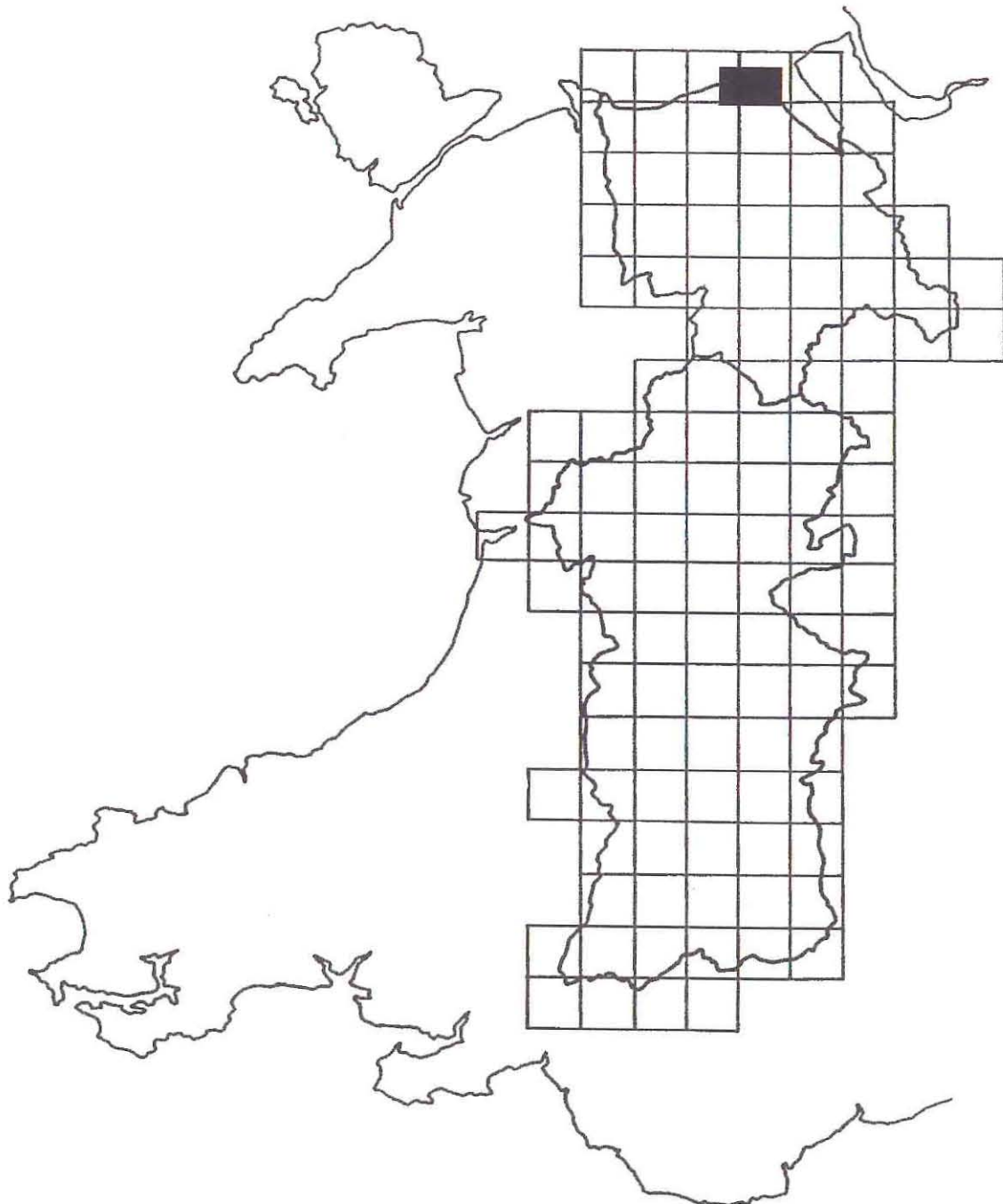


THE CLWYD-POWYS ARCHAEOLOGICAL TRUST

Chwyd Coastal Survey 1995/6

PRESTATYN TO MOSTYN

Revised Report



CPAT Report No 162.1

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PRESTATYN TO MOSTYN

Revised Report

by N.W. Jones

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Report prepared for Cadw: Welsh Historic Monuments

The Clwyd-Powys Archaeological Trust

7a Church Street Welshpool Powys SY21 7DL

tel (01938) 553670, fax 552179

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Summary

The study of coastal erosion has been promoted and funded by Cadw: Welsh Historic Monuments as an all Wales initiative, to be conducted by the four Welsh Archaeological Trusts. The main objectives are to assess the nature of coastal erosion and relate this and other coast related threats to the likely impact on the archaeological resource.

Within the present study area the majority of the coastline was shown to be stable, largely due to extensive man-made protection, or suffering only slight erosion. One short section of coast at Point of Ayr appeared to be under serious threat from erosion. However, a significant proportion of the coastal plain is very low lying, consisting of soft glacial and post-glacial sediments, some of which lie below the HWM. Consequently, rising sea levels could have a serious impact on significant areas. Although erosion was not identified as a major threat, the development of both light industry and tourism has already had a significant impact on the archaeology of the area, most notably on the post-medieval and industrial sites around Mostyn.

A search of the Sites and Monuments Record (SMR) and the National Monuments Record (NMR) revealed few known sites within the immediate coastal fringe, all of which were post-medieval or industrial. The desk based and field surveys revealed several new sites, all belonging to a similar period. The generally low number of archaeological sites may in part be attributed to the relatively recent emergence of the present coastline, as a result of coastal protection and reclamation. The only sites identified as at possible risk from coastal erosion were the military defensive sites at Talacre Warren and Mostyn Quay itself, although as noted above, other pressures present a serious threat to the surviving archaeology.

Research Design

The format of the study draws heavily on the example set by the Gwynedd Archaeological Trust (Smith 1995) which largely set the standard for the survey of coastal erosion. Where a different approach has been adopted, it has been dictated by the nature of the coast and coastal strip within the study area which has presented certain situations not prevalent within the Gwynedd study area.

The parameters of the study were defined as the coast edge itself, the intertidal zone, tidal estuaries and rivers, and a strip of the land edge defined as follows. Generally, the Gwynedd approach was adopted whereby the land strip extended for 150m from the coast edge. However, the topography occasionally dictated a slightly wider area where the land zone was thought to be at risk of inundation. In such cases, the boundary was taken to be the first physical barrier, for example, a railway or former coastal defensive bank. Although the study was intended to encompass the whole intertidal zone, for reasons of safety this was limited to the first 300m of the foreshore along the Dee Estuary, where the intertidal zone can extend to almost 1km. This did, however, allow a view over the mudflats to the low water mark.

In the case of the Clwyd coast, during the first year of the project (1995/96) the study area has been defined as a 14.7km length of coastline between Prestatyn and Mostyn. The aim was to undertake a two-stage study of the coastline to assess and record the scale of coastal erosion and identify and record the condition of known and new archaeological sites. Stage One consisted of a desk-based study of a variety of existing sources, followed in Stage Two by a fieldwalked assessment. A scoping study was also undertaken to assess the nature and quality of the documentary, cartographic and photographic sources relating to the remaining 52km of the Clwyd coastline in preparation for a continuation of the study during 1996/97.

Prior to the commencement of this project the archaeological resource had never been specifically related to the effects of erosion, and the main aim was therefore to assess the relationship between the three key elements of site type, coast type and erosion. The study is also concerned with the future management of the archaeological resource, identifying areas where sites may be at risk either from erosion or development, particularly where the perceived threat arises from an increase in the use of coastal areas for amenities and tourism, or from the likely effects of rising sea-levels.

The field study involved the identification and rapid recording of archaeological remains of all periods within the defined coastal strip, recording the nature of the coast edge, land edge and foreshore and assessing the extent and nature of any erosion. As such, this is a study which may be of use to a variety of disciplines and should not necessarily be seen as archaeologically specific. It is intended that copies of this report be circulated to those bodies considered to have a direct interest in the study area.

It is anticipated that once the survey has been completed, encompassing the entire coastline of Wales, a further report will be produced to synthesize the results from each individual Trust area.

The Survey Area

The present study can be divided into two distinct areas: an 8km length of coast to the west of the Dee Estuary from Prestatyn to Point of Ayr, and the western side of the Dee Estuary from Point of Ayr to Mostyn (7km). The coast generally faces north-north-west with prevailing winds from the northwest, west and southwest causing waves to strike the coast obliquely. This wave action causes a general movement of beach material from west to east, known as longshore drift, which is most noticeable with the diversion of the Prestatyn Gutter and the sand spit at Point of Ayr (Neaverson 1947). With the exception of Prestatyn itself, which has substantial sea defences, the coastline is characterised by a wide sandy foreshore backed by stable sand dunes protecting a wide coastal plain, much of which has been reclaimed from marshland over the past 250 years. Erosion is only evident along short sections of the coast at Point of Ayr, where the dunes are in retreat and are suffering serious erosion at high tides. However, the low lying nature of the coastal plain, particularly those areas of reclaimed marsh, suggests that rising sea levels could have serious consequences for much of the area.

The present coastline and coastal plain are of relatively recent origin. There is considerable historical and archaeological evidence for extensive changes to the coast of Clwyd, notably the advance of the land edge. This is perhaps most evident at Prestatyn where excavations have recently revealed extensive Mesolithic shell middens at Nant Hall Road, which is now 1km inland. During the historic period there is further evidence from the gradual silting and decline of the Prestatyn Gutter, which had been navigable with an active port in the town at least until the 18th century.

The estuarine coast generally faces northeast and is largely protected by a variety of man-made defences, both against erosion and inundation. Consequently, erosion is not a significant problem, with the exception of the immediate area of Mostyn Quay and Docks.

The drift geology is mainly composed of glacial (boulder clay) and post-glacial deposits. Solid rock is, however, exposed near Mostyn. (Neaverson 1947).

Much of the coastal area is encompassed by two Sites of Special Scientific Interest (SSSI). The Gronant Dunes and Talacre Warren SSSI covers c. 5.5km of coast between Prestatyn and Point of Ayr. The dunes within this area represent the only significant remnant of the once extensive dune system of the North Welsh coast. Adjoining this area, the Dee Estuary SSSI runs the length of the estuary between the HWM on the two shores. At Talacre, the area north of Point of Ayr Colliery is managed as a nature reserve by the RSPB.

Management Plans for the coast are currently in preparation for two areas. The largest area is covered by the Dee Estuary Forum, which is currently preparing a strategy document for the management and future development of both sides of the Dee Estuary. The results from this survey will be incorporated as part of the chapter on the Historic Environment. At Point of Ayr, BHP Petroleum own a short section of the coast which is threatened by erosion. As well as regular meetings with Delyn Borough Council, a Management Plan is being developed for the area in conjunction with Clwyd County Council and AC Archaeology. Coastal protection is also managed by Delyn and Rhuddlan Borough Councils, as well as by British Rail.

The Scoping Study

The scoping study was undertaken to provide a basis for extending the survey over the whole of the Clwyd coast. The aim was to identify and assess the extent of available information, preparing the ground for further work during 1996/7. All readily available sources were examined at the repositories listed in the Desk-based survey below, and a summary list is provided in Appendix 3. As well as consulting the existing aerial photographic sources at CPAT, the NMR and Clwyd County Council, a new oblique aerial photographic coverage was also undertaken by CPAT, encompassing the whole Clwyd coast.

Following on from experience gained during the field survey, it is considered unlikely that access will be afforded to significant parts of the Dee Estuary which have been industrialised. At present, the significance of these likely omissions cannot be estimated.

The opportunity has also been taken to contact as many other organisations as possible who might have an interest in the management of the Clwyd coastline.

Desk-based Study

The first stage of the survey project consisted of a more detailed desk-based study of all readily available documentary, cartographic and photographic sources than had been undertaken for the scoping survey. The study involved an examination of the County SMR and the resources of the National Monuments Record (NMR), Aberystwyth, the National Library of Wales, Aberystwyth, Clwyd County Record Office, Hawarden and Mold Local Studies Library. The aerial photographic collections at CPAT and the NMR were also examined and CPAT also conducted its own programme of oblique aerial photography for the study area.

In general, the information held at Hawarden proved to be the most valuable, with a fairly extensive collection of historic maps providing considerable data relating to existing and former archaeological sites, as well as information on coastal change.

Acknowledgments

Thanks are due to the staff at Clwyd Record Office, Hawarden, Clwyd Local Studies Library, Mold, National Monuments Record, Aberystwyth, and the National Library of Wales, Aberystwyth, for their assistance during the desk based survey. I would also like to thank the following for their kind cooperation and assistance: Morwenna Bolas of CCW, Sally Stevenson of BHP Petroleum, Alan Jemmet of Dee Estuary Forum, André Berry of Clwyd County Council.

Field Survey

Methods

The field survey was undertaken by one person systematically walking the areas of foreshore, coast edge and land edge. Archaeological features, coast types and erosion details were recorded directly onto a series of 1:10,000 maplets, with written descriptions being recorded onto standard CPAT site visit forms and coastal survey forms, with photography where appropriate in 35mm black and white negative and colour slide formats. The information from the record forms was subsequently entered into a database and integrated into the SMR. The whole coastline was surveyed with the exception of Point of Ayr Colliery and the industrial units occupying part of Mostyn Docks, where access was not permitted.

The coast was divided into segments identified as having individual characteristics and each length was recorded on a separate record form. The 15km of coast within the initial study area was eventually divided into 19 segments, each receiving a consecutive record number running from west to east. The coast edge, land edge and foreshore types were recorded according to the various categories described below, each of which was assigned a code for entry into the database. The coding system adopted differed from the Gwynedd (GAT) system, but a concordance is given in the listings below.

Coast Edge Type

Natural coast edge		GAT Code
AMM	Alluvial/Marine Mud	11
DU	Dunes	10
SA	Sand	10
Defence (against erosion)		
SDB	Sea Defence Bank	2
SDD	Sea Defence Dump	3/4
SDW	Sea Defence Wall	1
Protection (against inundation)		
CPB	Coast Protection Bank	2
Man-made structures		
MMW	Man-made Wall	1
MMD	Man-made Dump	3/4
MMS	Man-made Structures (other)	-

The majority of the coast edge identified (9.45km) consisted of some form of man-made structure, either Sea Defence Walls or Dumps (5.35km), Coast Protection Banks (1.3km), or other dumps, walls or structures (2.8km). The only natural coastal edge consisted of sand dunes along the coast from Prestatyn to Point of Ayr (5.25km), and even here the dunes themselves had often been artificially stabilised.

Land Edge Type		GAT Code
CO	Coppice/woodland	5
GC	Golf Course	-
IP	Improved pasture	3
MMD	Man-made Dump	1
MMS	Man-made structures (buildings roads etc)	1
SC	Scrub	4

Only 5.85km of the coastline could be said to be mostly natural along the land edge, consisting of dunes. In general, man-made structures and dumps either relating to industry, transport or leisure activities accounted for the majority of the land edge, including significant encroachment into the dunes.

Foreshore Type		GAT Code
MA	Marsh	6
MU	Mud	5
SA	Sand	4
SH	Shingle	3

In general, the area could be divided into two types of foreshore, a wide sandy beach along the coast between Prestatyn and Point of Ayr, and a combination of sand and mud along the Dee Estuary. Locally, there were slight variations, but the underlying conclusion was that the width and composition of the foreshore gave no indication of significant erosion.

Erosion Class		GAT Code
Stable	No erosion, aggrading or man-made protection	1
Slight	Some soil exposure but well vegetated	2
Moderate	Widespread soil exposure, intermittent slumping	3
Major	General soil exposure, frequent slumping, little vegetation	4
Severe	Widespread slumping, no vegetation	5

The identification of this category depended solely on a visual assessment of the present day coast edge. It was evident from documentary and cartographic sources that the coastline in this area has been the subject of considerable change, but this has largely been due to the influence of man, and generally falls outside the scope of this study.

As might be expected with such extensive sea defences and coastal protection works, the majority of the coast (7.75km) was judged to be stable, with a further 4km showing only slight erosion. Only two lengths of coast displayed signs of significant erosion, one near Point of Ayr Lighthouse where the erosion of the dunes is serious, and the other at Mostyn Docks, where erosion is moderate.

Archaeological survey

The archaeological element of the survey was conducted concurrently with the survey of coastal erosion. This involved visiting known sites identified from either the County SMR, the NMR, or during the desk-based study, and recording those and any new sites identified during the field visits. Only two sites were previously recorded on the SMR within the study area and a further 18 were identified during the survey.

Each site was located on the 1:10,000 project maplets and recorded on standard CPAT site visit forms. A summary is provided in the form of a gazetteer in Appendix 2.

Each site has been evaluated to give an indication of its potential significance according to the following classification:

- A** Sites of national importance which meet the criteria for scheduling or listing and require appropriate recording and management.
- B** Sites of regional or county importance which do not meet the criteria for scheduling or listing, but which are nevertheless of particular importance and merit further recording and management.
- C** Sites of local importance which may merit further investigation and recording if threatened.
- D** Minor and damaged sites for which rapid recording is considered sufficient, or sites for which the information provided by the desk-top assessment and field survey is considered sufficient.
- E** Sites whose importance could not be fully determined from the desk-top assessment and field survey.

It should be noted that the inclusion of a site within one of the lesser categories is not an indication of lack of importance, and consideration should still be given to such sites regarding their future preservation and management.

KEY TO MAPS

4 DU/slight-moderate - Coast record No 4 / Coastal edge = Dunes /
Erosion = slight to moderate

Archaeology

+ Find spot

• Industrial

□ Military

◇ Medieval

* Post Medieval

Transport

102005 SMR existing record

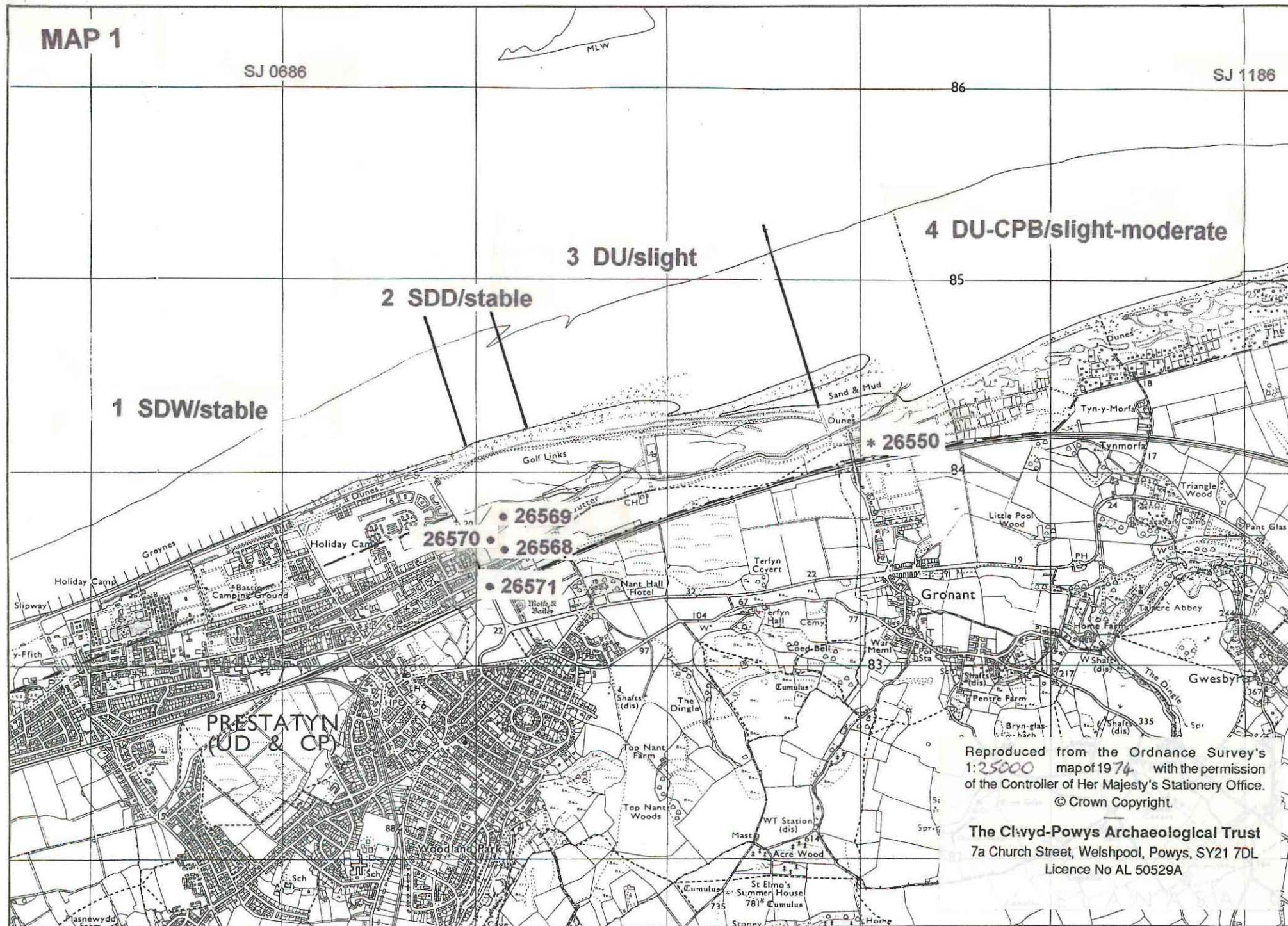
205560 New record

— • — Limit of survey area

MAP 1

SJ 0686

SJ 1186



1 SDW/stable

2 SDD/stable

3 DU/slight

4 DU-CPB/slight-moderate

• 26569
26570 • 26568
• 26571

* 26550

PRESTATYN
(UD & CP)

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4 DU-CPB/slight-moderate

* 26551

□ 26573

□ 26574

5 DU-SA/Major

26575 □

26552 *

◇ 103002

MAP 2

SJ 1685

6 CPB/stable

* 26553

• 26558

7 MMD- MMS/stable

26555

26556 •

26557

* 26554

MOSTYN BANK

8 SDW/stable

10 MMD-MMS/slight

* 26559

9 MMS-MMD/moderate

• 26572

* 102475

• 26560

26562 #

* 26566

26561 •

26564/26577

26563 #

26565

106098 •

• 26567

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Record no 1 PRESTATYN**Grid References** SJ050834-069841**Coastlength** 2.10**Map No** 1**Direction** NNW
Facing**Coastal Description**

Prestatyn seafront has its entire length protected by a concrete sea wall and stepped coastal defence, which was constructed between 1958 and 1971. Older timber groynes have more recently been replaced by substantial groynes composed of large boulders in a further attempt to prevent loss of sand. Within the last 20 years sand has been dredged from offshore and deposited on the beach to replace eroded deposits.

The seafront itself consists of the coastal drive with low sand dunes on the landward side at the west end and car parks, an amusement centre and yacht club to the east.

Although the sea defences are substantial and generally control coastal erosion in this area, they do not provide absolute protection from flooding. During the storms of 1990 there was considerable overtopping of the defences leading to serious flooding of the immediate coastal strip.

Archaeology

No surviving archaeological sites were noted within the area of study.

Record no 2 PRESTATYN**Grid References** SJ069841-074842**Coastlength** 0.40**Map No** 1**Direction** NNW
Facing**Coastal Description**

The coastal edge is formed by a dump of caged and loose rocks, fronting high, stable dunes. Behind the dunes lies Prestatyn Golf Course. The area of dunes and foreshore forms a part of the Gronant Dunes and Talacre Warren SSSI, an area of botanical, entomological and ornithological interest. This section, known as Gronant Dunes, consists of a single ridge of stable dunes.

Archaeology

The only archaeological evidence within the study area relates to the former Prestatyn Alkali Works (PRN26571), which was located north of the railway at the junction of Barkby Road and Marine Road East. The Works are depicted on the OS 1st Edition of 1872 as inactive, and the site is now built over. Three associated sites were revealed during the survey, lying in the field between Marine Drive East and the Prestatyn Gutter. An embankment (PRN26568) leads northwards to the site of the former landing stage (PRN26569) for the Alkali Works, located on the Prestatyn Gutter, and to the west lies the site of an Engine House (PRN26570), all of which appear on the OS 1st Edition and a plan of Nant Hall Estates dated 1879.

Record no 3	PRESTATYN/GRONANT	Map No	1
Grid References	SJ074842-087845	Coastlength	1.40
		Direction	NNW
		Facing	

Coastal Description

The area is characterised by high, stable dunes, with a mix of shingle/sand/pebbles forming bars along the foreshore which absorb most of the wave energy. Only one section, c.20m in length, shows signs of active erosion where a face c.1.8m high is exposed in the dunes. The area of dunes and foreshore forms a part of the Gronant Dunes and Talacre Warren SSSI, an area of botanical, entomological and ornithological interest. This section, known as Gronant Dunes, consists of a single ridge of stable dunes at the west, dividing into a series of ridges towards the mouth of the Prestayn Gutter, with shingle banks and dune ridges on the landward side, between which are tidal channels with developing salt marsh.

Archaeology

No sites of archaeological interest were noted within the study area.

Record no 4	TALACRE WARREN	Map No	1
Grid References	SJ083845-122853	Coastlength	3.35
		Direction	NNW
		Facing	

Coastal Description

The area of dunes and foreshore forms a part of the Gronant Dunes and Talacre Warren SSSI, an area of botanical, entomological and ornithological interest. This section, known as Talacre Warren, consists essentially of two dune ridges between which are a series of dune slacks, or hollows, which are of particular botanical interest as habitats ranging from damp slacks to brackish marsh.

At the west end a bar of low dunes with sandy foreshore protects an area of salt marsh at the mouth of the Prestatyn Gutter. The Gutter, which was once navigable, is now blocked by flood control defences consisting of an embankment c.120m long with a sluice. East of the sluice, the Gutter has silted to form the salt marsh which is backed by low dunes and Presthaven Sands Caravan Park. Slight erosion is evident along the sand/dunes bar. Further east, a wide, sandy foreshore is backed by high, stable dunes with the caravan park to the rear. Slight erosion of the dune face is evident, increasing to moderate erosion with some slumping of the dunes towards Point of Ayr Lighthouse.

Archaeology

No known archaeological sites had been identified within the study area, although the survey revealed two new sites. At the western end, close to the entrance to Presthaven Sands Caravan Park, a stone building (PRN26550), now the Anchorage Public House, was formerly part of the Life Boat Station, depicted on the OS 1st Edition of 1872. The building has been much altered with recent additions.

Further to the east, on the beach in front of Talacre Warren, lies the remains of a Second World War Pillbox (PRN26576). The Pillbox is constructed of reinforced concrete and is cylindrical, 2m in diameter, with six gun slits. This is the westernmost of a series of four such features, of which three still survive. The pillboxes appear to be of a type known as Pickett-Hamilton Forts, usually associated with airfields. These were sunken structures which remained flush with the surface

until an attack threatened, at which time they were raised and manned (Lowry 1995, 122-3). The structure is now badly damaged and displaced, its original siting unclear.

There are several historical references to a turbary at "Gronandesmore" during the mid 14th century, and one dated 1357 which refers to the drainage of the "more" and protection from the sea by "great bunds". However, the location of the turbary is unknown, and there is no evidence remaining for the drainage works or sea defences.

Record no 5 POINT OF AYR

Grid References SJ122852-128852

Coastlength 0.70

Map No 2

Direction N
Facing

Coastal Description

This stretch of coast extends from Point of Ayr Lighthouse to the tip of Point of Ayr, at the mouth of the Dee Estuary. The area lies within the Dee Estuary SSSI, designated for its importance for waders and wildfowl. The coast edge is formed by low dunes and sand forming a spit, behind which lies an area of mudflats and salt marsh, with some scrub land and residential development at the landward edge. The foreshore consists of a wide expanse of sand backed by low dunes. Coastal erosion is a serious problem, with the dunes under constant threat. There is evidence that the high dunes further west were formerly more extensive but have been eroded in this area.

Archaeology

The only previously known site is the find spot of a silver groat (PRN103002), found somewhere on the beach. The survey has added five new sites to the SMR. Point of Ayr Lighthouse (PRN26551), standing to five storeys, was designed by Walker and Burgess Engineers of London, and constructed in 1776 on piles driven into the sand. Later replaced by the Dee lightship in 1883, it was converted to a dwelling in 1977. The lighthouse is located on the beach c. 70m in front of the dunes. A print of 1815 shows the lighthouse amongst high dunes, indicating the extent of erosion during the past 180 years. Adjacent to the lighthouse are the remains of a slipway (PRN26552) constructed of dressed stone slabs, and presumably associated with a former lifeboat station, which was closed in 1923, and its location now lost. This feature has suffered considerable erosion and damage from the sea.

The beach and dunes at both Point of Ayr and Talacre Warren were used by the military during the Second World War as a training ground, and several sites survive from this period. Two Pillboxes (PRN26574 and 26575) are situated on the beach, one either side of the lighthouse. They are constructed of reinforced concrete and are cylindrical, 2m in diameter, and appear to be of a type known as Pickett-Hamilton Forts. Both are severely damaged and displaced. Their position so far from the High Water Mark may be evidence for considerable erosion of the dunes since their construction. Along the foreshore within this area are a series of rows of larch poles (PRN26573) which are assumed to be the remains of glider defences. All of these military features are under serious threat from erosion by the sea, and a study has been commissioned by BHP Petroleum from AC Archaeology to assess their importance, survival and future management.

Record no 6	TALACRE	Map No	2
Grid References	SJ128852-125840	Coastlength	1.10
		Direction	E
		Facing	

Coastal Description

A coastal protection bank forms the coastal edge, with sand and mudflats along foreshore forming part of the Dee Estuary SSSI. The area is important for waders and wildfowl, and is managed as a nature reserve by the RSPB. Inland, there is residential/tourist development at the northern end with the BHP Petroleum Gas Terminal to the south and a small area of nature reserve in between.

Archaeology

The only archaeological feature identified within the area was the early 18th-century coastal protection bank (PRN26553), which still forms the coast edge. The bank was constructed to protect reclaimed areas to the west, and the earliest reference is dated 1787 on a map of Talacre Harbour.

Record no 7	POINT OF AYR COLLIERY	Map No	2
Grid References	SJ127840-132829	Coastlength	1.25
		Direction	NE
		Facing	

Coastal Description

The entire coastal edge is formed by waste tips and structures relating to Point of Ayr Colliery, with the colliery itself occupying most of the land strip, separated from the BHP Petroleum Gas Terminal by the former Coastal Protection Bank (PRN26554). At the southern end, a small area of pasture lies between the railway and the former Coastal Protection Bank. The foreshore consists of a wide expanse of sand and mudflats, which lies within the Dee Estuary SSSI.

Archaeology

The archaeology of this stretch of coast is associated with two sites, Talacre Harbour (PRN26555) and Point of Ayr Colliery (PRN26558). The Harbour is assumed to date back at least to the 18th century, and appears on a map of 1787. The main development of the Harbour dates to the 1830s and 1840s, although its later incorporation into the Colliery, has significantly changed its appearance, resulting in the loss of jetties at the eastern end. Picton Pool, which lies to the west of the Harbour and is now silted, may originally have been used as a flushing pond for the harbour.

The first borings for Point of Ayr Colliery occurred in 1865 but there was no significant production there until the 1880s. It is still in production, under the ownership of RJB Mining. Modern additions and improvements to the plant have probably damaged or destroyed the earlier features, although it was not possible to gain access to inspect the site.

Two other features associated with the colliery and harbour are the sites of former tramways. The earlier, Crockford's Tramway (PRN26557), served the harbour and dates to 1840-50, located between the modern access road and the former coastal protection bank. No visible trace remains. The later colliery tramway (PRN26556) ran along the eastern side of Tanlan Road, which is now the main access road for the colliery.

Record no	8	FFYNNONGROYW	Map No	2
Grid References	SJ132829-153811	Coastlength	2.85	Direction
				NE
			Facing	

Coastal Description

The long stretch of coast edge is formed by the sea defensive wall associated with and along side the railway. The recently constructed Ffynnongoyw bypass follows the SW side of railway for much of the length, the remainder of the land edge being formed by pasture, with small areas of woodland. The foreshore consists of a wide expanse of sand and mudflats, forming part of the Dee Estuary SSSI.

Although the coast edge is generally stable, the sea defences were breached during the severe storm of 1990, leading to flooding within Ffynnongoyw. This demonstrates the vulnerability of low lying areas along the coast.

Archaeology

A boundary stone (PRN26559) located on the beach at Ffynnongoyw bears the initials of the River Dee Company, and a date of 1785. Also, a disused colliery shaft (PRN26560) and two further shafts (PRN26561) lie within 150m of the HWM. At the edge of the landstrip lies Llwyn y Bedd cross base (PRN102475). The pedestal of a cross c.0.45m square lies in the NW corner of the wood and is assumed to be post-medieval.

Record no	9	MOSTYN QUAY	Map No	2
Grid References	SJ153811-156814	Coastlength	0.35	Direction
				NW
			Facing	

Coastal Description

The coast edge is formed by the old Mostyn Quay, consisting of a dump of material forming the breakwater, with a badly eroded stone facing at the NE tip. The foreshore consists of a wide expanse of sand and mudflats, forming part of the Dee Estuary SSSI.

Archaeology

The Old Quay (PRN26562) survives, but with no trace of original features. The coastal side is actively eroding, particularly noticeable at the tip of the breakwater where the stone facing is now in a poor state. A late 19th-century flour mill and a saw mill have now disappeared, and the only buildings are recent warehouses.

The dock area is probably that constructed as part of the Darwen and Mostyn Iron works during the late 18th century, and is still in use. A triangular flushing pond (PRN26563) survives between the dock and the railway, and together with a second pond further east but now lost, was used to prevent silt deposits building up within the dock.

Record no 10 MOSTYN DOCKS**Grid References** SJ156814-164804**Coastlength** 1.20**Map No** 2**Direction** NE
Facing**Coastal Description**

The coast edge is formed by the docks and spoil dumps from the colliery and ironworks. Although the immediate docks area is still in use, the remainder of the area forming the land edge is now either derelict or occupied by industrial units, to which it was not possible to gain access. The coast is generally stable apart from slight erosion along the old breakwater which has caused undercutting.

The foreshore consists of a wide expanse of sand and mudflats, forming part of the Dee Estuary SSSI.

Archaeology

Mostyn Docks (PRN26564) is now a small ports authority, but was originally constructed as part of the Darwen and Mostyn Ironworks (PRN26567) around 1890. At this time iron ore was imported from Spain with large steamers discharging their cargoes into lighters in Mostyn Deep, before landing at the Docks. Prior to this the site was occupied by a foundry and shipyard c.1840. The Docks still operate but the remainder of the dockyard and ironworks area has been almost completely levelled and is largely occupied by industrial units.

Associated with the docks are two flushing ponds (PRN26563 and PRN26565), as well as the site of the Isolation Hospital (PRN26566), which is located on the old breakwater (PRN26572). Within the docks, along the northern side, lie the remains of a small timber vessel settled in the mud (PRN26577). The only surviving remains associated with Mostyn Colliery (PRN106098) is a brick collar for a capped shaft which is located within the docks area.

Conclusions and Recommendations

Summary of results

The statistics for the different categories of coast edge type are presented in Fig. 1, below.

Fig. 1. Coast edge types

Type	Code	Length (km)	%
Dunes	DU	5.25	35.8
Sea Defence Dump	SDD	0.40	2.7
Sea Defence Wall	SDW	4.95	33.7
Coast Protection Bank	CPB	1.30	8.8
Man-made Dump/ Man-made Structure	MMD/MMS	2.80	19.0

The figures illustrate that although coastal dunes may be the single most extensive type of coast edge, accounting for 5.25km (35.8%), the various man-made coastal defences actually account for 9.45km (64.2%). The result is that the overwhelming majority of the coastal length remains stable, a fact which is highlighted by the statistics in Fig. 2.

Fig. 2. Erosion classes

Type	Length (km)	%
Stable	7.70	52.4
Slight	5.45	37.0
Moderate	0.35	2.4
Major	1.20	8.2

A total of 28 new sites have been added to the SMR, largely resulting from the desk-based study. Several of these sites have no surviving trace, but are still recorded because of their significance or likely impact for Development Control. All of the 28 new sites are of post-medieval or modern date, of which 18 relate to industrial or port functions. Reflecting the overall stability of the coast, only six sites were identified as being under serious threat from coastal erosion, five of which lie on the beach at Point of Ayr. The sixth site is a small timber vessel within Mostyn Docks, which is under serious threat. The gazetteer in Appendix 2 lists all new and known sites, together with the perceived threat and suggested responses. The threat from coastal erosion is perhaps not the main problem facing those archaeological sites within the study area. The development of the coast for tourism, leisure and industry poses a significant threat and has resulted in the loss of several major industrial sites without any archaeological response. The sites identified during this study warrant close monitoring in relation to development control to avoid further losses.

Assessment of Erosion

As with the study by the Gwynedd Archaeological Trust, the recording of erosion has been descriptive and qualitative rather than quantitative, due to the lack of available information. For much of this stretch of the Clwyd coast the historical evidence suggests that the coast edge has been advancing rather than retreating, due both to nature and land reclamation. During the Late Mesolithic period, at least for a time, it would appear that the coast edge was close to Nant Hall Road, Prestatyn, where extensive shell middens have been recorded, at a position which is now c.1km from the coast. The draining of marshes and construction of sea defences at Prestatyn, and the protection afforded by the dunes at Gronant and Talacre Warren have resulted in a relatively stable coastline, as indicated by a comparison between the 1st edition OS survey of 1872 and the present day.

The Dee Estuary has been subjected to considerable changes during the last 300 years, with significant alterations to the navigable course of the Dee, the disappearance of salt marshes along the coast and the fixing of the coast edge between Talacre Harbour and Mostyn by the construction of the railway. These changes are documented by a series of maps of the estuary, including the 1684 survey by Greenville Collins, John Mackay's survey of 1732 and further surveys in 1840 and 1849.

These surveys, together with a comparative map (D/LA/97) detailing changes in the area around Talacre Harbour in Hawarden Record Office, also illustrate the changes at Point of Ayr, which is currently the only area where coastal erosion may be considered a significant problem. It is clear that the high dunes of Talacre Warren were formerly more extensive, and have retreated significantly during the last 200 years. A significant marker is Point of Ayr Lighthouse, which was constructed in 1776. A print dated 1815 shows the lighthouse amongst high dunes, whereas today it stands on the foreshore at least 70m in front of the dunes.

Long term erosion cycles and changing sea-levels

From the end of the last glaciation (c. 10000BP) to the early Neolithic (c. 5700BP) sea-levels have risen steadily in Britain (Tooley 1974), although the local effects are often complicated, not least as a result of isostatic recovery. Thus, low-lying coastal margins have been submerged, as evidenced by the offshore remains of forests and peat beds near Rhyl. Since the Neolithic period sea-levels are thought to have fluctuated within 5m of present day levels (Tooley 1974).

During normal conditions, wave erosion is not seen to be a significant problem within the study area. However, even during normal high tides there is an erosion threat at Point of Ayr, which becomes serious during exceptional tides and storms. The effects of this combination of factors was amply illustrated in 1990 when the sea defences were breached at Towyn and Ffynnonroyw and overtopped at Prestatyn, leading to extensive flooding. This type of event has serious implications when considered in the context of rising sea-levels. The generally low-lying nature of the Clwyd coastal strip could mean that significant areas may be prone to inundation. The likely effects on the archaeological resource are difficult to predict, but few of the sites identified lie above the 5m contour, and an area extending inland at least as far as the A548 could be at risk.

Other coastal influences affecting archaeology

Increasingly, the coastal area is being developed as a leisure and tourist resource, as well as a location for industry. In the case of the former, virtually the entire land strip between Prestatyn and Point of Ayr has been occupied by leisure parks, golf courses and caravan sites, clearly illustrating the impact on the environment in general. A general scarcity of archaeological sites has meant, however, that the effect on this resource has been less than might be expected. Along the Dee Estuary industry has been the major development, with three significant sites within the study area: Point of Ayr Colliery, BHP Petroleum Gas Terminal and Mostyn Docks. It is this type of development which poses a serious threat to the archaeology, and in particular to the industrial sites.

The majority (83%) of the coast between Prestatyn and Mostyn is protected as an SSSI, including the Gronant Dunes and Talacre Warren, and the Dee Estuary, although this only extends to the HWM. The safeguarding of the archaeological resource from development threats is dealt with under Development Control procedures, but generally this is the only protection afforded to coastal sites. At the time of this study, two management reports are in preparation which relate to this area and include archaeological components. The main document is being prepared by the Dee Estuary Forum, and includes a chapter on the Historic Environment, which will take into account those sites identified by this study. A smaller scale report is being prepared by BHP Petroleum to manage their holdings at Point of Ayr and as part of that an assessment of the archaeology has been commissioned, specifically in relation to the military sites. At present, although the Local Plans for Delyn and Rhuddlan Boroughs as well as the Clwyd County Structure Plan do take account of the archaeology, this focuses on threats from development rather than from erosion.

Conclusions

The survey is an important step in furthering the protection of the archaeological resource within the coastal margins. Although the nature of the study is that of a rapid survey, it has been successful in identifying new sites and recording the nature of the coastline and assessing the perceived threat from erosion. Although the majority of the study area has a relatively stable coast edge, largely due to man-made defences and high dunes, localised areas are at particular risk. The continuation of the study to include the remainder of the Clwyd coast and Dee Estuary will enable a better understanding of the archaeology and the nature of the coast, and will allow a better assessment of their relationship.

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Appendix 1: Coast Types and Erosion Assessment

Record No.	Grid refs	Coast length length (km)	Coast edge type	Land edge type	Foreshore type	Erosion Class
1	SJ050834-069841	2.10	SDW	MMS/DU	SA	stable
2	SJ069841-074842	0.40	SDD	DU/GC	SA	stable
3	SJ074842-087845	1.40	DU	DU/GC	SA/SH	slight
4	SJ083845-122853	3.35	DU/CPB	DU/MMS	SA/MA/S	slight/mod
5	SJ122852-128852	0.70	DU/SA	SA/MA/SC	SA	Major
6	SJ128852-125840	1.10	CPB	MMS/CO	SA/MU	stable
7	SJ127840-132829	1.25	MMD/MMS	MMD/MMS/IP	SA/MU	stable
8	SJ132829-153811	2.85	SDW	MMS/IP	SA/MU	stable
9	SJ153811-156814	0.35	MMS/MMD	MMS	SA/MU	moderate
10	SJ156814-164804	1.20	MMD	MMD/MMS	SA/MU	slight

Total coastal length 14.70

Appendix 2: Gazetteer of Archaeological Sites

PRN	NGR	Site Description	Period	Condition	Cat	Threat	Coast Unit	Action
26550	SJ09058415	Gronant Lifeboat House	Modern	Intact	C	tourism	4	Monitor
26551	SJ12108525	Point of Ayr Lighthouse	Post Medieval	Intact	A	ser. erosion	5	Monitor
26552	SJ12108525	Point of Ayr Slipway	Post Medieval	Damaged	C	stable	5	Survey
26553	SJ12108525	Talacre Coastal Protection Bank	Post Medieval	Near intact	D	stable	6	Nil
26554	SJ128830	Tanlan Coastal Protection Bank	Post Medieval	Near intact	D	stable	7	Nil
26555	SJ126836	Talacre Harbour	Post Medieval	Damaged	D	industry	7	Monitor
26556	SJ125833	Point of Ayr Colliery Tramway	Modern	Intact	D	industry	7	Monitor
26557	SJ125832	Point of Ayr Crockford's Tramway (site of)	Modern	Destroyed	D		7	Monitor
26558	SJ127837	Point of Ayr Colliery	Modern	Intact	B	industry	7	Monitor
26559	SJ14158205	Ffynnongroyw Boundary Stone	Post Medieval	Intact	C	stable	8	Monitor
26560	SJ14738135	Llinegar Mine Shaft	Modern		D	none	8	Nil
26561	SJ15108115	Mostyn Mine Shafts	Modern		D	none	8	Nil
26562	SJ155812	Mostyn Quay	Post Medieval	Damaged	B	mod. erosion	10	Monitor
26563	SJ15458105	Mostyn Docks Flushing Pond 1	Modern	Intact	B	industry	10	Monitor
26564	SJ156810	Mostyn Docks	Modern	Intact	B	industry	10	Monitor
26565	SJ157810	Mostyn Docks Flushing Pond 2	Modern	Intact	B	industry	10	Monitor
26566	SJ15638123	Mostyn Docks Isolation Hospital (site of)	Modern	Destroyed	D		10	Nil
26567	SJ158808	Darwen and Mostyn Ironworks	Modern	Destroyed	D		10	Nil
26568	SJ07138365	Prestatyn Alkali Works Trackway	Modern	Damaged	C	industry	2	Survey
26569	SJ07138370	Prestatyn Alkali Works Landing Stage (site of)	Modern	Destroyed	D		2	Nil
26570	SJ07138365	Prestatyn Alkali Works Engine House (site of)	Modern	Damaged	D		2	Survey
26571	SJ071835	Prestatyn Alkali Works (site of)	Modern	Destroyed	D		2	Nil
26572	SJ158815	Mostyn Docks Breakwater	Modern	Damaged	B	mod. erosion	10	Nil
26573	SJ123852	Point of Ayr Anti Glider Poles	Modern	Damaged	B	ser. erosion	5	Survey
26574	SJ12308515	Point of Ayr Pill Box 1	Modern	Damaged	B	ser. erosion	5	Survey
26575	SJ11958525	Point of Ayr Pill Box 2	Modern	Damaged	B	mod. erosion	4	Survey
26576	SJ10408513	Point of Ayr Pill Box 3	Modern	Damaged	B	mod. erosion	4	Survey
26577	SJ15638122	Mostyn Dock Wreck	Modern	Damaged	C	mod. erosion	10	Record
102475	SJ14128178	Llwyn y Bedd Cross base	Post medieval	Damaged	B	none	8	Nil
103002	SJ1285	Talacre Beach Groat	Medieval		E		5	Nil
106098	SJ15388115	Mostyn Coalmine	Modern	Destroyed	D		10	Nil

Appendix 3: Scoping Study reference material

Date	Type	Record Office	Reference
ABERGELE			
1741	MAP	NLW	PENTRE (p12)
1831	MAP	NLW	PENTRE (p28)
1835	MAP	NLW	ADMIRALTY CHART
BAGILLT			
	ARTICLE		ARCH CAMB
	MAP		M/WMC/A
	MAP	HAWARDEN	D/DM/734/3
c1910	PHOTO	HAWARDEN	2/184
c1915	PHOTO	HAWARDEN	2/145
COLWYN			
1745	MAP	RUTHIN	DD/DM/488/6-7
1872	MAP	RUTHIN	DD/PO/2979
L 19th	MAP	HAWARDEN	D/M/4848
CONNAH'S QUAY			
1849	MAP	NLW	BRN 6242
1862	MAP	NLW	BET p349
1864	MAP	NLW	BRN 1878
?1866	MAP	NLW	BRN 6252
DYSERTH			
	MAP	HAWARDEN	D/GW/664
	MAP	HAWARDEN	D/DM/540/5
1814	MAP	HAWARDEN	DC/221
c.1736	MAP	HAWARDEN	NT/M/9
FFYNNONGROYW			
		NMR	
19th	MAP	HAWARDEN	D/MT/594
c1920	PHOTO	HAWARDEN	19/34
FLINT			
	MAP	HAWARDEN	MS 8542
	MAP	NLW	BET p352
1737	MAP	HAWARDEN	D/DM/12/1
1740	MAP	HAWARDEN	NT/M/28
1850	MAP	NLW	BET p332
1854	MAP	HAWARDEN	NT/M/90
1924	MAP	HAWARDEN	D/DM/136/5(d)

Appendix 3: Scoping Study reference material

Date	Type	Record Office	Reference
c1799	MAP	HAWARDEN	D/DM/50/1
GREENFIELD			
c.1843	MAP	HAWARDEN	D/M/5251
HAWARDEN			
1732	MAP	HAWARDEN	DC/199
1733	MAP	HAWARDEN	D/HA/599
1740	MAP	HAWARDEN	D/DM/8
1740	MAP	HAWARDEN	D/HA/602
1836	MAP	HAWARDEN	D/HA/622
1858	MAP	HAWARDEN	DC/202-12
18th	MAP	HAWARDEN	NT/M/7
Mid19	MAP	HAWARDEN	D/HA/623
HOLYWELL			
1717	MAP	HAWARDEN	D/DM/540/3
1800	MAP	HAWARDEN	D/GR/1690
1817	MAP	HAWARDEN	D/GR/1704
1824	MAP	HAWARDEN	D/DM/136/a-f
1833	MAP	HAWARDEN	D/DM/12/4
19th	MAP	HAWARDEN	NT/M/98
L18th	MAP	HAWARDEN	D/BC/302
c1735	MAP	HAWARDEN	D/MT/593
c1780	MAP	HAWARDEN	D/GW/670
c1833	MAP	HAWARDEN	D/KK/550
LIVERPOOL BAY			
1980	ARTICLE		JONES 1980
1947	BOOK		NEAVERSON 1947
LLANERCH Y MOR			
19th	MAP	HAWARDEN	D/BC/286,289
1900	PHOTO	HAWARDEN	42/57
LLWYN Y BEDD			
		NMR	
MELIDEN			
1820	MAP	HAWARDEN	D/DM/136/1
1858	MAP	HAWARDEN	D/BD/149
MOSTYN			

Appendix 3: Scoping Study reference material

Date	Type	Record Office	Reference
	ARTICLE		ARCH CAMB
1970	ARTICLE		FLINT HIST SOC
	MAP	HAWARDEN	D/M/5139
1742	MAP	HAWARDEN	D/M/5248
1743	MAP	HAWARDEN	NT/M/135
1751	MAP	HAWARDEN	D/M/5139
1814	MAP	HAWARDEN	D/M/5139
1816	MAP	HAWARDEN	NT/M/136
1848/1879	MAP	HAWARDEN	D/M/5134-8
1865	MAP	HAWARDEN	QS/DP/4
1870	MAP	HAWARDEN	D/DM/359/1
1870	MAP	HAWARDEN	D/DM/182/2-4
1870/1901	MAP	HAWARDEN	D/DM/359/1-3
1879	MAP	HAWARDEN	D/DM/255/26
1888	MAP	HAWARDEN	QS/DP/9
1888-9	MAP	HAWARDEN	D/DM/161/5
1931-2	MAP	HAWARDEN	D/M/4893-7
1938	MAP	HAWARDEN	D/M/5250
c1850	MAP	HAWARDEN	D/DM/315/1
1969	PHOTO	HAWARDEN	42/27B
c1905	PHOTO	HAWARDEN	42/50

POINT OF AYR

1885/1890	MAP	HAWARDEN	D/LA/103-5
1990	PHOTO	NMR	
c1906	PHOTO	HAWARDEN	19/66
	PRINT	NMR	

PRESTATYN

		NMR	
1978	BOOK	MOLD LSL	COAST PROTECT.
1981	BOOK	MOLD LSL	THOMPSON 1981
1984	BOOK	MOLD LSL	THOMAS 1984
1989	BOOK	MOLD LSL	HARRIS 1989
1993	BOOK	MOLD LSL	THOMAS 1993

QUEENSFERRY

1848	MAP	HAWARDEN	DC/775
1861	MAP	HAWARDEN	D/BC/627

RHOS

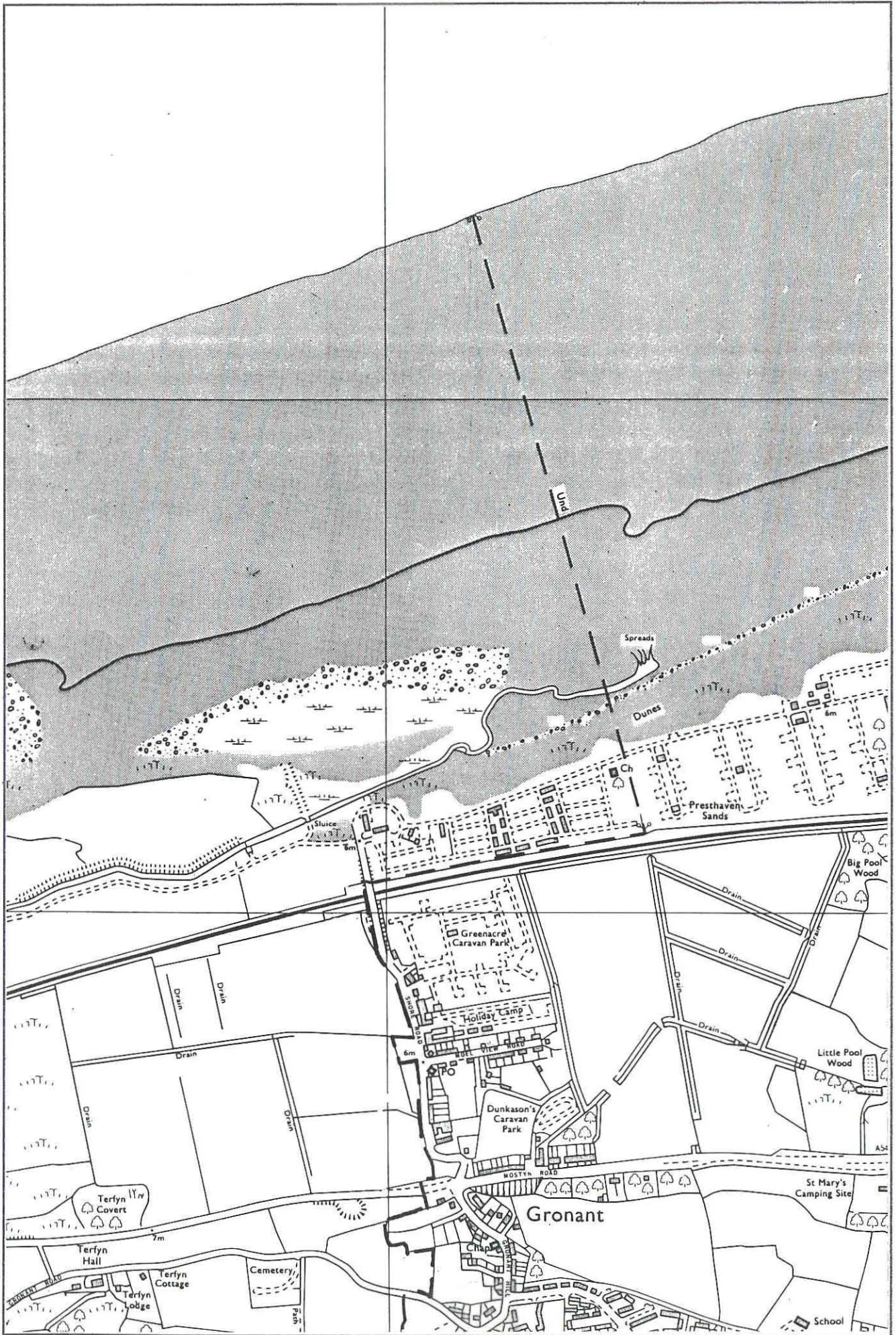
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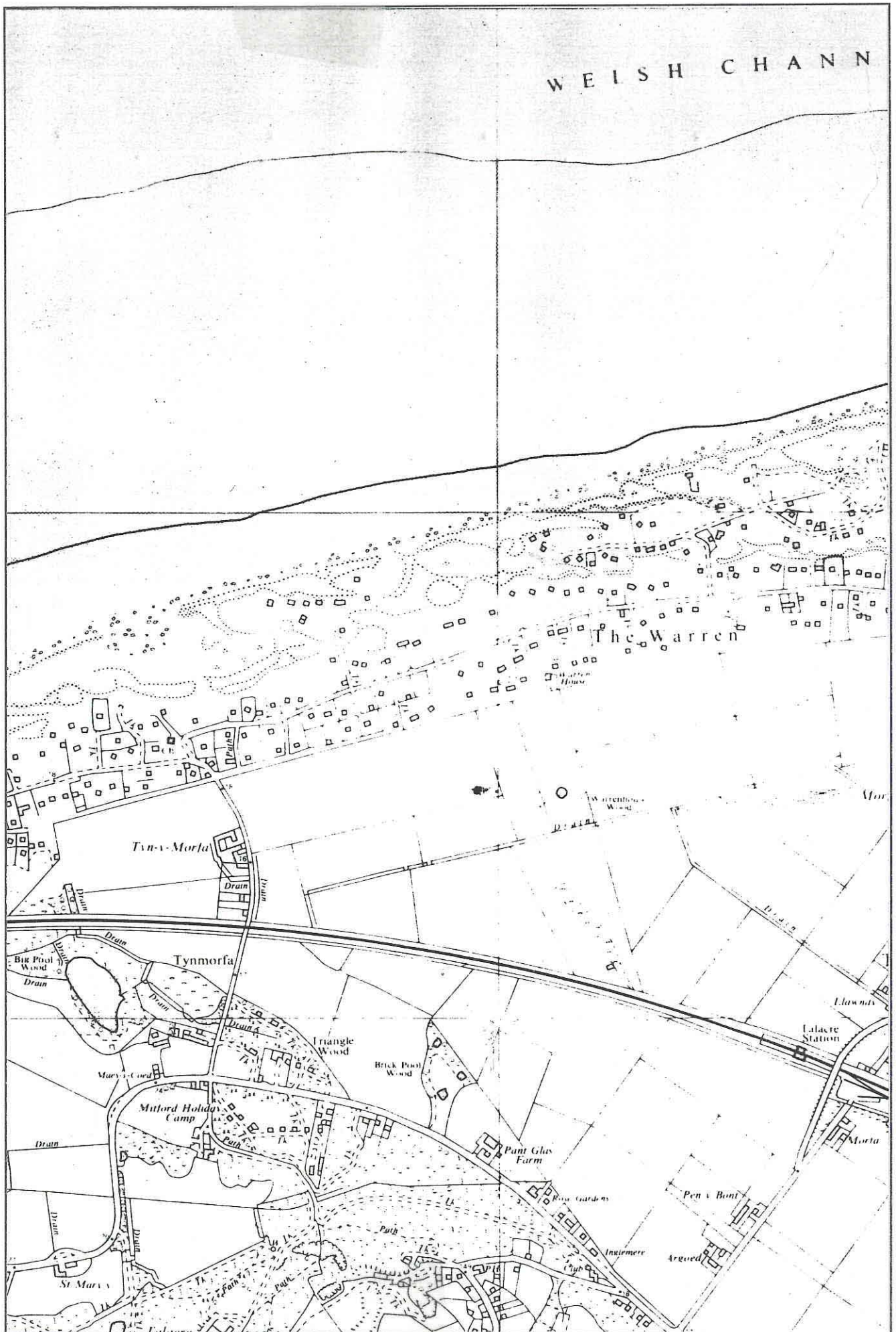
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1926	ARTICLE		ARCH CAMB 1926
1907	DOC	HAWARDEN	DC/189
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1780	MAP	HAWARDEN	D/GW/663
1794	MAP	HAWARDEN	DC/219
1796	MAP	HAWARDEN	DC/220
1800	MAP	HAWARDEN	D/DM/136/11
1855	MAP	HAWARDEN	DC/233
1865	MAP	HAWARDEN	DC/237
RHYL			
		NMR	
	ARTICLE		ARCH CAMB
1895/1939	DOC	HAWARDEN	D/DM/714/41-56
1914/1935	DOC	HAWARDEN	FC/C/6/815-17
1836	MAP	HAWARDEN	DC/240
1842	MAP	HAWARDEN	NT/M/10
1842	MAP	HAWARDEN	NT/M/11
1851	MAP	HAWARDEN	DC/243
1852	MAP	HAWARDEN	IC/3B
1852	MAP	HAWARDEN	DC/244
c1826	MAP	HAWARDEN	DC/228
RIVER DEE			
1986	BOOK	HAWARDEN	COHEN 1986
1995	BOOK	MOLD LSL	
1907	DOC	HAWARDEN	DC/74
1674	MAP	HAWARDEN	D/M/5139(ii)
1684-1849	MAP	HAWARDEN	D/BJ/424-30
1732	MAP	HAWARDEN	D/M/5139(iv)
1736/1889	MAP	HAWARDEN	D/LA/64-82
1737/1937	MAP	HAWARDEN	D/DM/223/29-35
1740	MAP	HAWARDEN	D/HA/602
1772	MAP	HAWARDEN	D/DM/819
1787	MAP	HAWARDEN	D/LA/39
1807	MAP	HAWARDEN	D/M/4888
1970	MAP/DOC	HAWARDEN	D/DM/390/12
SALTNEY			
1856	MAP	NLW	BRN 2180

Appendix 3: Scoping Study reference material

Date	Type	Record Office	Reference
SHOTTON			
1973	ARTICLE		FLINT HIST SOC
1758	MAP	HAWARDEN	D/BC/625
TALACRE			
	ARTICLE		FLINT HIST SOC
1839	MAP	HAWARDEN	D/LA/97
TOWYN			
1992	DOC	MOLD LSL	
1992	DOC	MOLD LSL	

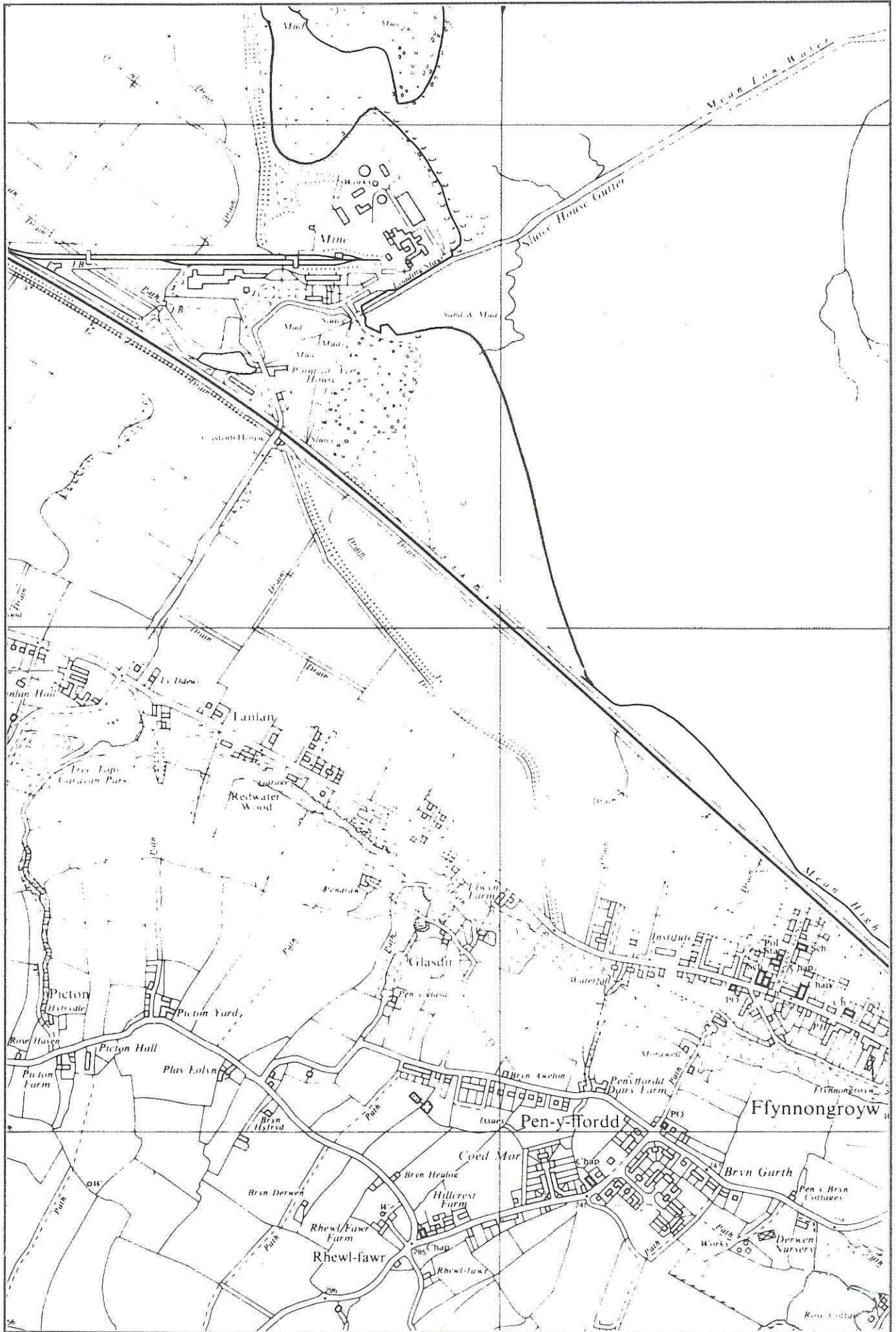


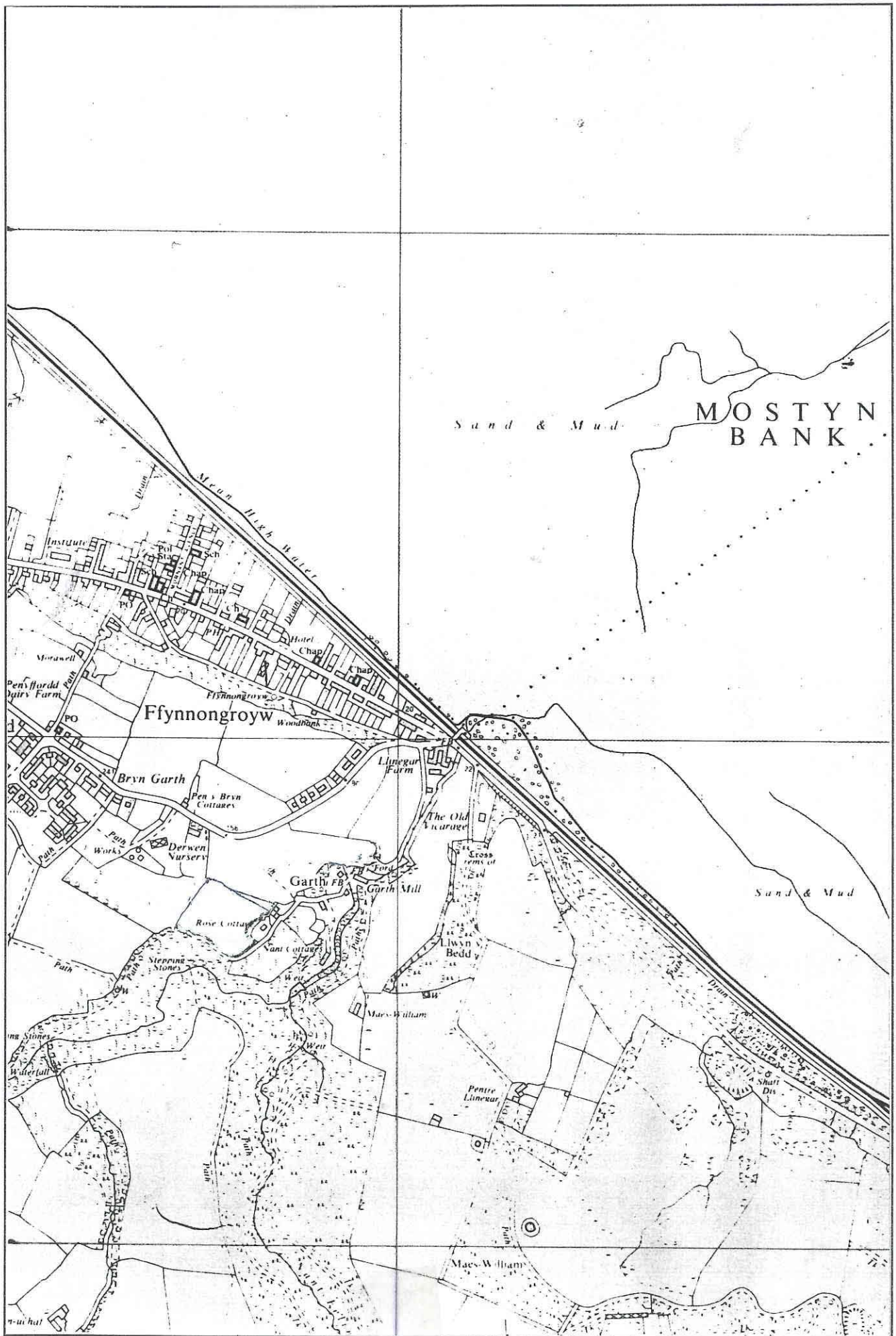
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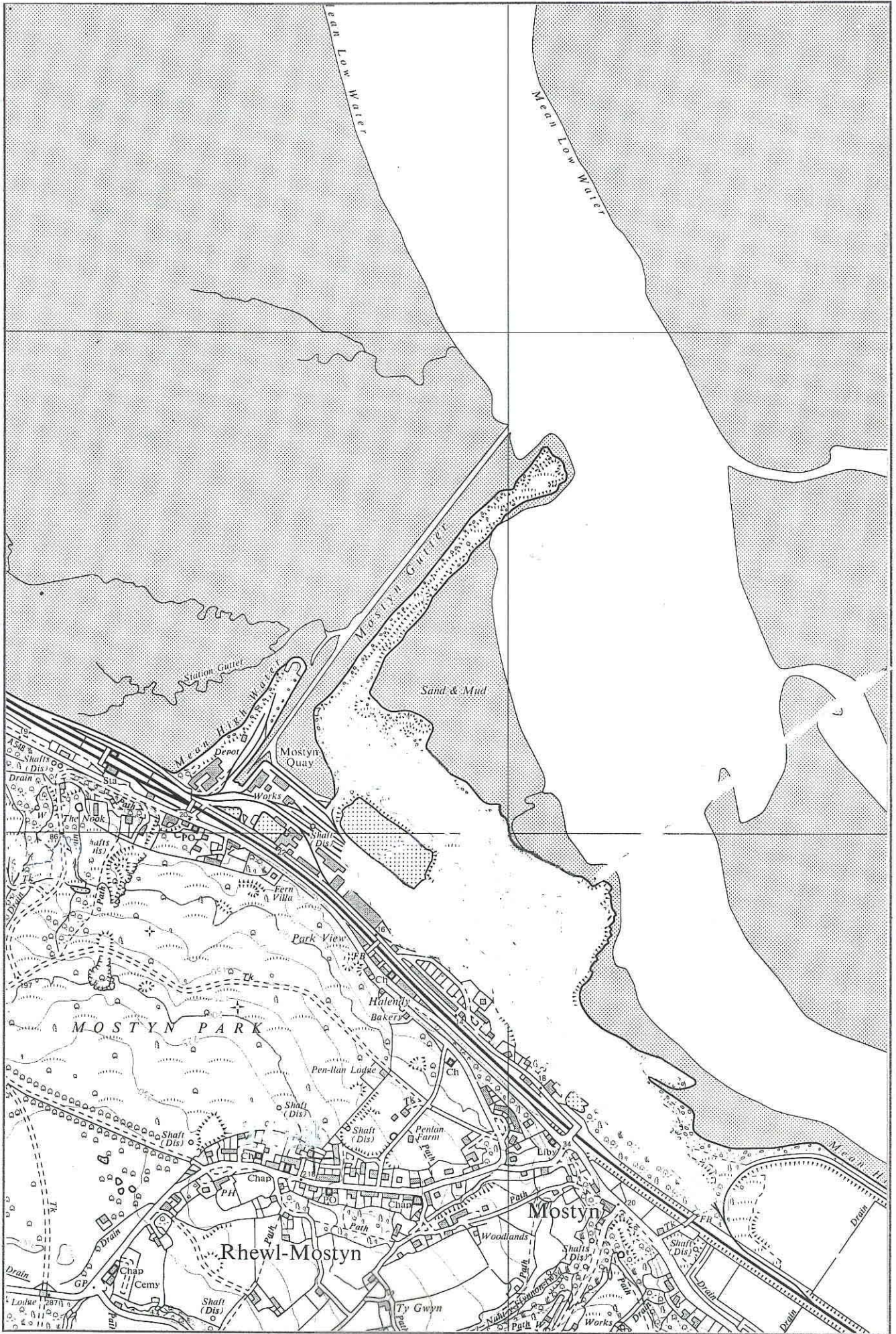


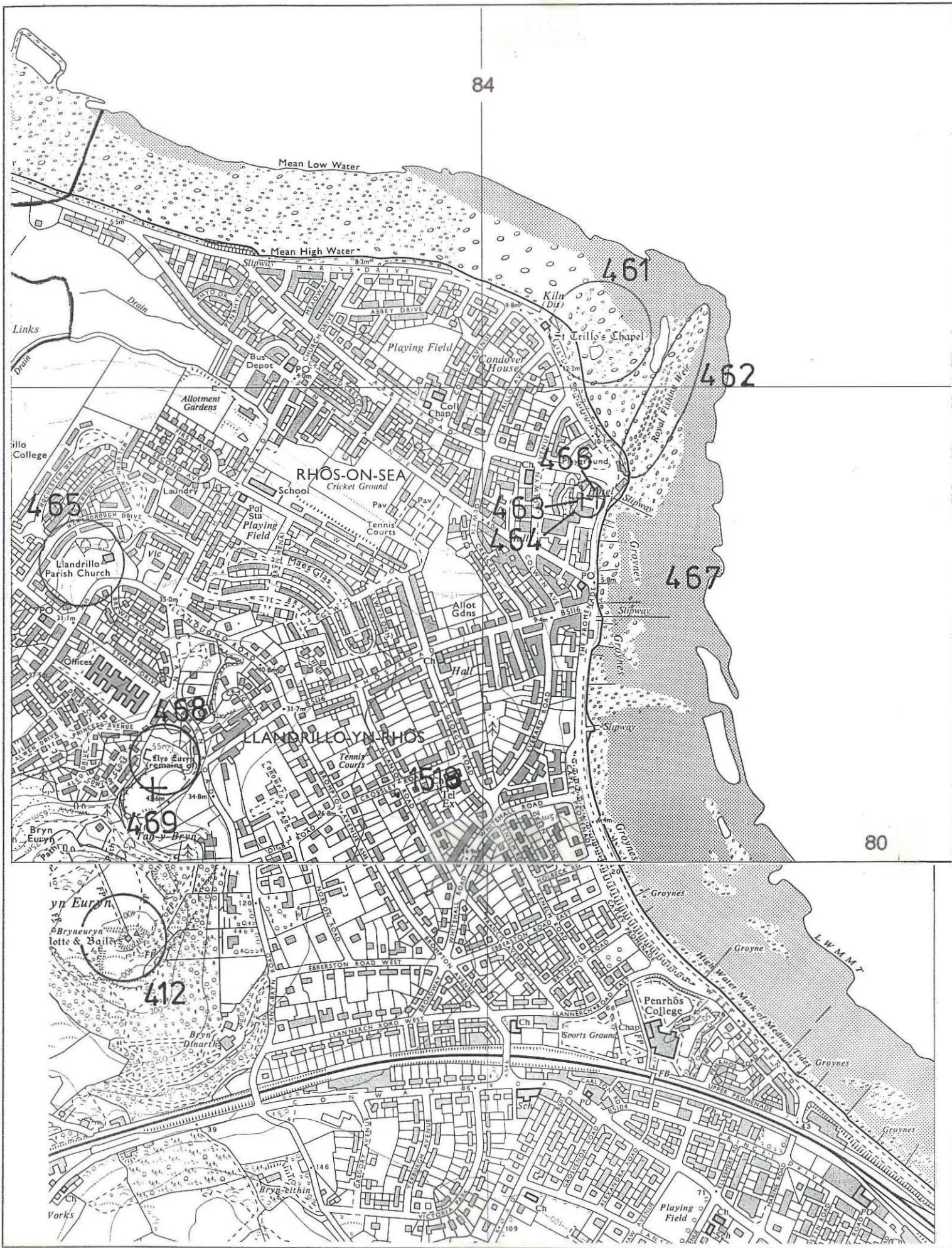
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Clwyd Coastal Survey. Record Map 5. SJ 18 SW 1:10,000











RHOS OR COLWYN BAY

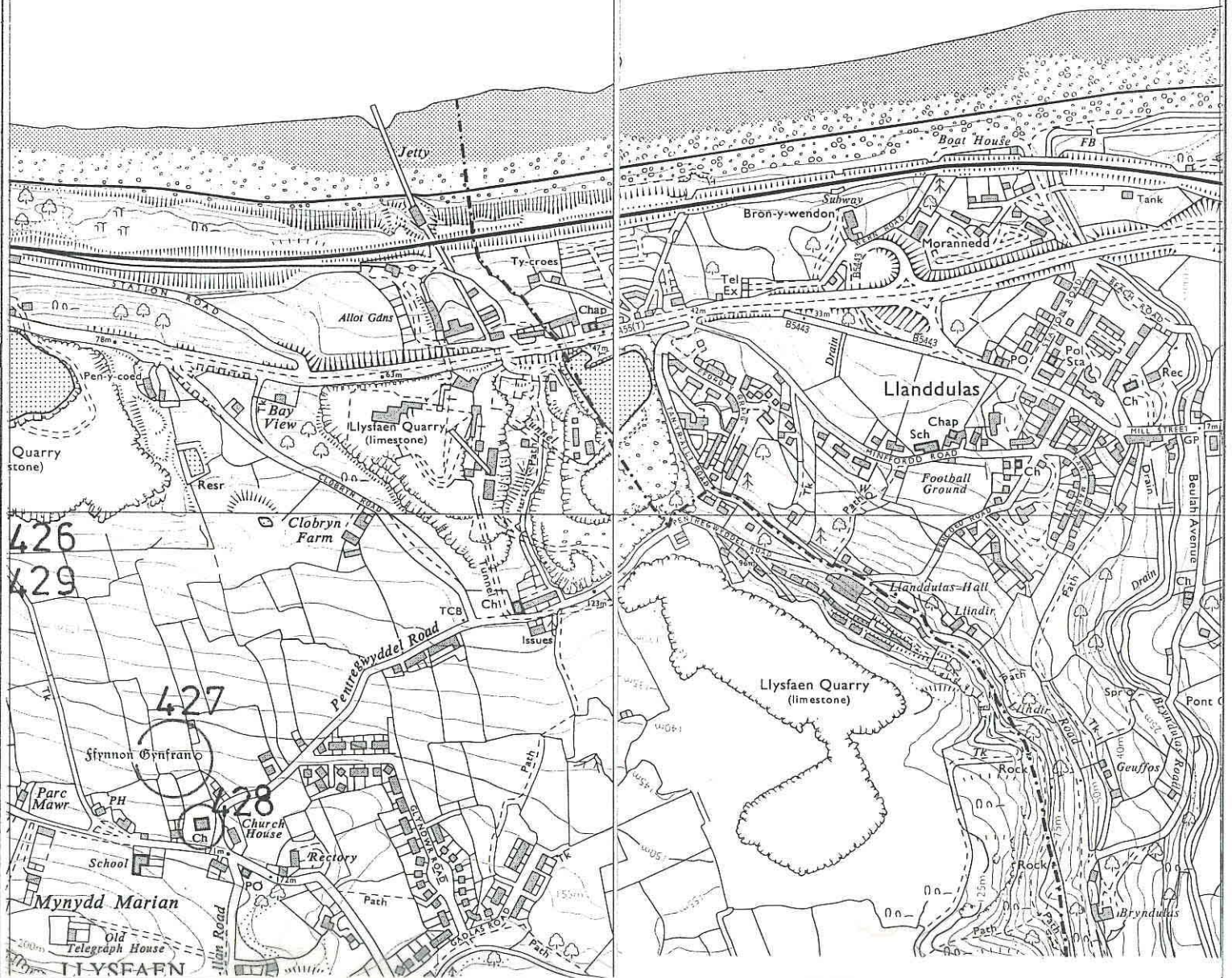
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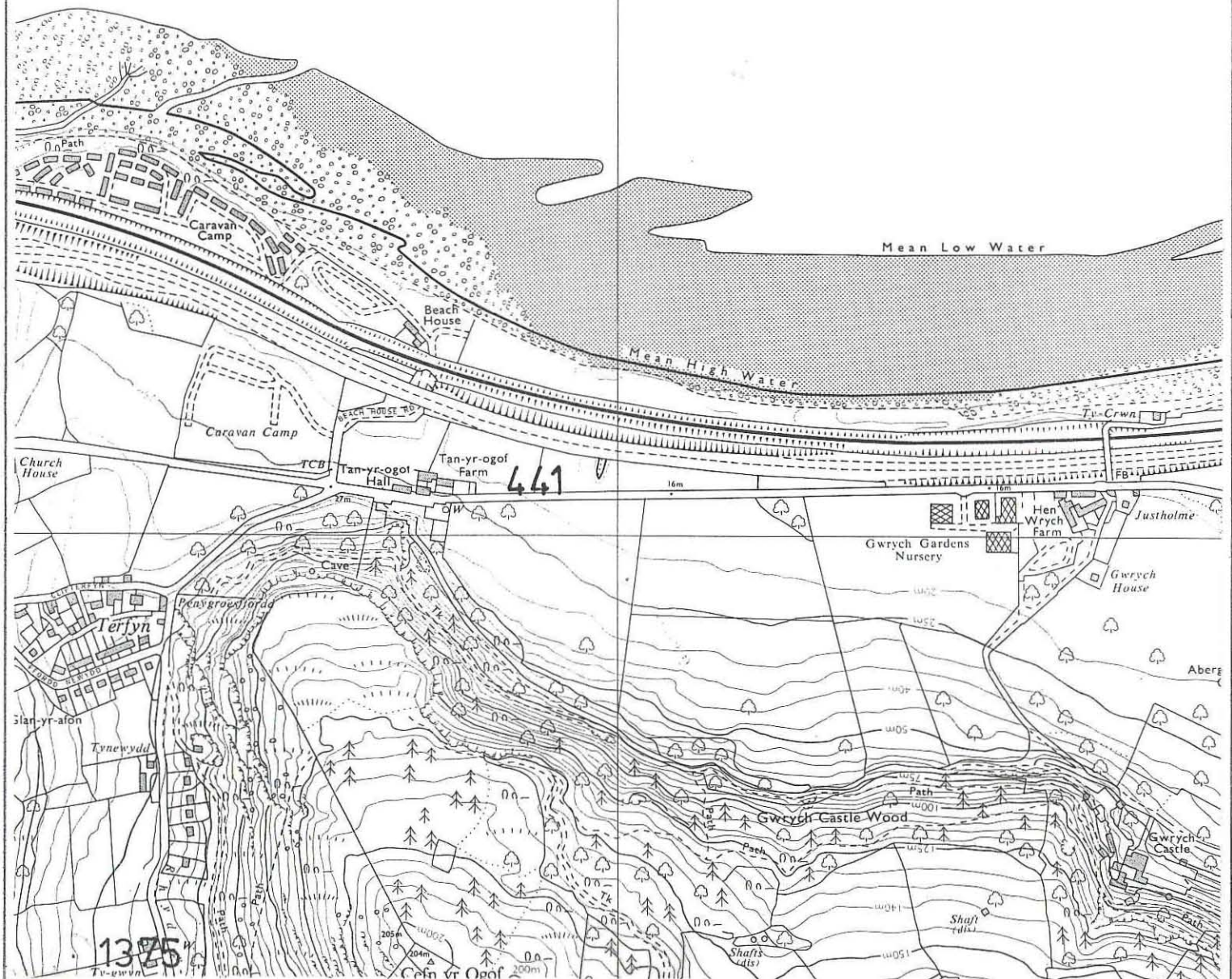
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