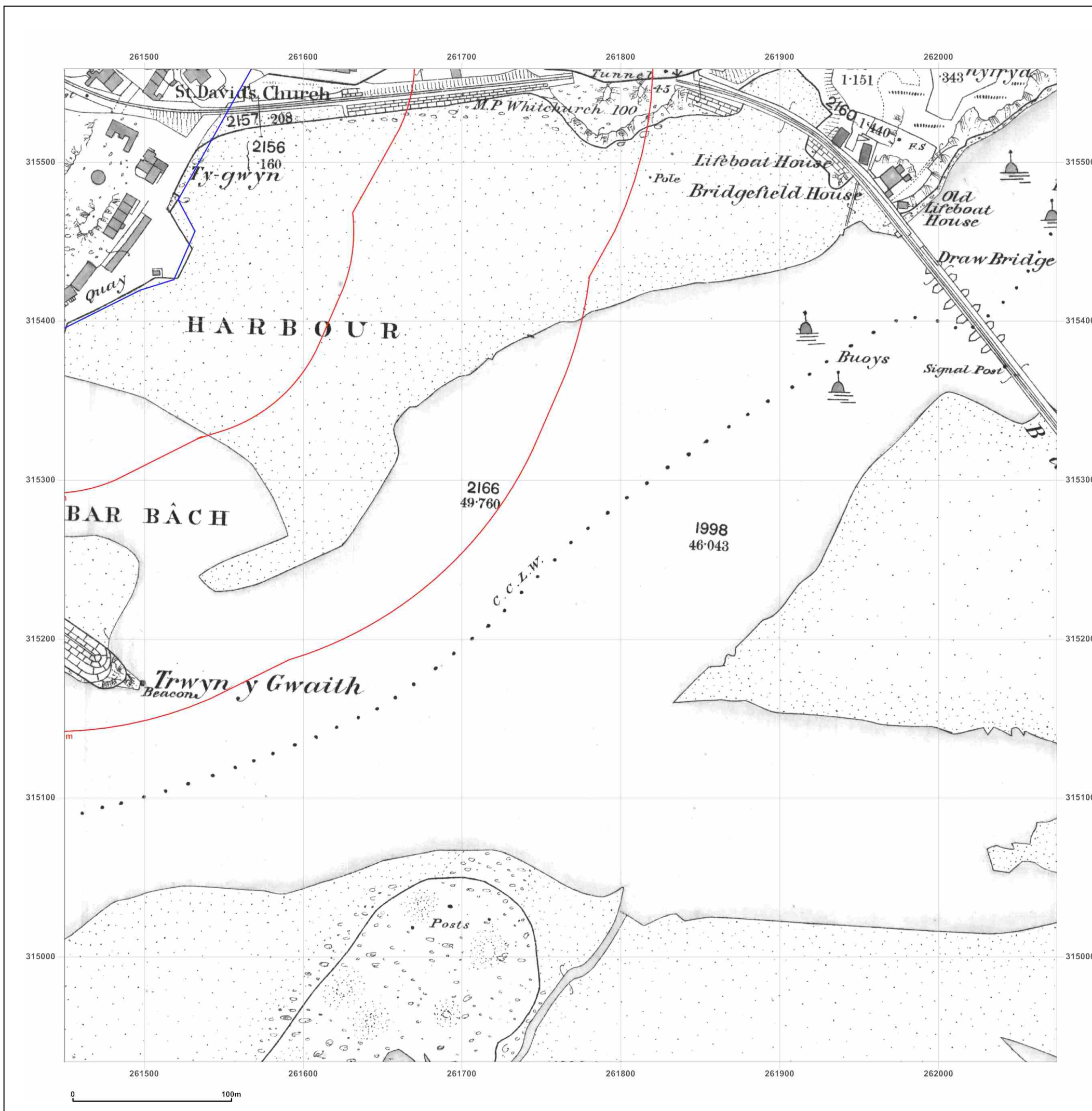


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_1
Grid Ref: 261762, 315246

Map Name: County Series

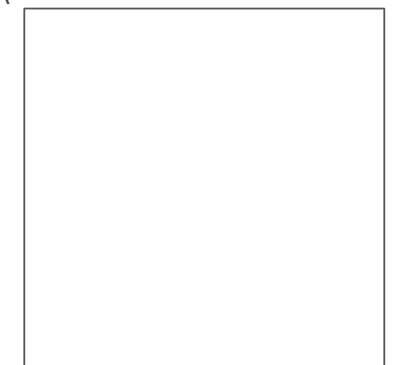
Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
 Revised 1901
 Edition N/A
 Copyright N/A
 Levelled N/A

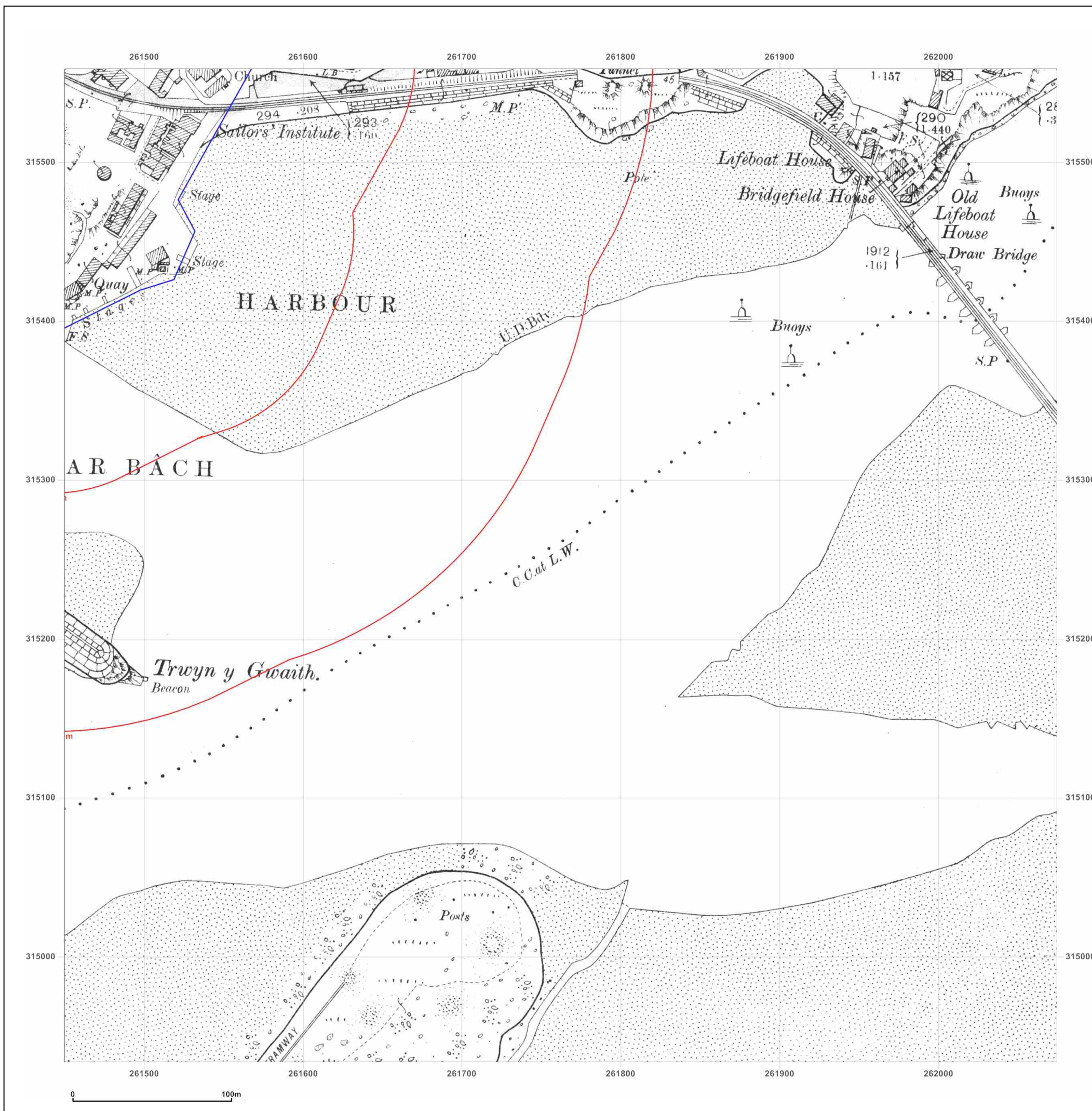


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_1
Grid Ref: 261762, 315246

Map Name: National Grid

Map date: 1990

Scale: 1:2,500

Printed at: 1:2,500



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

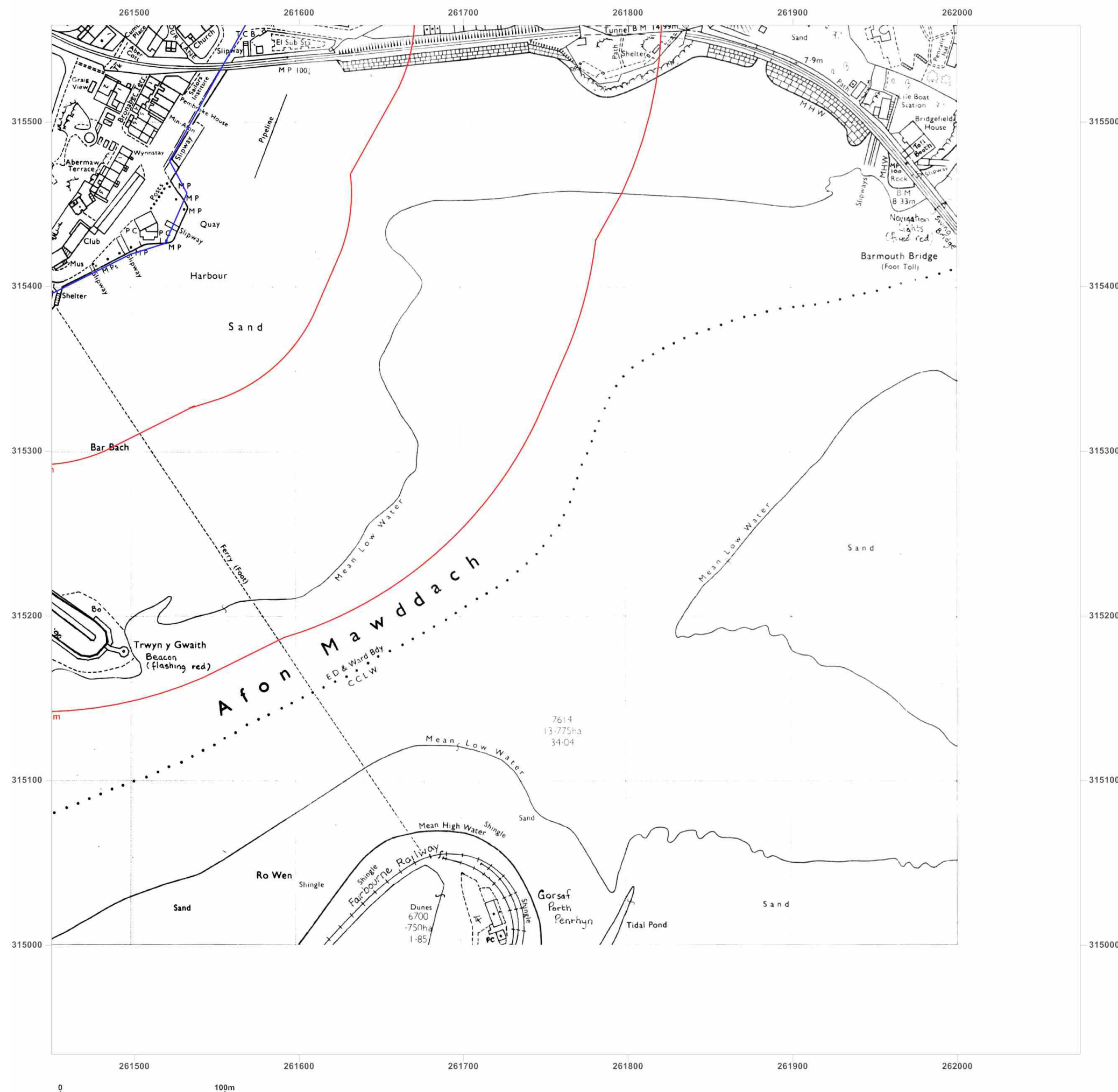


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_1
Grid Ref: 261762, 315246

Map Name: National Grid

Map date: 1992-1995

Scale: 1:2,500

Printed at: 1:2,500



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

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

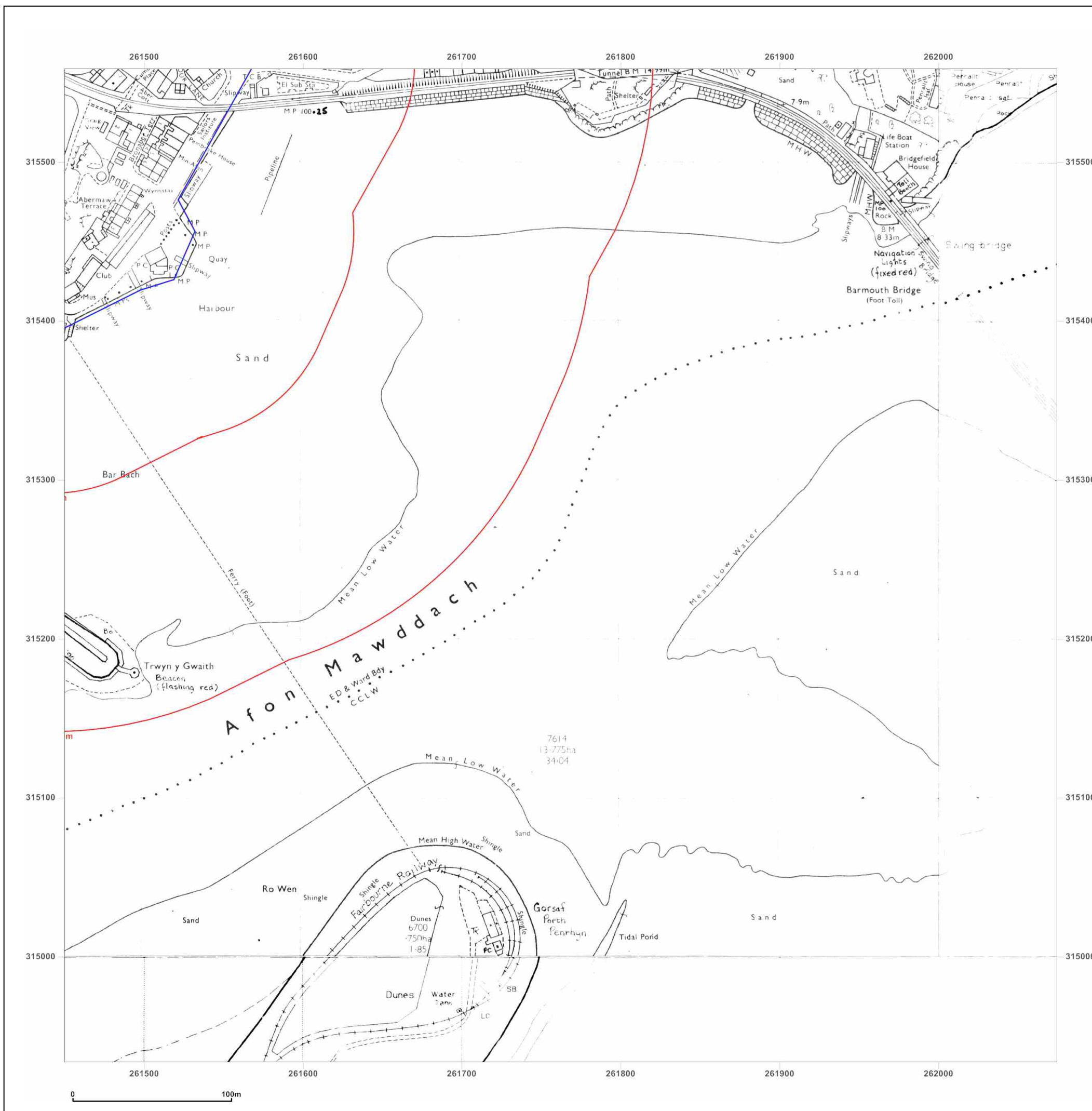


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_1
Grid Ref: 261762, 315246

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

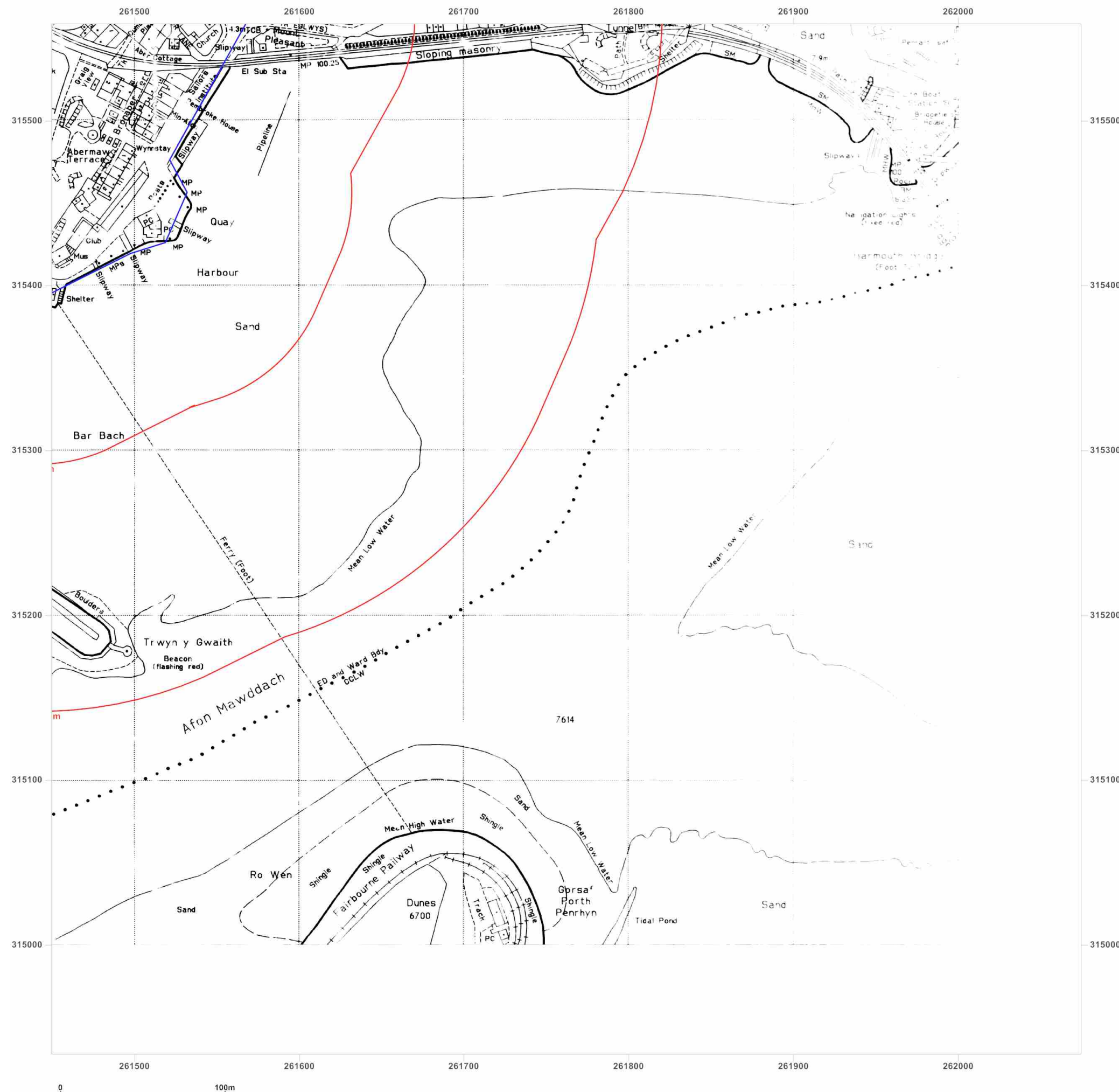


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_2
Grid Ref: 261762, 315871

Map Name: County Series

Map date: 1889

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
Levelled N/A

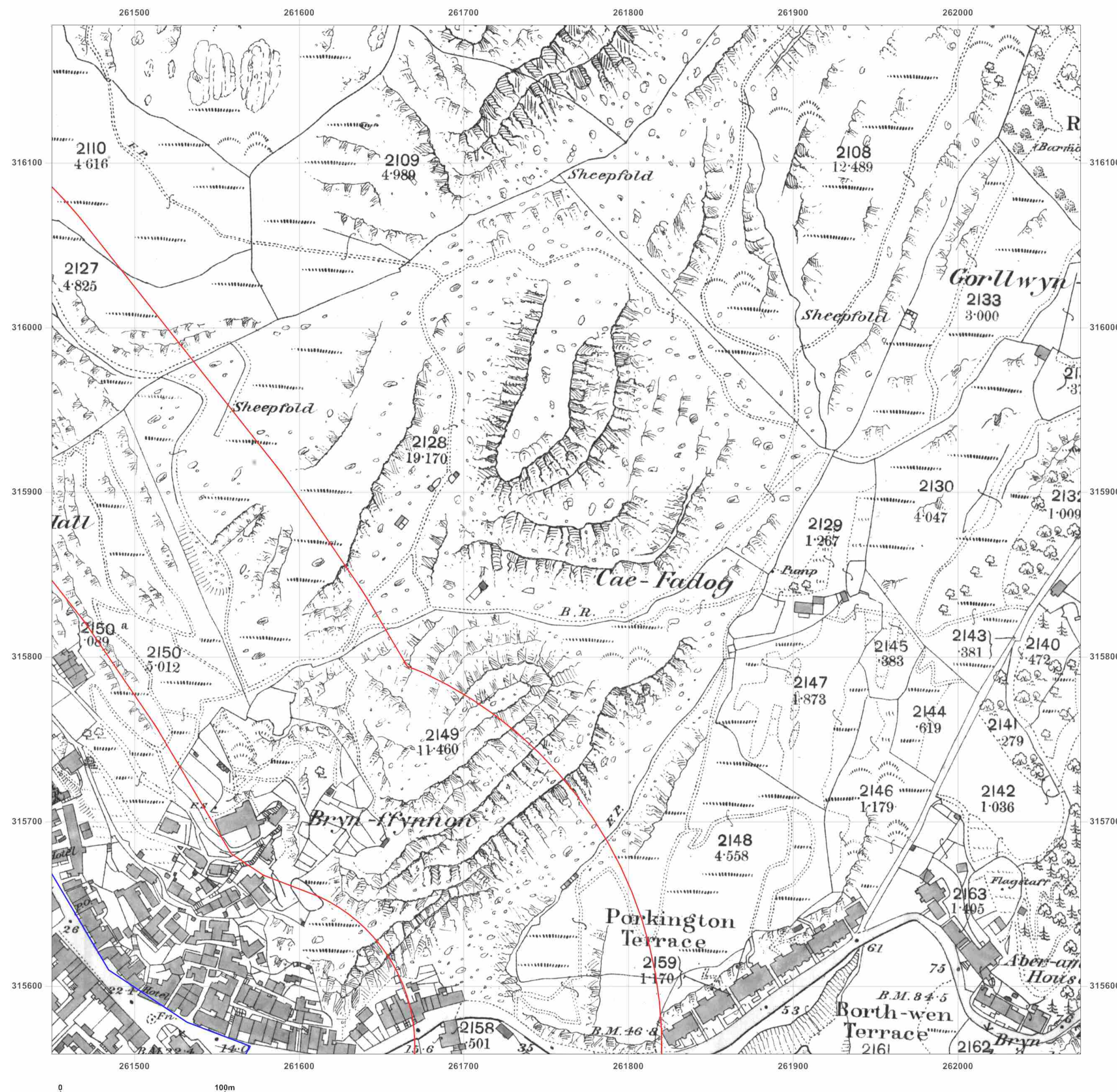


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_2
Grid Ref: 261762, 315871

Map Name: County Series

Map date: 1901

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1901
 Revised 1901
 Edition N/A
 Copyright N/A
 Levelled N/A

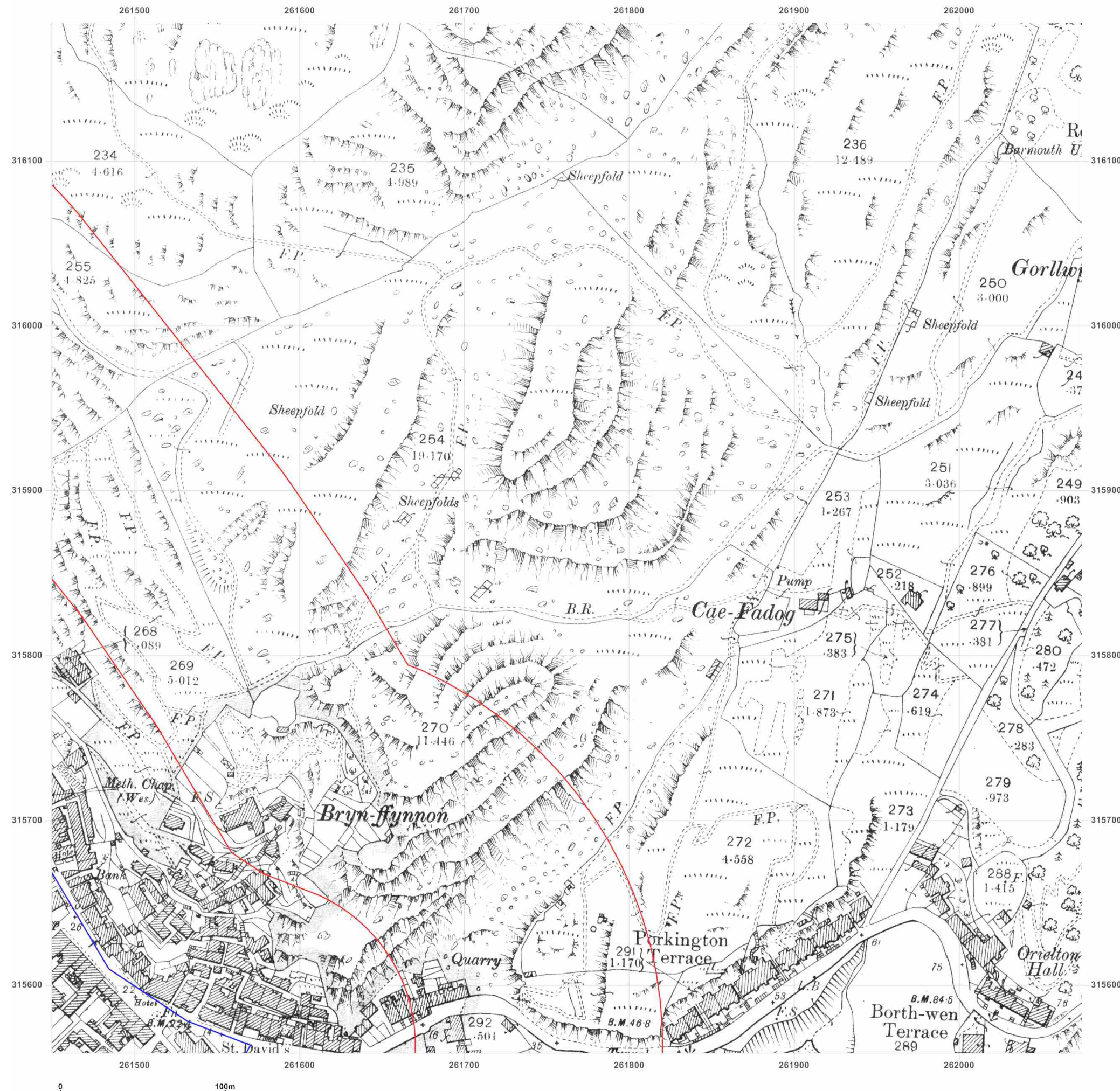


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_2
Grid Ref: 261762, 315871

Map Name: National Grid

Map date: 1978-1979

Scale: 1:2,500

Printed at: 1:2,500



Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973

Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1980
 Levelled 1973

Surveyed 1978
 Revised 1978
 Edition N/A
 Copyright 1981
 Levelled 1973

Surveyed 1979
 Revised 1979
 Edition N/A
 Copyright 1980
 Levelled 1973

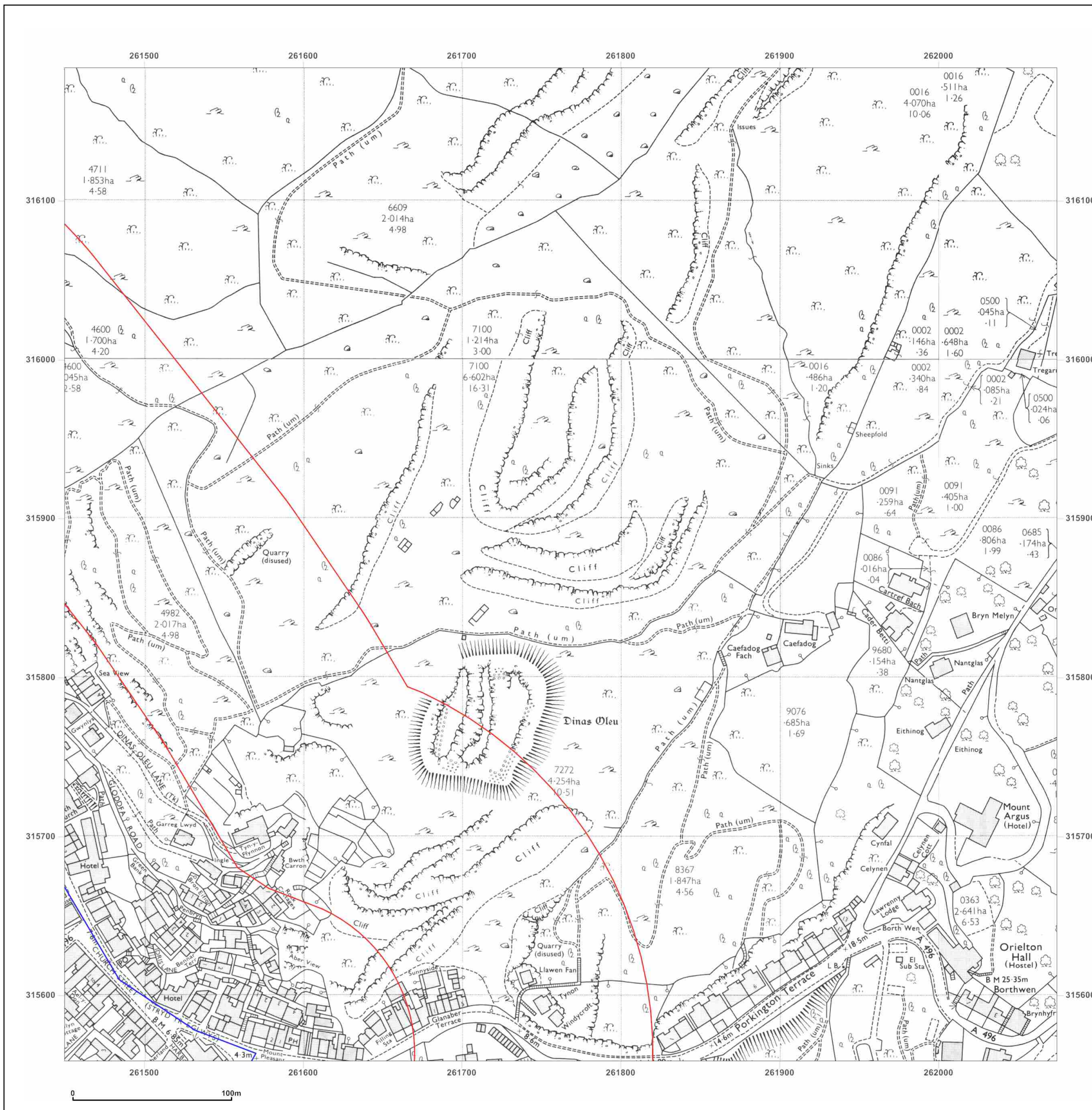


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_2
Grid Ref: 261762, 315871

Map Name: National Grid

Map date: 1990

Scale: 1:2,500

Printed at: 1:2,500



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

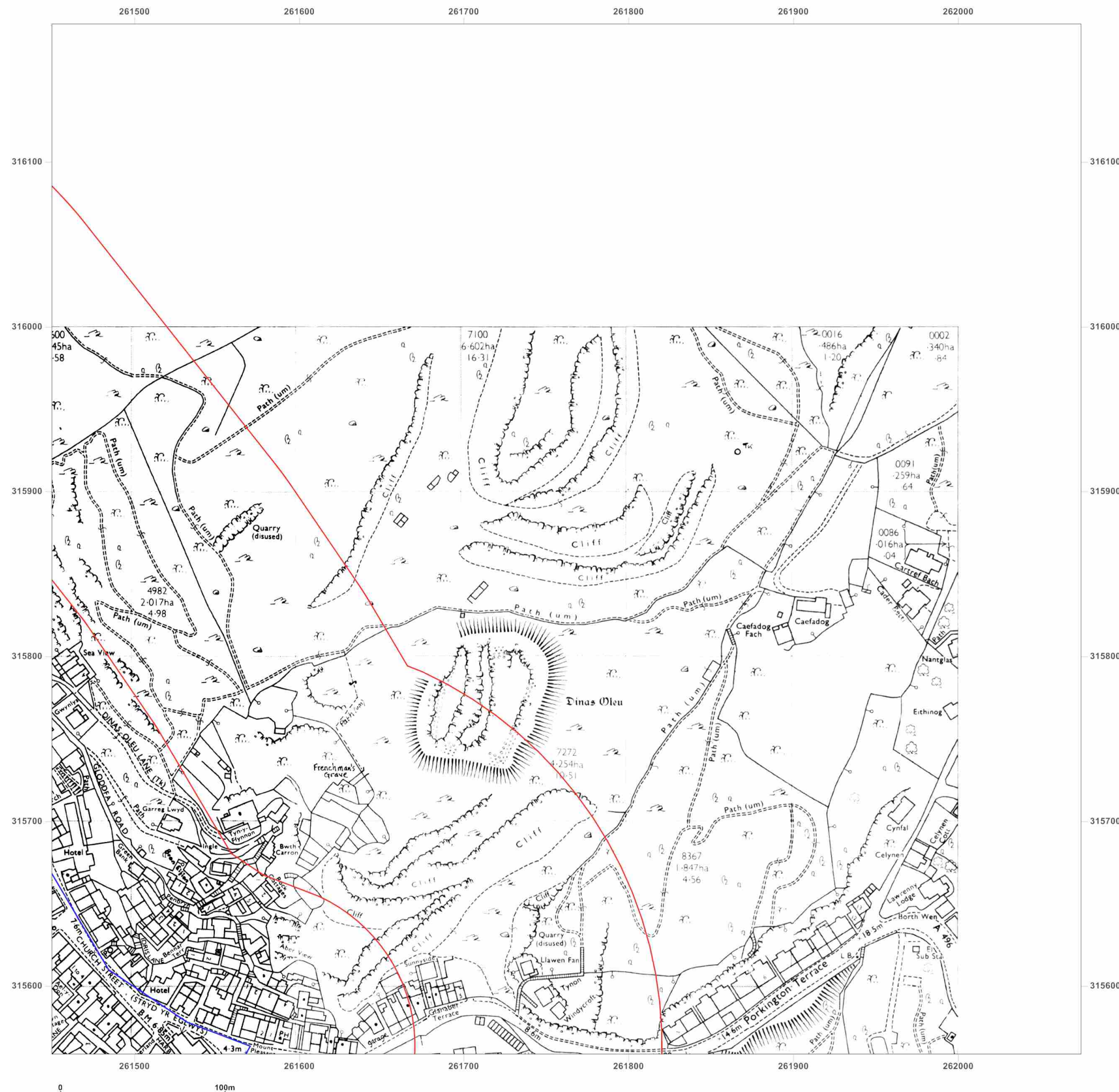


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_2
Grid Ref: 261762, 315871

Map Name: National Grid

Map date: 1992-1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

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

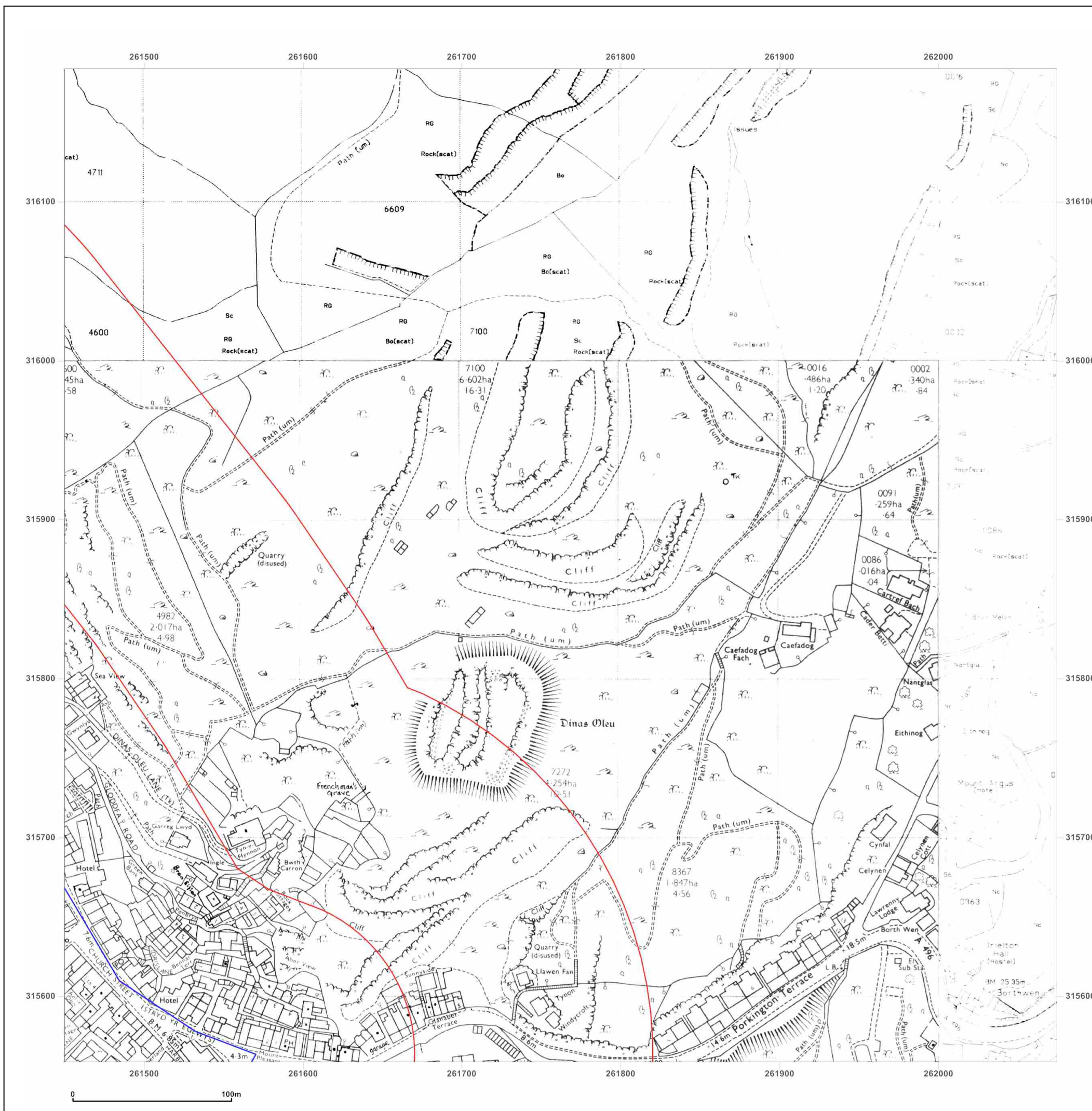


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_LS_4_2
Grid Ref: 261762, 315871

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500



Surveyed N/A
 Revised N/A
 Edition N/A
 Copyright 1995
 Levelled N/A

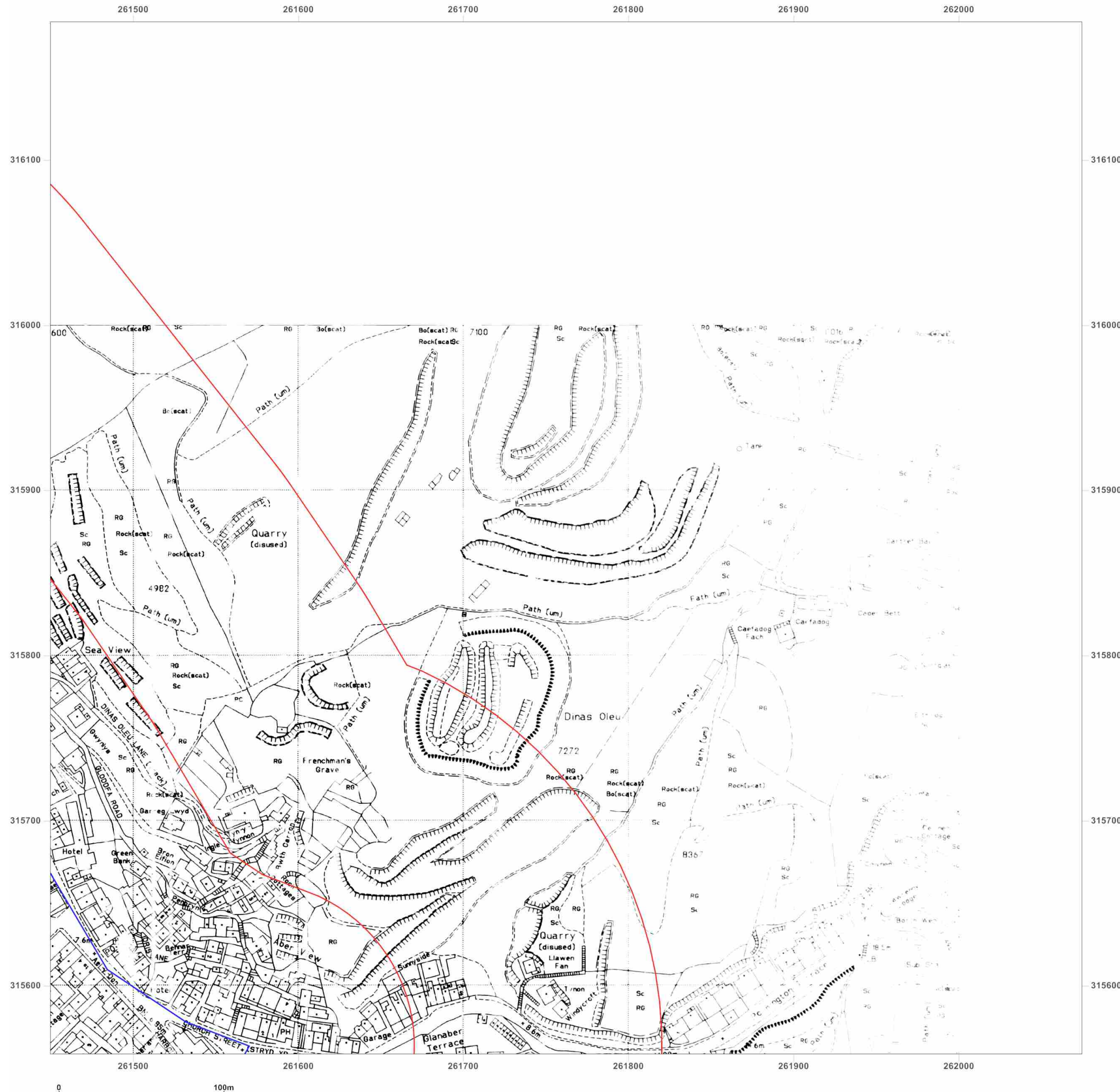


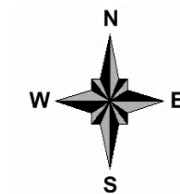
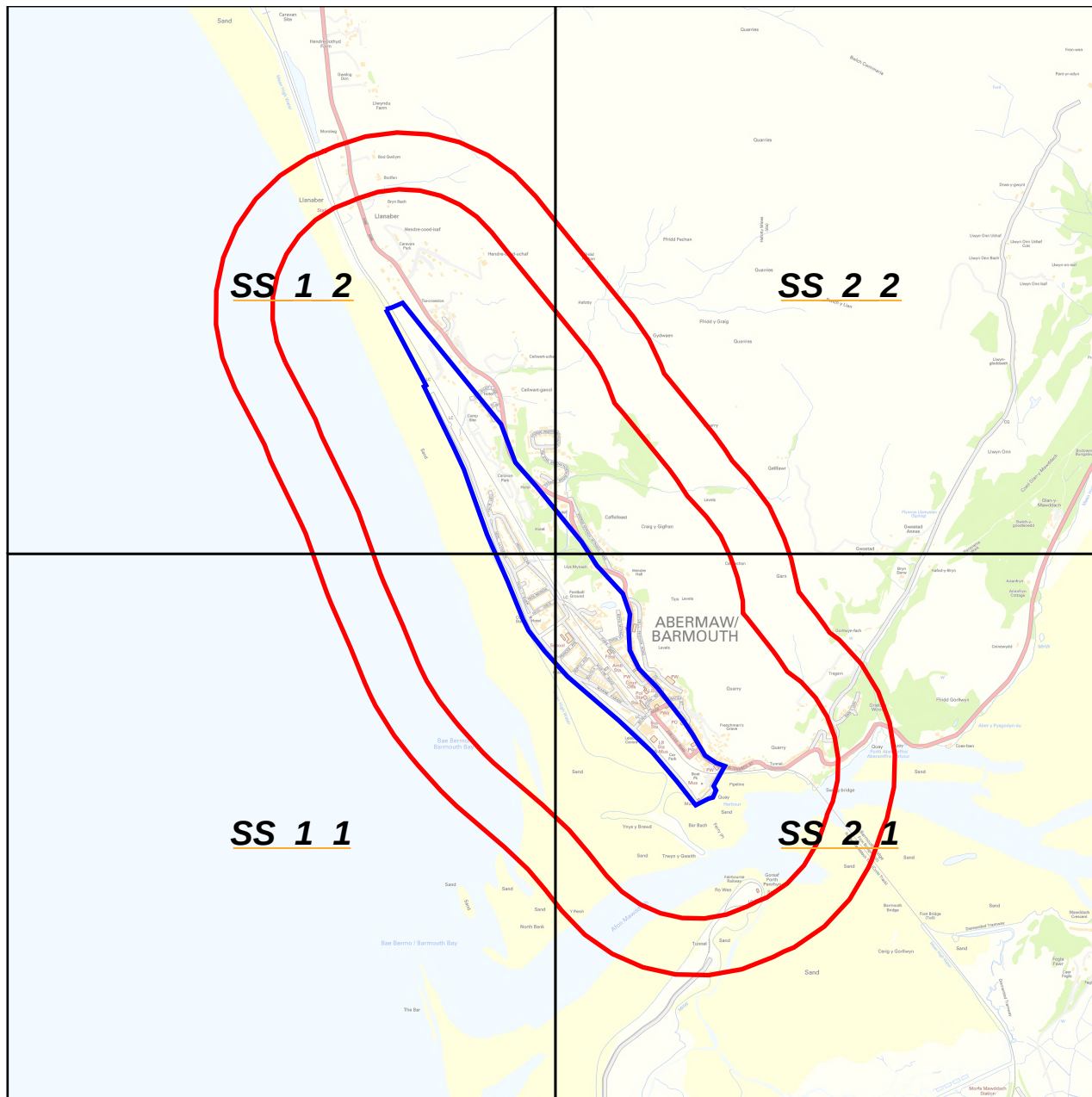
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Small Scale Grid Index

Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_1
Grid Ref: 259620, 315292

Map Name: County Series

Map date: 1887-1888

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1887
 Revised 1887
 Edition N/A
 Copyright N/A
 Levelled N/A

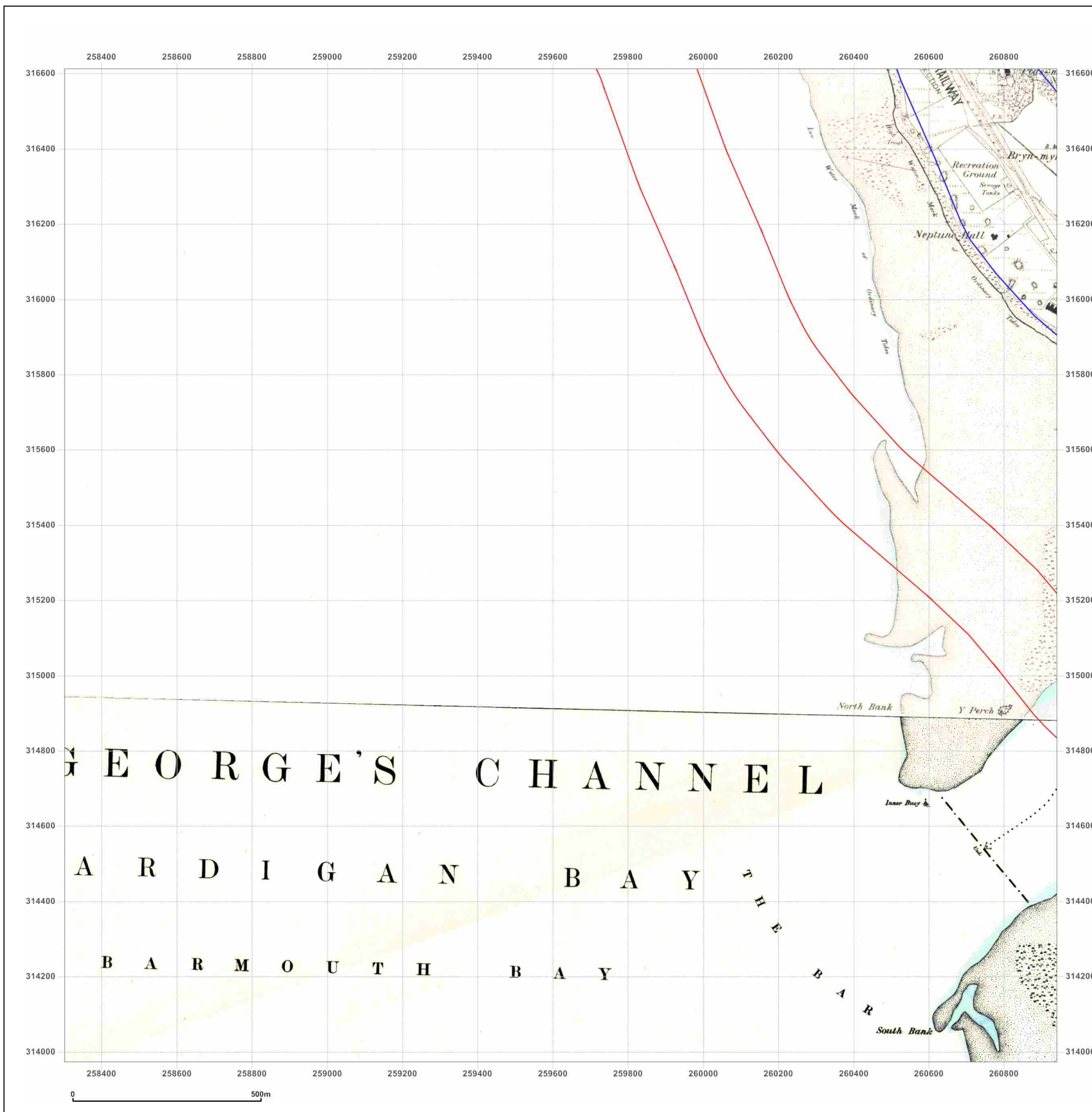


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_1
Grid Ref: 259620, 315292

Map Name: County Series

Map date: 1887-1888

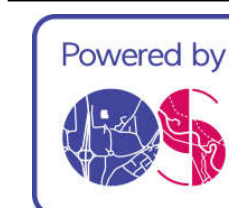
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Printed at: 1:10,560



Surveyed 1887
 Revised 1887
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1887
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

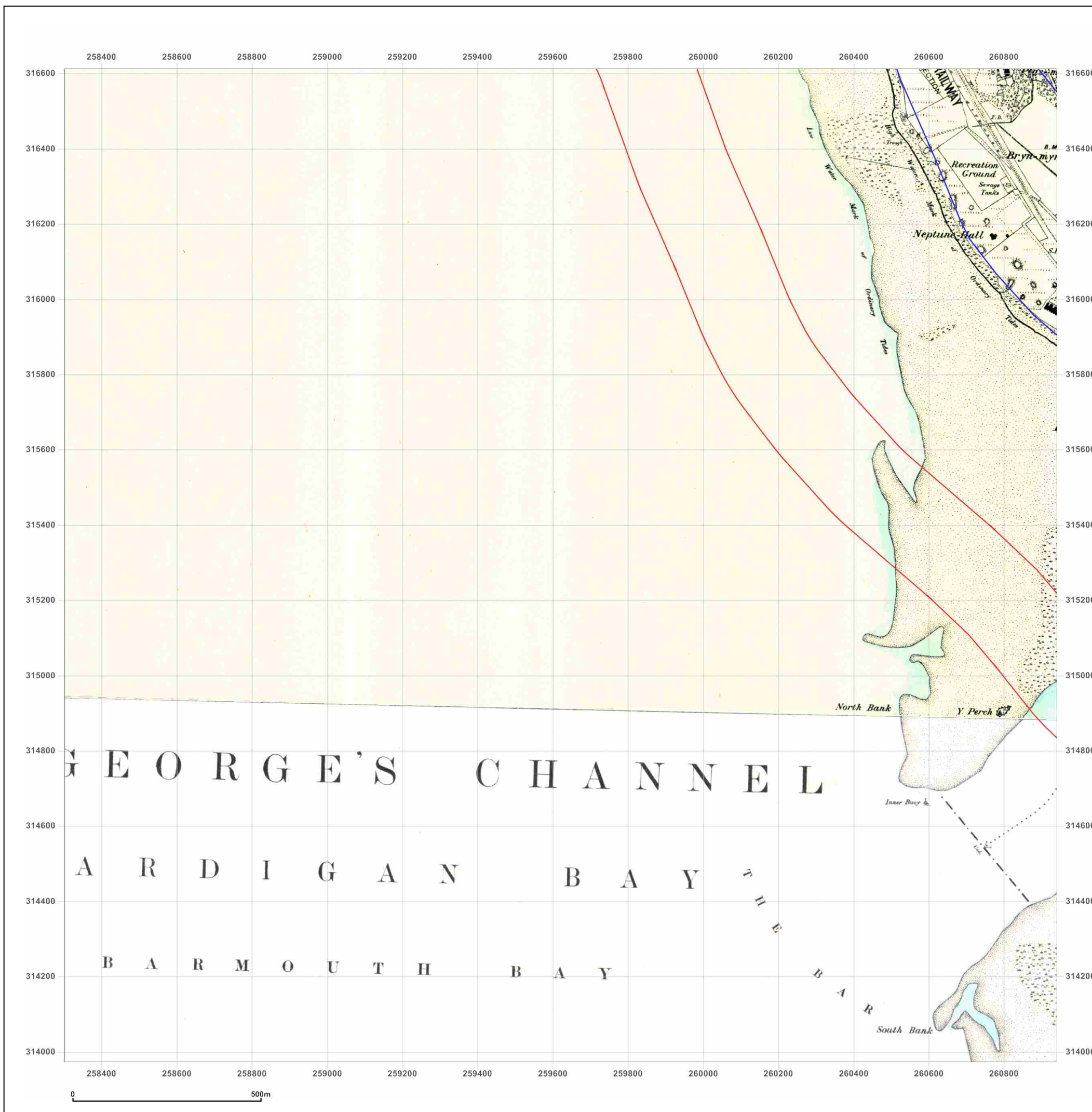


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_1
Grid Ref: 259620, 315292

Map Name: County Series

Map date: 1900

Scale: 1:10,560

Printed at: 1:10,560



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 Revised 1900
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1887
 Revised 1900
 Edition N/A
 Copyright N/A
 Levelled N/A

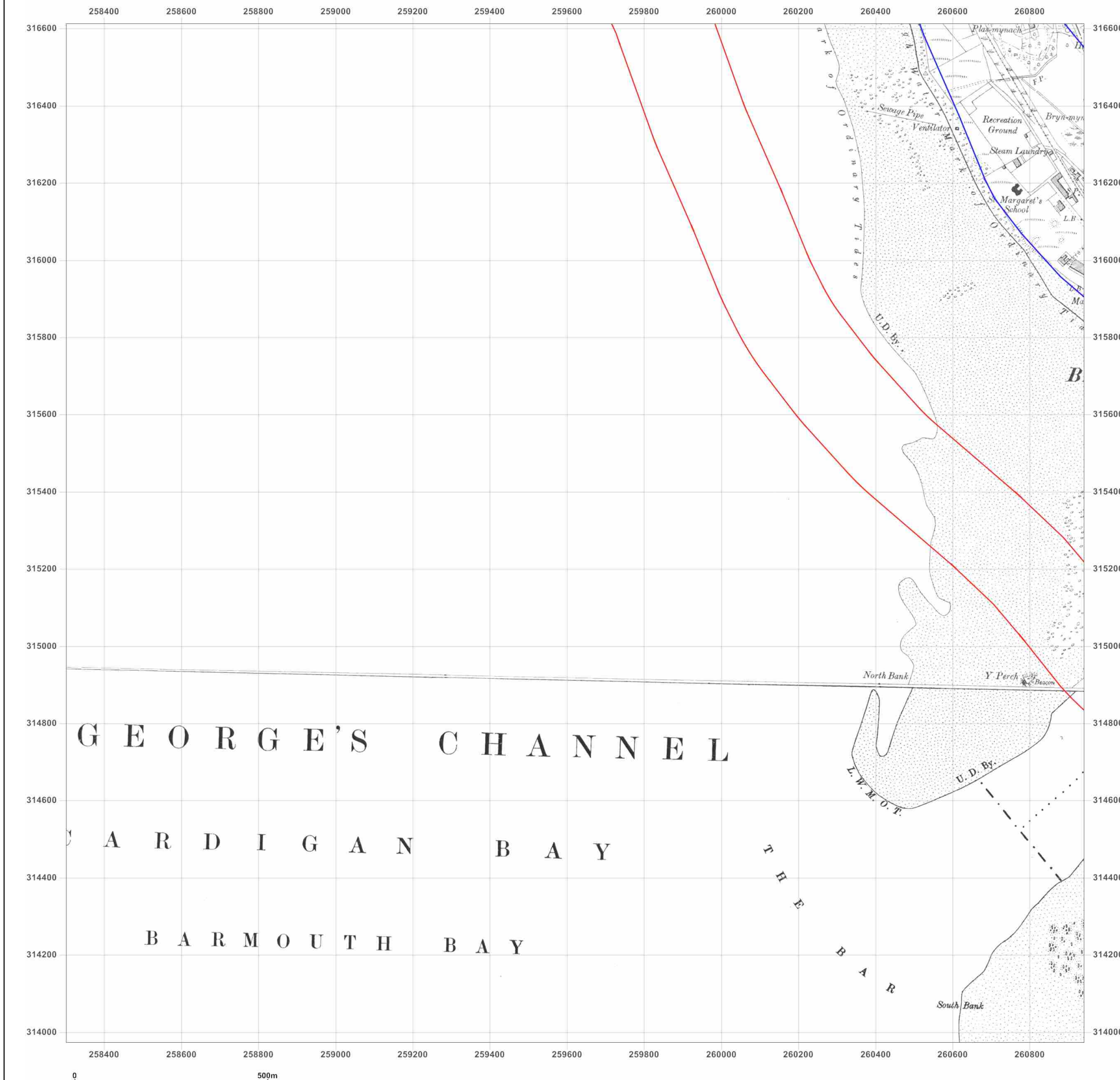


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_1
Grid Ref: 259620, 315292

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A

Surveyed 1887
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A

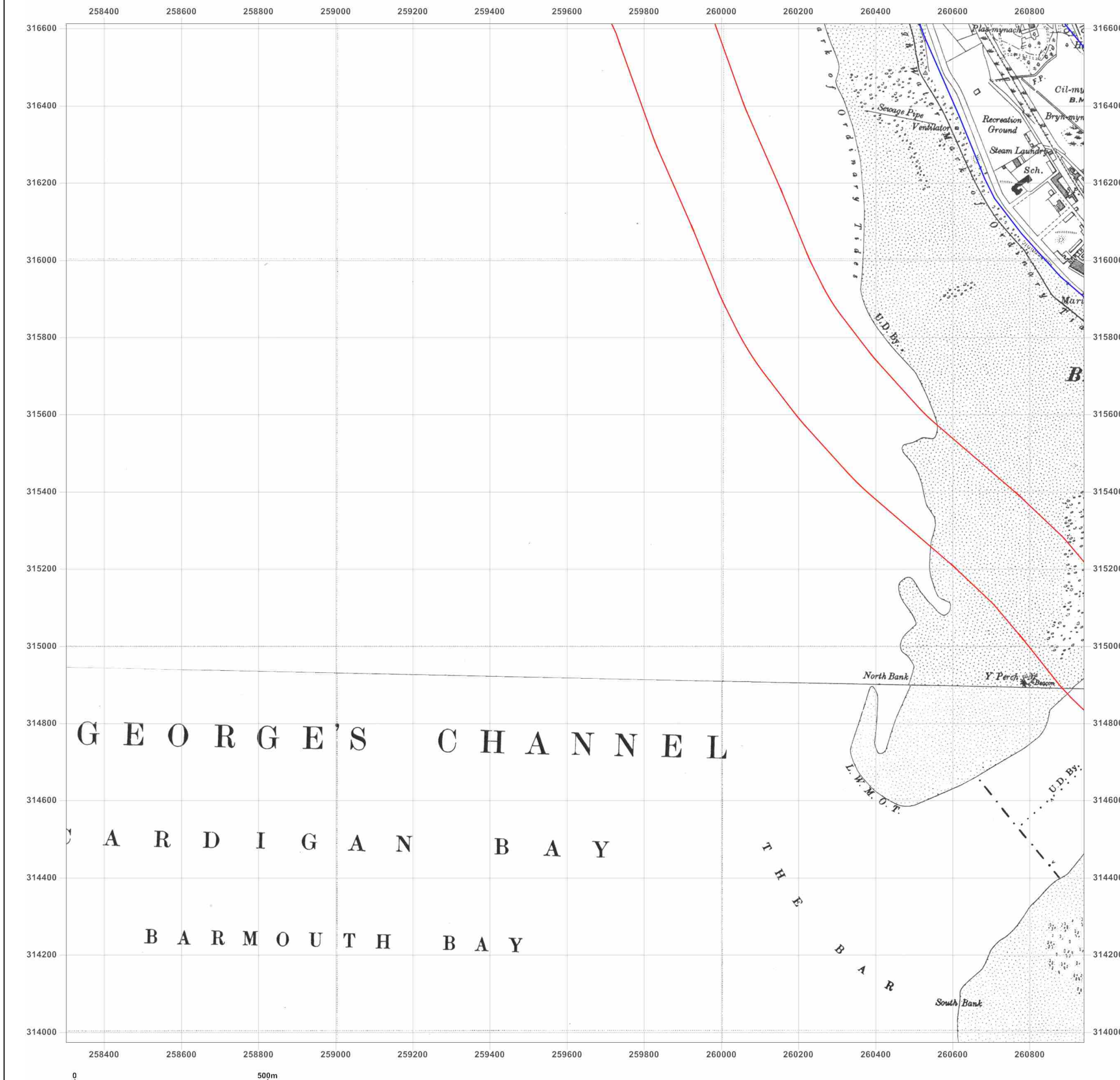


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Site Details:

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Client Ref: 264326
Report Ref: GS-5539750_SS_1_1
Grid Ref: 259620, 315292

Map Name: National Grid

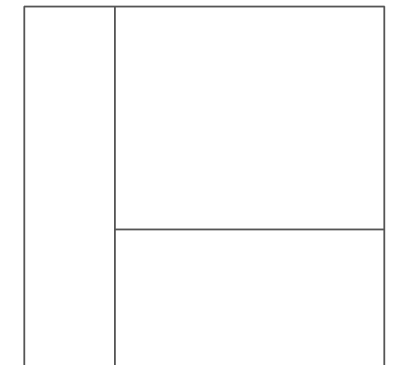
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Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1979
 Revised 1981
 Edition N/A
 Copyright N/A
 Levelled N/A



Surveyed 1980
 Revised 1981
 Edition N/A
 Copyright N/A
 Levelled N/A

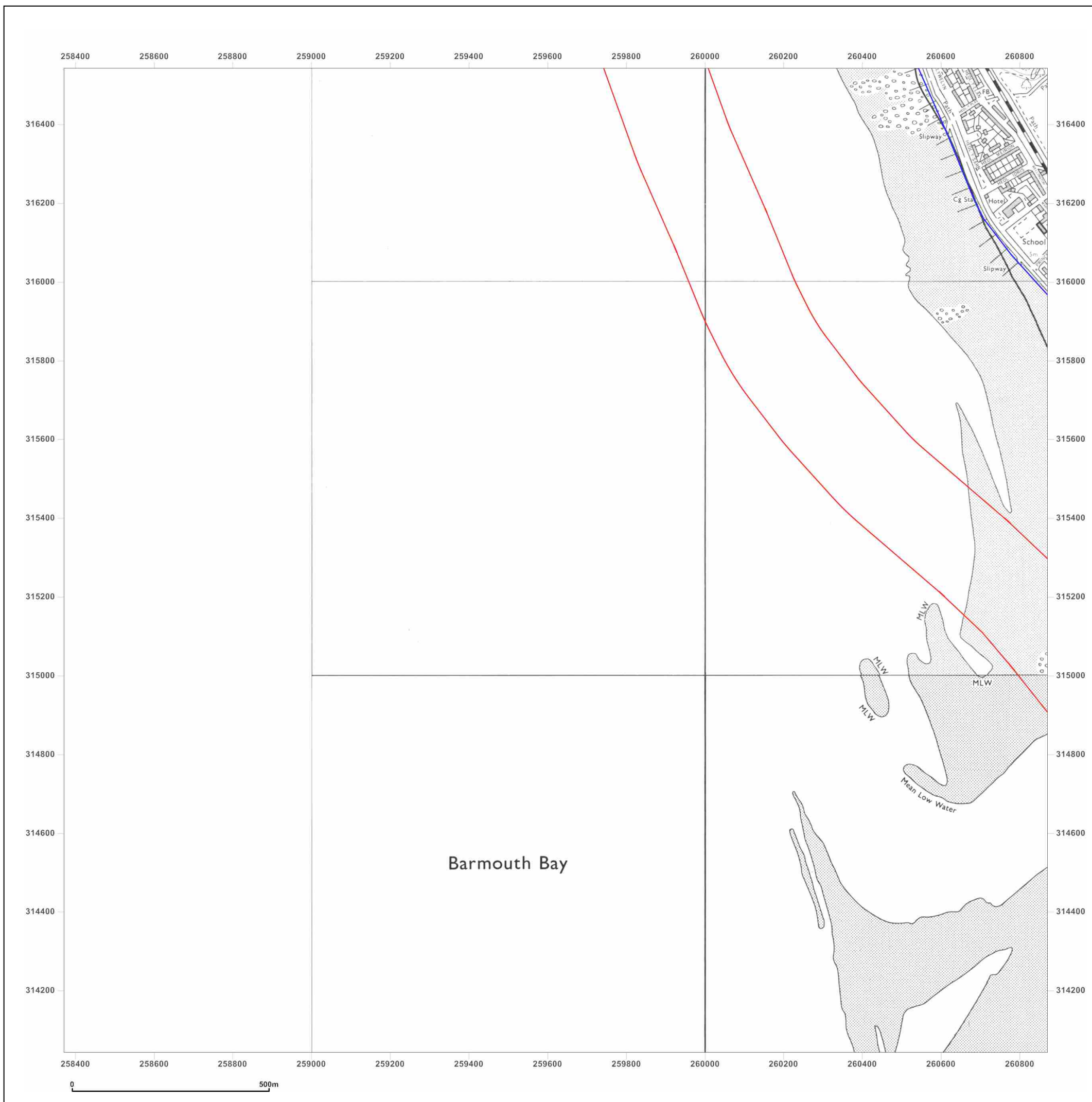


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Production date: 17 October 2018

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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_1
Grid Ref: 259620, 315292

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002

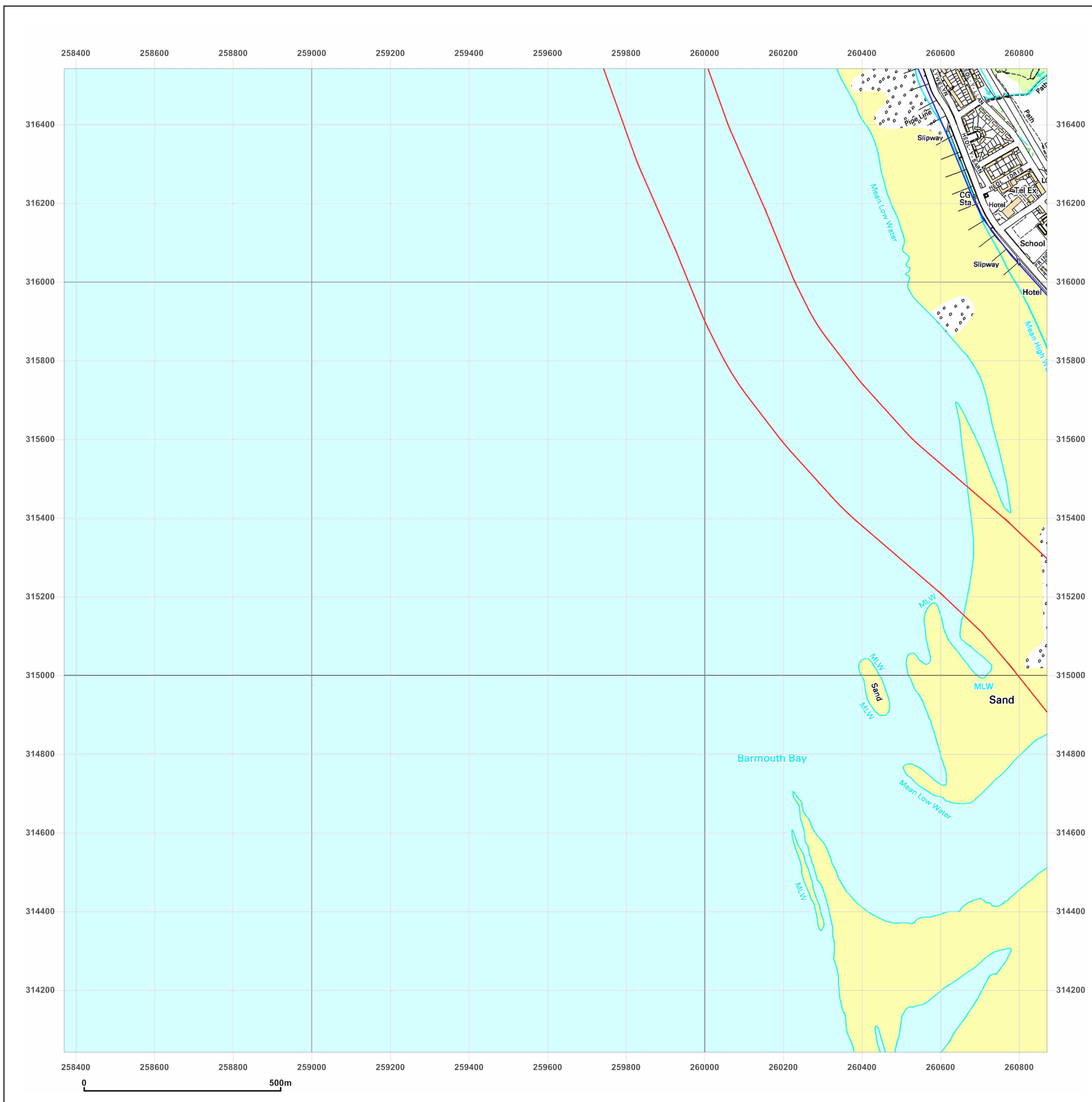


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Site Details:

Barmouth Northern Promenade

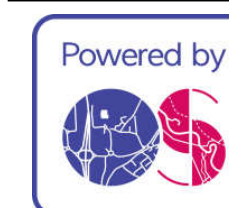
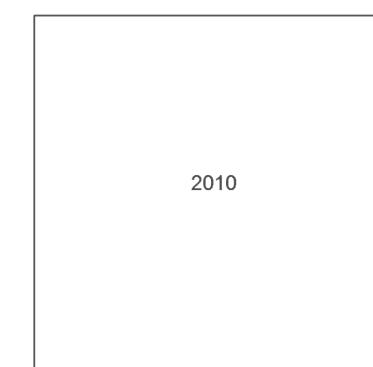
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Grid Ref: 259620, 315292

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000

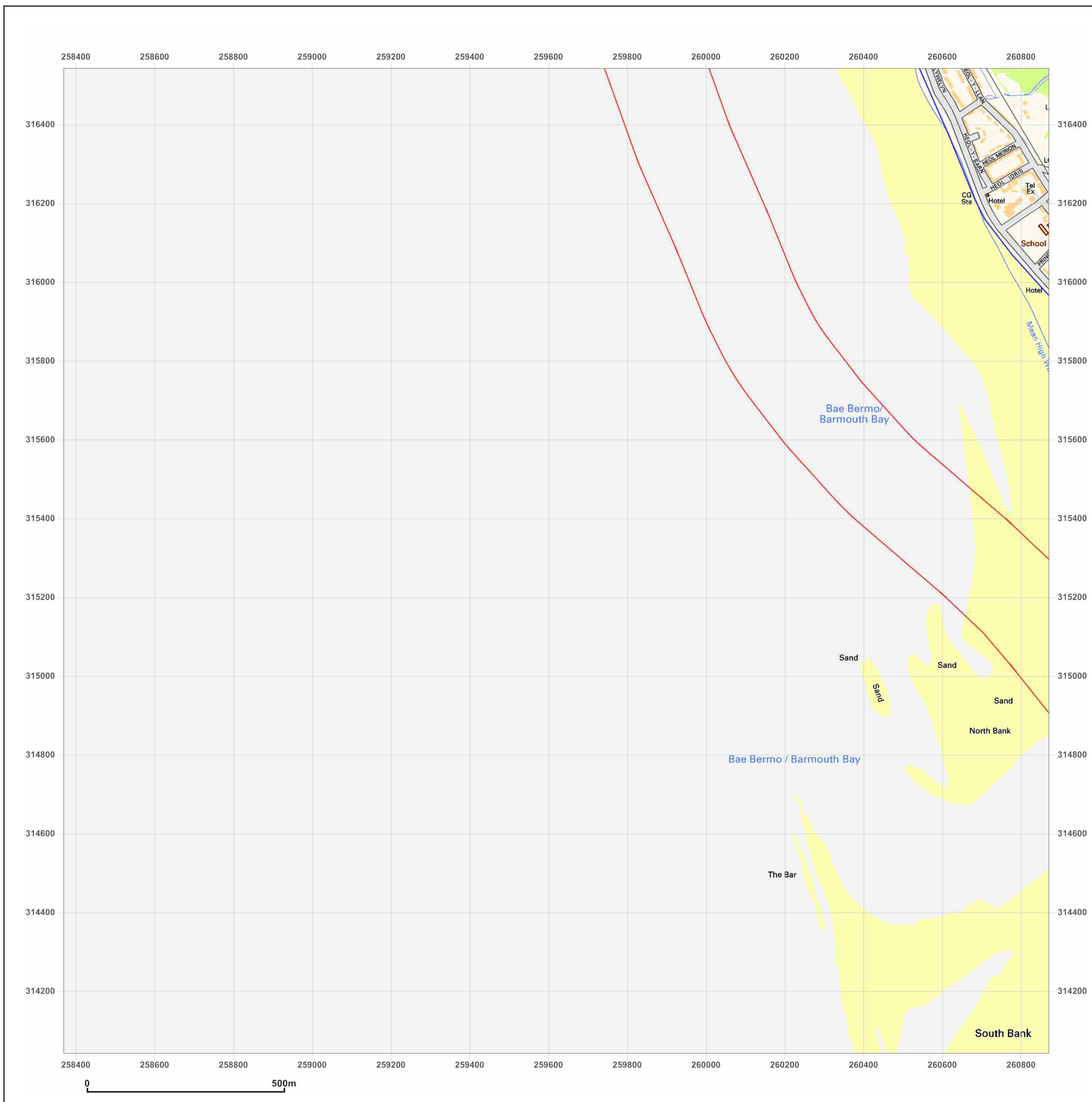


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_1
Grid Ref: 259620, 315292

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014

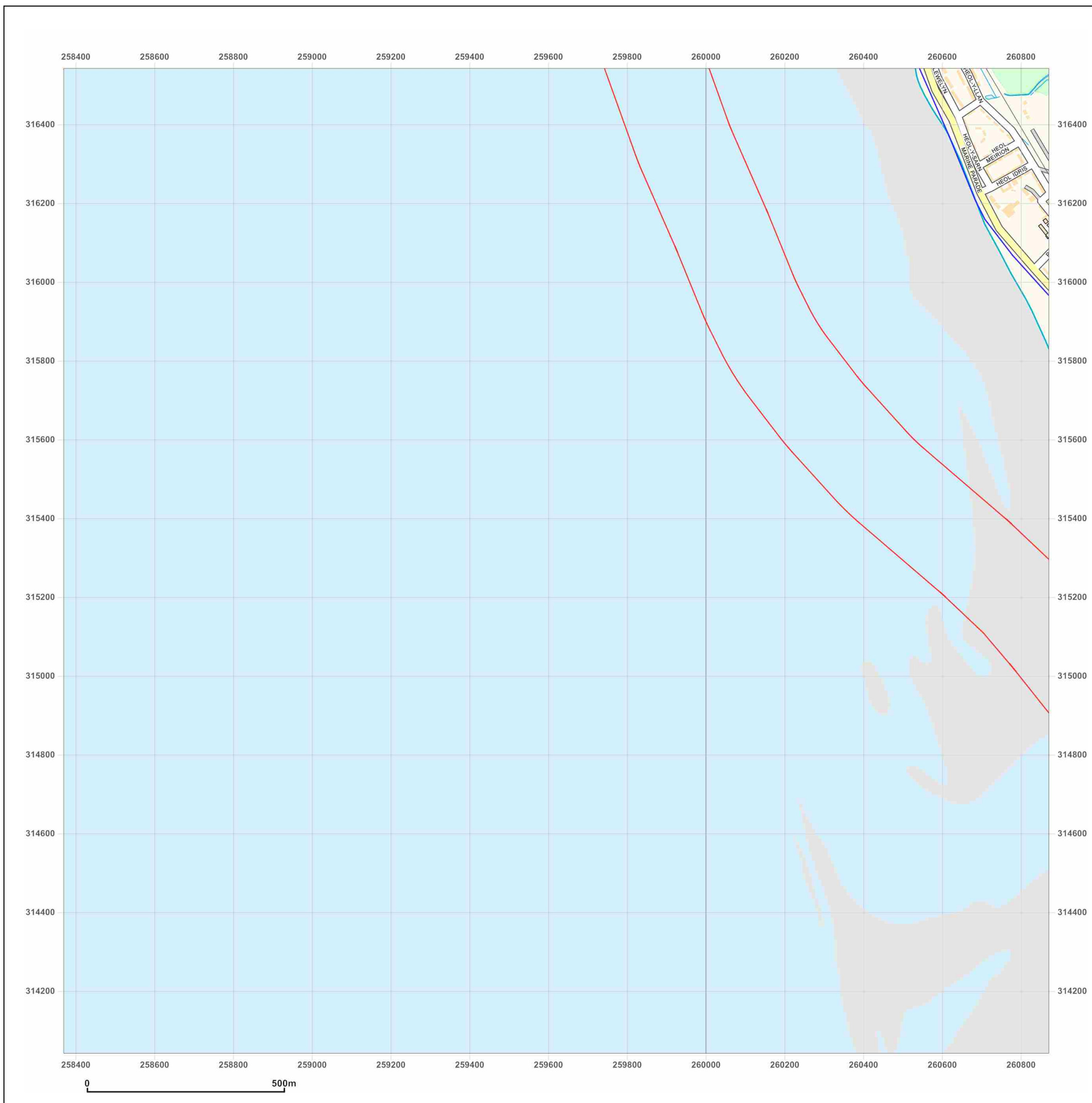


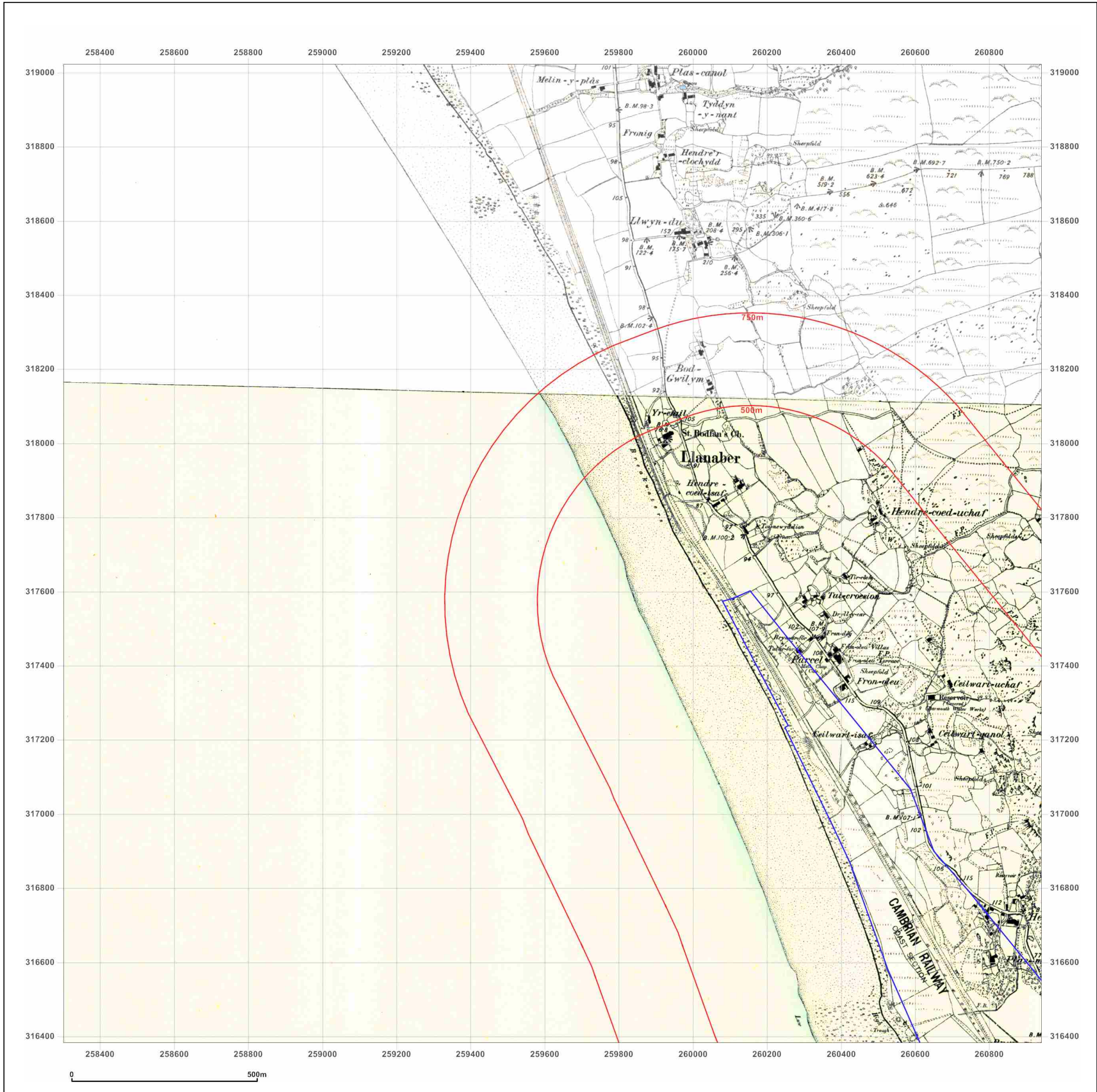
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Site Details:

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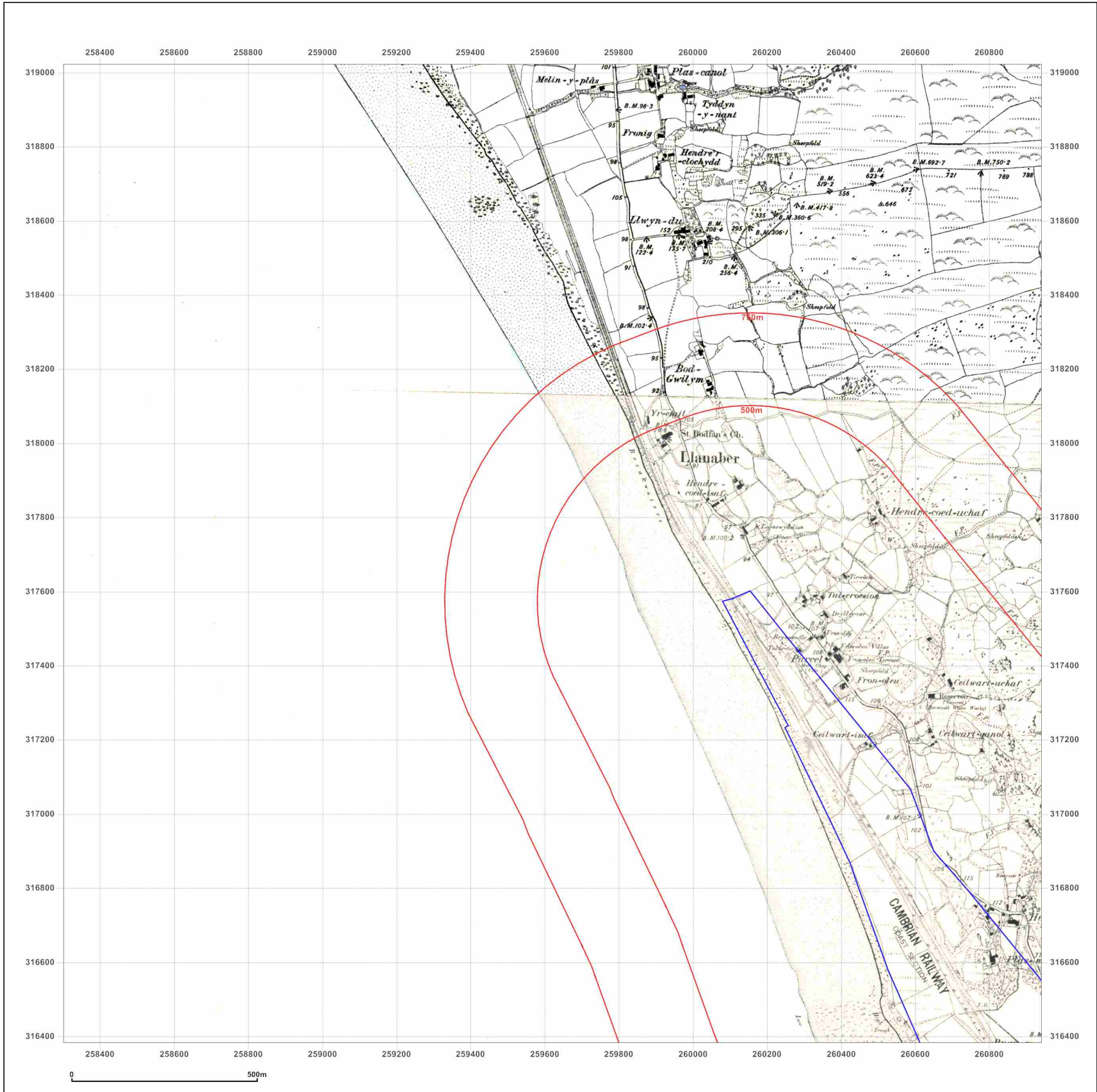
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Report Ref: GS-5539750_SS_1_2
Grid Ref: 259620, 317702

Map Name: County Series
Map date: 1887-1888
Scale: 1:10,560
Printed at: 1:10,560

Surveyed 1887
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Revised 1887
Edition N/A
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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_2
Grid Ref: 259620, 317702

Map Name: County Series
Map date: 1887-1888
Scale: 1:10,560
Printed at: 1:10,560



Surveyed 1887
Revised 1887
Edition N/A
Copyright N/A
Levelled N/A

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Revised N/A
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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_2
Grid Ref: 259620, 317702

Map Name: County Series

Map date: 1900-1901

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
Revised 1901
Edition 1901
Copyright N/A
Levelled N/A

Surveyed 1887
Revised 1900
Edition N/A
Copyright N/A
Levelled N/A

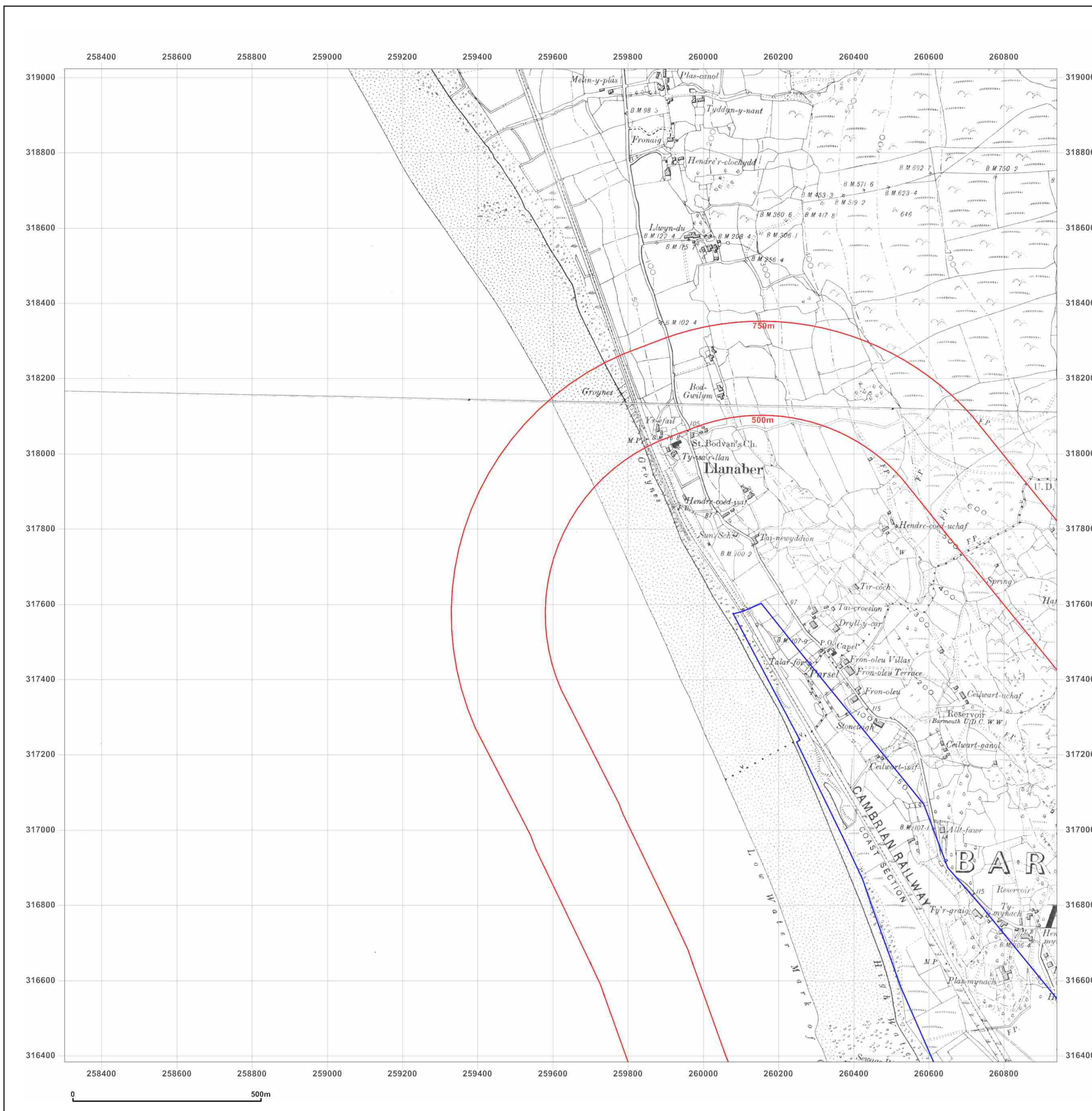


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_2
Grid Ref: 259620, 317702

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A

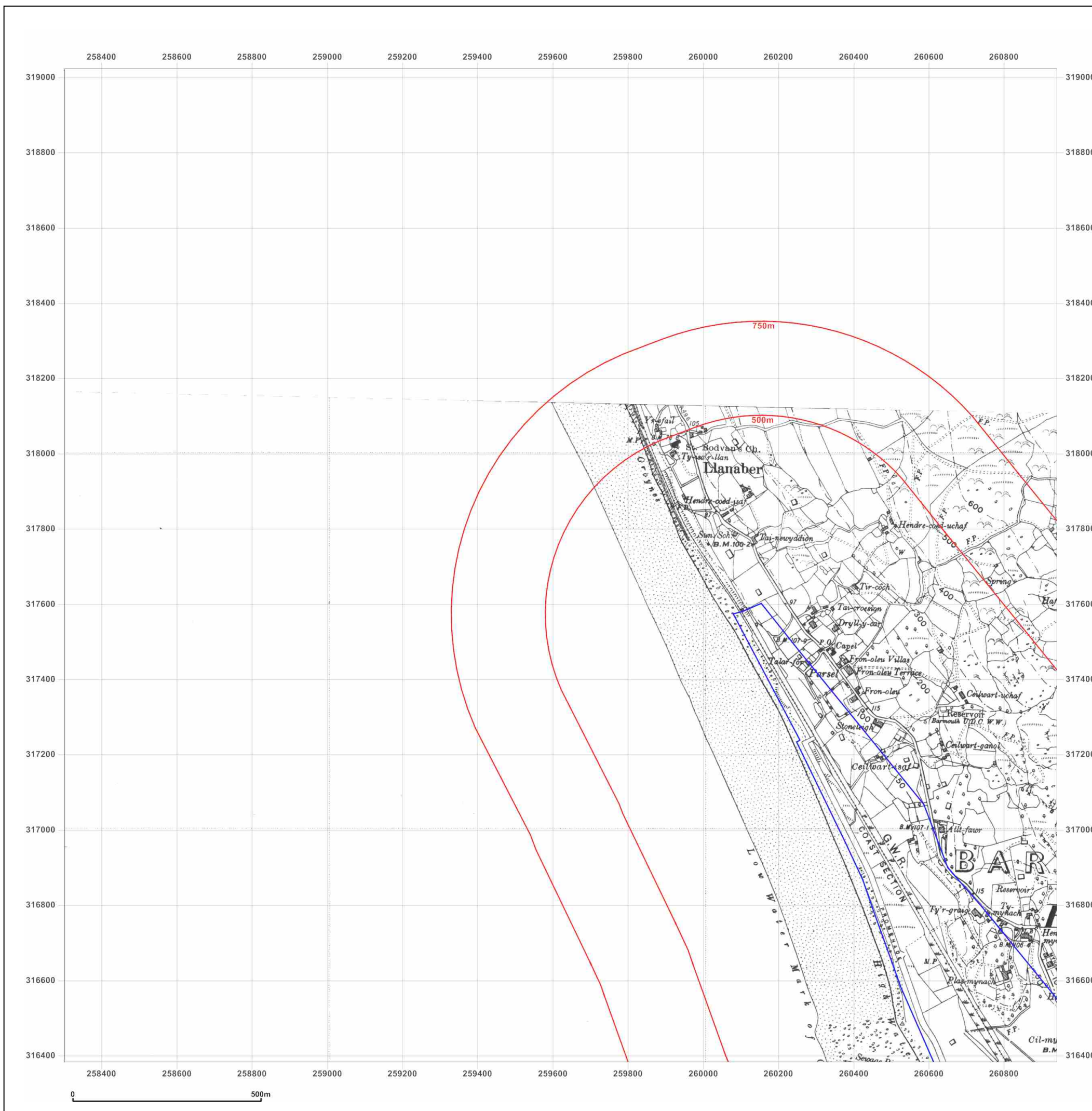


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_2
Grid Ref: 259620, 317702

Map Name: County Series

Map date: 1949

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised 1949
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1887
 Revised 1949
 Edition N/A
 Copyright N/A
 Levelled N/A

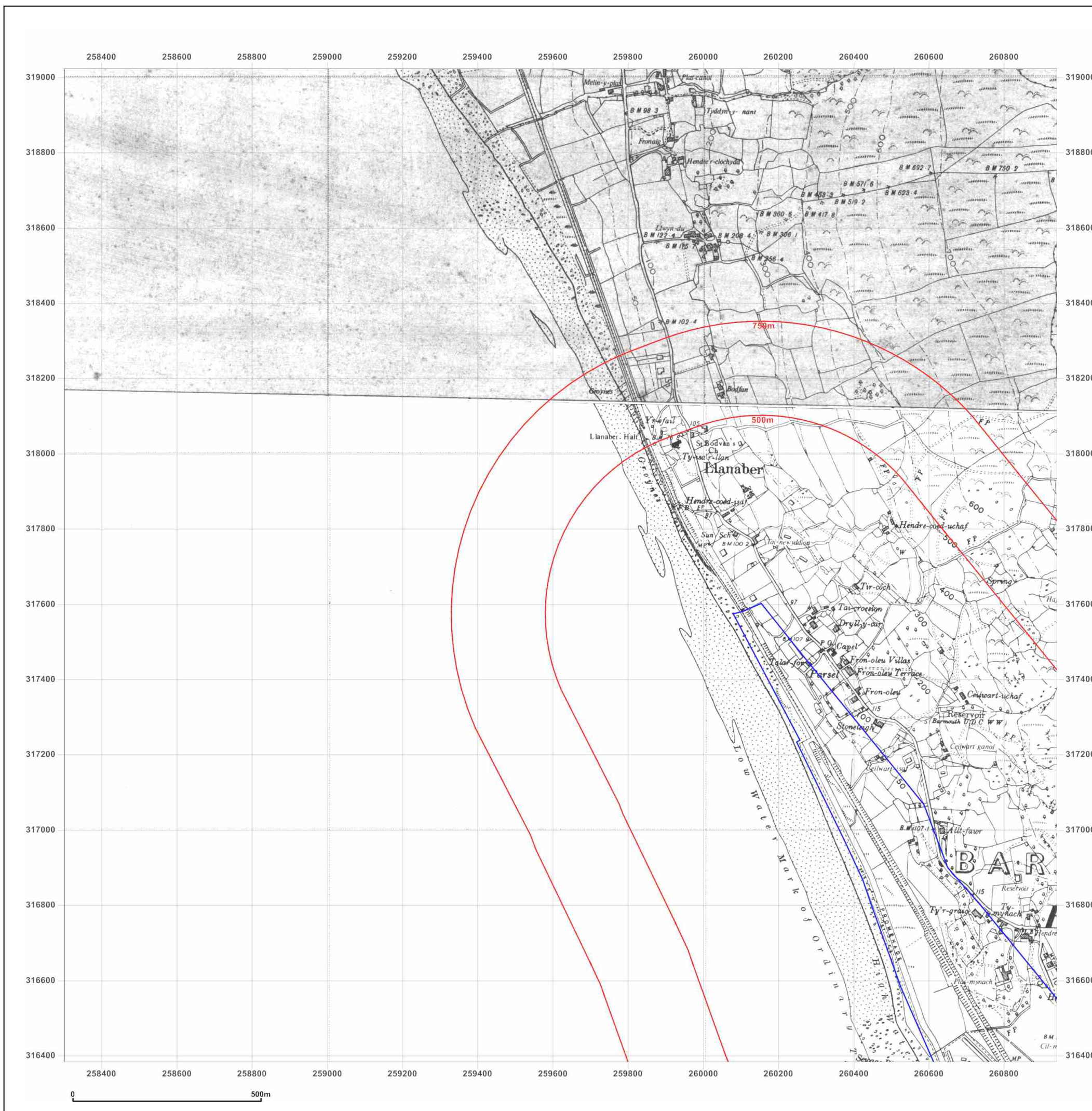


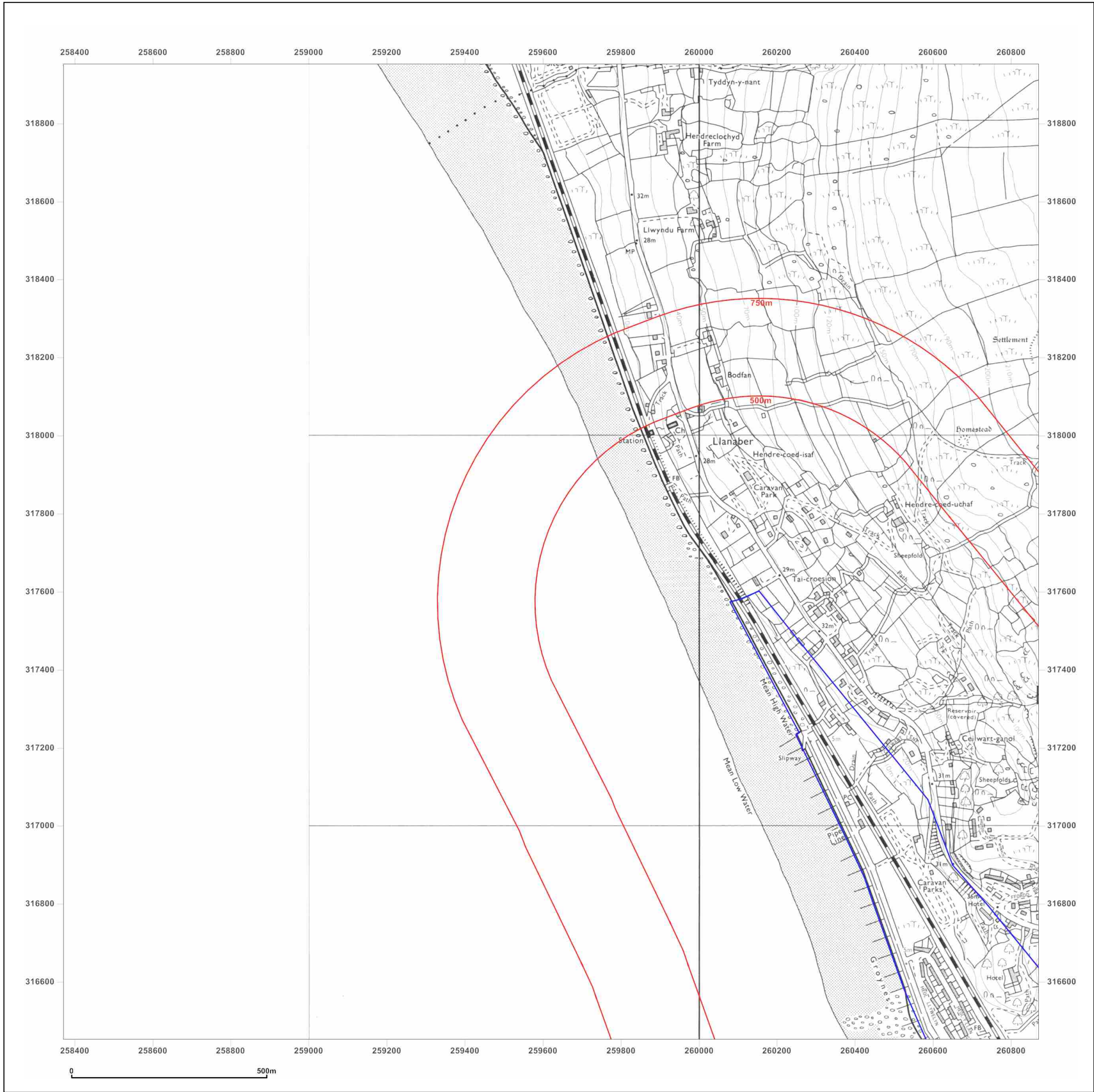
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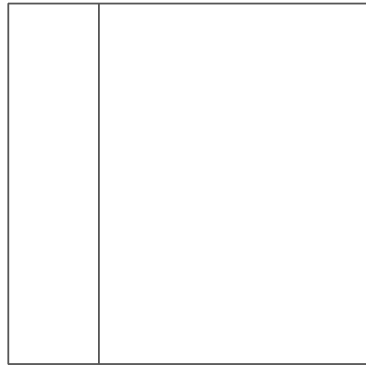
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Client Ref: 264326
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Grid Ref: 259620, 317702

Map Name: National Grid
Map date: 1981
Scale: 1:10,000
Printed at: 1:10,000





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Revised 1981
Edition N/A
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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_2
Grid Ref: 259620, 317702

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002



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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_2
Grid Ref: 259620, 317702

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

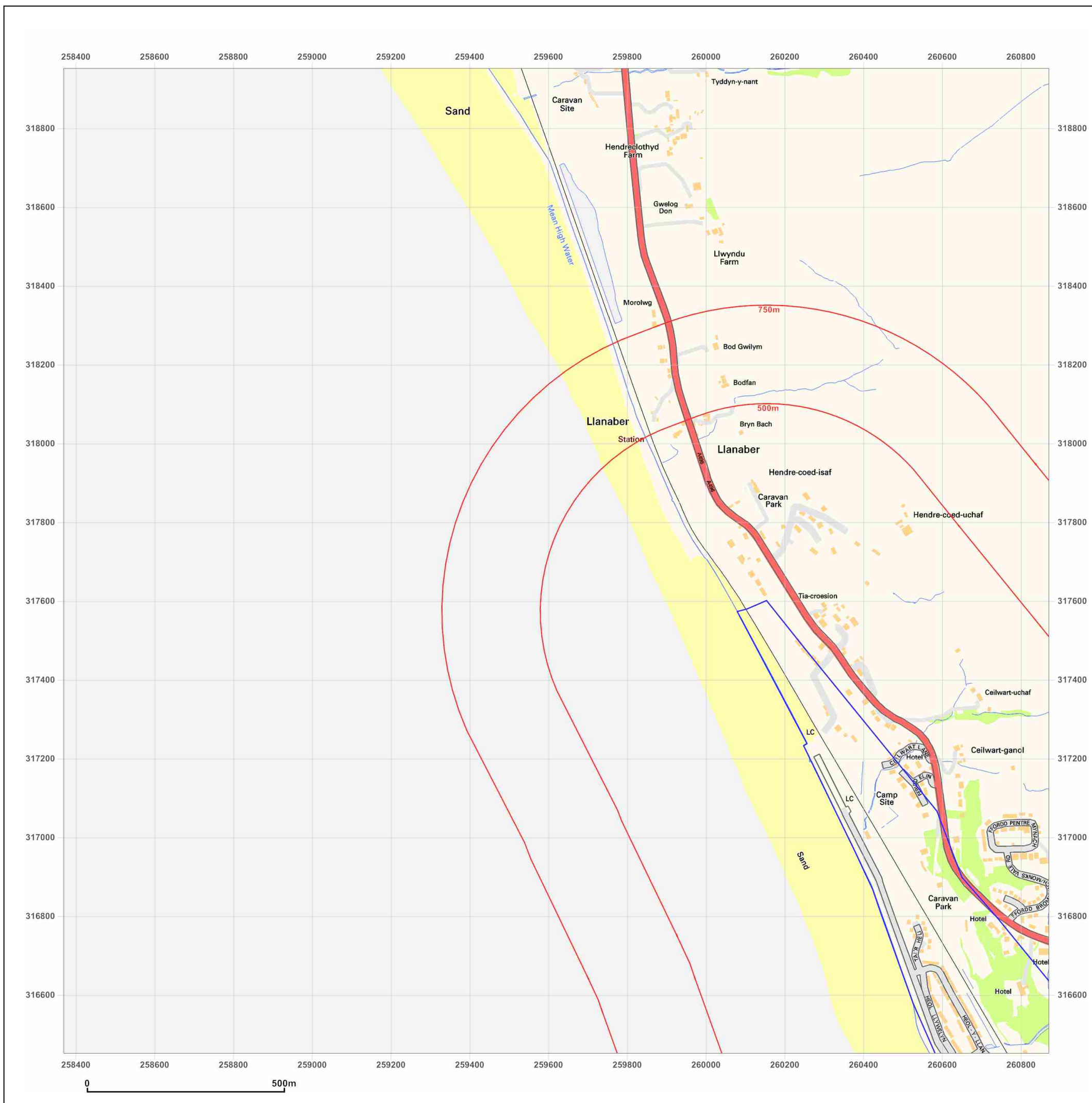


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_1_2
Grid Ref: 259620, 317702

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014



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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: County Series

Map date: 1887-1888

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
Revised 1887
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1887
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: County Series

Map date: 1887-1888

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1887
 Revised 1887
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1887
 Revised N/A
 Edition N/A
 Copyright N/A
 Levelled N/A

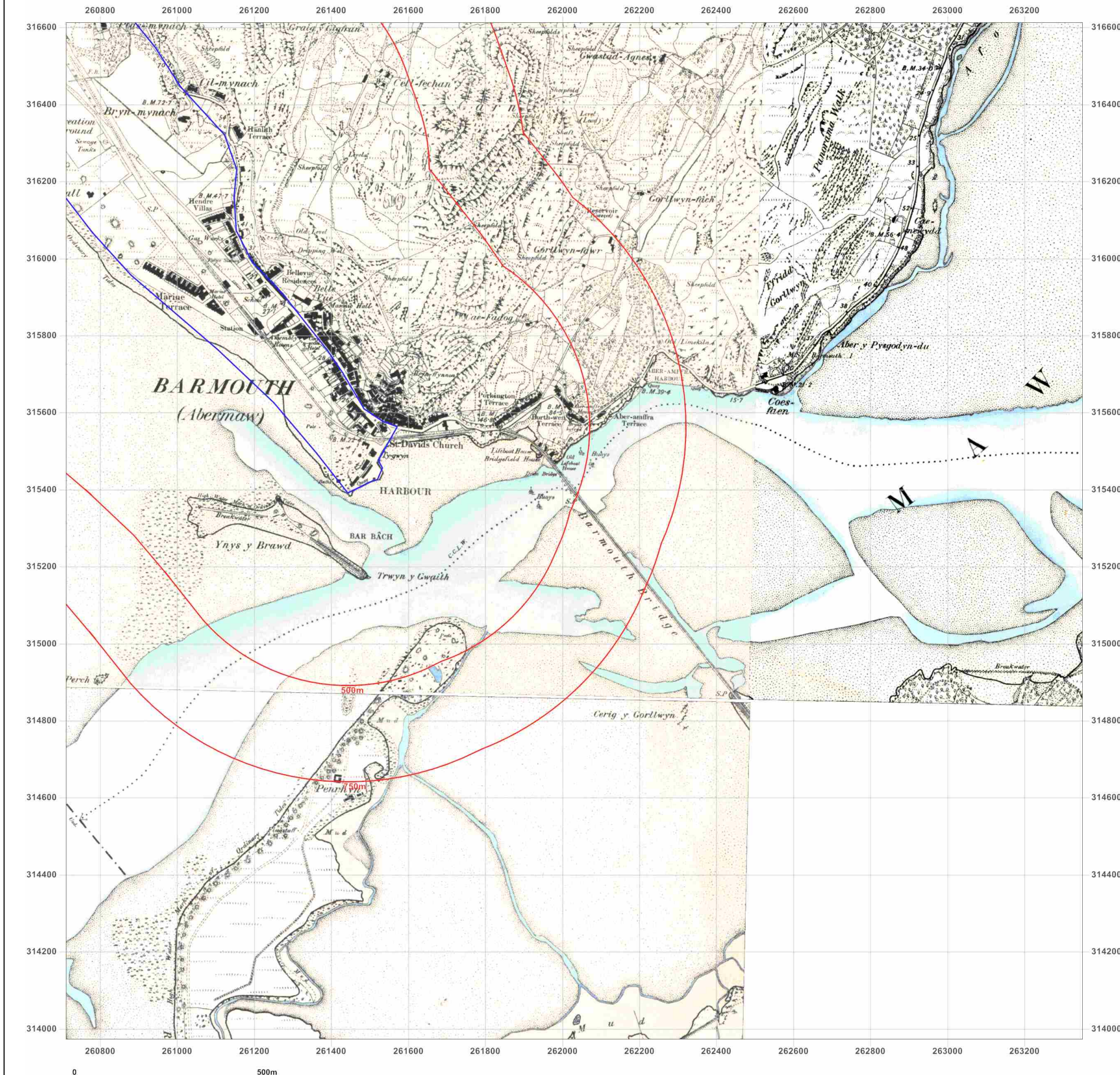


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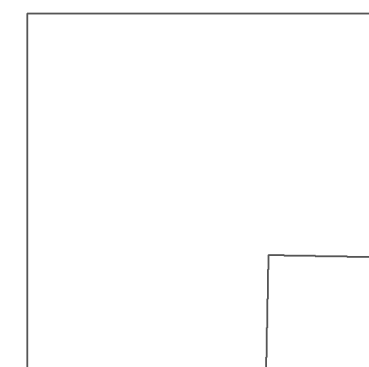
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Grid Ref: 262030, 315292

Map Name: County Series

Map date: 1900

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised 1900
 Edition N/A
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 Levelled N/A

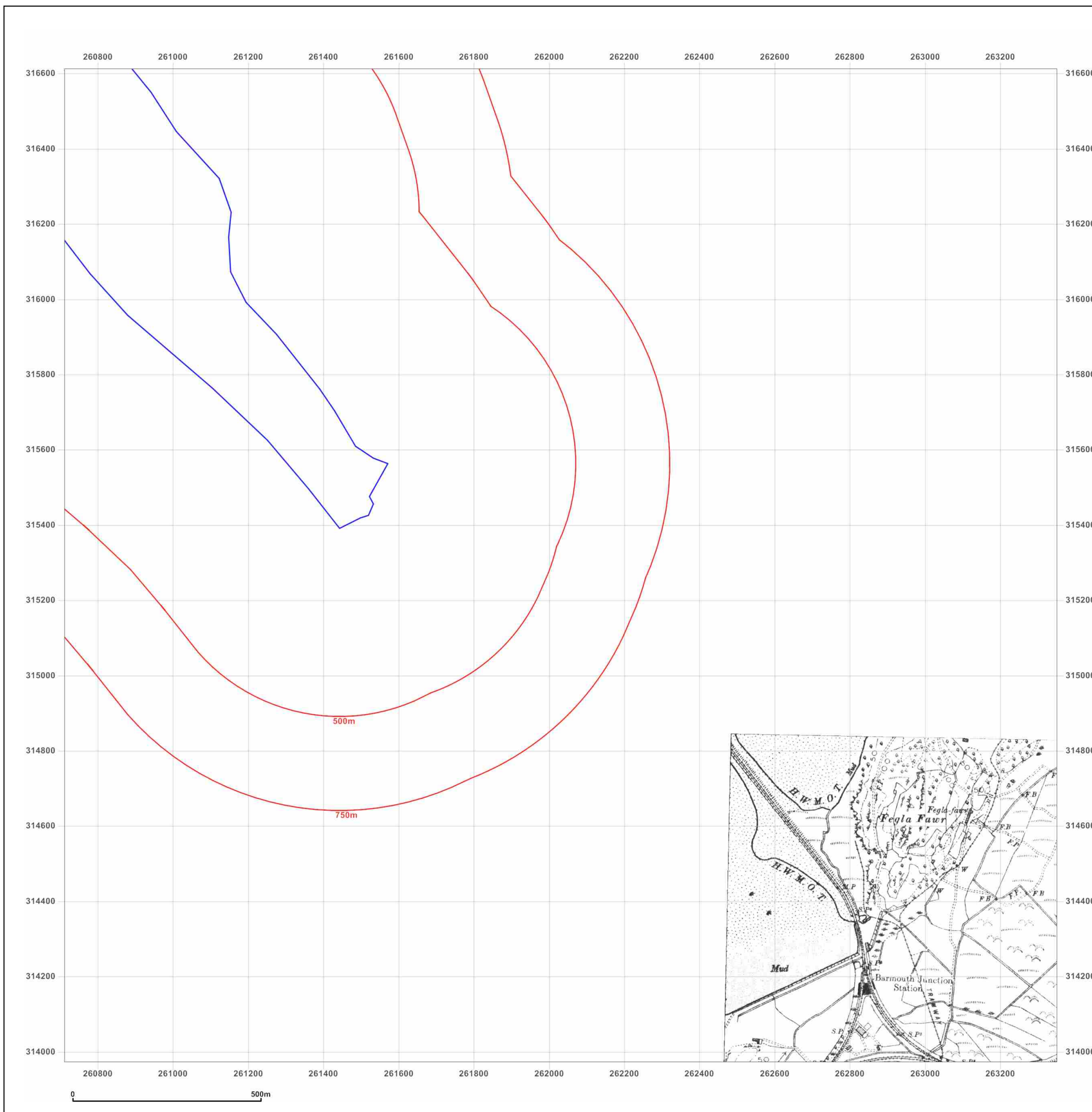


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: County Series

Map date: 1900-1901

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised 1900
 Edition N/A
 Copyright N/A
 Levelled N/A

Surveyed 1887
 Revised 1901
 Edition 1901
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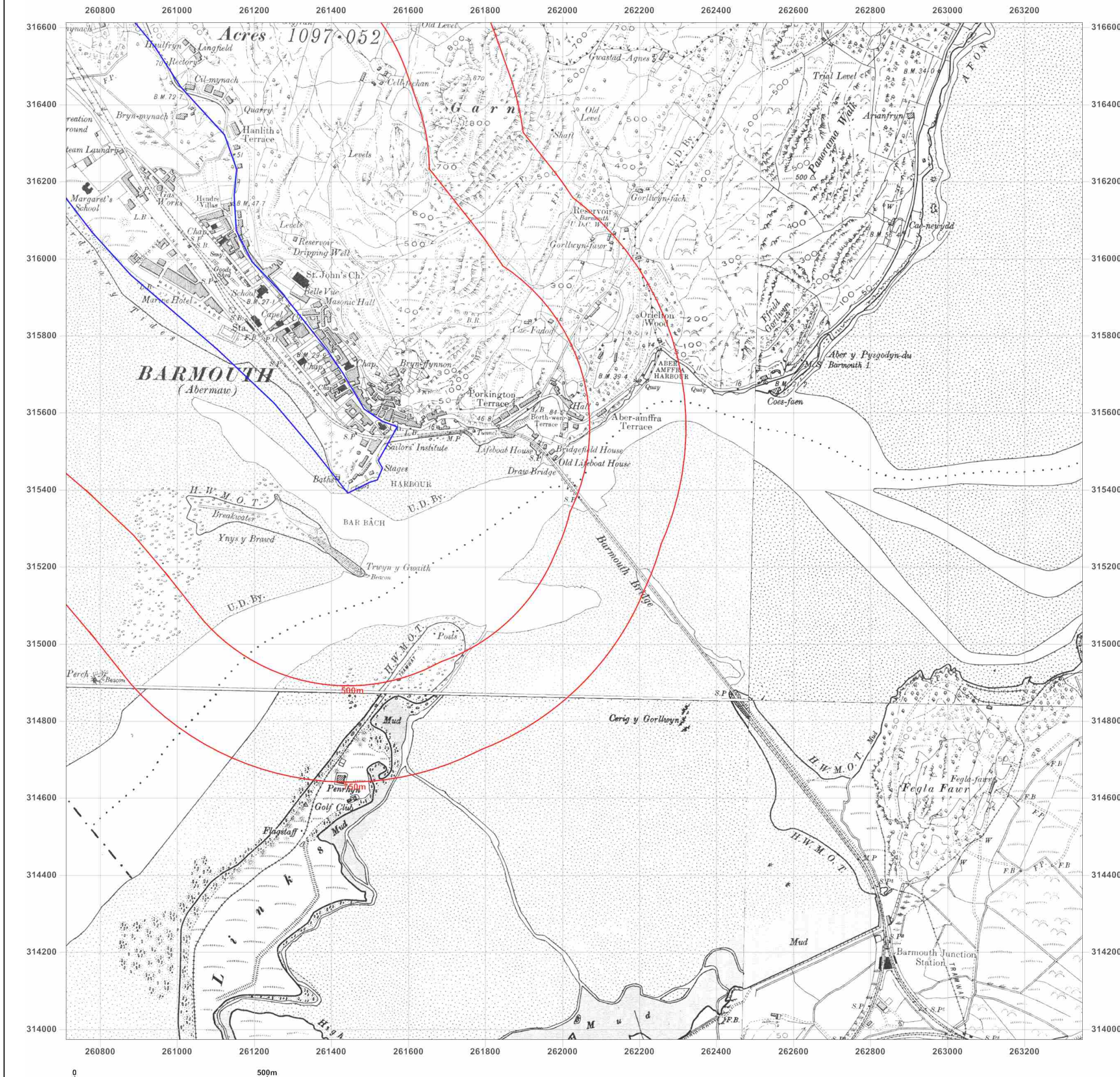


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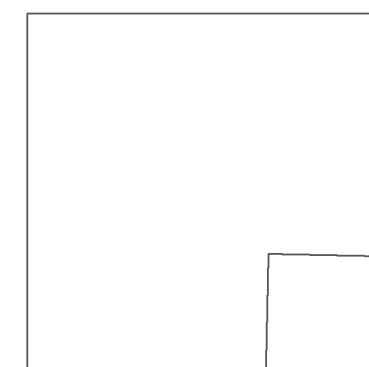
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Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: County Series

Map date: 1901

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised 1901
 Edition 1901
 Copyright N/A
 Levelled N/A

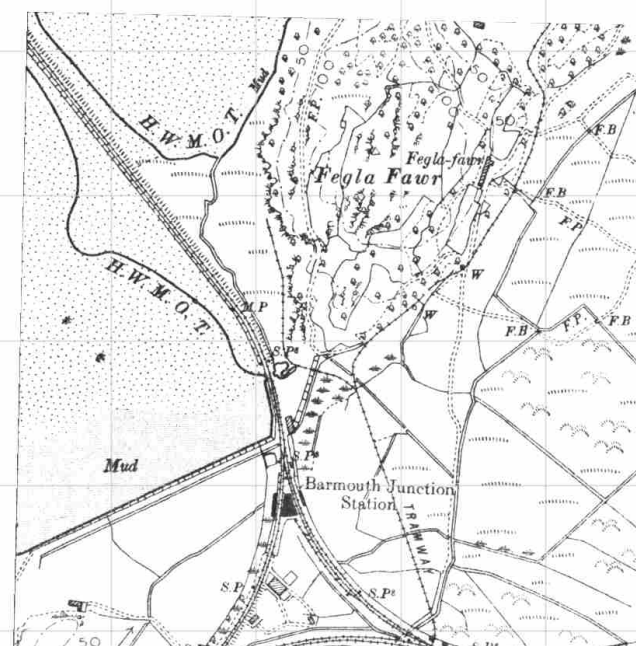
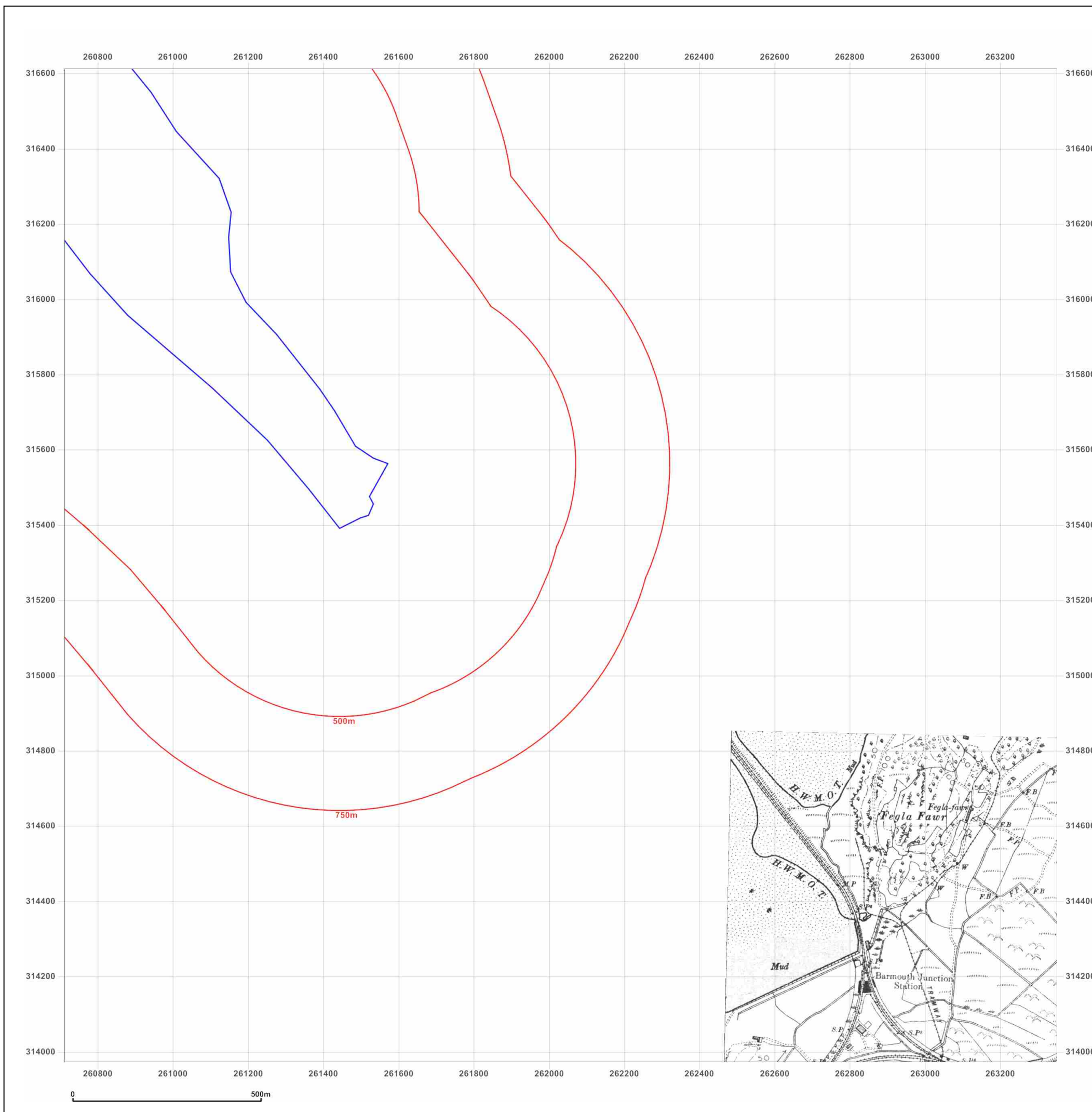


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Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: County Series

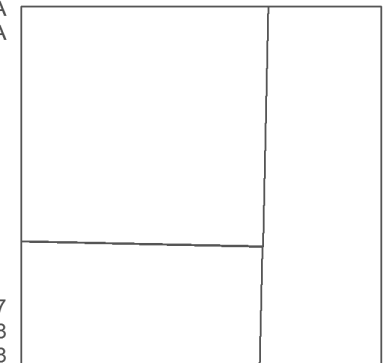
Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A



Surveyed 1887
 Revised 1938
 Edition 1938
 Copyright N/A
 Levelled N/A

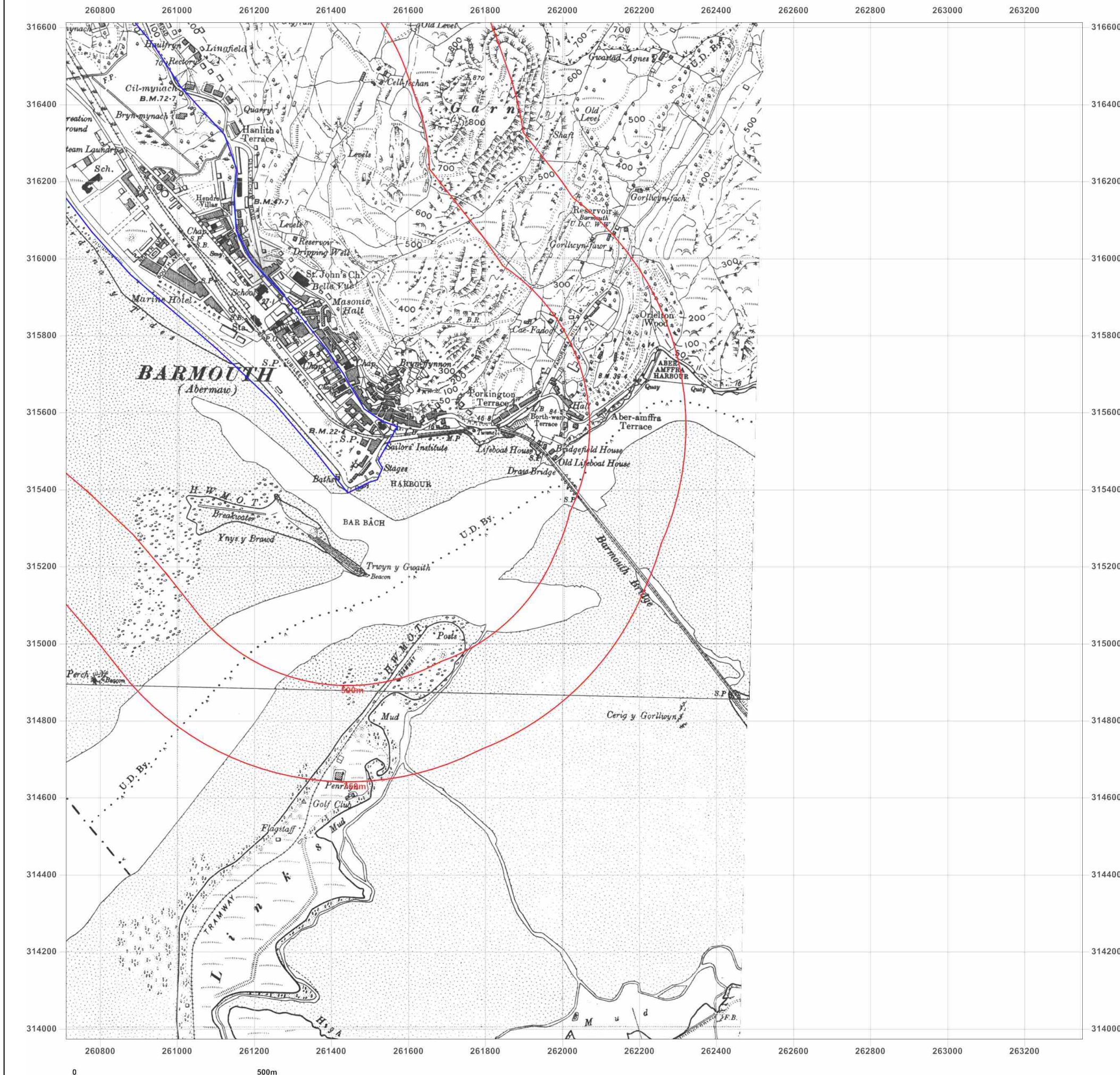


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: County Series

Map date: 1949-1951

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
Revised 1949
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1887
Revised 1951
Edition N/A
Copyright N/A
Levelled N/A

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Levelled N/A

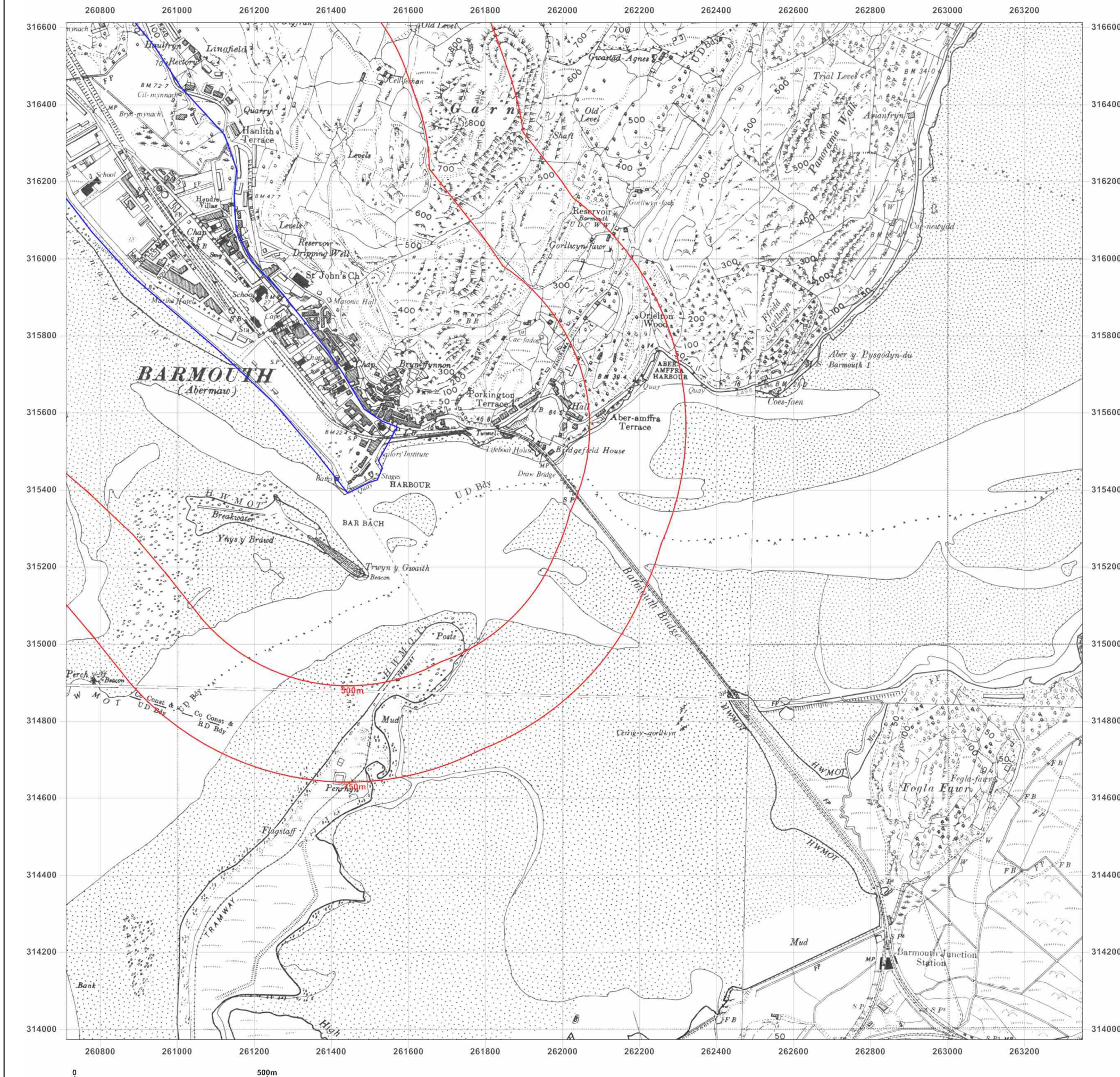


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: National Grid

Map date: 1981

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1979
Revised 1981
Edition N/A
Copyright N/A
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Surveyed 1980
Revised 1981
Edition N/A
Copyright N/A
Levelled N/A

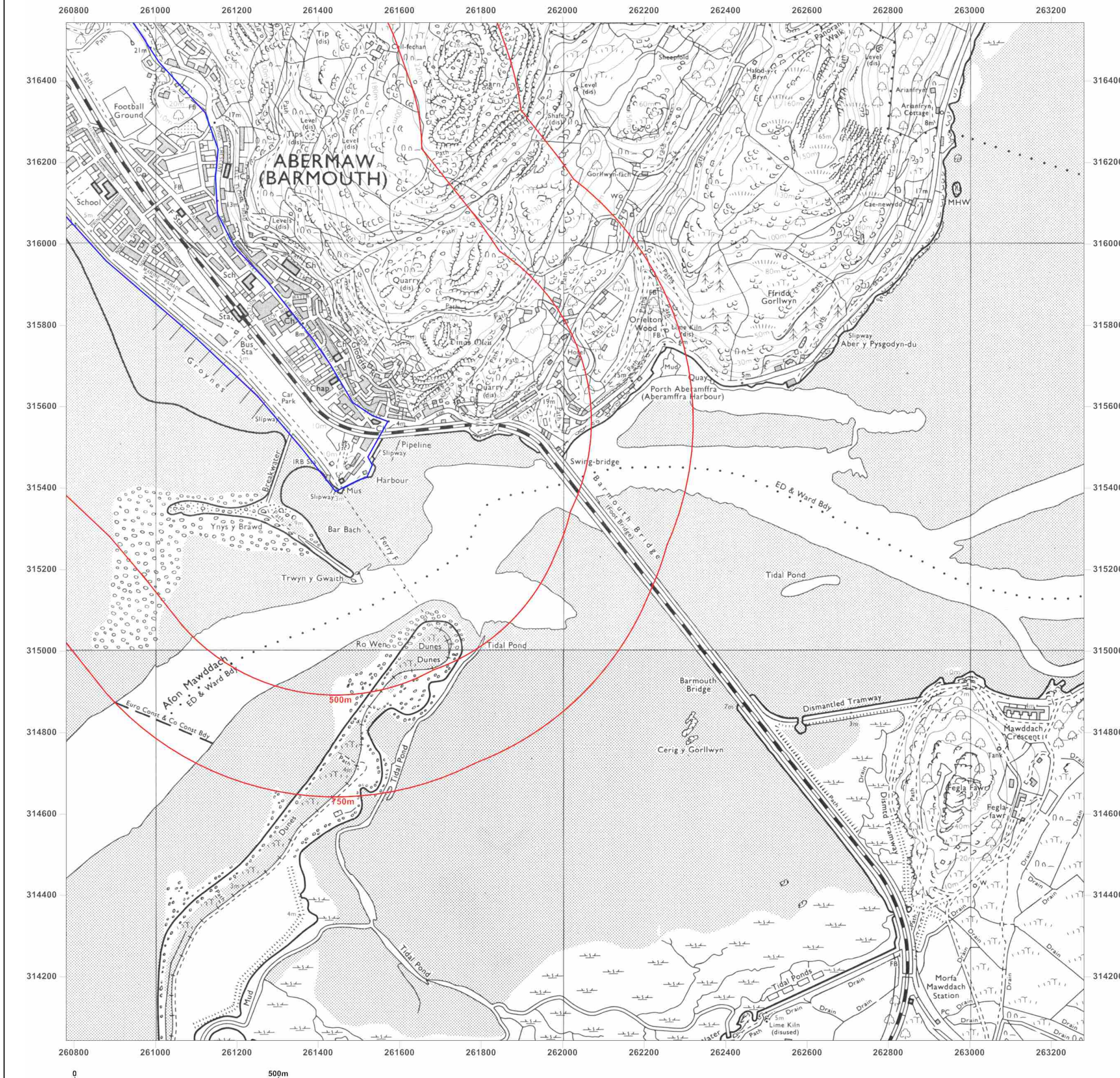


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002

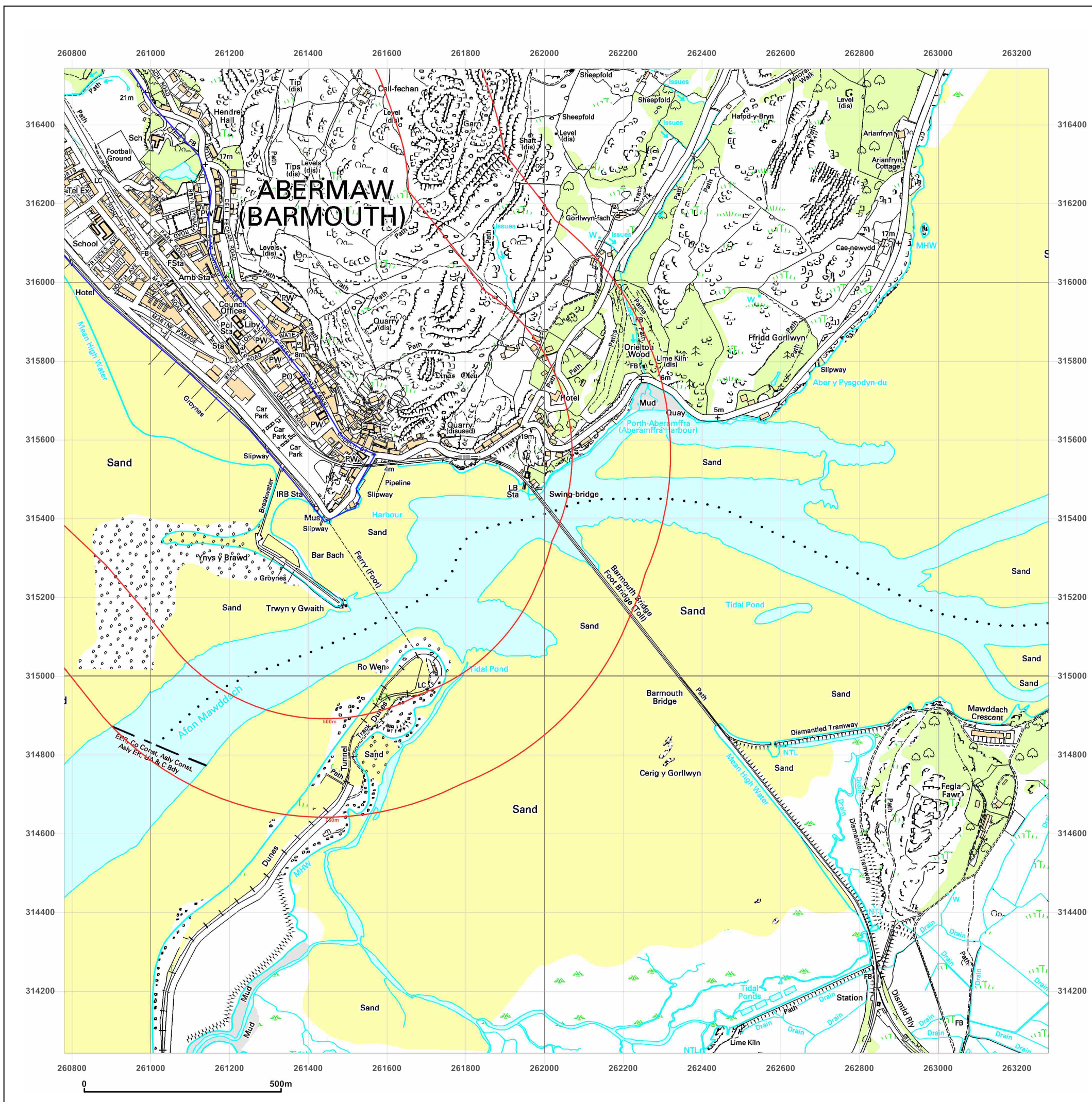


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



2010

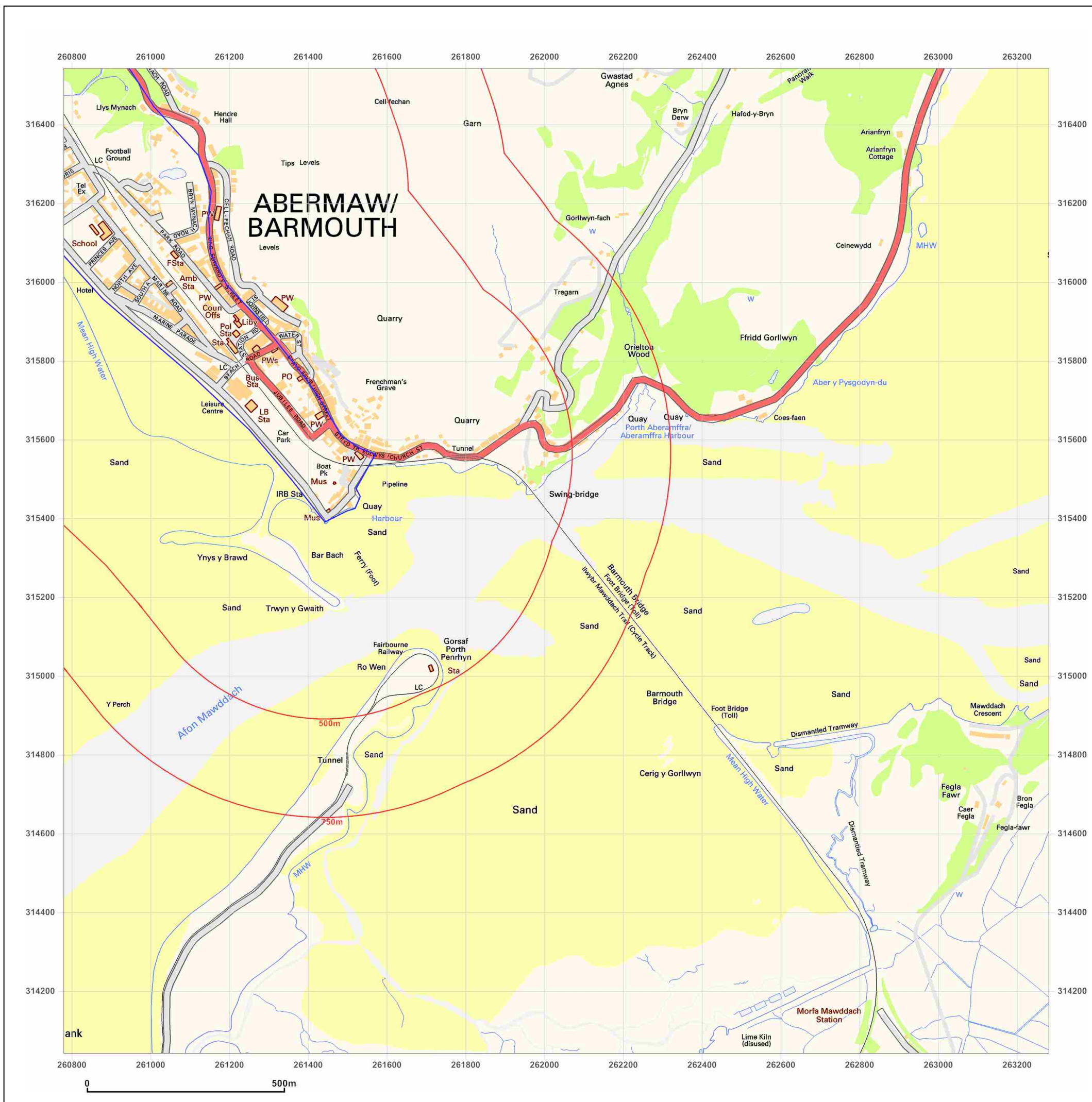


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_1
Grid Ref: 262030, 315292

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



2014

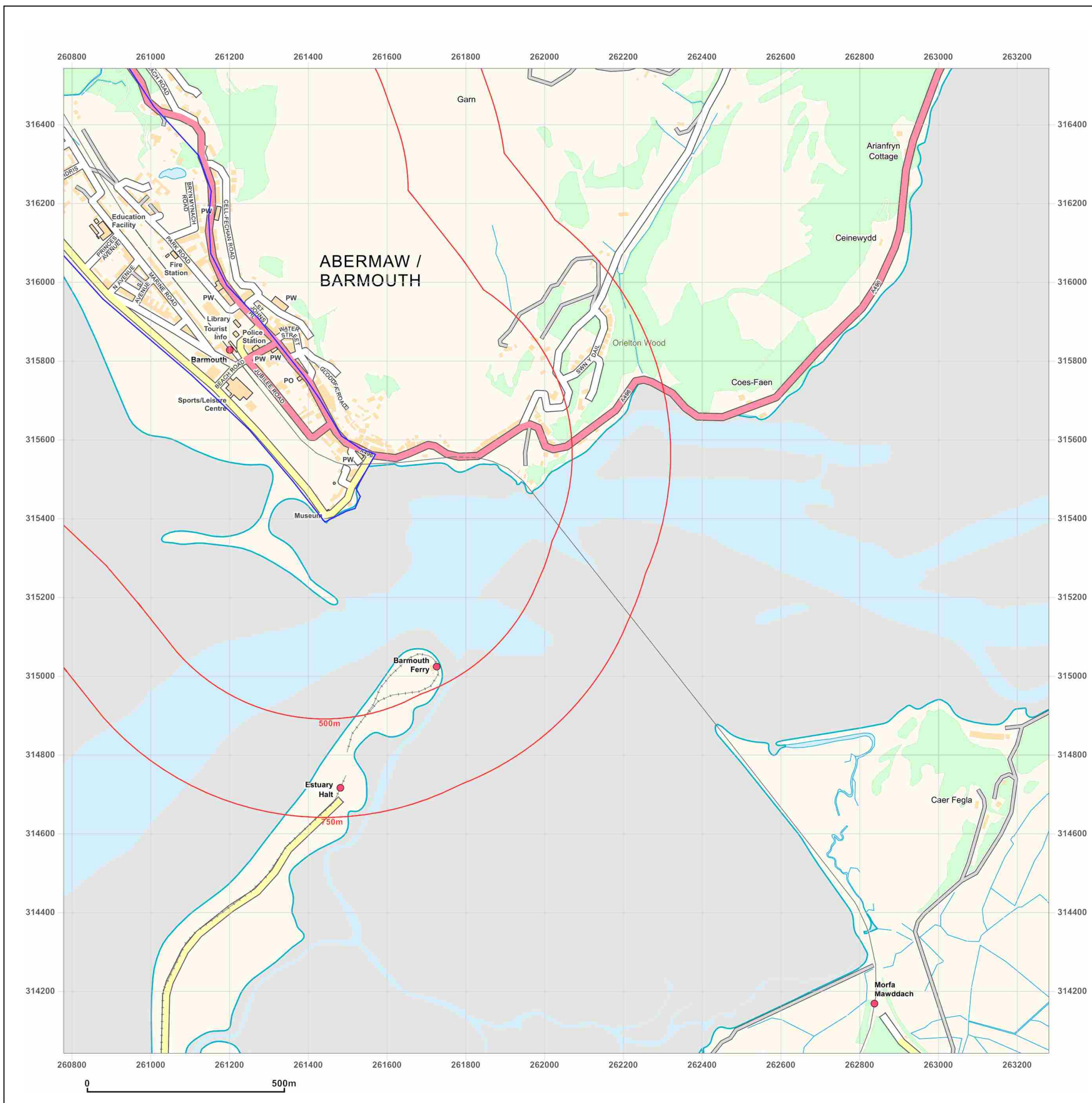


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_2
Grid Ref: 262030, 317702

Map Name: County Series

Map date: 1887-1888

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
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Edition N/A
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Surveyed 1887
Revised 1887
Edition N/A
Copyright N/A
Levelled N/A

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Edition N/A
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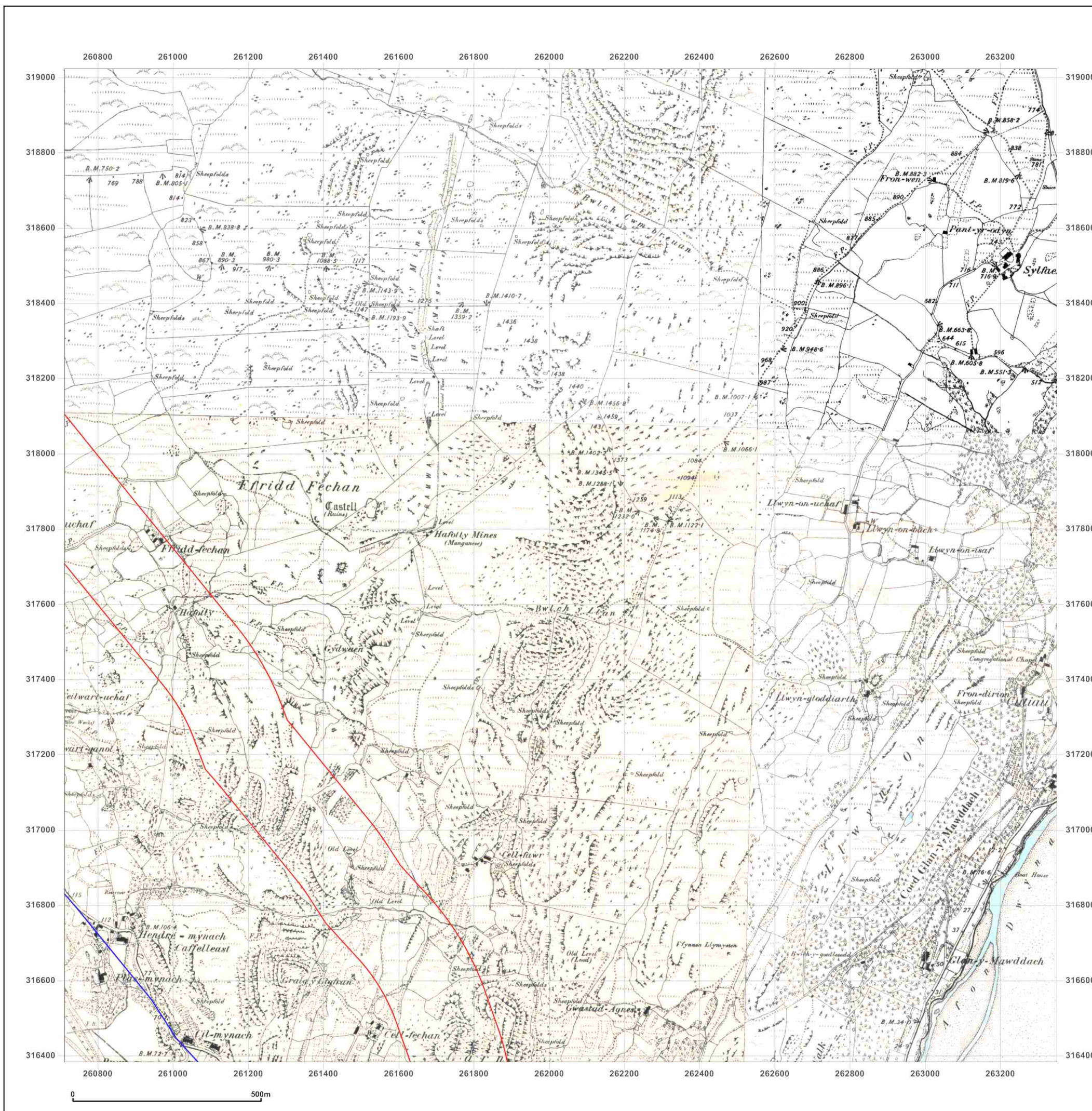


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Production date: 17 October 2018

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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_2
Grid Ref: 262030, 317702

Map Name: County Series

Map date: 1900-1901

Scale: 1:10,560

Printed at: 1:10,560



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Revised 1901
Edition 1901
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Revised 1900
Edition N/A
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Levelled N/A

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Revised 1901
Edition 1901
Copyright N/A
Levelled N/A

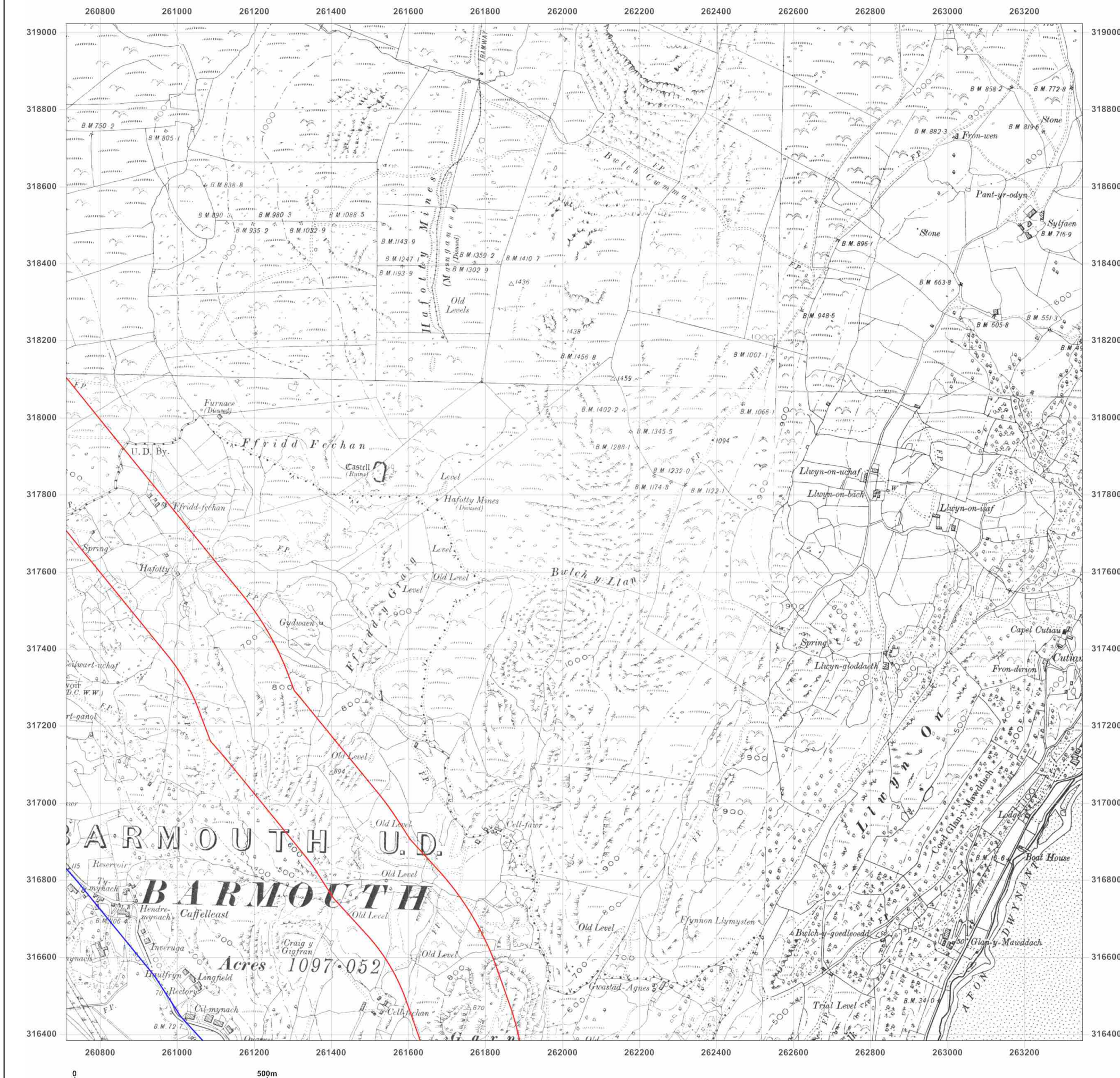


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Production date: 17 October 2018

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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_2
Grid Ref: 262030, 317702

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
Revised 1938
Edition 1938
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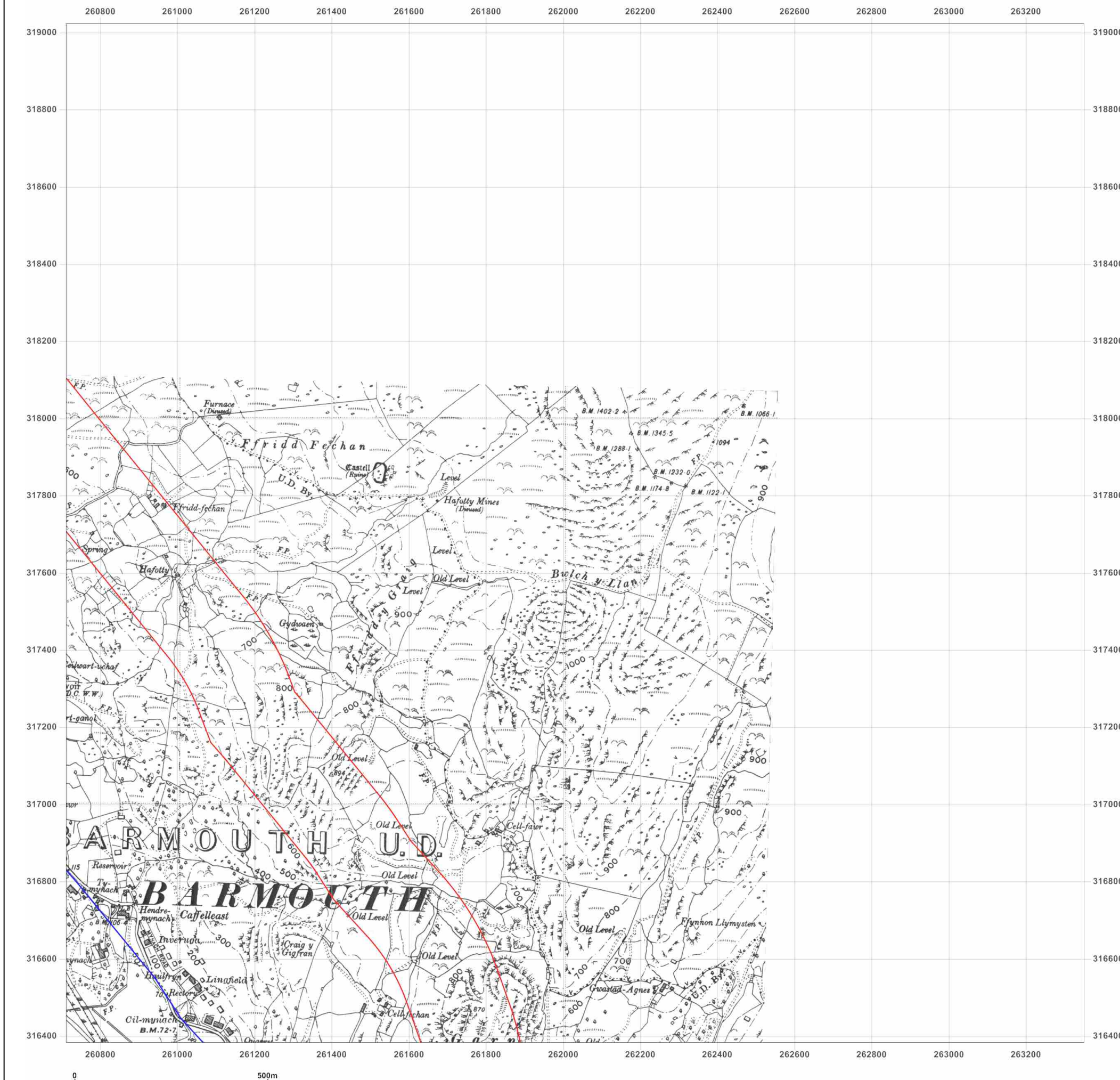


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_2
Grid Ref: 262030, 317702

Map Name: County Series

Map date: 1949-1951

Scale: 1:10,560

Printed at: 1:10,560



Surveyed 1887
Revised 1949
Edition N/A
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Surveyed 1887
Revised 1949
Edition N/A
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Surveyed 1887
Revised 1949
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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_2
Grid Ref: 262030, 317702

Map Name: National Grid

Map date: 1981

Scale: 1:10,000

Printed at: 1:10,000



Surveyed 1979
Revised 1981
Edition N/A
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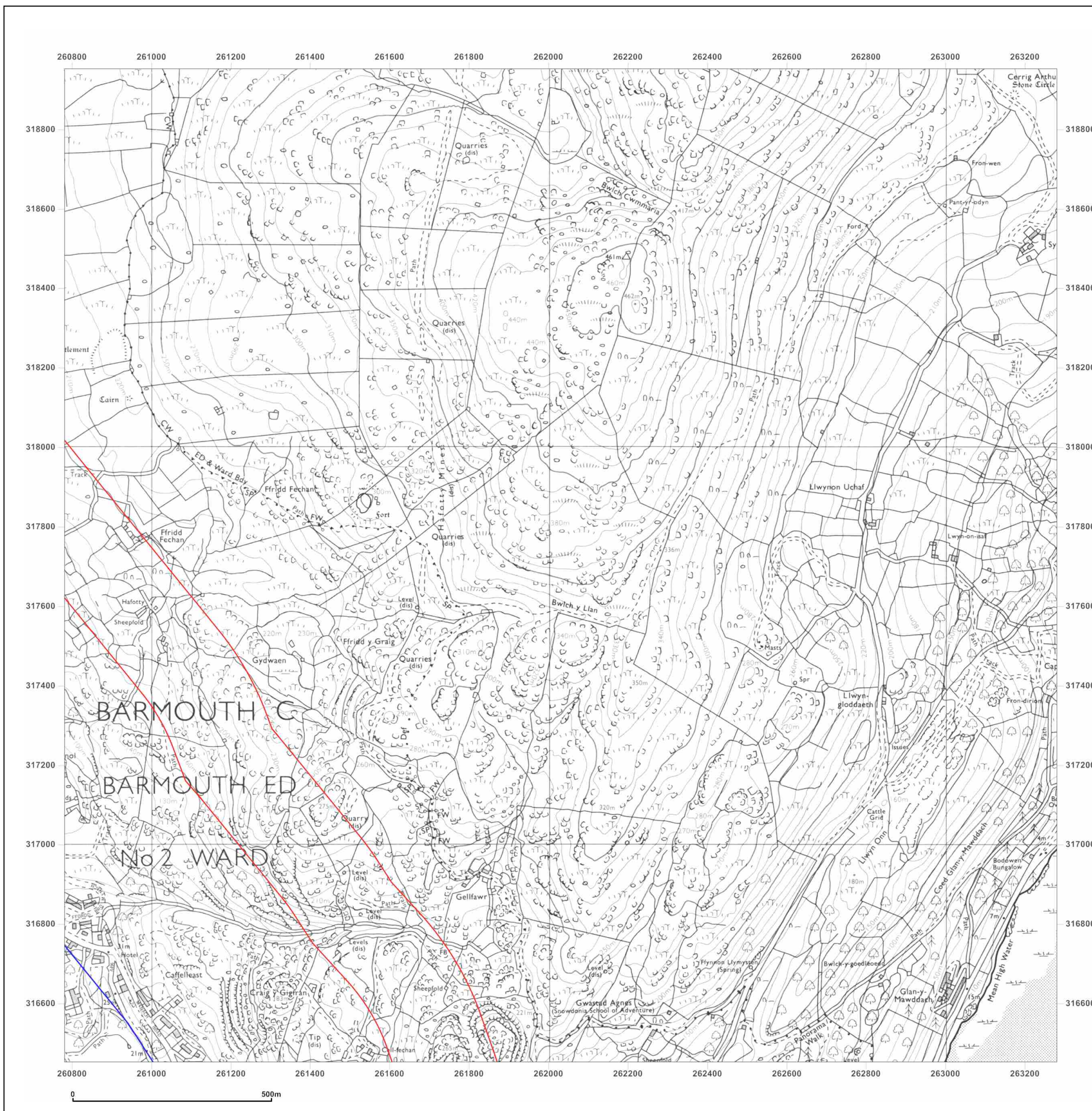


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_2
Grid Ref: 262030, 317702

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

Printed at: 1:10,000



2002

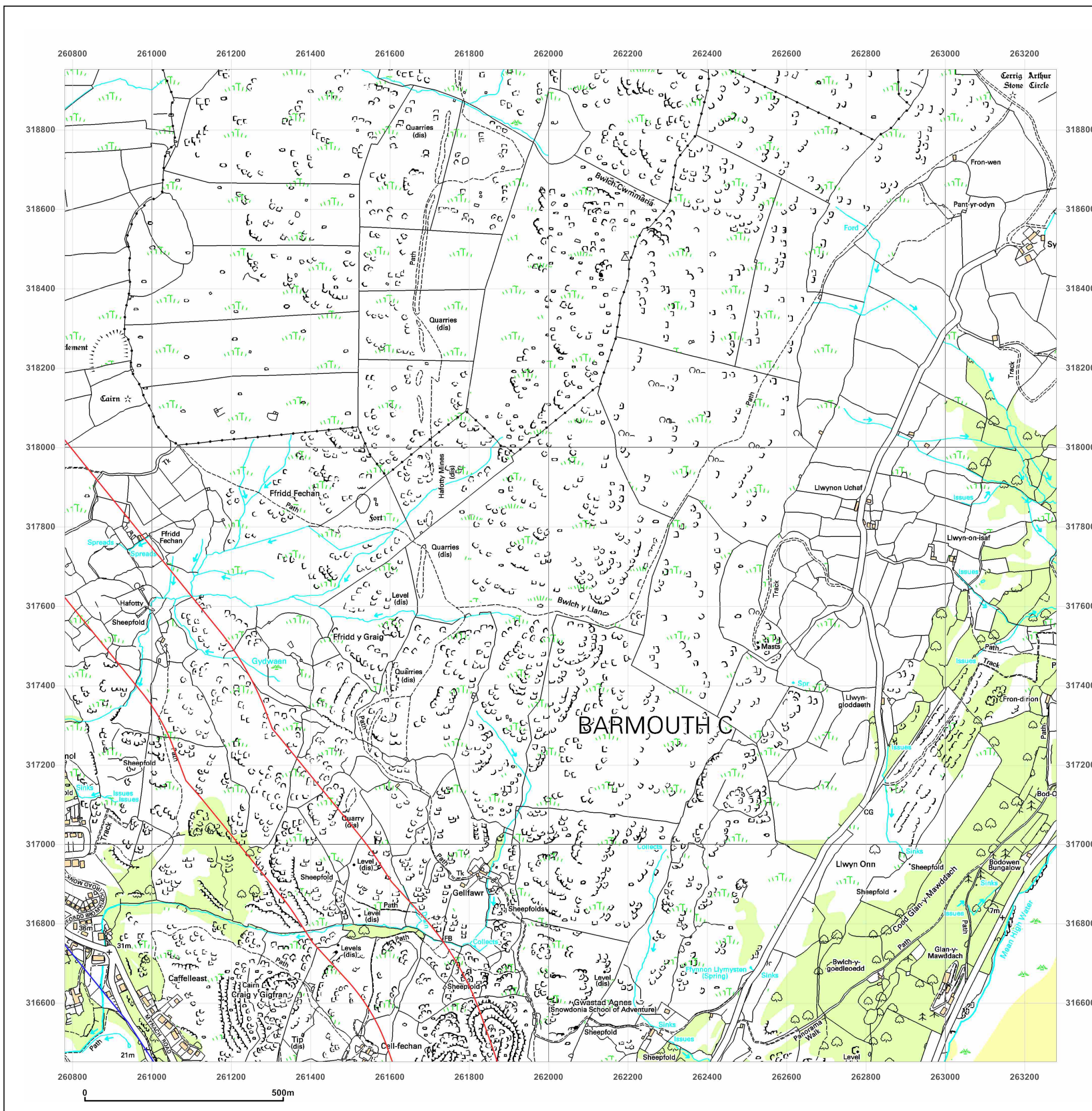


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Site Details:

Barmouth Northern Promenade

Client Ref: 264326
Report Ref: GS-5539750_SS_2_2
Grid Ref: 262030, 317702

Map Name: National Grid

Map date: 2014

Scale: 1:10,000

Printed at: 1:10,000



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