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Glossary & Abbreviations

CCC	Carmarthenshire County Council
CCRA	Climate Change Risk Assessment
CIL	Community Infrastructure Levy
DCLG	Department for Communities and Local Government
DCWW	Dŵr Cymru Welsh Water
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EAW	Environment Agency, Wales
ERDF	European Regional Development Fund
EU	European Union
FDGiA	Flood Defence Grant in Aid
FWMA	Flood and Water Management Act 2010
GIS	Geographical Information Systems
LFRRMS	Local Flood Risk Management Strategy
LLFA	Lead Local Flood Authority
LSSG	Local Services Support Grant
PAG	Project Appraisal Guidance
PAR	Preliminary Assessment Report
PFRA	Preliminary Flood Risk Assessment
PPW	Planning Policy Wales
SAB	SUDS Approval Body
SEA	Strategic Environment Assessment
SFCA	Strategic Flood Consequences Assessment
SMP	Shoreline Management Plan
TAN	Technical Advice Note
UK	United Kingdom
WCMC	Wales Coastal Monitoring Centre

Synopsis

Carmarthenshire County Council (CCC) are a designated Lead Local Flood Authority (LLFA) under the Flood and Water Management Act (the Act) 2010, and are required to produce a Local Flood Risk Management Strategy. The strategy is required to address flood risk arising from surface water, ground water and ordinary watercourses. Addressing flood risk arising from main rivers, sea and reservoirs within Carmarthenshire is the responsibility of the Environment Agency Wales and is therefore not required to be included within the strategy.

This document identifies the Risk Management Authorities within Carmarthenshire, the key requirements and contents of the strategy, and outlines the high level objectives and measures for implementing the strategy. In addition, this document identifies the potential sources which could fund the implementation of the measures. The document also discusses the context within which the strategy is required to achieve wider environmental benefits.

1 Introduction

1.1 Background

Flooding resulting from extreme events has become an increasing global concern in recent years. The risk to life, and the built and the natural environment from flooding is further exacerbated by climate change. The Climate Change Risk Assessment (CCRA) published by the Government of United Kingdom (UK) in January 2012 [1] indicates that approximately 6 million properties in Great Britain are at risk of flooding. The annual damage to properties in the UK resulting from flooding is estimated at approximately £1.3b on average.

The National Strategy for Flood and Coastal Erosion Risk Management in Wales (National Strategy), published by the Welsh Government in November 2011 [2], states that one in six properties in Wales are at risk of flooding. In addition, the CCRA for Wales, published by the Welsh Government in January 2012 [3], indicates that approximately 23% of the 1,500km long Welsh coastline is eroding.

The potential increase in intensity and frequency of rainfall, and the rise in sea levels, is likely to increase the risk of flooding and coastal erosion. Consequently, the risk to life, economy and the environment is also expected to rise. The extreme floods experienced in the UK during the summer of 2007 and across Europe during the summer of 2005 highlight these risks.

Flooding and coastal erosion are natural phenomenon and therefore it is not possible to prevent them from occurring. However, the risks associated with these phenomenon and the resulting consequences are reasonably well understood. Therefore, steps can be taken to manage those risks and minimise their impact.

In the UK, the Environment Agency (EA) is responsible for leading the management of flood risk arising from the sea and the main rivers, and the sewer operator is responsible for addressing flood risk arising from sewers. Leading the management of flood risk arising from all other sources and the management of coastal erosion risk is the responsibility of the Lead Local Flood Authority (LLFA). Although responsibilities are allocated based on the source of flooding, it is acknowledged that when flooding occurs, those affected by it do not distinguish between the source or the type of flooding. Therefore, greater emphasis is now being placed on all agencies to work in close collaboration to minimise the risk of flooding, and manage the consequences.

As a LLFA, Carmarthenshire County Council (CCC) has a duty to coordinate and lead the management of flood risk arising from local sources within Carmarthenshire. In addition, CCC has a duty to manage coastal erosion risk along the Carmarthenshire coastline. This report outlines the high level strategy of managing such risk.

To ensure that the management of local flood risk and the management of coastal erosion is holistic, CCC have set up a steering group Chaired by the Director of Technical Services and comprising of representatives of the following departments:

- Planning
- Economic Development
- Drainage and Flood Risk
- Communications
- Highways
- Emergency Planning

The strategic leadership and direction for the strategy has and will continue to be provided by the Steering Group.

Section 1 of this document briefly outlines the purpose of the strategy and gives an overview of the study area. Section 2 provides an overview of the legislation relevant to the production of the strategy. The scope of the strategy and its key requirements are identified in Section 3. The Risk Management Authorities within Carmarthenshire and their functions are listed in Section 4. Information on the public consultation undertaken prior to the preparation of this Local Strategy is included in Section 5. Information on assessing local flood risk is included in Section 6, and information on coastal erosion risk is included in Section 7. The objectives of the strategy and the measures required to deliver those objectives are outlined in Section 8. The options for funding specific measures required for management of local flood risk are discussed in Section 9 and information on how the strategy is expected to meet wider environmental objectives is discussed in Section 10. The programme for delivering this strategy is outlined in Section 11 and the conclusions are noted in Section 12.

1.2 Purpose

This document has been prepared in accordance with the Local Flood Risk Management Strategies, Local Strategy, published by the Welsh Government in November 2011 [4]. This guidance document is neither prescriptive nor directive, and is limited to providing a framework for preparing a strategy.

This report is a high level strategy document and provides a framework for the development of specific measures, and decision making, associated with managing local flood risk and coastal erosion. Specific measures required for mitigating local flood risk and coastal erosion will be identified during subsequent stages of the process, and following publication of the flood hazard maps by the Welsh Government.

Managing flood risk and coastal erosion is a continuous process. The strategy will therefore evolve as the understanding of flood risk and coastal erosion develops further.

1.3 Study Area

The study area for the preparation of the strategy is defined by the administrative boundary of CCC as shown in Figure 1. Carmarthenshire is located in south west Wales and has an area of approximately 2,400km². It forms part of the Western Wales River Basin District as identified by the EA. It is bounded to the north by Ceredigion, to the east by Powys, Neath Port Talbot and Swansea, to the south by the Bristol Channel, and to the west by Pembrokeshire. Carmarthen, Ammanford and Llanelli are some of the most populous areas of Carmarthenshire.



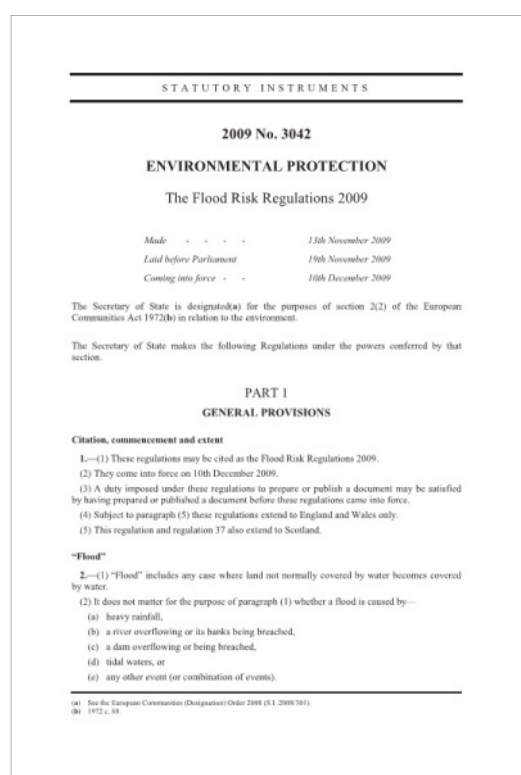
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2 Legislative Context

The requirement for preparing a Local Flood Risk Management Strategy stems from the Flood Risk Regulations (the Regulations) 2009, and the Flood and Water Management Act (the Act) 2010. Policy guidance associated with flood risk and development is also contained within Planning Policy Wales (PPW) and Technical Advice Note 15 (TAN15) *Development and Flood Risk*. Although PPW and TAN15 *Development and Flood Risk* do not dictate the requirements for, or provide any guidance on, preparing a strategy, the strategy is consistent with the requirements of these documents.

2.1 Flood Risk Regulations 2009


The Regulations came into force in December 2010 and implement the requirements of the European Union (EU) Floods Directive. The Directive came into force in November 2007 and emerged as a result of widespread flooding across Europe, particularly in summer 2005. The Directive aims to provide a consistent approach towards managing flood risk across Europe. Under this directive, member states are required to identify the risk of flooding from various sources, map the extent of flooding, and implement coordinated measures to reduce the risk of flooding. The Regulations require the Environment Agency to prepare Directive deliverables associated with flood risk arising from main rivers, sea and reservoirs, and the LLFAs to do the same for flood risk associated with local sources such as surface water, ground water and ordinary watercourses.



The Environment Agency and the LLFAs execute their functions, as required under the Regulations, by preparing a Preliminary Assessment Report as part of the Preliminary Flood Risk Assessment (PFRA) process, publishing flood risk and flood hazard maps and preparing flood risk management plans. CCC submitted their Preliminary Assessment Report [5] to the Environment Agency Wales in June 2011. The report did not identify any areas of significant flood risk that satisfied the significance criteria set by the Welsh Government and the Department for Environment, Food and Rural Affairs (DEFRA) within the administrative boundary of CCC. As a result, CCC were not required to produce flood risk maps, flood hazard maps or flood risk management plans as part of the PFRA process. However, under the Regulations, CCC will be required to review the Preliminary Assessment Report in June 2017.

2.2 Flood and Water Management Act 2010

The Act entered into force in April 2010 and formed a significant part of the UK Government's response to the Pitt Review – undertaken by Sir Michael Pitt – following widespread flooding across the UK in the summer of 2007. The review identified the need for local authorities to take the lead role in addressing flood risk arising from local sources such as surface water, ground water and ordinary watercourses, and lead the coordination of relevant agencies during a flood event. Whilst the national leadership role associated with flood risk management continues to rest with the Environment Agency, the County Councils and Unitary Authorities assume the role of leading local flood risk management under the Act.



**Flood and Water Management Act
2010**

CHAPTER 29

CONTENTS

Part 1

FLOOD AND COASTAL EROSION RISK MANAGEMENT

1. Key concepts and definitions

1 "Flood" and "coastal erosion"

2 "Risk"

3 "Risk management"

4 "Flood risk management function"

5 "Coastal erosion risk management function"

6 Other definitions

2. Strategies, co-operation and funding

7 National flood and coastal erosion risk management strategy: England

8 National flood and coastal erosion risk management strategy: Wales

9 Local flood risk management strategies: England

10 Local flood risk management strategies: Wales

11 Effect of national and local strategies: England

12 Effect of national and local strategies: Wales

13 Co-operation and arrangements

14 Powers to request information

15 Civil sanctions

16 Funding

17 Levies

3. Supplemental powers and duties

18 Environment Agency: reports

2.3 Planning Policy Wales

The land use planning policies of the Welsh Government are set out in the Planning Policy Wales (PPW) which is supplemented by a series of Technical Advice Notes (TANs). These national planning policy documents provide a framework for the preparation of the Local Development Plans.

The policy highlights the importance of flood risk as a material consideration when planning land use. The Welsh Government's objectives for sustainable development encourage a move away from flood defence and mitigation of the consequences of flooding for a new development, towards avoiding developing in areas of extreme floodplain. Planning authorities are encouraged to take a precautionary approach when considering new development in an area of extreme floodplain.

In addition to this, the local planning authorities are also encouraged to work closely with the developer, the Environment Agency and drainage bodies to minimise the risk of surface water flooding and implement sustainable urban drainage systems, where deemed appropriate, to help control surface water run-off as close to the source as possible.

2.4 Technical Advice Note 15

TAN15 *Development and Flood Risk* provides guidance on assessing flood risk. It supplements the guidance provided in PPW and provides a framework for assessing fluvial, coastal, surface water and groundwater flooding, and associated risks for any development. The framework is based on precautionary principles which give due consideration to flood risk whilst recognising the need for development. TAN15 *Development and Flood Risk* also requires that due consideration be given to surface water run-off strategy from a new development. It encourages the implementation of sustainable drainage systems to minimise surface water run-off and hence minimise the risk of surface water flooding.



3 Scope of the Strategy

3.1 Key Requirements

In accordance with the requirements of the Act, the strategy only needs to address flood risk arising from local sources. Under the Act, local sources of flooding are defined as follows:

- Surface water runoff;
- Groundwater; and
- Ordinary watercourses including any lakes, ponds or other water bodies that flow into an ordinary watercourse.

Flood risk arising from sewers is not included within the definition of local flood risk. Under the Act, the management of sewer flood risk is the responsibility of the sewer operator/water company.

It is acknowledged that when flooding occurs, those affected by it, do not distinguish between the source or the type of flooding. However, it is essential to identify the source to ensure that the responsibility for managing the flood risk is clearly allocated. The potential sources of flooding and the organisations that are responsible for managing it within Carmarthenshire are identified in Table 3.1.

Table 3.1 – Description of the potential sources of flooding within Carmarthenshire

Type of Flooding	Description	Management Responsibility
Coastal and tidal flooding	This is flooding resulting from extreme high tides and/or wave action from the sea.	Environment Agency Wales
Main river flooding	This is flooding arising from main rivers or strategic watercourses that are managed by the Environment Agency Wales	Environment Agency Wales
Ordinary watercourse flooding	This is flooding arising from local and relatively smaller watercourses that are not managed by the Environment Agency Wales	Carmarthenshire County Council
Reservoir flooding	This is flooding that can be caused as a result of a breach or failure of a reservoir	Dŵr Cymru Welsh Water for public water supply reservoirs. Environment Agency Wales for other reservoirs discharging to main rivers or strategic watercourses. Carmarthenshire County Council for other reservoirs discharging to ordinary watercourses.
Surface water flooding	This is flooding arising from surface water runoff – often in the form of overland flow – during periods of high rainfall.	Carmarthenshire County Council
Sewer flooding	This is flooding arising from sewers. In areas which have combined sewers (i.e. sewers that contain both surface water and sewage) such flooding is often caused during periods of high rainfall due to the limited capacity within the sewer	Dŵr Cymru Welsh Water (public sewers) Sewer owner (private sewers)
Groundwater flooding	This is flooding arising as a result of high water table from beneath the ground.	Carmarthenshire County Council

The Local Flood Risk Management Strategy needs to be consistent with the four overarching objectives of the National Strategy [2]. These objectives are as follows:

- i. Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;
- ii. Raising awareness of, and engaging people in the response to, flood and coastal erosion risk;
- iii. Providing an effective and sustained response to flood and coastal erosion events; and
- iv. Prioritising investment in the most at risk communities.

3.2 Contents of the Strategy

In accordance with the requirements of the Act, the following items are included within this strategy.

- i. The Risk Management Authorities within Carmarthenshire County Council;
- ii. The flood and coastal erosion risk management functions that may be exercised by those Authorities in relation to the area;
- iii. The objectives for managing local flood risk;
- iv. The measures proposed to achieve those objectives;
- v. How and when the measures are expected to be implemented;
- vi. The costs and benefits of those measures, and how they are to be paid for;
- vii. The assessment of local flood risk for the purpose of the strategy;
- viii. How and when the strategy is to be reviewed; and
- ix. How the strategy contributes to the achievement of wider environmental objectives.

4 Risk Management Authorities and their Functions

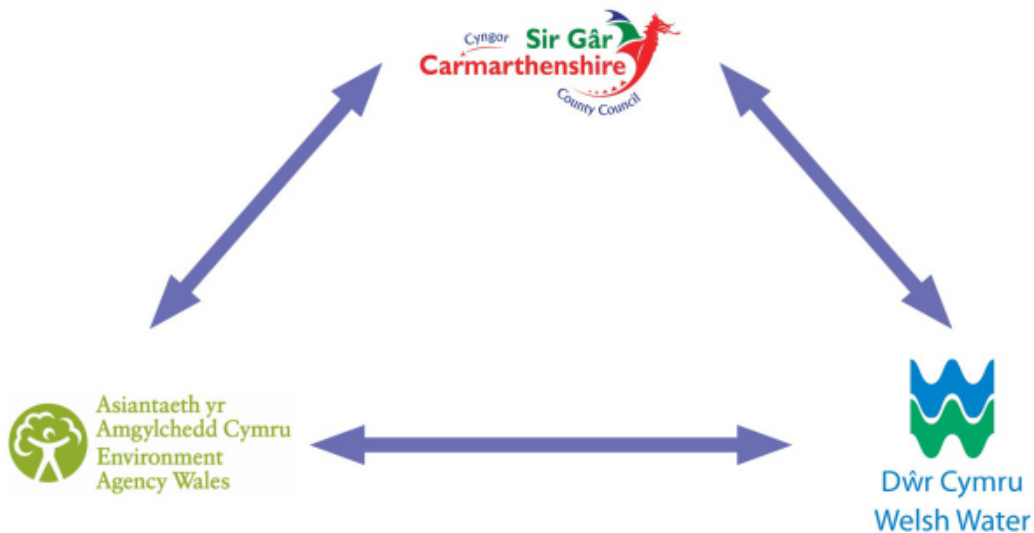
Under the Act, the Lead Local Flood Authority is responsible for leading the management of local flood risk. However, the responsibility for exercising the functions associated with local flood risk management rests with the relevant Risk Management Authority.

The Act identifies the various Risk Management Authorities and describes their statutory duties. Within Carmarthenshire, the following bodies are designated as the Risk Management Authorities under the Act.

- Carmarthenshire County Council
- Environment Agency Wales
- Dŵr Cymru Welsh Water

The statutory duties of these Authorities are noted in this section of this report. In addition to the statutory duties, the Authorities also have the following responsibilities under the provisions of the Act:

- Act in a manner consistent with the local strategy and the National Strategy; and
- Co-operate with, and provide information to, other Risk Management Authorities.



4.1 Carmarthenshire County Council

Under the Act, CCC are designated as the Lead Local Flood Authority and are responsible for leading the management of flood risk arising from local sources. This responsibility is also replicated by the Regulations, under which CCC successfully submitted the Preliminary Assessment Report in June 2011 as part of the Preliminary Flood Risk Assessment process.

In their role as the Lead Local Flood Authority, CCC has the following statutory duties.

- The duty to prepare a Local Flood Risk Management Strategy;
- The duty to comply with the National Strategy;
- The duty to co-operate with other Authorities, including sharing data;
- The duty to investigate all flooding within its administrative boundary, insofar as it is consider necessary or appropriate;
- The duty to maintain a register of structures and features likely to affect flood risk;
- The duty to contribute to sustainable development; and
- The duty to issue consent for works on ordinary watercourses.

In addition to the statutory duties, CCC also has permissive powers to undertake the following.

- Request information;
- Designate certain structures or features that affect flood or coastal erosion risk;
- Expansion of powers to undertake works to include broader risk management actions; and
- The ability to cause flooding or coastal erosion under certain conditions.

In addition, CCC is also required to take on the role of the Sustainable Drainage System Approval Body (SAB).

4.2 Environment Agency Wales

As a result of the Act, the Environment Agency Wales has assumed a dual role. In addition to executing operational responsibility for managing flood risk arising from main rivers and the sea, and coastal erosion, the agency now has oversight responsibility in relation to all flood and coastal erosion risk management in Wales, including flood risk arising from local sources. As part of the oversight role, it is required to provide technical guidance and support to other Risk Management Authorities. The Environment Agency Wales will also be the sole Risk Management Authority responsible for monitoring and reporting on the implementation of the National Strategy. In addition to the statutory duties, the agency also has the following permissive powers.

- Power to request information;

- The ability to raise levies for local flood risk management works, via the Regional Flood and Coastal Committees;
- Power to designate certain structures or features that affect flood or coastal erosion risk;
- The expansion of powers to undertake works to include broader risk management actions; and
- The ability to cause flooding or coastal erosion under certain circumstances.

It should be noted that some of the permissive powers provided to the Agency under the Act are the same as the permissive powers provided to Carmarthenshire County Council. The two Authorities will therefore work closely to ensure that the execution of their permissive powers does not result in duplication of effort.

The Welsh Government announced in November 2011 that the Environment Agency Wales, the Countryside Council for Wales and the Forestry Commission Wales are to be merged into a single organisation named Natural Resources Wales. Consultation on the roles and functions of Natural Resources Wales began in January 2012, and the new body is expected to be fully functional from 1 April 2013. Following the merger, the statutory duties and functions of the Agency will be executed by Natural Resources Wales.

4.3 Dŵr Cymru Welsh Water

Dŵr Cymru Welsh Water (DCWW) is the only water and sewerage company within Carmarthenshire. Under the Act, Dŵr Cymru are responsible for managing flood risk arising from the water and sewerage systems under their management. The Act does not make any changes to the operational arrangement for Dŵr Cymru in respect of managing flood risk.

The maintenance responsibility for the public sewers within Carmarthenshire rests with CCC who act as Dŵr Cymru's agents. The initial response to any sewer flooding incidents will therefore be provided by CCC. However, addressing hydraulic performance issues, and refurbishment and upgrading of the sewers will be undertaken by Dŵr Cymru.

Due to their current roles in the operation and maintenance of public sewers, collaborative working partnership already exists between CCC and Dŵr Cymru. The two Authorities are currently working on pilot schemes in Llanelli which primarily involve the removal of surface water from public sewers with a view to alleviating both sewer flood risk and surface water flood risk. Further information on this is included in Section 8 of this report.

4.4 Neighbouring LLFAs

Flooding does not restrict itself to administrative boundaries of individual local authorities. It is therefore essential for neighbouring authorities to liaise with each other to manage flood risk. The Lead Local Flood Authorities neighbouring Carmarthenshire are noted below.

- Ceredigion County Council;

- Neath Port Talbot County Borough Council;
- Powys County Council; and
- Swansea City and County Council

Carmarthenshire will continue to liaise with these neighbouring authorities during the development and implementation of the Local Strategy. This will avoid duplication of effort and will ensure that the measures proposed within the administrative boundary of one authority do not result in adverse consequences elsewhere. Such interaction and liaison will also help identify opportunities where resources and costs for managing flood risk could be shared between the neighbouring authorities.

5 Public Consultation

5.1 Purpose

Reducing the risk to life and property is one of the key aims of flood risk management. Successful management of flood risk relies on having a two way dialogue with those affected by flooding and at potential risk of flooding. It is important to enhance their understanding of the risk and increase awareness. At the same time it is essential to understand what is important to them so that measures can be implemented which prioritise the needs of the community.

Since the management of local flood risk is an on-going process, the consultation with the public and other stakeholders will also be an on-going process. An initial public consultation was undertaken by CCC during August-September 2012 with a view to understanding the concerns and needs of the residents and businesses within Carmarthenshire. The Local Strategy was drafted following the initial consultation, and was subjected to a public consultation during December 2012. In addition, the Environment Agency Wales and the Welsh Government were also invited to comment on the draft. Details of these consultations are discussed below.

5.2 Initial Consultation

The initial public consultation was undertaken with a view to understanding public perception on local flood risk.

This was undertaken by inviting the members of the public, businesses and organisations across Carmarthenshire to respond to a questionnaire drafted by CCC. Provisions were made to allow the responses to be received online – via CCC’s website – and on paper copies posted to CCC’s offices. The consultation was advertised on the website and in the September 2012 edition of Carmarthenshire News.

Response to the questionnaire was received from three residents of Carmarthenshire. In addition, correspondence was received from the Llanelli Flood Forum welcoming the preparation of the strategy. No response was received from any other organisation or business. The number of responses to this initial public consultation was extremely low and the key points of the response can be summarised as follows:

- The respondents identified groundwater as being one of the major sources of flooding in their area. The Environment Agency Wales have previously stated that the risk of groundwater flooding in Wales is not a major issue, and where groundwater flooding occurs, it is confined to a very local



scale. CCC will investigate this further with the aim of clarifying the source of flooding.

- Those affected by flooding are most concerned about damage to property, local amenities and the distress caused due to flooding.
- The respondents identified the need for better support to deal with the aftermath following a flood incident
- The respondents expressed the view that funding contribution towards flood risk management schemes should be made by developers, local authorities, the national government and the EU.

The objectives of the strategy set by CCC and discussed in Section 8 have incorporated the feedback received from the initial public consultation.

5.3 Consultation on the Local Strategy Draft

A questionnaire prepared by CCC was made available to enable residents and businesses across Carmarthenshire to provide feedback and comment on the Local Strategy draft. Similar to the initial public consultation, provisions were made to allow the responses to be received online – via CCC’s website – and on paper copies posted to CCC’s offices.

Response to the questionnaire was received from two residents of Carmarthenshire. The number of responses to this consultation was also low. In addition, comments on the draft were also received from the Welsh Government and the Environment Agency Wales. The key points of the responses can be summarised as follows:

- The responses from residents agree with the objectives and measures proposed under the strategy.
- The responses from residents are of the view that building new flood defence infrastructure, and providing better assistance and advice on installing property level flood protection measures are likely to be the most effective ways of managing local flood risk.
- The Welsh Government is satisfied with the overall contents of the strategy. It accepts that at the time of preparing this strategy, Carmarthenshire may not have all the information required to identify specific details associated with the proposed measures, or undertake cost and benefit analysis of those measures.
- The Environment Agency Wales recommended including further details, mainly to clarify the management responsibilities of the various risk management authorities.

The response to the consultation on the Local Strategy draft has been incorporated within this document. Further consultation will be undertaken by Carmarthenshire during subsequent stages of development of the measures as noted in the following section.

5.4 Further Consultations

Additional public consultation(s) will be undertaken when specific measures for mitigating local flood risk and coastal erosion are identified during subsequent stages. These are likely to be held within the communities where such specific measures are proposed to be implemented.

As part of this strategy, CCC will also undertake appropriate exercises to increase flood risk awareness across Carmarthenshire and provide further guidance and information on managing such risk and minimising damage.

6 Assessing Local Flood Risk

6.1 Proposed Methodology

It is important to assess and gain a reasonable understanding of local flood risk prior to identifying and implementing specific measures to manage such flood risk.

The Preliminary Assessment Report, produced as part of the Preliminary Flood Risk Assessment for Carmarthenshire in July 2011, included a brief description of the historical flood incidents recorded by CCC and the potential future flood risk based on the Flood Map for Surface Water (FMfSW) as published by the Environment Agency Wales. The Preliminary Assessment Report was produced with a view to identifying significant flood risk areas. The governing threshold beyond which the consequences are classes as being significantly harmful – and therefore an area is considered to be at significant flood risk – was dictated primarily by the number of people likely to be affected. In Wales, this threshold was set at 5,000 people by the DEFRA and the Welsh Government. The Preliminary Assessment Report did not identify any areas of flood risk within Carmarthenshire which met this threshold. However, this does not imply that flood risk is non-existent within Carmarthenshire.

The Welsh Government has commissioned the EAW to produce flood hazard maps for Wales. These maps are due to be published in June 2013 and Lead Local Flood Authorities across Wales will be encouraged to use these maps for assessing local flood risk within their administrative boundaries. To ensure that the strategy is consistent with the requirements of the Welsh Government, CCC will use these flood hazard maps as the primary source of data for assessing local flood risk. In addition, CCC will also consider flood risk associated with the interaction between ordinary watercourses, surface water and other sources.

CCC will continue to gather information on flood incidents arising from local sources across Carmarthenshire. This information is currently held by CCC in a Geographic Information System (GIS) database. This information will supplement the flood hazard maps. In addition, Strategic Flood Consequences Assessments (SFCAs), flood studies and any hydraulic modelling exercises commissioned by CCC prior to the publication of the flood hazard maps will also be used to inform the assessment of local flood risk.

The assessment of local flood risk will enable the identification of local flood risk areas. These are areas where the consequences of flood risk arising from local sources are considered to have significant harmful impact on **human health**, **economic activity** and the **environment**. The threshold beyond which the consequences will be considered significant will be determined by CCC and will depend upon the population of the area, the presence of critical infrastructure and the environmental sensitivity of the area.

The determination of such thresholds will enable CCC to prioritise efforts in areas considered to be at most risk of local flooding. Such a prioritisation system will ensure transparency and provide immunity from external influences.

6.2 Historical Flood Risk

Gathering information on flood incidents is an essential part of flood risk management. It can often help identify the source of flooding which will enable the relevant authority to take appropriate action. In addition, it helps identify areas which are at risk of flooding and the severity of the incident. Such information is particularly useful when verifying the results of any hydraulic modelling exercise which aim to identify areas that may be at risk of flooding.

Where possible, information on past flood incidents is gathered by CCC and held in a GIS database. Some of the key datasets which constitute this database are described below in Table 6.1.

Table 6.1 – Dataset of historical flood risk information collated by CCC

Source	Dataset	Description
Various	Correspondence	This contains correspondence received by CCC relating to flooding incidents or risk of flooding from local sources.
CCC	External and Internal Flooding	This identifies locations and properties that have experienced either fluvial or surface water flooding.
Dŵr Cymru Welsh Water	DG5 register for Dŵr Cymru Welsh Water	This dataset identifies individual properties that have experienced sewer flooding in the past.

A brief description of the local flood risk that exists in some areas of Carmarthenshire is provided below, and is based on the historical flood information gathered by CCC in these areas.

Historical flood records for Ammanford indicate that flooding is localised and mainly related to surface water runoff and sewer flooding. Furthermore, two of the responses received to the initial public consultation are from residents of Maesquarre Road in Ammanford, which state that their properties and adjoining properties have flooded in the past. This indicates particular susceptibility of certain areas of Maesquarre Road to flooding arising from local sources.



Image courtesy Carmarthenshire County Council

In Carmarthen, flooding from local sources is mainly related to sewers, with the risk being more concentrated in the vicinity of Tollgate House along St. Clears Road.

In Burry Port, the Nant Dyfatty, which is an ordinary watercourse, has flooded on several occasions in the past. Flooding from the Nant Dyfatty affects the area around the Memorial Park and the main harbour. CCC has undertaken mitigation works, mainly associated with minimising blockages at the intake structures along the watercourse. DG5 records of Dŵr Cymru also indicate that properties to the north of the main harbour and in Pembrey have experienced sewer flooding in the past.



Image courtesy Carmarthenshire County Council

Records of CCC indicate that in Llanelli some of the properties along Exchange Road and New Road in the vicinity of Dafen Industrial Park, and along Maescanner Road have experienced flooding occurring from an unnamed ordinary watercourse located to the east of the A4138 and adjacent to the Avon Inflatables industrial estate unit. CCC has undertaken improvement works on this watercourse to reduce the risk of flooding. DG5 records of Dŵr Cymru also indicate that several properties across Llanelli have experienced sewer flooding in the past.

Records of flood incidences within Ammanford, Carmarthen, Burry Port and Llanelli are highlighted in Figures 2-5.

In addition to the areas mentioned above, the historical records indicate localised flood risk across several areas within Carmarthenshire. These historical records will be used to verify the flood hazard maps.

7 Assessment of Coastal Erosion Risk

According to the Wales Coastal Monitoring Centre (WCMC), approximately 60% of the population of Wales live on or near the Welsh coastline. The aim of the monitoring centre is to provide information to assist with the management of flood and coastal erosion risk management.

Coastal erosion risk maps are published by the EA and are available to view on their website.

In January 2012, the Swansea and Carmarthen Bay Coastal Engineering Group, led by Carmarthenshire County Council, published the second generation Shoreline Management Plan (SMP2) [6]. The SMP2 developed long term sustainable shoreline management policies for the coast and estuaries between Lavernock Point (Vale of Glamorgan) and St. Ann's Head (Pembrokeshire), and therefore covered the coastline along Carmarthenshire.



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The plan identifies policies for managing the shoreline along the Carmarthenshire coast which extends from the western banks of the River Loughor in the east, to Dolwen Point and Amroth in the west.

The SMP2 proposes the need for managed realignment or maintenance of the existing defences along majority of the Carmarthenshire coastline. This will minimise any coastal erosion and therefore allow the risk to be managed at an acceptable level. However, there are certain areas of the coastline where the plan proposes no intervention to allow the coastline to evolve naturally. This is based on the assessment that there are fewer assets at risk in these areas, and therefore the social-economic consequences of coastal erosion are not considered significant. These areas exist predominantly along the coastline along the west bank of the Loughor Estuary, to the north of Pembrey Forest, to the south of

Kidwelly, to the south west of Llansteffan and to the west of Pendine. Further details on the policies associated with various areas along the Carmarthenshire coastline can be found in the plan.



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Management of coastal erosion requires collaborative efforts between the LLFA, neighbouring coastal authorities, the EAW, the Welsh Government and the Countryside Council for Wales (CCW). Although the risk of coastal erosion along the Carmarthenshire coastline is manageable, Carmarthenshire will continue to engage with various stakeholders to monitor and develop plans for management of coastal erosion risk through the Shoreline Management Plan [6].

The National Strategy [2] states that the Welsh Government is responsible for the undertaking a review of national policies in relation to coastal risk management including research on the options for communities facing increasing levels of risk. This review is due to be completed by the end of 2013. The National Strategy also indicates that further legislation relating to flood and coastal erosion risk management will be drafted and will come into force by 2017.

8 Objectives and Measures for Delivering the Strategy

8.1 Objectives for Managing Local Flood Risk

It is important to ensure that the Local Flood Risk Management Strategy is sustainable and holistic. The strategy aims to achieve this by reducing the social, economic and environmental consequences of local flood risk and coastal erosion. In addition, the strategy needs to be consistent with the following four overarching objectives of the National Strategy [2].

- i. Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;
- ii. Raising awareness of, and engaging people in the response to, flood and coastal erosion risk;
- iii. Providing an effective and sustained response to flood and coastal erosion events; and
- iv. Prioritising investment in the most at risk communities.

CCC has set objectives for Carmarthenshire's strategy by translating the four overarching objectives of the National Strategy into objectives specific to Carmarthenshire. These objectives are aimed at reducing the consequences of flood risk arising from local sources and coastal erosion risk, and address both, the short term and the long term outcomes of the strategy. This ensures that the objectives are also consistent with the requirements of the Regulations. The objectives of the strategy are described in Table 8.1.

As the Risk Management Authorities, the governing bodies and the industry as a whole develop their understanding of local flood risk, coastal erosion, and climate change, the strategy will also evolve and consequently, the objectives will need to be reviewed.

8.2 Measures to Deliver the Objectives

CCC has identified a variety of measures which will be implemented to fulfil the objectives of the strategy. These measures are varied and range from future land use planning and administration, to maintenance of assets, and emergency response to flood and coastal erosion incidents. This will ensure that the strategy is forward-thinking and not just reactive to incidents of extreme flooding and coastal erosion. As recommended by the Welsh Government guidance [4], the measures identified by CCC are based on the themes of Prevention, Protection and Preparedness. In addition, they include short term, medium term and long term measures.

The proposed objectives and measures are shown in Table 8.1, and have been reviewed by Dŵr Cymru and the Environment Agency Wales. To ensure successful delivery of the objectives and the measures, CCC will work in close partnership with these Risk Management Authorities.

Collaborative working partnership between the Risk Management Authorities is already taking place in Carmarthenshire. Dŵr Cymru and CCC, with support from

the Welsh Government and the Environment Agency Wales, have commissioned the detailed design for ten schemes which involve the removal of surface water from public sewers. Eight of these schemes are in Llanelli and two are in Gowerton. These schemes are earmarked to be implemented by March 2015 and construction will begin with two schemes in Central Llanelli along Glevering Street and Queen Mary's Walk. It is estimated that surface water amounting to some 1,000 l/sec will be removed from the public sewers as part of these schemes, combined with other capital works. This surface water will be discharged via alternative methods, involving the use of sustainable drainage systems. Upon completion, it is estimated that these schemes will alleviate sewer flood risk from 44 properties and afford protection from surface water flooding for storms in excess of 1 in 30 year return periods. Construction work on one of the schemes in Central Llanelli is due to begin as early as December 2012.

It should be noted that structural measures such as the one identified above cannot be applied in every area that is susceptible to local flood risk. The measures have to be proportionate to the risk of flooding and the consequences of such flooding. In addition, the measures must also be economically viable.

A Memorandum of Understanding (MoU) is also in place between CCC and Dŵr Cymru which aims to relieve excess pressure on public sewer and surface water flood risk.



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Table 8.1 – Proposed Objectives and Measures of the Local Flood Risk Management Strategy

Overarching objectives of the National Strategy for Flood and Coastal Erosion Risk Management in Wales	Objectives of CCC's LFRMS	Proposed High Level Measures	Proposed Timescales
Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion	<ul style="list-style-type: none"> Provide strategic leadership for assessment and management of flood risk arising from local sources and coastal erosion Reduce distress and risk to life Reduce disruption to essential services and critical infrastructure Minimise damage to environmentally sensitive sites Develop effective land use and land management policies, and development management procedures Prepare an asset maintenance and management plan 	<ul style="list-style-type: none"> In accordance with the requirements of the Act, CCC in partnership with other Risk Management Authorities (RMAs) will lead the management of flood risk arising from local sources (i.e. surface water, groundwater and ordinary watercourses), and coastal erosion risk within Carmarthenshire. The WG is due to publish flood hazard maps in 2013. CCC will use these maps to identify areas of significant local flood risk. This will be supplemented with historical flood data held by CCC. Flood risk management strategy and plans will be prepared based on this information. A preliminary flood risk management plan will be prepared by CCC by 2015. The National Strategy indicates that the WG will publish coastal erosion maps for Wales by the end of 2012. CCC will use these maps to identify areas at high risk of coastal erosion, and prepare appropriate management strategy and plans. Where appropriate, CCC will undertake Strategic Flood Consequences Assessments to identify flood risk. CCC will ensure that the LDP adequately addresses flood and coastal erosion risks. This should be undertaken by directing developments away from areas at high risk of flooding or coastal erosion, and where the consequences of flooding and/or coastal erosion are deemed unacceptable, unless the information outlined in Development Advice Maps is demonstrated to be incorrect, and feasible and acceptable mitigation measures can be incorporated. In addition, the LDP will identify opportunities for creating habitat and environmental restoration areas. Where required and when funding becomes available, CCC will undertake catchment based studies with a view to identifying flood risk and mitigation measures. CCC will prepare, and regularly update, a register of natural and CCC owned manmade structures or features that are likely to influence local flood risk and coastal erosion. This register will be supplemented with an asset maintenance plan for assets owned by CCC. The WG is leading the Development of National Standards for Sustainable Drainage Systems and accompanying guidance. CCC will adopt this guidance to implement Sustainable Drainage Systems and to execute its role as a SUDS Approval Body (SAB), subject to the implementation of this legislation. CCC will annually monitor the strategy and will review the strategy at least every 5 years. 	<p>Ongoing</p> <p>2015, subject to publication of flood hazard maps in 2013.</p> <p>Short term (0-20 years)</p> <p>Ongoing</p> <p>Short to long term (0-100 years)</p> <p>Ongoing</p> <p>Ongoing</p> <p>Awaiting appropriate guidance from the Welsh Government</p> <p>First review due before 2019.</p>
Raising awareness of and engaging people in the response to flood and coastal erosion risk	<ul style="list-style-type: none"> Ensure that those living in areas susceptible to local flood and coastal erosion risks are aware of it and understand the consequences of such incidents. Form effective partnerships with Risk Management Authorities and other stakeholders to enable the implementation of the strategy. 	<ul style="list-style-type: none"> CCC, in conjunction with the RMAs, will liaise with local communities and businesses to raise awareness on flood and coastal erosion risks. CCC will raise awareness on the implementation of property level flood resilience measures. CCC, in conjunction with the RMAs, will encourage participation from willing local communities and businesses in managing local flood risk. CCC, in conjunction with the RMAs, will make appropriate provisions to enable local communities and businesses to find information associated with flood and coastal erosion risks. This will include guidance on how to report a flood incident, important contact details and guidance on preparing flood plans. CCC will continue to form partnerships with the Risk Management Authorities (RMAs) and other relevant stakeholders to manage local flood risk. For instance, CCC is currently working in partnership with DCWW and WG on schemes involving removal of surface water from combined sewers in Llanelli with the overall aim of reducing sewer flooding. 	<p>Short term (0-20 years)</p> <p>Short term (0-20 years)</p> <p>Ongoing</p> <p>Short term (0-20 years)</p> <p>Ongoing</p>
Providing an effective and sustained response to flood and coastal erosion events	<ul style="list-style-type: none"> Prepare emergency response plans and test their implementation Respond to flood incidents and implement subsequent recovery measures in a timely manner 	<ul style="list-style-type: none"> CCC, in conjunction with the Dyfed Powys Local Resilience Forum (LRF), will prepare emergency response plans to deal with flood risk arising from local sources. This will include identification of suitable respite accommodation, preparing evacuation protocol and identifying sources of mutual aid. CCC, in conjunction with the LRF, will assist local communities, businesses and individuals with the preparation of emergency plans. CCC, in conjunction with the LRF, will undertake exercises to test the implementation of their emergency plans, and their response and recovery mechanism to flooding incidents. Where necessary, CCC will endeavour to undertake investigations into flood incidents within four weeks. 	<p>Short term (0-20 years)</p> <p>Short term (0-20 years)</p> <p>Ongoing</p> <p>Ongoing</p>

Overarching objectives of the National Strategy for Flood and Coastal Erosion Risk Management in Wales	Objectives of CCC’s LFRMS		Proposed Timescales
		Proposed High Level Measures	
Prioritising investment in the most at risk communities	<ul style="list-style-type: none">Prepare a programme of investment for flood and coastal erosion risk management	<ul style="list-style-type: none">CCC will identify communities that are at most risk of flooding from local sources or from coastal erosion, consider the cost and benefits of identified schemes that manage or reduce the risk of flooding from these sources, and prepare and implement a prioritisation system for specific projects. CCC will also prepare a business case for securing funding for these projects.CCC will annually review their current maintenance regime and consider targeted maintenance changes to manage or reduce local flood and coastal erosion risk.	Short to long term (0-100 years) Ongoing

9 Funding for Local Flood Risk Management

9.1 Cost and Benefit Analysis

Measures implemented for managing flood risk and coastal erosion are required to be proportionate to the risk and the consequences. Analysis of the potential cost incurred as a result of flooding and coastal erosion, and the potential benefits gained by implementing measures to manage flood risk and coastal erosion risk will need to be undertaken to assess the economic viability of the measures. General principles of flood risk management dictate that only those measures should be implemented where the long term benefits are greater than the cost incurred in implementing the measures.

In accordance with the Welsh Government guidance [4], CCC will use the Project Appraisal Guidance series published by DEFRA for undertaking economic assessments of specific measures when these are identified during subsequent stages of the process. Where cost-benefit analysis is required, then this will be undertaken in accordance with the guidance contained in the Flood and Coastal Defence Project Appraisal Guidance FCDPAG3 Economic Appraisal document.

Not all the measures proposed under the strategy will be subject to a cost and benefit analysis. For instance, non-structural measures such as running a flood awareness campaign will result in intangible benefits which may not be easily quantified.

The National Strategy [2] states that the Welsh Government is in the process of undertaking research into the cost and benefits of softer engineering approaches including the use of natural processes to flood and coastal erosion risk management. The findings of this research are due to be published in 2013, and will be reviewed by CCC to inform the cost and benefit analysis of specific measures which will be identified during subsequent stages of the development of the strategy.

9.2 Sources of Funding

Funding for implementing the measures proposed under the strategy can be sourced locally, nationally or via the European Union. Some of the potential avenues from where funding could be sourced are noted below.

- Central capital fund made available by the Welsh Government for managing local flood risk.
- Capital funding sourced from the Flood and Coastal Resilience Partnership Funding or Flood Defence Grant in Aid (FDGiA)
- Department for Communities and Local Government (DCLG) Local Services Support Grant (LSSG) which originates from DEFRA.
- Local Authority's existing prudential borrowings
- Increase in council tax precepts and/or local business rates
- Alternative sources such as Section 106 (S106) agreements, local tariffs, community infrastructure levy (CIL)

- Private and/or community beneficiary contributions
- European Union funding available via the European Regional Development Fund (ERDF)

These sources could provide either partial funding, match funding or full funding. The source from where the funding can be provided will depend upon the nature of the scheme.

The Welsh Government is currently developing a national funding policy which is due to be published in 2013. It is understood that this funding policy will aim to prioritise the applications received by the Welsh Government for the financing of flood and coastal erosion risk management activities.

The National Strategy states that the Welsh Government is in the process of developing a business case for the establishment of a single capital funding programme for the implementation of flood and coastal erosion risk management in Wales. This exercise is due to be completed in 2014 and could result in the establishment of a central funding pot available to Lead Local Flood Authorities for implementing their strategies.

To access national funding made available by the Welsh Government, it will be necessary to demonstrate that the measures for which funding is required are consistent with the National Strategy, and the objectives of the National Strategy can be met by implementing those measures. In addition, these measures will need to meet any prioritisation criteria set out by the Welsh Government to obtain national funding.

If the measures do not meet the objectives of the National Strategy, then CCC will consider financing those measures via local funding. Such funding can be provided by utilising the Authority's existing prudential borrowing.

In the current economic climate, it is imperative to explore alternative funding sources. The Community Infrastructure Levy (Amendment) Regulations 2012 came into force on 6th April 2012. Under this regulation, local authorities in England and Wales can choose to impose a levy on new developments within their administrative areas. The purpose of the levy is to fund infrastructure and development that is thought necessary by the local authority and the local community. The Welsh Government is due to publish a national policy on the use of contributions towards flood and coastal erosion risk management schemes in Wales.

Funding can also be sourced from the ERDF. If it can be demonstrated that the proposed measures meet the requirements of the ERDF, then match funding can be accessed via the Interreg IV programme which ends in 2013.

CCC will explore all possible sources from where funding can be secured for implementing the measures proposed under the strategy.

CCC will also liaise with the Environment Agency Wales and Dŵr Cymru to identify what, if any, flood risk management schemes are being implemented by these Risk Management Authorities, and whether there is an opportunity to work jointly and share the costs associated with any of the proposed measures.

10 Contribution to the Wider Environmental Objectives

The contribution of the strategy towards wider environmental objectives is largely dictated by the following three legislations:

- Water Framework Directive (WFD);
- Strategic Environmental Assessment (SEA) Directive; and
- Habitats Directive

10.1 Water Framework Directive

The Water Framework Directive came into force 22 December 2000 and was introduced by the European Commission (EC). Under the directive, member states are required to improve the management of water bodies with the aim of achieving improved chemical and ecological status in inland and coastal waters by 2015. The requirements of this directive are implemented in the UK via the Water Environment Regulations 2003. In addition to improving water quality, the regulation also promotes sustainable use of water as a natural resource, and encourages relevant authorities to conserve habitats and species that are directly dependant on water.

To meet the requirements of the Directive, the EAW have produced a management plan for each of the three River Basin Districts in Wales. The River Basin Management Plan for the Western Wales River Basin District is applicable to the administrative boundary of CCC. This management plan outlines the measures that the EAW are likely to implement to meet the requirements of the Directive.

Specific measures, particularly structural measures, associated with managing local flood risk and coastal erosion will have to comply with the requirements of the Directive. As part of the on-going liaison between CCC and the Environment Agency Wales, CCC will consider how the strategy could assist, and benefit from, the delivery of the Water Framework Directive objectives.

10.2 Strategic Environmental Assessment Directive

The Strategic Environmental Assessment Directive was introduced by the EC in 2001. The requirements of the this environmental Directive are implemented in Wales by the Environmental Assessment of Plans and Programmes Regulations 2004 which came into force in July 2004. The directive is aimed at providing high level protection to the environment and encourages the integration of environmental considerations into the relevant plans and programmes. The EC's website states that a Strategic Environmental Assessment is mandatory for plans and programmes that:

- Are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/water management, telecommunications, tourism, town & county planning or land use *and* which set the framework for future development consent of project listed in the Environmental Impact Assessment (EIA) Directive; OR

- Have been determined to require an assessment under the Habitats Directive.

The Strategic Environmental Assessment needs to be proportionate to the level of detail contained within the strategy. Since the strategy is a high level document, the supporting assessment has also been prepared at a strategic level. A SEA Scoping Report has been prepared for the strategy. This report sets out the framework for undertaking further assessments as and when specific measures – and the strategy itself – are developed further during subsequent stages. In accordance with the statutory requirements, this Scoping Report has been reviewed by the Environment Agency Wales.

Following on from the Scoping Report, CCC have commissioned the preparation of an Environmental Report. This Environmental Report will highlight the likely significant impact of the strategy on the environment and advise of reasonable alternatives or additional measures that may be necessary to achieve compliance with the relevant legislation. This Environmental Report will also be subject to a public consultation. Further information on the consultation will be made available nearer the time of its publication.

10.3 Habitats Directive

The Habitats Directive was introduced by the EC in 1992. Implemented in conjunction with the Birds Directive, the purpose of the Habitats Directive is to offer protection to natural habitat and wild flora and fauna. The adoption of the directive led to the creation of protected sites across Europe.



The requirements of the Habitats Directive are implemented in Wales by the Conservation of Habitats and Species Regulations 2010, often referred to as the Habitats Regulations. The sites that are afforded protection under this regulation are referred to as Special Areas of Conservation (SAC) and Special Protection Areas (SPA) in the UK. As a matter of policy, the Welsh Government and the UK Government have also chosen to apply the same level of protection to Ramsar sites. Under the regulations, competent authorities are required to undertake appropriate assessments where a plan or a project is likely to have an impact on a protected (SAC, SAP and Ramsar) site. Such assessment is referred to as a Habitats Regulations Assessment (HRA).

The National Strategy is subject to a Habitats Regulations Assessment. Specific measures due to be identified during subsequent stages of the development of the strategy may also be subject to a Habitats Regulations Assessment. The need for such an assessment will depend upon the type of measure proposed to be implemented. For instance, a non-structural measure which involves raising flood risk awareness by holding community engagement exercises will not be subject to this assessment. However, a structural measure which involves constructing a

flood alleviation scheme will be subject to this assessment. The assessment, if required, will be undertaken in the following four stages.

Stage 1 – Screening

The screening stage assesses the likely impact of the project, either alone or in combination with other plans and projects, on a protected site. The screening process also assesses the significance of the likely impacts.

Stage 2 – Appropriate Assessment

This stage considers the impact of the proposed project on the integrity of the protected site in relation to its conservation objectives and its functions. If any adverse impact is identified, then mitigation measures need to be considered. If the mitigation measures cannot avoid the adverse impact on the protected site, then consent for the project can only be granted provided that Stages 3 and 4 are followed.

Stage 3 – Assessment of Alternative Solutions

This stage determines if it is possible to achieve the objectives of the proposed project by considering alternative solutions which will have lesser impact on the protected site.

Stage 4 – Imperative Reasons for Over-riding Public Interest (IROPI)

If the adverse impacts associated with the proposed project cannot be mitigated, then a Stage 4 assessment is undertaken. If this assessment concludes that the proposed project should proceed, then compensatory measures, which maintain the overall coherence of the site, will need to be secured. The national government will need to be consulted prior to the implementation of the project. In addition, the Secretary of State for Communities and the local government will need to inform the EC about the compensatory measures secured as part of the process.

If the Habitats Regulation Assessment concludes that a certain specific measure will impact on a protected site, then in addition to a full Habitats Assessment, an Environmental Assessment will also be undertaken.

Given that the strategy is required to demonstrate wider environmental benefits, measures that have significant adverse environmental impacts are unlikely to be viewed positively by the public, the Risk Management Authorities and the Welsh Government who will need to approve the strategy. However, if a particular measure demonstrates greater benefits for the local community and local businesses, then it may be possible to justify the adverse environmental impact.

11 Next Steps

11.1 Programme of Delivery

The National Strategy requires the Authorities to have completed proportionate implementation of the measures specified in the strategy by 2017.

The proposed timescales for delivering the objectives of the strategy are shown in Table 8.1. The programme for delivering the management of local flood risk and coastal erosion will be dictated by the specific measures required for undertaking such management. However, the specific measures can only be developed after the flood hazard maps are published, allowing a detailed assessment of flood risk to be undertaken. These maps are due to be published in June 2013. As a result, a detailed programme for delivering the strategy cannot be developed at this stage.

Regardless of the detailed programme of implementation of the specific measures which will be developed in the future, CCC will monitor the strategy on an annual basis and review the strategy every five years.

12 Conclusions

Carmarthenshire County Council, in their role as a Lead Local Flood Authority, has commissioned the preparation of this Local Flood Risk Management Strategy for Carmarthenshire. This high level strategy document has been drafted in accordance with the requirements of the Act. A Steering Group has been set up by CCC to provide direction to the strategy and ensure its inclusivity.

In addition to CCC, the Environment Agency Wales and Dŵr Cymru have been identified as the Risk Management Authorities in Carmarthenshire. All three authorities will work in close collaboration to ensure the management of local flood risk and coastal erosion.

The strategy is only required to address flood risk arising from surface water, ground water and ordinary watercourses. Addressing sewer flood risk as part of the strategy is not a requirement under the Act, as this responsibility rests with the sewer operator. However, CCC are Dŵr Cymru's maintenance agents for the public sewers in Carmarthenshire, and will therefore continue to work in close collaboration with Dŵr Cymru to address sewer flooding. The responsibility for dealing with hydraulic overload issues, refurbishments and upgrades of the public sewers will continue to rest with Dŵr Cymru.

The responsibility for addressing flood risk arising from main rivers and the sea within Carmarthenshire rests with the Environment Agency Wales, and is therefore not addressed as part of this report. However, where flood risk arising from such sources has an impact on the local communities and business within Carmarthenshire, CCC will work jointly with the agency to address the risk.

CCC undertook an initial public consultation during August-September 2012. The purpose of the consultation was to understand the views of the residents, businesses and other organisations across Carmarthenshire on local flood risk, and help shape the strategy. Following the initial public consultation, a draft of the Local Strategy was prepared and was subjected to a public consultation in December 2012. In addition, the Welsh Government and the Environment Agency Wales were also invited to provide feedback and comment on the draft. The response received from the public and the statutory bodies has been incorporated within this Local Strategy.

To enable effective management, it is imperative to gain a reasonable understanding of flood risk. This requires undertaking an assessment of flood risk with a view to identifying those areas that are considered to be at most risk. It is understood that the Welsh Government has commissioned the preparation of flood hazard maps for Wales, and these maps are due to be published in June 2013. These maps will form the basis of assessing flood risk and identifying areas that require the management of flood risk. Following their publication, CCC will review these maps alongside the historical flooding information currently held by CCC and identify areas where management of local flood risk needs prioritising within Carmarthenshire.

The specific measures required for the management of local flood risk cannot be identified until the assessment of flood risk – and identification of flood risk areas – is completed. However, CCC has compiled a set of high levels objectives for the strategy and the measures required to achieve those objectives. These objectives

and measure aim to reduce the social, economic and environmental consequences of flooding, and include short term and long term targets.

CCC will consider funding of the strategy and the specific measures from a variety of sources ranging from European funding to CIL and funding raised from S106 agreements. Where necessary, cost and benefit analysis will be undertaken of the specific measures required to manage local flood risk and coastal erosion risk to ensure the economic viability of such measures.

References

- [1] *Climate Change Risk Assessment* (January 2012), Department for Environment, Food and Rural Affairs (DEFRA), Government of United Kingdom
- [2] *Climate Change Risk Assessment, Wales* (January 2012), Department for Environment, Food and Rural Affairs (DEFRA) and Welsh Government
- [3] *Local Flood Risk Management Strategies, Local Strategy* (November 2011), Welsh Government
- [4] *National Strategy for Flood and Coastal Erosion Risk Management in Wales* (November 2011), Welsh Government
- [5] *Preliminary Assessment Report, Preliminary Flood Risk Assessment* (July 2011), Carmarthenshire County Council
- [6] *Lavernock Point to St. Ann's Head Shoreline Management Plan (SMP2)* (January 2012), Swansea and Carmarthen Bay Coastal Engineering Group

Figures

Figure 1 Administrative boundary of Carmarthenshire County Council

Figure 2 Ammanford Historical Flood Risk


Figure 3 Carmarthen Historical Flood Risk

Figure 4 Burry Port Historical Flood Risk

Figure 5 Llanelli Historical Flood Risk



Legend

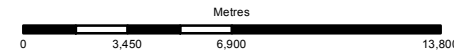
 Carmarthenshire Boundary

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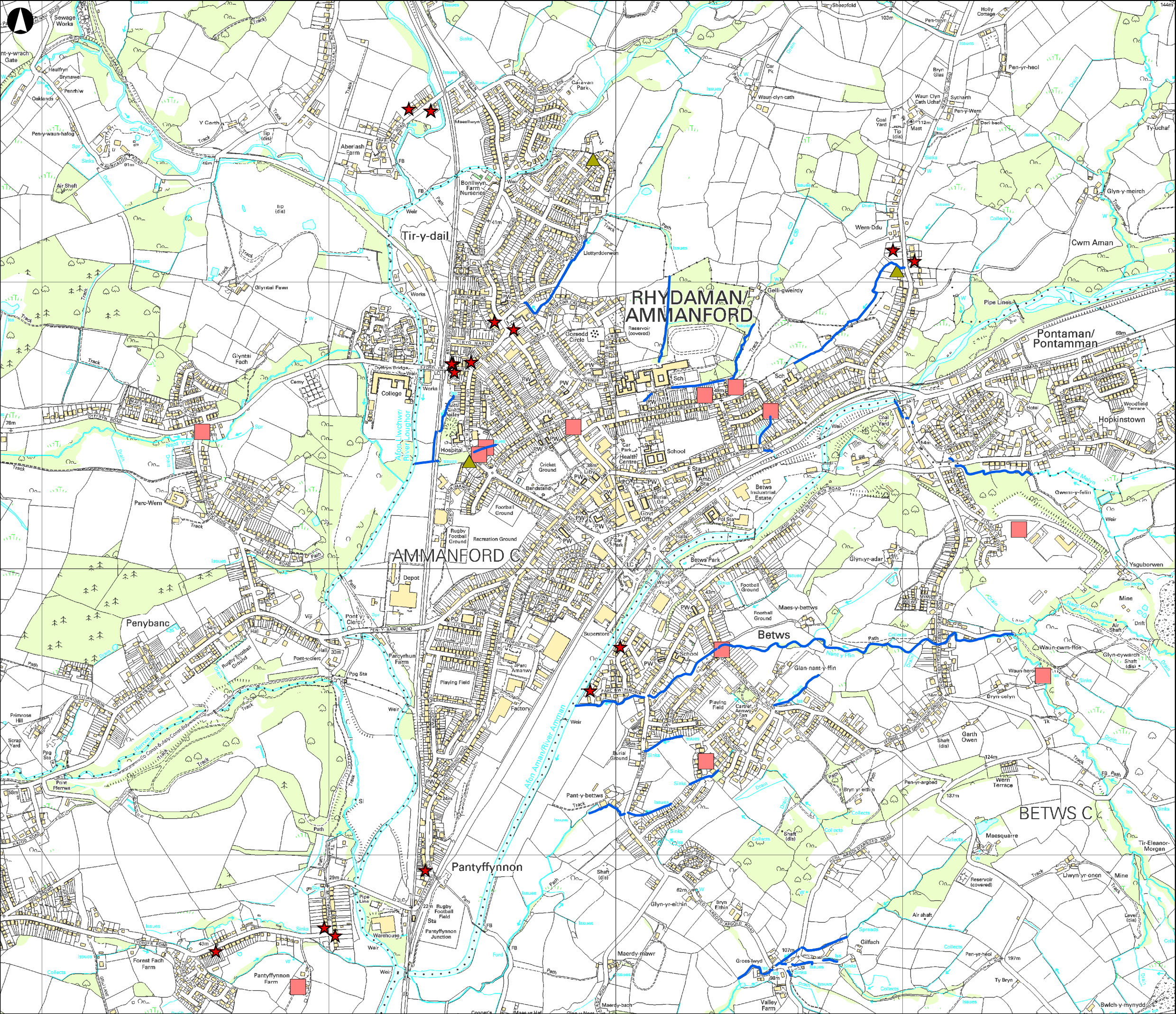
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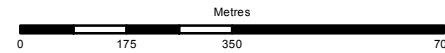
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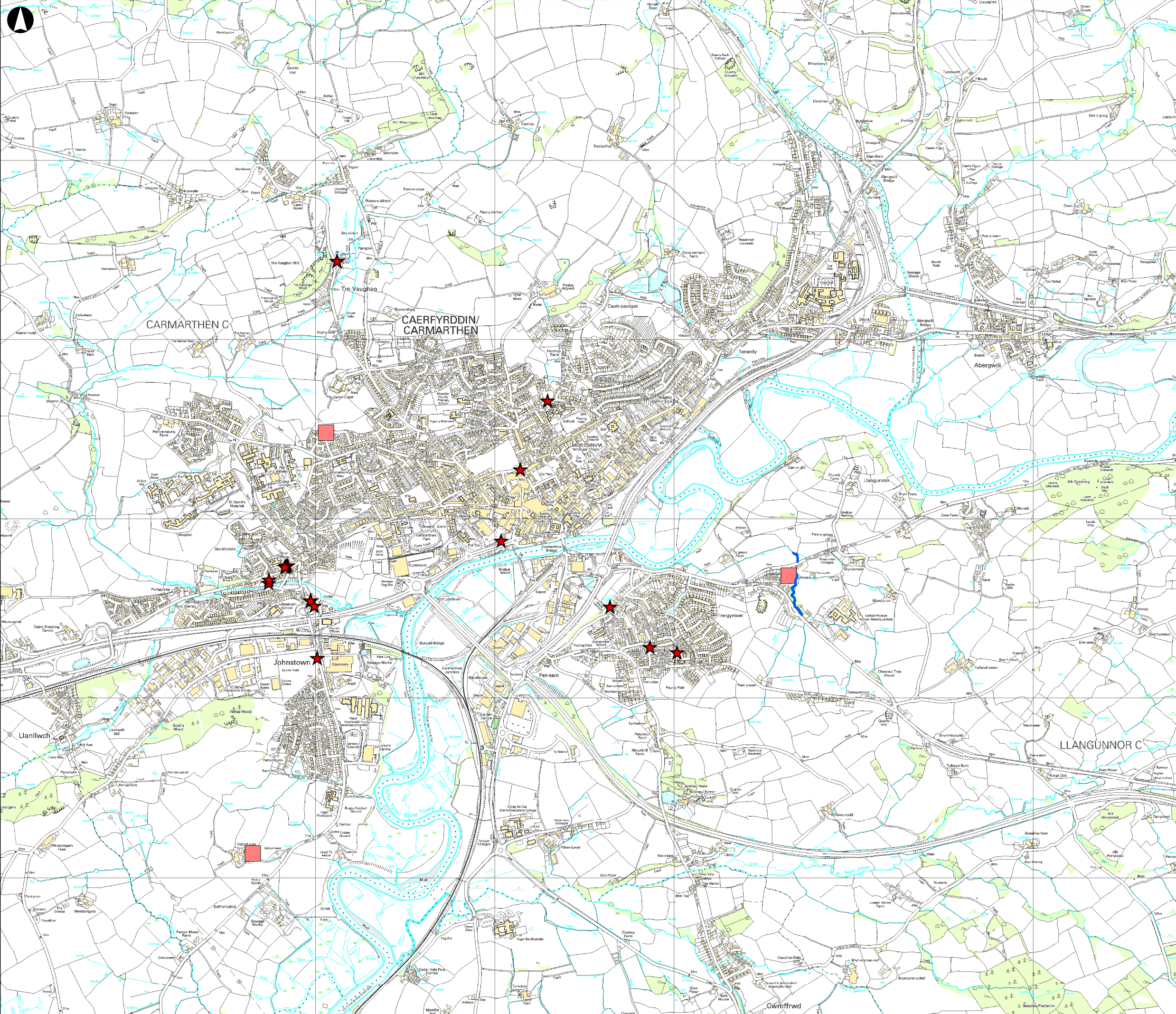
Job Title
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Drawing Title
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Historical Flood Risk**

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Drawing Status
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Job No 223614	Drawing No Figure 2	Issue 10
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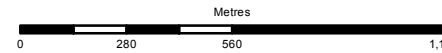
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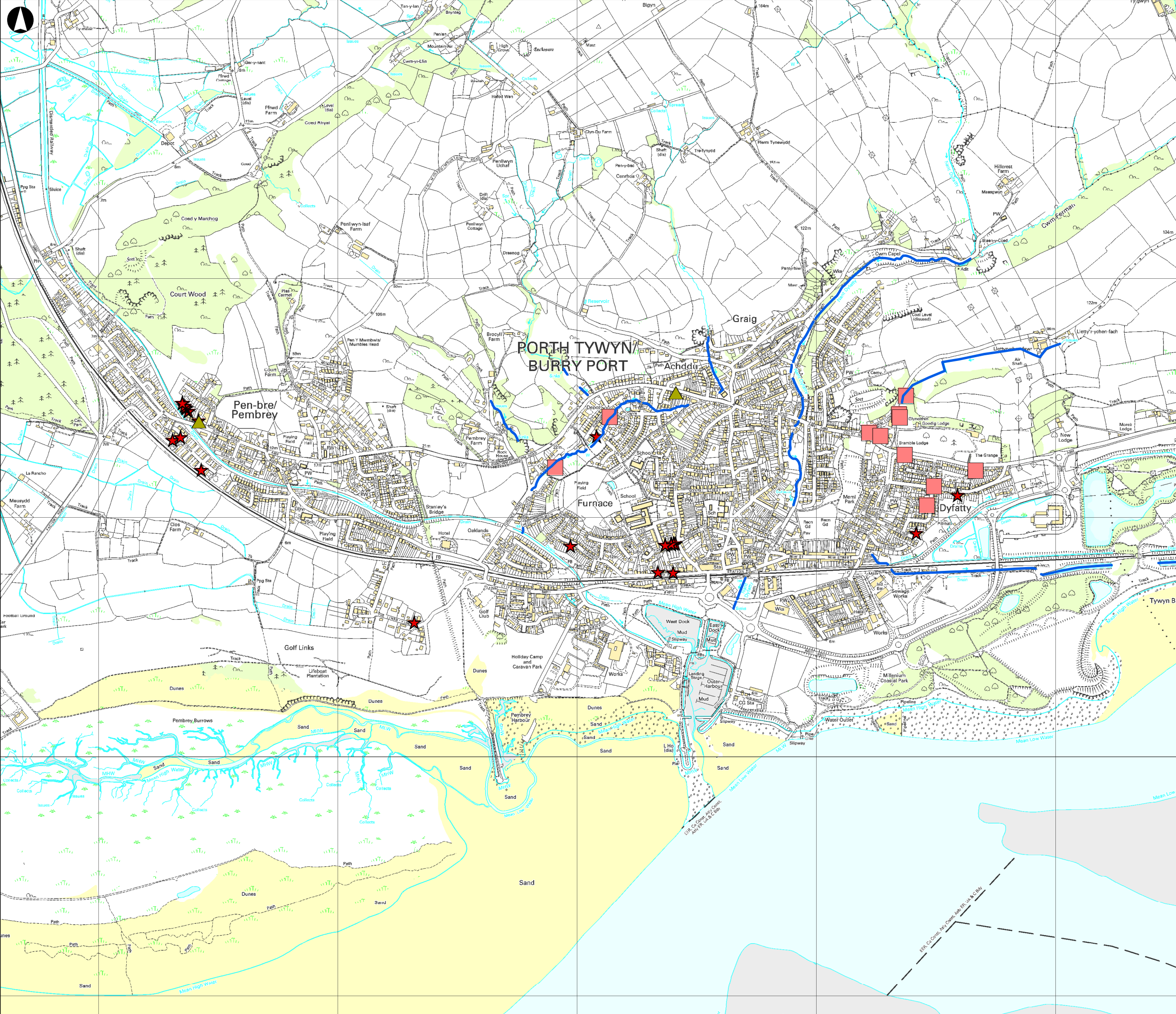
Job Title
Carmarthenshire LRFS

Drawing Title
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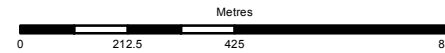
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Tel +44 29 2047 3727 Fax +44 29 2047 2277
www.arup.com

Client

Job Title

Carmarthenshire LRMS

Drawing Title

Burry Port
Historical Flood Risk

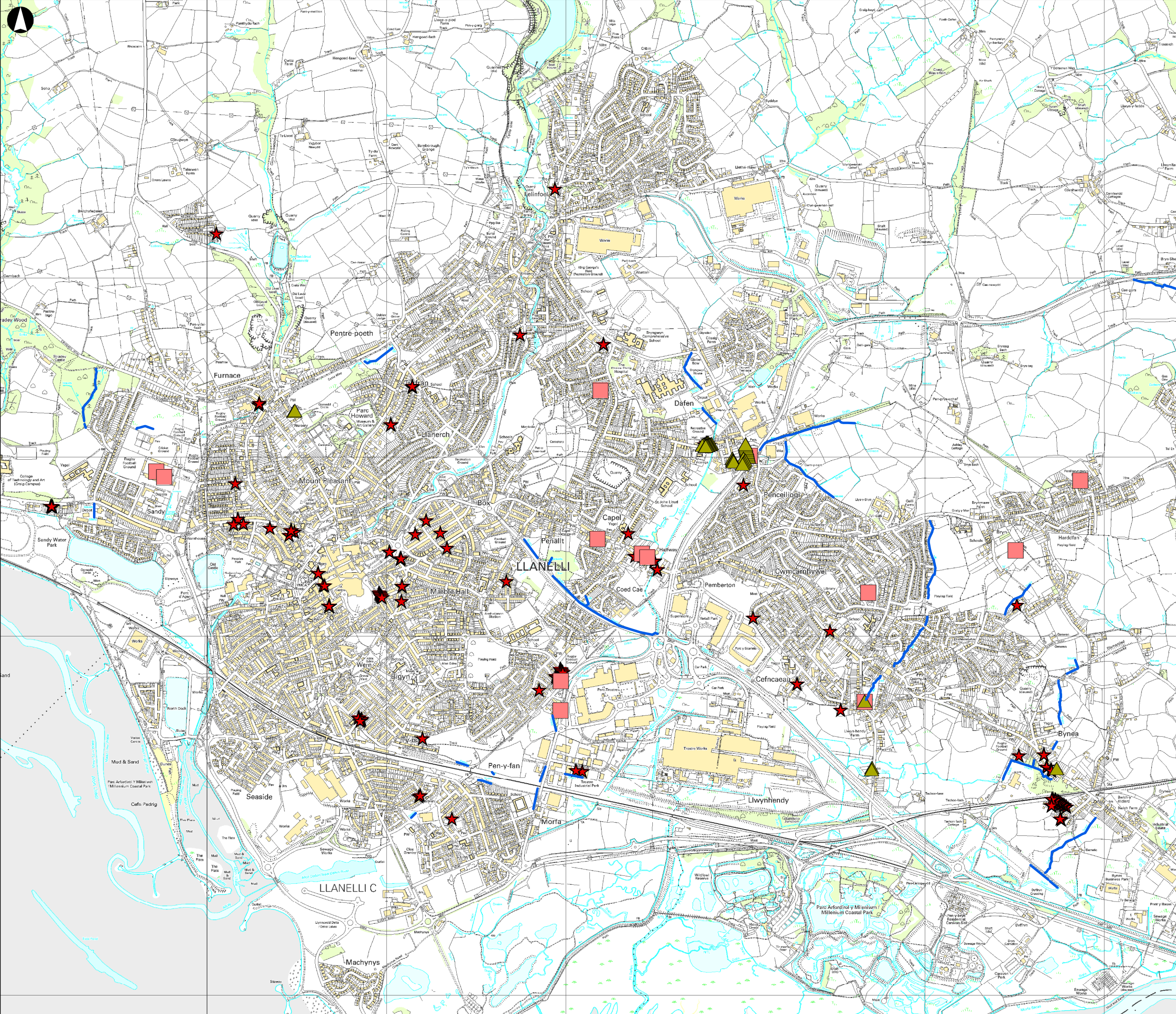
Scale at A3

1:15,000

Drawing Status

For Information

Job No	Drawing No	Issue
223614	Figure 4	10



Legend

- Open Urban Watercourses
- External and Internal Flooding
- Correspondence
- Sewer Flooding Risk Sites

Notes:

- Data shown on this drawing is based on information received from CCC.
- Information on this drawing should not be used to identify individual properties at risk of flooding.
- Sewer flood risk sites identified on this drawing are based on information received from DCWW.

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Carmarthenshire County Council 10002337 (2011)

10	2012-10-29	KM	PC	JS
Issue	Date	By	Chkd	Appd
Metres				
0	280	560	1,120	

ARUP

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Client

Job Title
Carmarthenshire LRMS

Drawing Title
**Llanelli
Historical Flood Risk**

Scale at A3
1:20,000

Drawing Status
For Information

Job No 223614	Drawing No Figure 5	Issue 10
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