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Monmouthshire County Council

Flood Risk Management Plan

Final Version

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Document Control Sheet

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Revision History

Date	Version No.	Summary of Changes
July 2014	*Scoping Report Draft 1*	
Jan 2015	*Draft 2*	*Revised template issued with new structure, draft updated accordingly*
Aug 2015	*Working Draft 3*	*For Scrutiny Committee on 14 September 2015*
Sep 2015	*Working Draft 3A Pre Consultation Draft*	*Internal Consultation*
Nov 2015	*Draft 3B with amendments from internal consultation*	*Final Consultation with Scrutiny Committee Members*
Dec 2015	*Draft 4 - including comments from Scrutiny Consultation*	*Public Consultation Stage(15 Dec 20155 to 1 Feb 2016)*
Feb 2016	*Final - including comments form the Public Consulation Stage*	*For Cabinet Member Approval*

Approvals

Approved by	Version	Date
Stronger Communities Select Committee	*Draft of Pre Consultation*	*Sept 2015*
Stronger Communities Select Committee	*Draft for Public Consultation*	*Dec 2015*
Cabinet Member Approval	*Final Draft*	
Welsh Government		

FOREWORD

Bryan Jones, Cabinet Member for County Operations

This is the first Monmouthshire Plan for Flood Risk Management and it is a key step in making sure that the risk of flooding in Monmouthshire is dealt with as a whole, joining up the work done by Councils, Government bodies and Water Companies with that of Communities and individual households. It will consider how a range of activities can help manage flood risk, from better planning which makes sure new developments decrease rather than increase flood risk for its neighbours, to ensuring that emergency responses have a good understanding of where flood risk is greatest. This Plan leads on from the Flood Risk Management Strategy produced in 2013 and is a voluntary and developed as part of Monmouthshire's commitment to its residents.

However, the activities identified in this strategy can only manage flood risk. It would not be possible, even if we were not in an era of austerity, to protect all households from any flood risk. Instead efforts need to be made by all involved, organisations and householders, alike to reduce flood risk in practical ways. Sometimes this involves focussing not just on decreasing the probability of flooding but also reducing its impact and making sure that properties and households can cope in the event of a serious flood.

We recognise that, in the past, the different organisations involved in risk management have not always worked together effectively enough in tackling the difficult problems that flood risk often creates. It is vital that organisations work better not just with each other but crucially with the public. This is why the strategy details the roles and responsibilities of all major stakeholders, including households and community groups, so that there is better clarity and understanding about when different stakeholders should be involved.

This Plan focuses on 'local flood risk' that is flooding caused by surface runoff, groundwater and ordinary watercourses (rivers, streams, ditches etc.) These types of flood risk were the cause of most of the serious damage of the 1979, 2000, 2002, 2007 floods as well as those that occurred during 2012/13 and need to be taken as seriously as flooding from main rivers or the coast. However it's not only the source of flooding but the effects that matter and therefore we are keen to make sure that

all forms are managed together and tackled according to the level of risk rather than by what caused it or who shouts loudest.

Assessing levels of risk from flooding is a difficult task. With greater development and increasingly uncertain weather patterns, properties that have never been flooded in living memory may be at risk. We recognise householders may have concerns about using computer models to determine areas of flood risk, but they are crucial to making sure that limited resources are used most effectively to reduce the impact and probability of properties being flooded.

This Plan sets out how we will meet our duties and obligations to residents and how we can help residents to tackle flooding in Monmouthshire. We hope it will help you become better informed of everyone's responsibilities, how to find out your flood risk and what we can do to help you become safer.

CONTENTS

1. Introduction

1.1 The Flood Risk Regulations 2009, transposes into domestic law the provisions of the European Commission Floods Directive (Directive 2007/60/EC) on the assessment and management of flood risk across European Union Member States. The overall aim of the Regulations is to reduce the likelihood and consequence of flooding.

1.2 Part 2 of the Regulations sets out a four stage process to identify, assess and manage flood risk (see Table 1.1). Under the Regulations, and in line with responsibilities under the Flood and Water Management Act (2010), Lead Local Flood Authorities (LLFA's) are initially responsible for undertaking a **Preliminary Flood Risk Assessment** (PFRA) to satisfy the requirements of Stages 1 and 2.

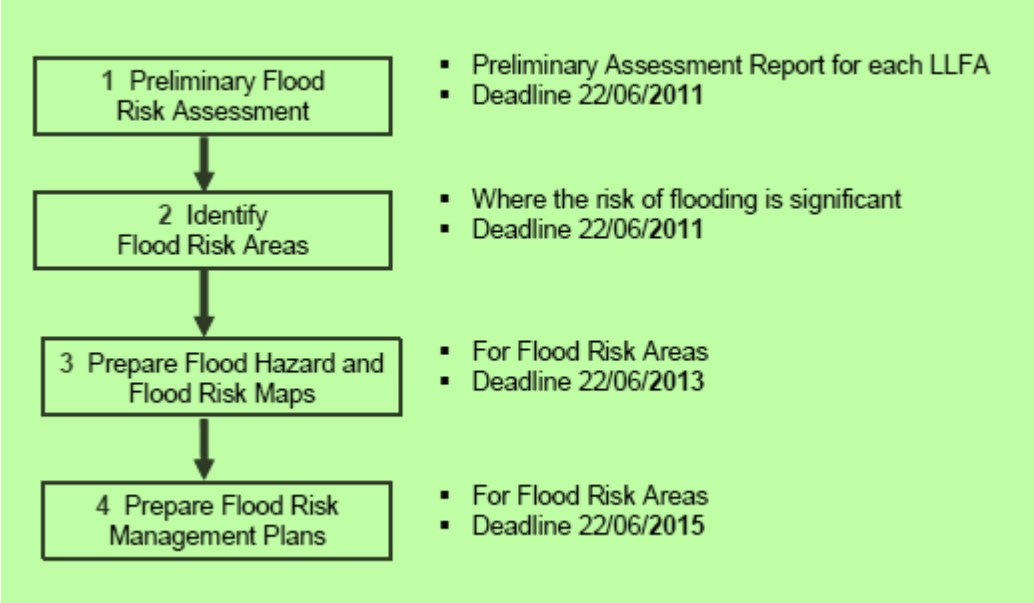


Table 1.1: Stages of the Flood Risk Regulations

1.3 The **PFRA** was a high level screening exercise which involved collecting existing and available information on past (historic) and future (potential) floods, assembling it into a preliminary assessment report, and using it to identify Flood Risk Areas where the risk of flooding is significant. This was completed in Nov 2011.

1.4 The **Local Flood Risk Management Strategy** was a more detailed assessment of the Monmouthshire Area and was a key step in making sure that the risk of flooding in Monmouthshire is dealt with as a whole, joining up the work done by councils, government bodies and water companies with that of communities and individual households. Monmouthshire was also designated as a Lead Local Flood Authority with the role to co-ordinate flood management with other risk management bodies. It considered how a range of activities can help manage flood risk, from better planning which makes sure new developments decrease rather than increase flood risk for its neighbours, to ensuring that emergency responses have a good understanding of where flood risk is greatest. It developed a set of key objectives and measures, including climate change to ensure that the measures are designed and

are resilient to the changing climate. Sustainable development is a central core operating principle of the Welsh Government and has and will continue to be reflected through the work of the LLFA, in line with the statutory duty set out the Act. The strategy was approved and published in April 2013

2. Purpose of Flood Risk Management Plans in Managing Flood Risk

2.1 What is a Flood Risk Management Plan?

Flooding remains a key threat to communities across Wales, and managing this risk through careful planning is important to minimise the risk to communities. Flood risk management planning allows risk management authorities (RMAs) to develop a better understanding of risk from all sources of flooding and agree priorities to manage that risk.

This Flood Risk Management Plan (FRMP) has been developed with this in mind and sets out how Monmouthshire will over the next 6 years manage flooding so that the communities most at risk and the environment benefit the most. In doing so, this FRMP takes forward the objectives and actions set out in our Flood Risk Management Strategy. The timescale was a deadline of 22 December 2015 for those areas with a Flood Risk Areas and for others in Wales 26 February 2016.

This FRMP also aim to achieve some of the objectives set out in the Welsh Government's National Flood and Coastal Erosion Risk Management Strategy[1] which provides the national framework for flood and coastal erosion risk management in Wales through four overarching objectives:

- **Reducing the consequences** for individuals, communities, businesses and the environment from flooding and coastal erosion.

- **Raising awareness of and engaging people in the response** to flood and coastal erosion risk.

- **Providing an effective and sustained response** to flood and coastal erosion events.

- **Prioritising investment** in the most at risk communities

2.2 What is included in this FRMP?

The information included in Monmouthshire's FRMP includes the components set out in the EU Flood Directive. Most of this information has been gathered and updated through this first cycle, and has been drawn from the findings of our PFRA and the measures we identified and set out in our Local Flood Risk Management Strategy (LFRMS), see link in Section 2.1 above.

This FRMP sets out appropriate objectives for the management of flood risk within the areas covered by the plan. The objectives focus on:
- reducing the adverse consequences of flooding for human health,
- the environment,
- cultural heritage and,
- economic activity.

[1] http://wales.gov.uk/topics/environmentcountryside/epq/flooding/nationalstrategy/strategy/?lang=en

To do so, this FRMP highlights the areas most at risk from surface water flooding and ordinary watercourses in Monmouthshire, draws the conclusions from these risks and sets out the measures we will take over the next 6 years to mitigate these risks and make our communities more resilient.

Due to the nature of flooding and current funding situation, we have also looked at measures to reduce the likelihood of flooding using non-structural measures and covering all aspects of flood risk management, including raising awareness of flooding and better understanding of local flooding issues. All the measures identified in this plan have been classed in four categories:

- Prevention
- Protection
- Preparedness
- Recovery and Review

2.3 Legislative Context

2.3.1 Flood Risk Regulations 2009

Under the Flood Risk Regulations 2009, Lead Local Flood Authorities (LLFAs) are responsible for producing Flood Risk Management Plans (FRMPs) for Indicative Flood Risk Areas that were identified in the Preliminary Flood Risk Assessments (PFRAs)[2].

While Natural Resources Wales (NRW) is responsible for producing FRMPs at a River Basin District level for communities at risk of flooding from main rivers and the sea, LLFAs are only required to produce local FRMPs to manage flooding from surface water and ordinary watercourse.

The Regulations set out a six year cycle with timescales for reporting to the European Commission and the publication of 3 key outputs:

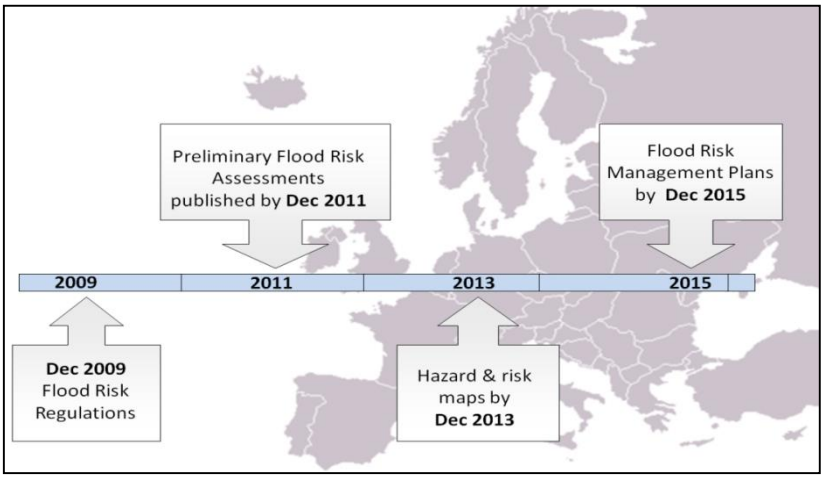


Figure 2.1: Flood Risk regulations (2009) Timescale

[2] Indicative Flood Risk Areas have been identified where more than 5,000 people are at risk of flooding

2.3.2 Preliminary Flood Risk Assessment

The PFRA was a high level screening exercise that compiled information on significant local flood risk from past and future floods, based on readily available information. The scope of the PFRA was to consider flooding from surface runoff, ground water and ordinary watercourses, and any interaction these sources have with main rivers with the aim of identifying flood risk areas as set out under the European Flood Directives (see section 3.3).

2.3.3 Production of flood hazard and flood risk maps for Flood Risk Areas

In 2013 the Environment Agency, working with Natural Resources Wales (NRW) and LLFAs, produced the updated Flood Map for Surface Water. The updated map represents a significant improvement on the previous surface water flood maps (2008 and 2010), both in terms of method and representation of the risk of flooding. The updated Flood Map for Surface Water assesses flooding scenarios as a result of rainfall with the following chance of occurring in any given year:

1 in 30 (3%); 1 in 100 (1%); 1 in 1000 (0.1%)

The updated map also provides the following data for each flooding scenario:

Extent; Depth; Velocity (including flow direction at maximum velocity) and Hazard (as a function of depth and velocity), it also includes information about the source of the data (i.e. whether it was from the nationally produced modelling or locally produced modelling) and the confidence in the data outputs.

Detailed maps for your area can be obtained using the following link:

https://naturalresources.wales/our-evidence-and-reports/maps/flood-risk-map/?lang=en

2.3.4 Flood Risk Management Plans for Flood Risk Areas.

We are currently in the first cycle of the Regulations and FRMPs represent the final output of this cycle and should be published by December 2015.

2.3.5 Flood and Water Management Act

The Flood and Water Management Act was introduced in April 2010 in England and Wales. It was intended to implement Sir Michael Pitt's recommendations following the widespread flooding of 2007. The act was also intended to clarify roles and responsibilities between Risk Management Authorities (RMAs).

Under the Act, the Welsh Government was required to produce a National Strategy for Flood and Coastal Erosion Risk Management, and Monmouthshire to produce a Local Flood Risk Management Strategy (LFRMS) which was completed in April 2013.

LFRMS were created to define who the Risk Management Authorities are, what their functions are and what their responsibilities are and went through a public consultation exercise. LFRMS also must be consistent with the Welsh National Strategy for Flood and Coastal Erosion Management.

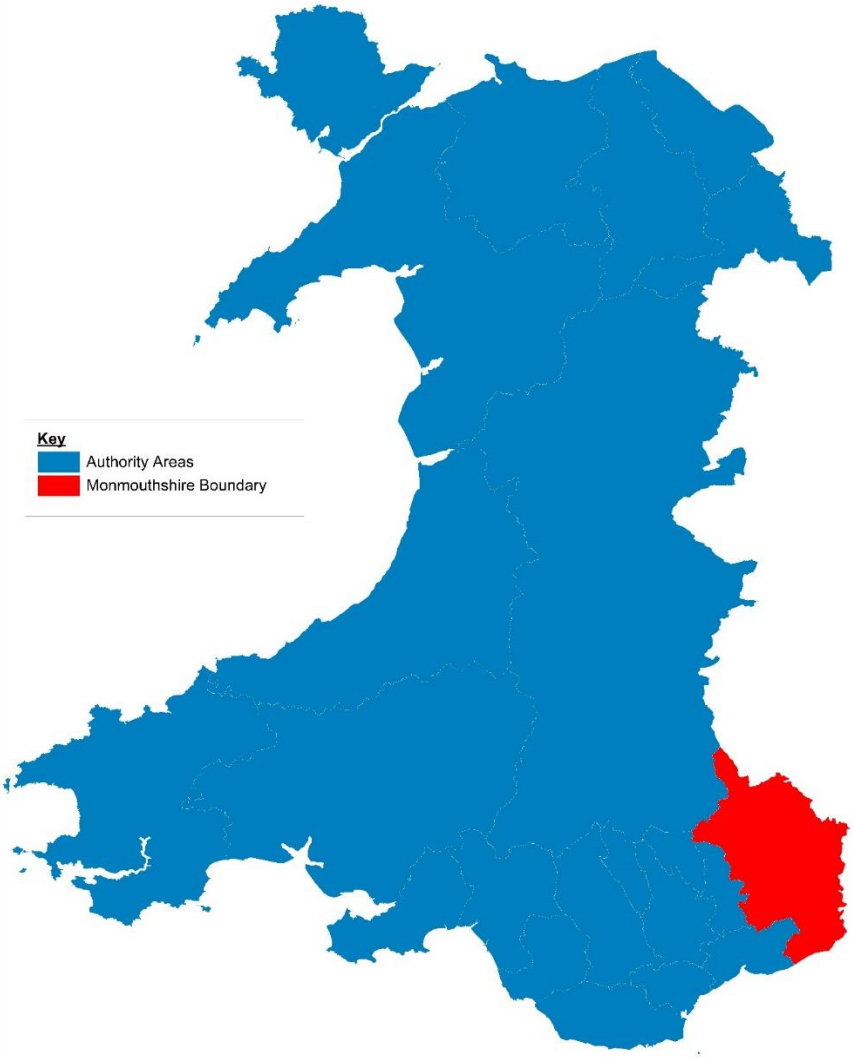
3. Study Area

3.1 Administrative Area

3.1.1 Monmouthshire County Council is a unitary authority in South East Wales with a population of approximately 93,000 and 39,500 properties and an area of 880 square kilometres. The area comprises a number of main towns including Abergavenny, Monmouth, Chepstow, Caldicot, Magor with Undy, Usk and Raglan. The remainder of the County is predominately rural. The local economy is largely reliant on tourism and farming with many people travelling to Cardiff and Newport for employment

3.1.2 There are three substantial main rivers that pass through Monmouthshire, the Rivers Wye, Usk and Monnow and a number of smaller but significant ones are the R Trothy, Olway and Neddern. From a flood risk aspect the R Wye has the potential to affect more properties than the others. Monmouthshire also borders the Severn Estuary and the Caldicot Levels that extend along most of Monmouthshire's southern boundary are mainly defended from the sea by earth embankments.

Figure 3.1: Location of Monmouthshire County Council within Wales



3.2 Flood risk in Monmouthshire

3.2.1 Summary of types of flooding present in Monmouthshire

Monmouthshire is at risk from all types of flooding: surface water, ordinary watercourses, groundwater, rivers and the sea. Both the towns and rural areas are at risk from surface water flooding to various extents during heavy rainfalls. The terrain of the County with its hills, valleys and plains is also at risk of flooding from watercourses. The towns of Abergavenny, Monmouth and Usk are at particular risk of flooding from rivers and all were seriously flooded in the 1979 flood event, as were other settlements close to the rivers, ie, the Wye, Usk and Monnow. Parts of Chepstow and Tintern are at risk of flooding from the R Wye during tidal surge events and the Caldicot levels which cover communities along the Severn Estuary, including Caldicot, Magor & Undy, Rogiet and Mathern, are at risk from the sea due to overtopping or breech of the coastal defences.

3.3 Preliminary Flood Risk Assessment

3.3.1 The Preliminary Flood Risk Assessment process was carried out in order to establish the level of flood risk within each LLFA area. The process looked specifically at flooding from surface water, ground water and ordinary watercourses and the interface with flooding from Main river. Main river flooding and coastal flooding, however, still remains the responsibility of NRW.
In order to have a consistency of approach, DEFRA and WG identified a number of key risk indicators and their thresholds to establish significant risk and to determine the existence of Flood Risk Areas.

3.3.2 The methodology was based on using the flood maps produced by the NRW to identify 1km squares where flood risk exceeds a defined threshold. These squares are known as areas above Flood Risk Threshold (Blue Squares). The key flood risk indicators and their thresholds for a 1km square were set as follows:-

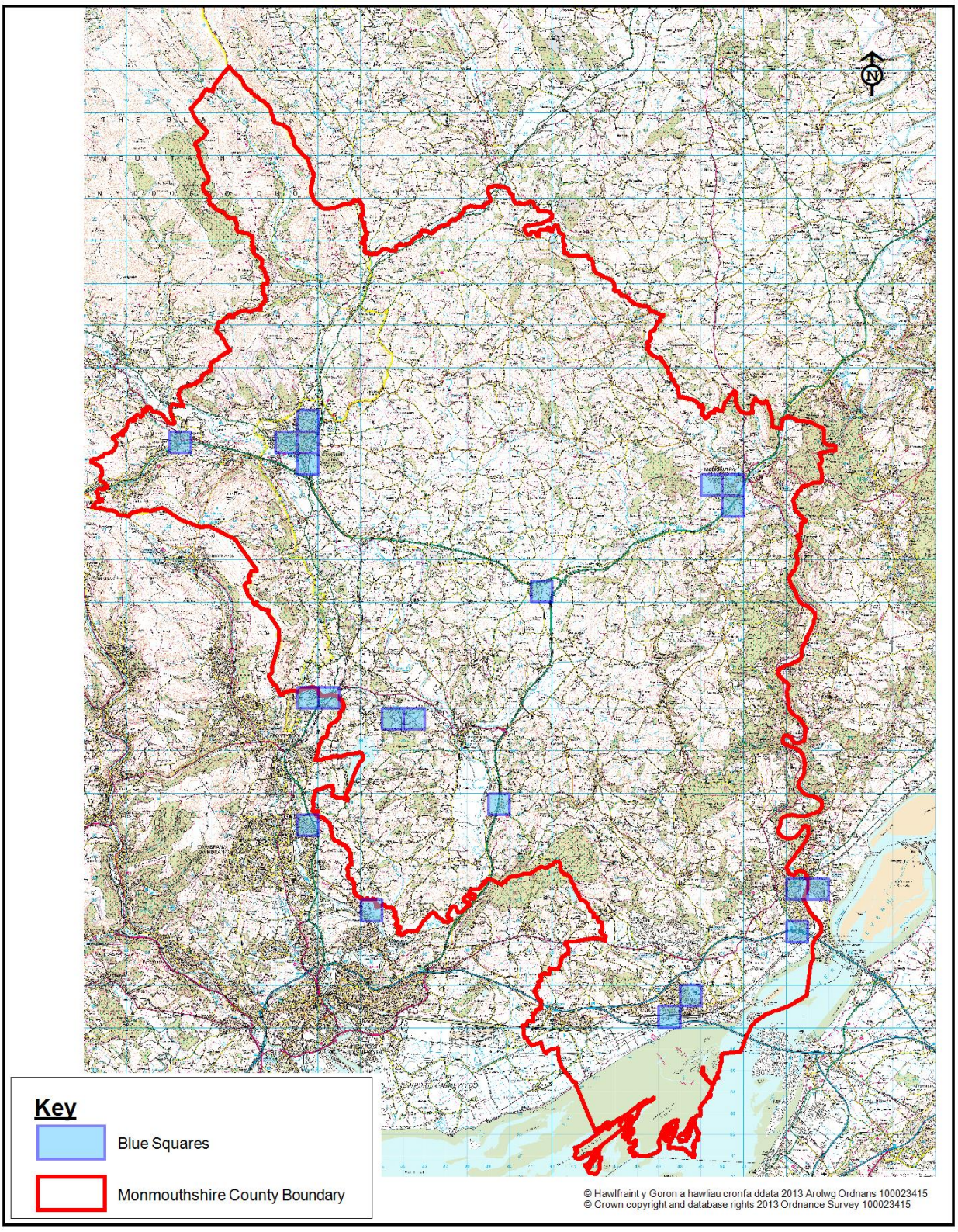
- a minimum of 200 people at risk of flooding
- a minimum of 20 businesses at risk of flooding
- 2 or more critical services at risk of flooding

NRW identified 21 blue squares within Monmouthshire meeting one or more of the criteria. The map below, Fig 3.2, shows the locations of the Blue Squares.

3.3.3 A cluster of blue squares is an indication that an area of concentrated flood risk has been identified. Where there are four or more touching blue squares within a 3km x 3km square the whole 3km x 3km square was considered as an area which could form part of an indicative Flood Risk Area.

The key flood risk indicator for establishing an indicative Flood Risk Area was set as - numbers of people at risk of being affected by flooding exceeding 5,000.
On the basis of the 21 blue squares identified by NRW and the methodology defined above, no Indicative Flood Risk Areas were identified within Monmouthshire. The plan below shows the location of the Blue Squares.

Figure 3.2: Blue Squares Map



3.3.4 In order to review the indicative Flood Risk Area all 1 x 1 km squares within Monmouthshire were reviewed and were satisfied that all the squares which were listed by NRW, as blue squares had been correctly identified. The Key Flood Risk Indicators for Monmouthshire were calculated by the NRW as follows:-

- Human health consequences – Number of Properties 8,200
- Economic consequences – Number of Non-residential properties flooded 5100

3.3.5 As part of the Preliminary Flood Risk Assessment process significant past flooding events within the County were also considered.
To decide on the significance of an individual flood DEFRA, WG and NRW set key flood risk indicator which define a Flood Risk Area in Wales as having 5,000 people at risk or an individual 1km square where at least 200 people or 20 businesses or more than 1 critical service might be flooded to a depth of 0.3 metres and above by a rainfall event with a chance of 1 in 200 of occurring in any given year. Following the PFRA assessment, Monmouthshire identified that it did not have any Indicative Flood Risk Areas as set out by the Regulations.

3.4 The Flood Risk Maps at County Wide Level and Conclusions.

3.4.1 Background to Production of the Maps

Under Part 3 of the Flood Risk Regulations 2009 (FRR 2009) Natural Resources Wales has the duty to prepare for each flood risk areas, flood hazard and flood risk maps related to the risk of flooding from the sea, main rivers and reservoirs while Lead Local Flood Authorities (LLFAs), have the duty to prepare flood hazard and flood risk maps related to surface water flooding for the flood risk areas identified in the PFRAs.

A service level agreement was signed between Welsh Government (WG), Natural Resources Wales (NRW) and the Environment Agency (EA) for the production of these maps and JBA Consultants were contracted to produce the maps on behalf of EA, NRW and LLFAs. The maps were completed in the autumn of 2012 and published as required by the Regulations in 2013.

3.4.2 The information in the Maps

a) Data for each of the modelling probability of flooding – 1 in 30 (3.3%), 1 in 100 (1%) and 1 in 1000 (0.1%) – in any given year
b) Flood extent – the extent of the land that could be affected
c) Flood depth - the depth of flooding
d) Velocity – the velocity of flooding
e) Hazard – the flood hazard rating (defined as a function of the concurrent depth and velocity - see below)
f) Flow direction – the direction of flow, on a 2 metre grid
g) Flow direction – 25m – the direction of flow, displayed on a 25 metre grid (to allow viewing a scale of 1:10,000

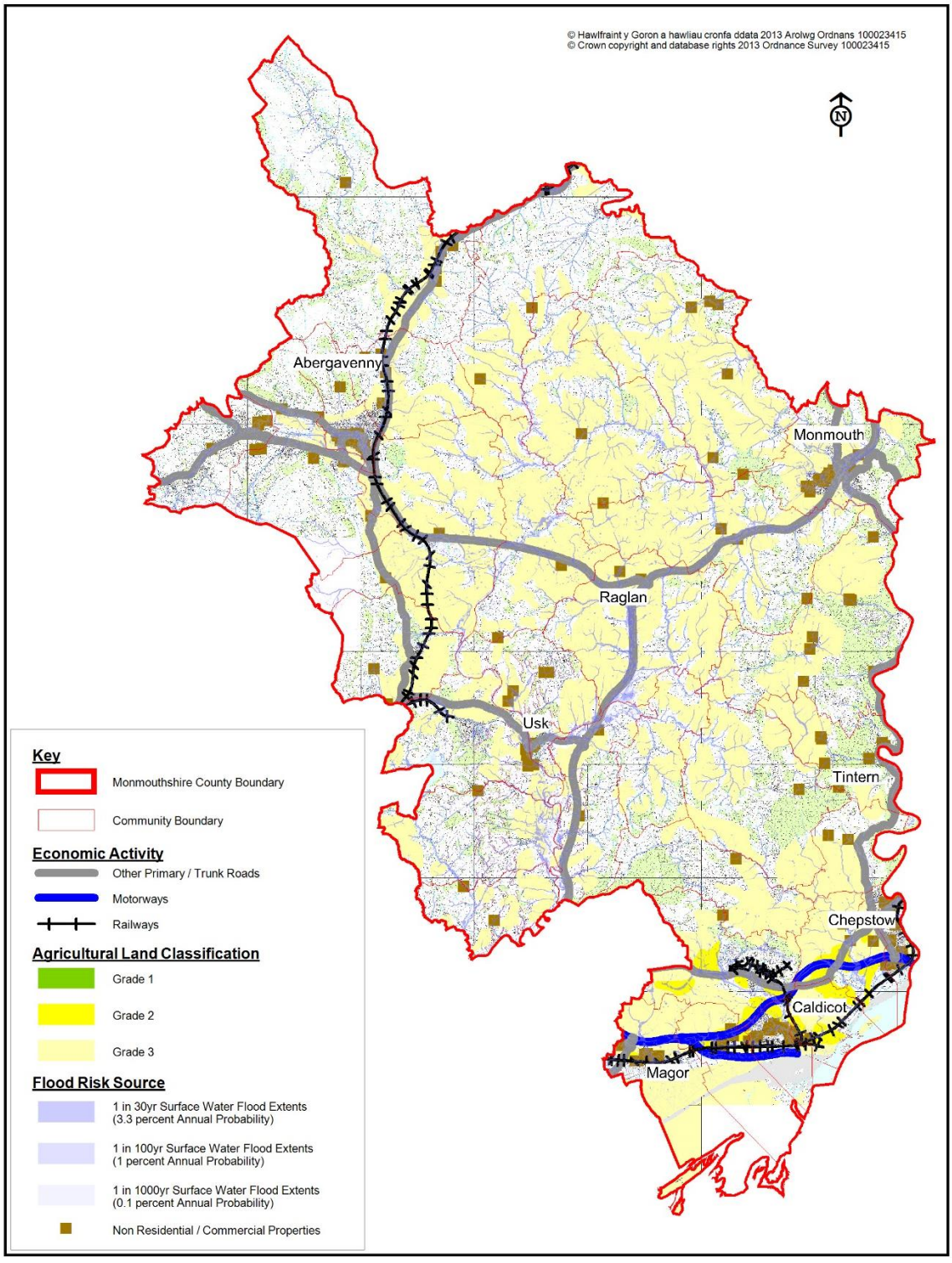
3.4.3 More detail on the maps, the analysis and the data are covered in Appendix 7 below**.** The table below shows the counts representing flood risk from surface water for the whole of Monmouthshire. These were derived from the flood map described in 3.4.1. The numbers in the Medium column are additional to the High risk and the Low risk column is additional again.

Table 3.1: County Wide Counts

Monmouthshire - County Wide Counts (Surface Water)				
		Risk Counts		
	Totals	HIGH (1 in 30yr)	MEDIUM (1 in 100yr)	LOW (1 in 1000yr)
Risk to People				
Residential Properties in areas at risk of flooding (D=0mm)				
Number of residential properties:	39,572	231	341	2035
Number of people in area (2.35 multiplier):	92,994	543	801	4782
Residential Properties at risk of flooding (D=200mm)				
Number of residential properties:	39,572	87	205	868
Number of people in area (2.35 multiplier):	92,994	204	482	2040
Number of services:	295	4	9	4
Risk to Economic Activity				
Number of non-residential properties (n):	3,219	52	70	121
Number of airports:	0	0	0	0
Primary/Trunk roads (km):	253	10	5	43
Length of railways (km):	142	2	2	8
Agricultural land (ha):	84,727	1,002	634	2,311
Risk to Natural and Historic Environment				
Number of EU designated bathing waters within 50m:	0	0	0	0
Special Areas of Conservation (SAC) (ha)	4,839	68	71	101
Special Protection Areas (SPA) (ha)	3,389	1	1	1
Ramsar Sites (ha)	3,389	1	1	1
World Heritage Sites (ha)	1,464	8	4	18
Sites of Special Scientific Interest (SSSI) (ha)	8,237	85	87	197
Parks and Gardens (ha)	103	2	1	4
Scheduled Ancient Monuments (ha)	312	8	4	10
Listed Buildings (n)	3,095	328	150	496
Sites of Interest for Nature Conservation (SINC) (ha)	3,841	96	123	0
Licensed Abstractions (n)	130	11	8	15

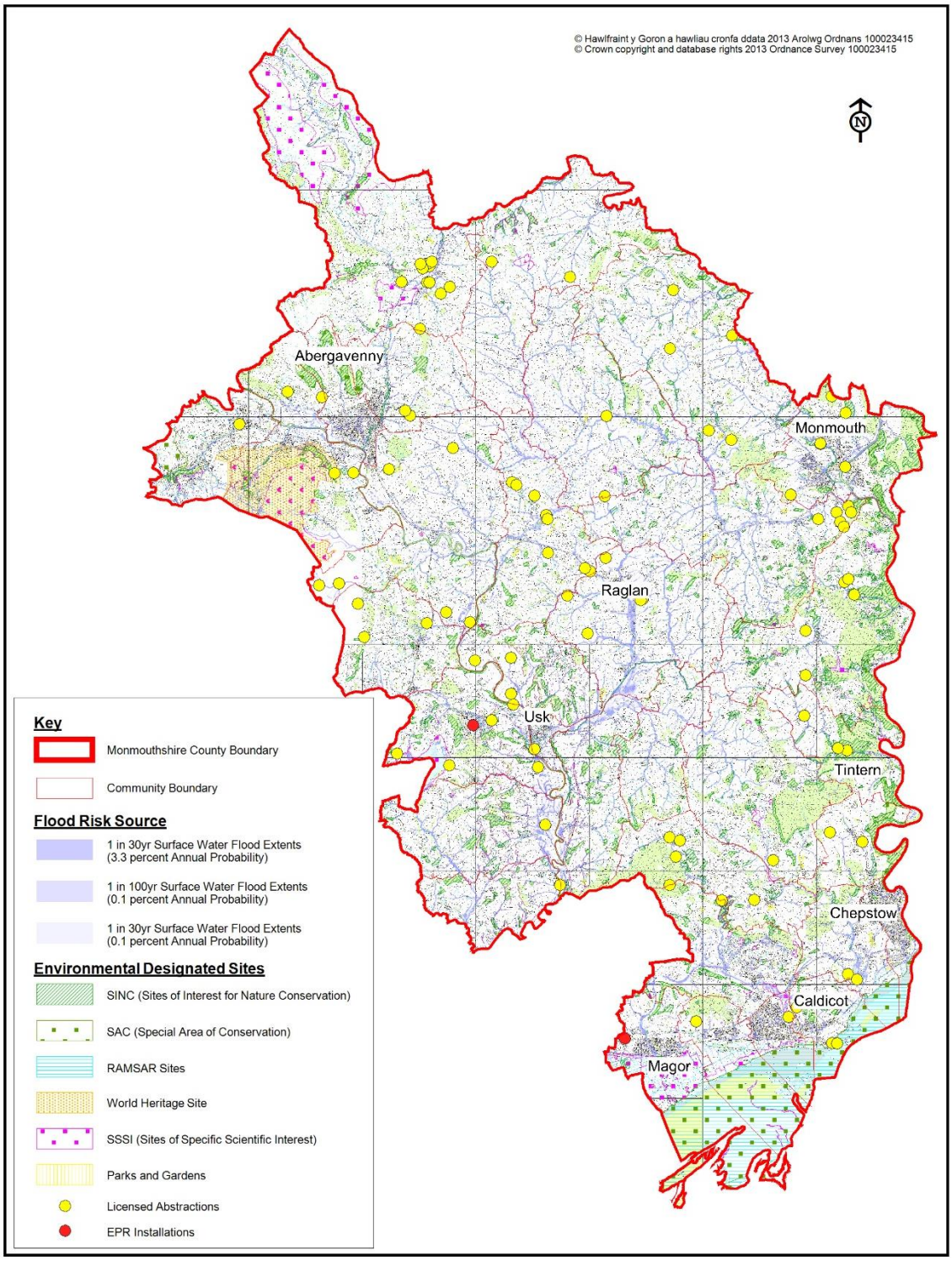
Figure 3.3: Area Covered by the Monmouthshire Flood Risk Management Plan

Figure 3.4 : Extent of Flood Risk to Economic Activity



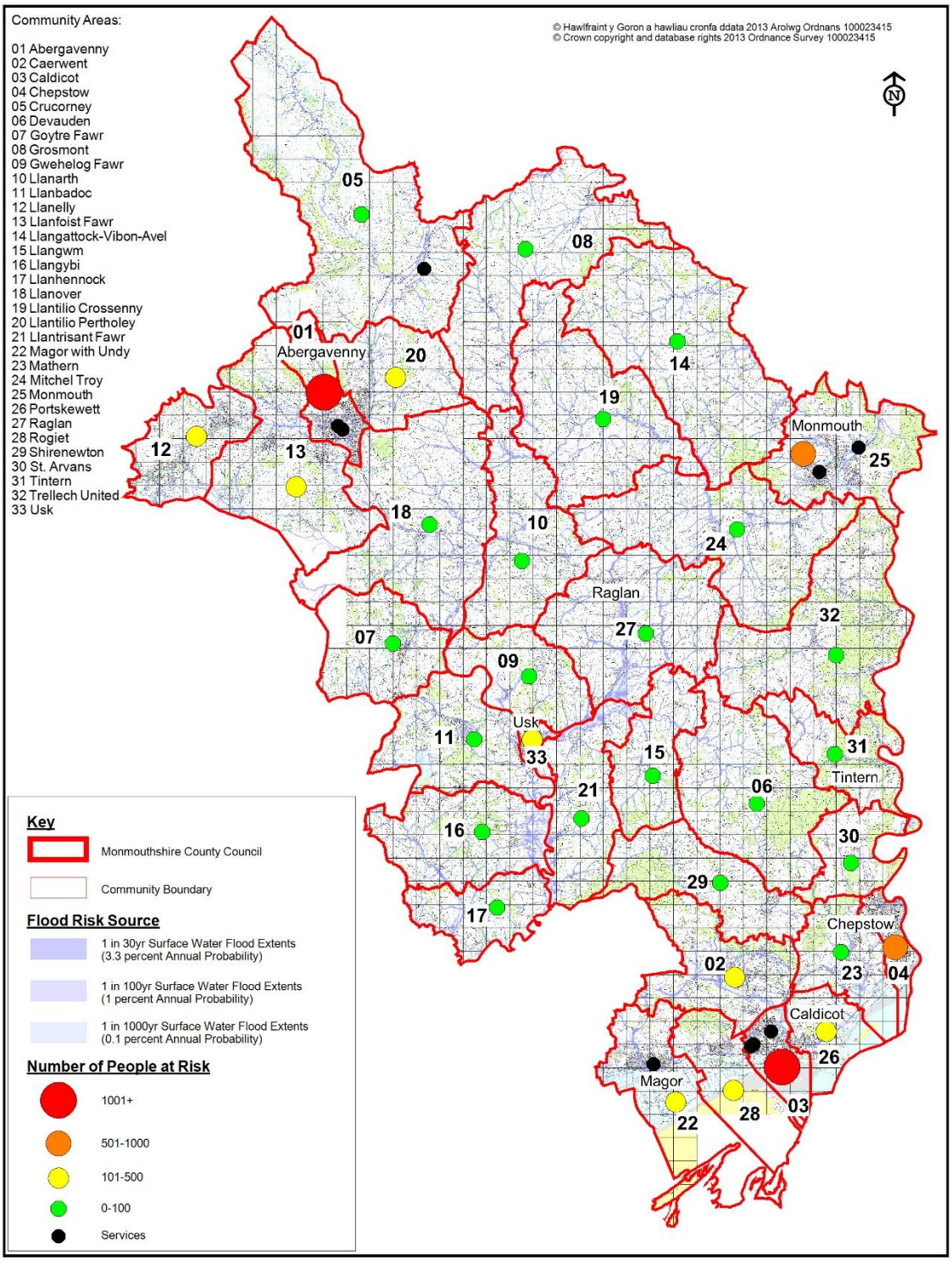
Out of the 3,219 non-residential properties in Monmouthshire, 52 are at a high risk with a 1 in 30 (3%) chance of flooding in any given year. A further 70 have a 1 in 100 (1%) chance of flooding in any given year, with a further 121 considered to have a low risk with a 1 in 1000 (0.1%) chance of flooding occurring each year. Of the 253 km of primary/ trunk road network 10 km's are at high risk of flooding, a further 5 at medium risk and a further 43 of low risk of flooding

Figure 3.5: Extent of Flood Risk to the Natural & Historic Environment



Of the 8,237 SSSI's (Sites of Special Scientific Interest) within the Monmouthshire 85 are considered to be at high risk with a 1 in 30 (3%) chance of occurring each year. 328 of the 3,095 Listed Buildings in Monmouthshire are at a 1 in 30 (3%) or greater chance of flooding each year; with a further 150 of these considered to be at medium risk of 1 in 100 and a further 496 at a low risk of 1 in 1000 of Flooding.

Figure 3.6: Extent of Flood Risk to People



There are 92,994 people and 295 services in Monmouthshire. Of these, 543 people and 4 services are considered to be at high risk with a 1 in 30 (3%) or greater chance of flooding in any given year. A further 801 are in medium risk with a 1 in 100 (1%) chance of flooding in any given year. A further 4,782 people are considered to be at low risk with a 1 in 1000 (0.1%) chance of flooding in any given year.

3.5 Top 10 Communities at Risk from Surface Water Flooding

The analysis for the flood mapping provided by the Environment Agency and Natural Resources Wales has identified properties at risk of flooding across the County. From these we have identified the numbers at risk in each Town & Community. The guidance has suggested we identify the ten communities with the highest numbers of properties at risk and these are set out in the two tables below.

From these it can be seen where the greatest number of properties at risk of Surface Water flooding are located. Those affected from flooding by Main Rivers and the Sea are also shown but these are to be managed through Natural Resources Wales.

Table 3.1 Number of Residents at Risk from Surface Water Flooding (Communities in Alphabetic Order)

Surface Water - No Depth Threshold		Main Rivers & the Sea
Community	**LOW (1 in 1000yr)**	**Flood Zone 2 (1 in 1000yr)**
Abergavenny	1135 (483)	2374 (1010)
Caldicot	1159 (493)	1377 (586)
Chepstow	947 (403)	369 (157)
Llanelly	139 (59)	45 (19)
Llanfoist Fawr	169 (72)	157 (67)
Llantilio Pertholey	207 (88)	75 (32)
Magor with Undy	472 (201)	949 (404)
Monmouth	663 (282)	3443 (1465)
Portskewett	120 (51)	63 (27)
Usk	169 (72)	1659 (706)

Based on 2.35 Persons per Property with property numbers in brackets Rivers and the Sea data given for the same areas

Table 3.2 Number of Residents at Risk from Main River & Sea Flooding (Alphabetic Order)

Rivers & Sea		Surface Water
Community	**Flood Zone 2 (1 in 1000yr)**	**LOW (1 in 1000yr)**
Abergavenny	2374 (1010)	1135 (483)
Caldicot	1377 (586)	1159 (493)
Chepstow	369 (157)	947 (403)
Crucorney	233 (99)	78 (33)
Llanfoist Fawr	157 (67)	169 (72)
Monmouth	3443 (1465)	663 (282)
Magor with Undy	949 (404)	472 (201)
Rogiet	289 (123)	118 (50)
Tintern	266 (113)	47 (20)
Usk	1659 (706)	169 (72)

Based on 2.35 Persons per Property with property numbers in brackets

4. How we currently manage flood risk in Monmouthshire

4.1 Current Management Arrangements

Under the terms of the Flood and Water Management Act 2010, Monmouthshire became a Lead Local Flood Authority and is responsible for what are termed local flood risks. These include the risks of flooding from ordinary watercourses, surface water and ground water. As a Local Authority the Council has always had certain responsibilities in relation to ordinary watercourses, and in practice has taken the lead in dealing with most flooding incidents prior to the changes contained within the Flood and Water Management Act 2010.

This is, however, the first time responsibility for the risks of flooding from surface water has been allocated to anybody in law. The Flood and Water Management Act 2010 placed a number of new statutory duties on Monmouthshire as a Local Authority in our role as a Lead Local Flood Authority including:

i) a duty to be consistent with the National Strategy;
ii) co-operation with other authorities, including sharing data;
iii) a duty to investigate flooding within our area, insofar as appropriate;
iv) a duty to maintain a register of structures and features likely to affect flood risk; and,
v) a duty to contribute to sustainable development.

The management of consents for works on ordinary watercourses was also transferred to the Council from Natural Resources Wales.

In addition to these, Monmouthshire as a LLFA have a number of what are termed permissive powers. These are powers that allow us to do something but do not compel us to do and include:

i) powers to request information;
ii) powers to designate certain structures or features that affect flood or coastal erosion risk;
iii) the expansion of powers to undertake works to include broader risk management actions; and,
iv) the ability to cause flooding or coastal erosion under certain conditions.

As a LLFA, Monmouthshire will also take on the role of the SuDS Adopting and Approving Body, in relation to sustainable drainage systems, when this is determined by Welsh Government. In this role we will be responsible for both approving the original design of the SuDS and adopting and maintaining those adopted systems on completion.

The Local Flood Risk Management Strategy (LFRMS) set out the objectives and measures for managing local flood risks along with the timescales and costs of implementation. To enable us to fully implement this new role and responsibility in respect of local flood risk certain functions previously held by the Environment Agency (now Natural Resources Wales) were transferred. This included taking responsibility for consenting works on ordinary watercourses, from April 2012.

Monmouthshire are also a designated Coastal Erosion Risk Management Authority under the Coast Protection Act 1949, providing us with certain powers in respect of coastal erosion and coastal protection. We were previously referred to as a Coast Protection authority and we are also referred to as a Coastal Local Authority or Maritime Authority and retain the permissive powers in relation to coastal erosion risk management. From October 2011 we need Natural Resources Wales approval for any coast protection works.

4.2 System Asset Management Plans

Under the Flood and Water management Act 2010 MCC as the LLFA is required to maintain a register of structures or features, which in the opinion of the authority, are likely to have a significant effect on a flood risk in the County. Information must be recorded about each of the structures and features including ownership and the state of repair.

To satisfy this requirement Monmouthshire has invested in a bespoke database with GIS functionality that allows us to keep the register and digital map layers showing the locations of these assets. This database is gradually being populated with information collected and works carried out. It is being also used for the management of drainage structures including the following:

- Database of all pipes, culverts, channels, drainage ditches, manholes, intakes and outfalls;
- GIS layers of all pipes, culverts, channels, drainage ditches, manholes, intakes and outfalls;
- Also records of day to day general land drainage investigations and issues

In addition the following are planned to be added:
- Records of all inspections carried out to grids or culverts and records of cleaning of grids and gullies and their locations;
- a register of those structures and features likely to have a significant effect on flooding;

Completing the collection of this data will be undertaken over time as resources permit.

4.3 Channel and Culvert maintenance

Channels and culverts, which have been identified as being significant to flood risk, are being included in the MCC database of drainage structures and the GIS layers. Where these structures are in the ownership of MCC they are maintained by the relevant MCC teams, whether highways, grounds maintenance, countryside, housing, education, etc. Channels may include ordinary watercourses, lined channels, drainage ditches, storage & retention ponds and swales. Bridges and larger culverts are inspected on at least a five yearly basis for structural integrity and directly after any reports of damage or defect arising. Footbridges on rights of way are also inspected regularly and work is underway to record all of these on the Access Management System. Where access inside the culverts is relatively easy and the culvert is regarded as being of strategic importance they are inspected on a regular basis. Any defects recorded are then scheduled for repairs on a priority basis

Highway bridges and culverts are recorded and visited for maintenance on a regular basis. The condition of other culverts and watercourses are less well known. Maintenance is generally carried out on an “as required” basis and may include the following, cutting of grass and shrubs where this may impede flows and reduce channel capacity, repairs to concrete inverts or bank protection where damage has occurred, which could undermine the integrity of the channel, construct new or improved intakes to culverts where existing structures are reducing the operational capacity of culverts or causing risk of flooding due to blockage. New structures will be designed and built in accordance with the Environment Agency Code of Practice for intakes.

As part of the Local Flood Risk Management Strategy the Council agreed to consider implementing a culverting policy. This is to minimise the installation of new culverts unless unavoidable and where possible the removal of culverts and reinstating open watercourses. The policy would be extended to general use as part of the Council’s consenting role on ordinary watercourses. In line with that decision a Draft Culverting Policy has been prepared in line with the one used by Natural Resources Wales –see Appendix 6.

4.4 How we prioritise our work

In order to satisfy the requirements of the National Flood and Coastal Erosion Risk Management (FCERM) Strategy including their four overarching objectives a total of 9 detailed objectives were included in the Monmouthshire Flood Risk Management Strategy. A total of 33 measures were included in the Strategy in order to implement the detailed objectives over the three epochs of 0 - 20 years, 20 to 50 years and 50 to 100 years. Each Measure was allocated to a particular lead for delivery. This information is included in Section 6 of this report and in Appendix 5

4.5 Who we work with to manage flood risk in Monmouthshire

Managing flood risk is the responsibility of each LLFA. The Local Strategy set out who the risk management authorities are and their relevant functions. In developing Local Strategies a LLFA must consult with the public and other risk management authorities who are affected by the strategy. This is covered in more detail in Appendix 1.

Table 4.1: Who We Work With

Risk Management Authorities	Relevant Body(s) for MCC Area
Natural Resources Wales	Natural Resources Wales - South East Area. This now includes the Caldicot & Wentlooge IDD and Lower Wye IDD
The Lead Local Flood Authority	Monmouthshire CC
The Highway Authority	Monmouthshire CC for local roads and Welsh Assembly for Trunk Roads and Motorways
Water Companies	Dwr Cymru/ Welsh Water

4.6 How this FRMP has been co-ordinated

Co-ordination and development of this FRMP has been achieved through regular meetings of the various groups as listed below:

1) South and East Wales Flood Risk Management Group attended by all LLFAs in South Wales, NRW, WLGA and DCWW.

2) Flood Risk Management Plans Working Group attended by all LLFAs in South East Wales, WG, NRW and WLGA.

3) Frequent meetings have taken place with WLGA. Meetings have also taken place with Dwr Cymru / Welsh Water and involvement with & attendance at RBMP Liaison Meetings.

Internal collaboration has also been achieved through meetings with staff who are involved with and deal with aspects of flood risk management, including Emergency Planning and Operations.

4.7 Measures already underway in Monmouthshire to manage flood risk

All of the Objectives and Measures are set out in Table 6.1 in Section 6 below which also sets out their relationship, status and detail and are based on the work done for the Local Flood Risk Management Strategy. More detail on these is set out in the Community Areas in Section 7.

Table 4.2: Progress on Implementing Measures

Measure Type	Measures Completed or Ongoing	Measure Ref.
Prevention	Issue of Land Drainage Consents on ordinary watercourses	1.1
	Comment on Planning Applications in respect of flooding from surface water or ordinary watercourses	1.1
	Comment on Flood Consequence Assessments	1.1 /1.2
	Completion of the Local Development Plan including Minerals and Waste	1.1 & 1.5
	Mapping and better understanding of local flood risk	4.2
	Regular Inspection of screens and locations where known flood risk, including cameras at some locations.	4.2
	Monmouthshire Emergency Plans on how to proceed when flooding is predicted and particular plans for Monmouth Riverside Park covering evacuation and temporary accommodation and support.	2.4 / 2.6
	Joint Emergency Plans for the Gwent Area and regular meetings between Agencies involved to maintain and update plans and hold exercises to test plans	2.6 & 6.1
	Regular flood warnings received from NRW and National Severe Weather reports in advance of heavy rain, river and coastal flooding	2.2, 2.3 & 6.1
	Community Flood Plans in place jointly prepared with NRW and local communities and we will support the development of further plans.	2.5 & 6.1
Protection	On-going maintenance programme;	4.2
	Grass cutting and vegetation removal from channels	4.3
	Inspection of screens and removal of obstructions	4.2
	De-silting channels and culverts where and as necessary	4.3
	Routine maintenance of culverts and channels that are Monmouthshire's responsibility	4.4
	Routine cleansing of road gullies	4.3
	Ongoing collection of data in respect of assets – drainage lines, gullies, manholes, culverts, etc	4.1
Preparedness	Monmouthshire's 'Corporate Flood Response Arrangements'	2.4
	On receipt of flood warnings from NRW on main rivers and the coast we share and cascade them to relevant parts of the Council for appropriate actions & responses.	2.2 / 2.3

	Issue details of high tides annually for Tintern and attend to close the A466 to reduce flooding impacts to residents when flood warnings are issued.	2.2/ 2.3
	Preparation of Guidance Leaflets for the Public, including ***'Does Your Home Get Flooded'*** *see* ***http://www.monmouthshire.gov.uk/flooding***	2.1
	Provide sandbags on request to locations at risk of flooding	3.2
	Close roads, set out warning signs, etc. where flooding is occurring to protect travellers	2.4
	Provide support and advice to minimise flood risk, leaflets providing guidance on prevention, '***What to do in a Flood'*** and ***'What to after a Flood'.***	2.4
	Advice and guidance on the Council's web site	2.1
Recovery and Review	Advice and guidance on the Council's web site	2.1
	Provide support and advice to minimise flood risk, leaflets providing guidance on prevention through leaflets such as, '***What to do in a Flood'*** and ***'What to after a Flood'.***	2.1
	Provide clean up and first aid support, eg, sweep roads, remove silt and debris, collect & dispose of any damaged property, etc.	3.4
	Debrief sessions of MCC staff and any other partners involved to identify any improvements that can be made	3.4
	Participation in Multi-Agency Strategic Recovery Co-ordinating Group as Chair or representation on group	6.1

5. Co-ordination with the Severn River Basin Management Plan

5.1 The Severn River Basin District

5.1.1 The Severn River Basin District covers an area of 21,590 square kilometres. It has a varied landscape from the uplands of Wales, down through valleys and rolling hills, to the lowlands and the Severn Estuary. As well as the River Severn and its main tributaries, the Warwickshire Avon, and the Teme, the river basin district includes the rivers of South East Wales, including the Wye, Usk, Monnow and Taff, and those of the South West, including the Bristol Avon, that drain directly into the Severn Estuary. The latest version of the Plan is available at the following link:

https://www.gov.uk/government/publications/severn-river-basin-district-river-basin-management-plan

5.1.2 The district is home to more than 5.3 million people, and includes the major urban centres of Bristol, Cardiff and Coventry. Despite this much of the river basin is rural in character, with around 80% of the land managed for agriculture and forestry. This includes extensive beef and sheep farming, large dairy units, conifer plantations and some arable and specialist horticulture. While agriculture dominates the landscape it makes up a small part of the economy, the main sectors being related to business, transport, health and industry.

5.1.3 The river basin district includes many important habitat and wildlife areas of national and international importance. For example, the Severn Estuary and its surrounding area are protected for their bird populations, habitats and migratory fish species such as Atlantic salmon, lamprey and eel. The natural environment of the district is also valued for its navigational and recreation uses and is an attraction for the people who live and work here, in addition to the many tourists who visit.

5.1.4 The river basin district faces many environmental challenges and opportunities. Many of our most important wildlife sites depend on a good supply of water but it is vitally important there is also enough water available for public water supplies, agriculture and industry. The changing climate is increasing river water temperatures, rainfall intensity and peak river flows and more information is available on the following web page. (http://www.lwec.org.uk/resources/report-cards/water) Predicted changes in the weather patterns, due to climate change, will create significant challenges in the river basin district. A general shift towards higher temperatures, particularly in the summer and more extremes (in both frequency and magnitude) of floods, droughts and heat waves are anticipated. This may make it harder and more costly to maintain the quality of the water environment across the river basin district. Further information can be found in the UK climate change risk assessment: Government report - Publications - GOV.UK (https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-government-report).

5.2. FRMP Links to the Severn River Basin Flood Risk Management Plan

5.2.1 Monmouthshire is in regular communication with The Environment Agency and Natural Resources Wales, Welsh Water and businesses about how to manage the water environment.

5.2.2 The river basin district has a liaison panel of which Monmouthshire is a member. Members contribute views from their perspective as the representative of an organisation that is responsible for implementing measures and projects.
The role of liaison panels is to endeavour to:

• contribute evidence to enable decision making and reporting on river basin management plans
• devise and track measures and projects as part of a programme of work to prevent deterioration and improve the environment
• work together to develop river basin management plans and associated consultation documents
• liaise with members and their sectors so as to ensure a broad base for decision making and communication
• assist the implementation of the catchment based approach

5.2.3 There are also catchment partnerships which are groups of organisations with an interest in improving the environment in the local area and are led by a catchment host organisation. The partnerships work on a wide range of issues, including the water environment but also address other concerns that are not directly related to river basin management planning. Monmouthshire has been a member of the Wye and Usk Partnership hosted by the Wye & Usk Foundation. It has covered both catchments of the Wye and Usk. This is a Defra led initiative but the partnerships work across entire catchments and the Wye Catchment covers both Wales and England. Catchment partnerships inform the river basin district planning process and drive local delivery of the measures. They:

• provide local evidence
• target and coordinate action in the catchment
• identify and access funding for improvements in the catchment
• incorporate river basin management planning in to the wider environmental management of the catchment
• work with NRW, Wye Valley AONB and others on the above and other longer term preventative actions.

5.2.4 By its involvement in the liaison group and Wye & Usk Catchment Partnership the Objectives and Actions developed will complement those in the River Basin Flood Risk Management Plan as well as the local issues for Monmouthshire. The links between Monmouthshire's FRMP Measures and the Severn River Basin Flood Risk Management Plan are shown in Table 5.1 below.

Table 5.1. Links between Monmouthshire FRMP Measures and Severn River Basin Flood Risk Management Plan

	Monmouthshire FRMP Measure	Description	Severn River Basin Measure
1	**2.1 & 2.2/2.3**	Flood Awareness and Flood Forecasting (Preparedness)	Hydrometry & Telemetry Improvements at Chepstow and Tintern Parva
2			Improvements in Existing Flood Warning System at Monmouth
3	**2.5**	Community Flood Plans (Preparedness)	Development of a Community Flood Plan for Riverside Park, Monmouth
4	**2.4 & 2.6**	Emergency Response Plans (Preparedness) and, Multi Agency Plans (Preparedness)	Undertake assessment & feasibility work to reduce flood risk in Usk.
5	**6.1, 2.4 & 2.6**	Partnership Working (Preparedness), Emergency Response Plans (Preparedness) and, Multi Agency Plans (Preparedness)	Design and construction of flood alleviation schemes at Magor, Caldicot and Rogiet,
6			Design and construction of flood risk asset improvements at Rogiet and Mathern,

5.3 WFD and Environmental Objectives

As part of producing the Local Flood Risk Management Strategy a Strategic Environmental Assessment and a Habitats Risk Assessment were undertaken. The Objectives and Measures developed at that stage have been carried forward into the FRMP. These will be reviewed as part of the progress of the FRMP's production but it is considered unlikely that any significant new assessments will be required.

5.4 Extracts from the Severn RBMP relating to Monmouthshire

NB: More detailed extracts are available in Appendix 3

5.4.1 Historic flooding

There is a long history of fluvial flooding within the Wye and Usk catchments. The most significant flooding event recorded occurred in 1947 affecting large numbers of properties in Hereford and isolating the town of Monmouth. This was catchment wide in its impacts. More recently flooding on the River Wye has occurred to varying degrees in 2012, 2007 and 2000 impacting on many communities including Lynbrook, Ross on Wye and Hampton Bishop, though the extents were not so great. Other notable events happened in 1929, 1960, 1979 and 1998.

In the lower reaches of the River Wye tidal flooding has also impacted on communities around Chepstow such as Brock weir and Tintern. The most recent events occurred in 2014 with the previous highest recorded event occurring in December 1981.

In the Usk catchment flooding has also occurred regularly. In May 1931 Abergavenny suffered with flooding from the Usk causing one recorded death. 1979 saw flooding at Llanfaes and Brecon town centre and at Usk Town, with damages estimated at greater than one million pounds. The water levels remain the highest on record in most locations along the Usk. Further floods occurred In December 2000 and February 2002. Christmas 2013 saw the highest recorded level along the Usk in recent years, but fortunately there was very little recorded flooding to properties. January 2014 saw the highest Tides recorded at Newport in several years.

5.4.2 Current flood risk

There is frequent, low level flooding in the Wye Valley, with agricultural and rural floodplain affected. Flooding from the River Wye at Monmouth is a regular occurrence and while the more commonly occurring events are disruptive to local communities, the number of properties directly affected is relatively low. During larger events such as that experienced in 1947 there are significant numbers of properties affected throughout the catchment. National and regional infrastructure, including utility sub stations and major transport routes, are also affected resulting in many rural communities becoming isolated. The main fluvial flood risks on the Wye are in Hereford and Monmouth.

The highest areas of tidal risk are at Chepstow, Tintern and the Caldicot Levels. A number of properties flood and the main road at Tintern are closed for the hours around high tide. Chepstow is at risk from high tides at Elmdale on the English side of the Wye and the area upstream of the railway bridge on the Welsh side.

The Caldicot Levels are an area of very flat reclaimed land served by flood defences that would become compromised should there be any overtopping, and the effect would be similar to those experienced elsewhere in the country, such as the Somerset Levels during the winter of 2013/14.

The Flood risk in the Usk catchment varies as the topography and source of risk changes. The areas of highest hazard are in the Usk Estuary and the more developed towns such as Brecon, Usk and Crickhowell. 6 of the top 100 risk communities in Wales are to be found in the Usk catchment, these are predominantly at risk from tidal flooding, around the Newport area. The hazard in the aforementioned towns is similarly managed via schemes built from the 1960's through to recent times and the residual risk is from failure or overtopping. All key locations of high risk benefit from a flood warning service and have been targeted by flood awareness and other engagement activities.

5.4.3 Future flood risk and issues in the catchment

In the future, the increased frequency and intensity of rainfall events in combination with fast responding catchments will be the greatest threat to the upper areas where a relatively large number of small to medium sized communities are distributed over a wide area.

The greatest threat to the lower catchment is from sea level rise which could increase flood risk significantly in Newport and surrounding low-lying areas, and potentially change the character of more than 2,000 hectares of low-lying land which is currently designated as three separate SSSIs across the Caldicot Levels.

A flood forecasting model was delivered for the Usk catchment in early 2014. In addition to this a major data collection exercise during and after the floods experienced over the Christmas and new year of 2013/4 has generated a major calibration and threshold review for the flood warning service in the Usk catchment.

There is a major modelling exercise being undertaken that will look to improve our knowledge of all the coastal risk along the South East of Wales, this includes all tidal risk along the Usk coastal reaches.

Rogiet, Caldicot and Nash communities all benefited from recent sea door CCTV surveys that have helped inform the sea door maintenance programme.

6 Monmouthshire Flood Risk Management Plan Objectives

6.1 Welsh Government Objectives

The Welsh Government has set **four overarching objectives** for managing flood and coastal erosion risk in Wales, over the life of the National Strategy:

a) Overarching Objective A1 - Reducing the impacts on individuals, communities businesses and the environment;

- Reduce distress by reducing the number of people exposed to the risk of flooding.
- Reduce community disruption by reducing the number of residential and commercial properties affected by the risk of flooding.
- Reduce risk to life by reducing the number of people exposed to risk of flooding of significant depth and velocity.
- Reduce disruption to critical infrastructure or prepare plans to allow the operations to be maintained.

b) Overarching Objective A2 - Raising awareness of and engaging people in the response to flood and Coastal Erosion

- Provide systems to give early warning of potential flooding to individuals and communities.
- Provide efficient systems for the management and maintenance of surface assets.
- Reduce economic damage
- Reduce cost of management

c) Overarching Objective A3 - Providing an effective and sustained response to flood events and Coastal Erosion

- Protect and improve Special Areas of Conservation SACs), Special protection Areas (SPAs), Sites of Special Scientific Interest (SSSIs) and Sites of Importance for Nature Conservation (SINCs)
- Contribute to the delivery of Monmouthshire Biodiversity Action Plan
- Create natural channels and water bodies with minimal modifications
- Protect and Improve water quality
- Provide Flood Risk management Plans for each area subject to flood risk
- Ensure that measures are designed and constructed in a sustainable way
- Ensure that MCC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities

d) Overarching Objective A4 - Prioritising investment in communities most at risk.

- Ensure that investment decisions for the implementation of flood risk management schemes are made on a consistent, defendable basis and are subject to cost benefit analysis.

Debris Build up on Wye Bridge, Monmouth

The following Table summarises these with the Objectives and Measures together with the time periods established as part of the Strategy.

Table 6.1 Objectives & Measures

				Overarching Objectives (A)				Flood Risk Objectives									Timescales		
								Social (S)				Economc (EC)		Environ - mental (EN)					
Delivery Theme	Ref	Measure	Measure Type	Reducing the Consequences (A1)	Raising Awareness & Engaging People (A2)	Providing Effective & Sustained Response (A3)	Prioritising Investment (A4)	Reduce Distress (S1)	Reduce Community Disruption (S2)	Reduce Risk to Life (S3)	Reduces Disruption to Critical Services (S4)	Reduce Economic Damage (EC1)	Reduce Cost of Management (EC2)	Reduces Damages to SSSIs etc (EN1)	Improve Naturalness (EN2)	WFD Objectives met (EN3)	0-20Yrs Short Term	20-50Yrs Medium Term	50-100Yrs Long Term
Development	1.1	Sustainable & Strategic Development Planning, LDP	Prevention	Y				Y	Y	Y	Y	Y	Y				Y		

	1.2	SFRA / SFCA	Prevention	Y				Y	Y	Y	Y	Y	Y				Y		
	1.3	Water Cycle Strategy	Prevention	Y				Y	Y	Y	Y	Y	Y				Y		
	1.4	Relocation	Prevention	Y					Y	Y	Y	Y							Y
	1.5	Minerals & Waste as part of the LDP	Prevention	Y				Y	Y	Y	Y	Y					Y		
	1.6	Sustainable Urban Drainage (SUDS)	Prevention	Y				Y	Y	Y	Y	Y		Y	Y	Y	Y		
Flood Forecasting & Response	2.1	Flood Awareness	Preparedness		Y			Y	Y	Y	Y	Y	Y				Y	Y	
	2.2 & 2.3	Flood Warning & Forecasting	Preparedness	Y	Y			Y	Y	Y	Y	Y	Y				Y		
	2.4	Emergency Response Plans	Preparedness	Y		Y		Y	Y	Y	Y	Y		Y			Y		
	2.5	Community Flood Plans	Preparedness	Y	Y	Y		Y	Y	Y	Y	Y		Y			Y		
	2.6	Multi Agency Flood Plans	Preparedness	Y		Y		Y	Y	Y	Y	Y					Y		
Land, Cultural & Environmental Management	3.1	Land Management	Prevention	Y					Y	Y	Y	Y		Y	Y	Y	Y	Y	
	3.2	Resilience	Preparedness	Y		Y		Y	Y	Y	Y	Y				Y	Y		
	3.3	Resistance	Protection		Y	Y		Y	Y	Y	Y	Y		Y		Y	Y		
	3.4	Restoration	Prevention			Y		Y	Y		Y	Y		Y		Y	Y	Y	
	3.5	Environmental Enhancement	Prevention				Y					Y		Y	Y	Y	Y	Y	
	3.6	Habitat Creation	Protection				Y							Y	Y	Y	Y	Y	Y
Asset Management & Maintenance	4.1	Asset Management Plans	Protection				Y		Y	Y	Y	Y					Y		
	4.2	Defence / Structure Management	Protection	Y			Y		Y	Y	Y	Y					Y	Y	
	4.3	Channel Maintenance	Prevention	Y				Y	Y	Y	Y	Y				Y	Y		
	4.4	Culvert Maintenance	Prevention	Y				Y	Y	Y	Y	Y				Y	Y		
Studies, Assessments & Plans	5.1	Investigation	Preparedness	Y			Y	Y	Y	Y	Y	Y					Y		
	5.2	Risk Assessments	Preparedness	Y	Y		Y	Y	Y	Y		Y		Y		Y		Y	
	5.3	Strategy Plan	Preparedness	Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
	5.4	Local Property level flood mitigation - resilience	Preparedness	Y	Y	Y		Y	Y	Y	Y	Y						Y	
	5.5	Local Property level flood mitigation - resistance	Protection	Y	Y	Y		Y	Y	Y	Y	Y						Y	
	5.6	Pre-Feasibility Studies / Feasibility Studies	Preparedness	Y			Y	Y	Y	Y	Y	Y		Y		Y	Y		
	5.7	Project Plans - Option Appraisals	Preparedness	Y			Y	Y	Y	Y	Y	Y		Y		Y		Y	
	5.8	Flood Risk Plans	Preparedness	Y			Y	Y	Y	Y	Y	Y		Y		Y		Y	
High Level Awareness &	6.1	Partnership Working	Preparedness	Y	Y		Y		Y		Y	Y					Y		
Monitoring	7.1	Monitoring - Waves, Beaches, Aerial Photography and Topographical Surveys	Preparedness	Y			Y		Y		Y	Y	Y	Y		Y	Y	Y	
	7.2	Habitats Monitoring		Y								Y		Y		Y	Y		

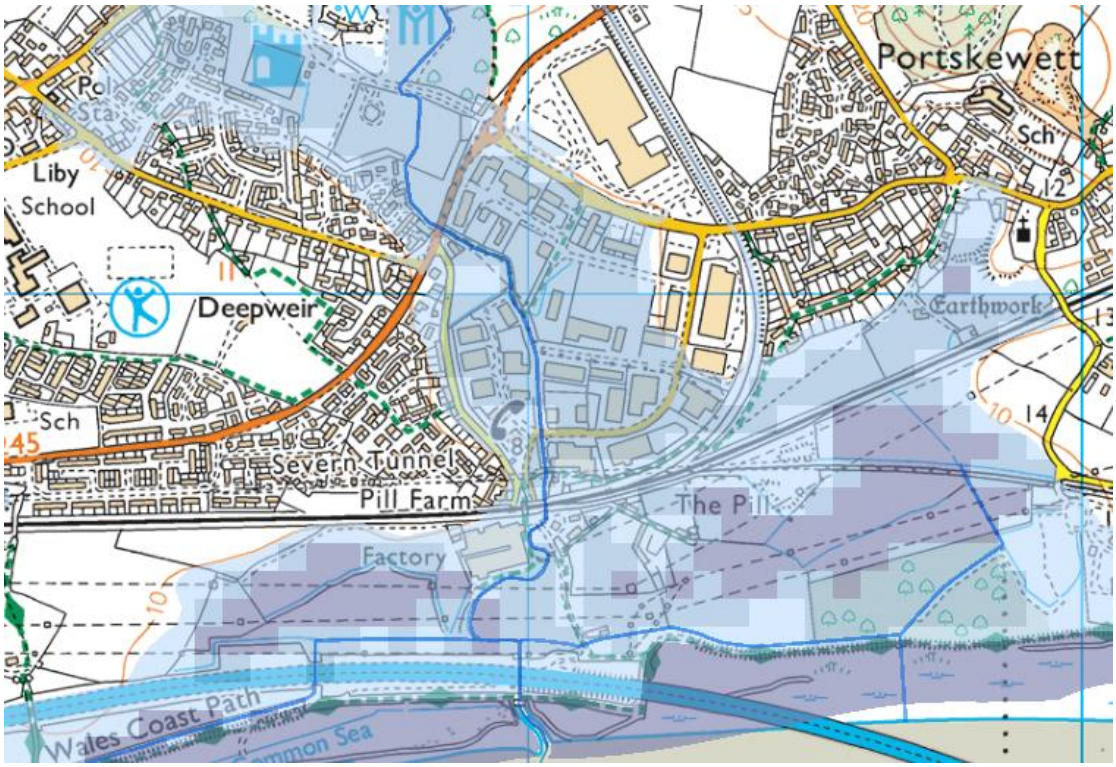
7. How we will manage flood risk at a local level

7.1 Area at Risk Overview

There are several issues that need to be progressed Countywide to prevent or at least reduce the risks of flooding to properties and these are shown in paragraphs 7.1.1 and 7.1.2 below. Section 7.4 below identifies each Community Area in Monmouthshire and provides a description of that area, the watercourses and main risks from flooding due to surface water and watercourses, together with a flood risk map and a table of impacts on properties and other sites. Risks from main rivers and the sea are formally dealt with by the Severn Estuary Flood Risk Management Plan being prepared by Natural Resources Wales and the Environment Agency and this is the document that should be consulted for such risks. However from a practical point of view we have included that risk information as well, based on information provided by EA and NRW, to provide a more complete picture of the flood risk to each community. Natural Resources Wales also show the Flood Risk Maps on their Web Pages and these can be viewed at the following: https://naturalresources.wales/our-evidence-and-reports/maps/flood-risk-map/?lang=en

The level of detail available can be seen below in Figure 7.1 an extact from the Caldicot / Portskewett area showing the areas at risk of flooding from Rivers & the Sea.

Figure 7.1 Extract from Natural Resources Wales Web Page for Flood Risk Areas



The final Severn River Basin Management Plan is available on line at:

https://www.gov.uk/government/publications/severn-river-basin-district-river-basin-management-plan

7.1.1 Culverting of Watercourses

Culverting of watercourses can cause significant flood risk if not done appropriately and not consented under the Land Drainage Act. Culverting increases maintenance costs and generally reduces flow capacity, can block more readily and often requires a screen to prevent debris or persons entering long sections. There are also negative habitat issues from culverting watercourses and under current legisialtion (the Water Framework Directive) we are obliged to ensure that any works done in watercourses do not have negative impacts on the environment and habitats and where possible improve habitats. The former Environment Agency in Wales and Natural Resources Wales have had a culverting policy document for many years. When the consenting procedures for watercourses were transferred to Local Authorities in April 2012 there was an expectation that we would develop a Culverting Policy for Monmouthshire. We have now drafted such a Policy and that is attached at Appendix 6. Its main objective is to avoid / reduce flood risk to properties, whilst meeting the environmental requirements set out in law.

7.1.2 Land Drainage Byelaws

Both the Environment Agency and the Internal Drainage Boards have sets of Byelaws to deal with aspects of Land Drainage not covered in main legislation (ie. the Land Drainage Act & the Flood & Water Management Act). These are issues we have no powers to deal with and include, building over culverts, creation of new watercourses, constructing buildings close to watercourses, removal of silting in watercourses, structures or excavations outside the consenting regulations etc. These all cause increased risks of flooding or make maintenance and prevention more difficult. This issue is recognised across all local authorities in Wales. As such a working group was established with representaives from WLGA, Welsh LA's, NRW, IDBs was established to review what is currently used and to develop a new set for Local Authorities. Once drafted it will be consulted on and will then need Ministerial approval. At that stage each Local Authority would also need to consider the Byelaws and take a decision on adopting them or not. As above the objective is to prevent or reduce the risks of flooding to properties.

7.2 Measures and Objectives to mitigate flood risk (Revenue & Capital)

The Table below identifies the Measures and Objectives developed as part of the Local Flood Risk Management Strategy (LFRMS) presented to Members of the Scrutiny Committee in 2012 and approved at Cabinet in March 2013. This was subsequently approved by the Welsh Minister. The Measures were grouped by delivery theme for clarity. Full details were set out in a spreadsheet format including a lead group or body and a timescale for delivery. Some of the Measures have been completed, for example Measures 1.1 and 1.2 were delivered as part of the Local Development Plan. Others are in progress such as Measure 5.8 which is this Flood Risk Management Plan. Some Measures have been built into operational practice, for example, Measures 4.3 and 4.4 in respect of maintenance of channels and culverts. Other Measures are set to be delivered over a longer timescale in line with Welsh Government targets and policies. A copy of the Objectives & Measures Spreadsheet is attached at Appendix 5 for reference.

For each Town and Community area the relevant Measures have been identified to reduce, remove or mitigate the risks of flooding, with their local description. These

lists also identify work already undertaken in each area. All of the measures also link to an EU Reporting Code, a standardised way of reporting for National Reports. These codes are shown alongside the measures and a summary of these codes is shown in Appendix 2

7.2.1 Measures for achieving objectives

Each measure shown in Table 7.2 below is categorised according to the following Implementation Phase shown in Table 7.1.

Table 7.1 Progress Categories on Implementing Measures

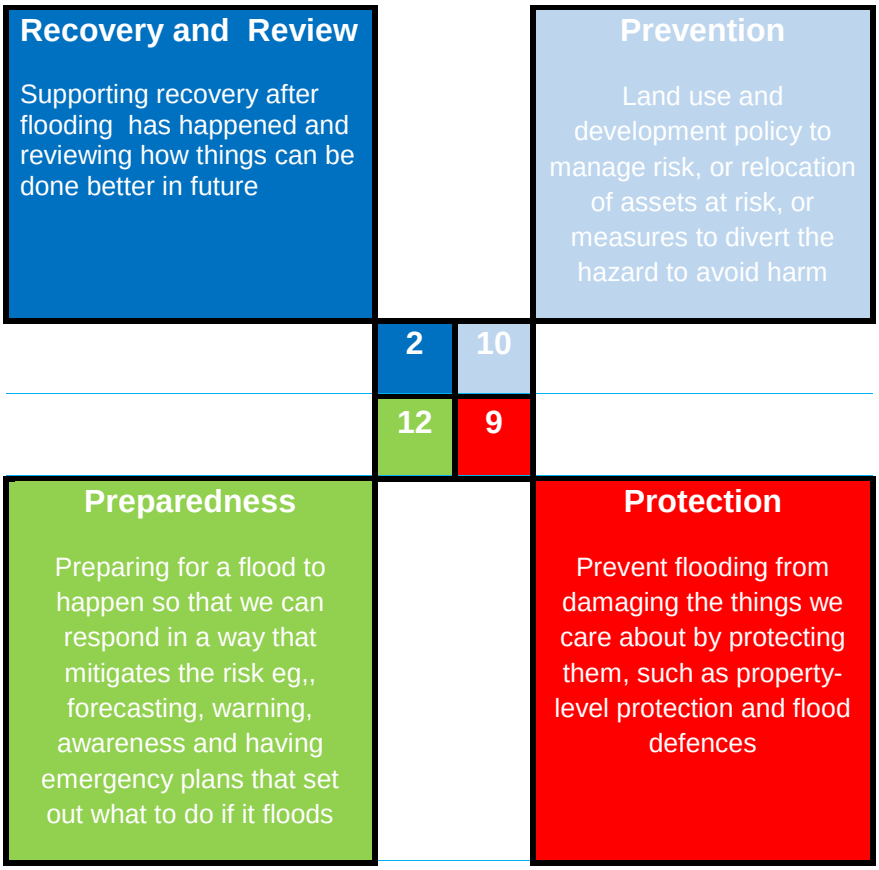
Category	Description	Colour
On-going Measures	those measures already being implemented or completed	**Orange**
Agreed Measures	those measures that are agreed for implementation (i.e. funding is approved), and will be implemented	**Yellow**
Planned Measures	those measures that are being proposed as part of the FRMP. These measures can include proposed changes to operational measures (e.g. the withdrawal of maintenance).	**Pink**

Table 7.2 Summary of Objectives and Measures with Progress

Delivery Theme	Ref	Measure	Overarching Objective	Measure Type	EU Reporting Code
Development Planning & Adaptation	1.1	Sustainable & Strategic Development Planning, LDP	A1	Prevention	M21
	1.2	SFRA / SFCA	A1	Prevention	M21
	1.3	Water Cycle Strategy	A1	Prevention	M24
	1.4	Relocation	A1	Prevention	M22
	1.5	Minerals & Waste as part of the LDP	A1	Prevention	M21
	1.6	Sustainable Urban Drainage (SUDS)	A1	Prevention	M23
Flood Forecasting & Response	2.1	Flood Awareness	A2	Preparedness	M43
	2.2 & 2.3	Flood Forecasting And Warning	A1 & A2	Preparedness	M43
	2.4	Emergency Response Plans	A1	Preparedness	M42
	2.5	Community Flood Plans	A1 & A2	Preparedness	M44
	2.6	Multi Agency Flood Plans	A1	Preparedness	M42
Land, Cultural & Environmental Management	3.1	Land Management	A1	Prevention	M23
	3.2	Resilience	A1 & A3	Preparedness	M23
	3.3	Resistance	A2 & A3	Protection	M23
	3.4	Restoration	A3	Recovery & Review	M51
	3.5	Environmental Enhancement	A4	Prevention	M31
	3.6	Habitat Creation	A4	Protection	M31
Asset Management & Maintenance	4.1	Asset Management Plans	A4	Protection	M35
	4.2	Defence / Structure Management	A1 & A4	Protection	M24
	4.3	Channel Maintenance	A1	Prevention	M24
	4.4	Culvert Maintenance	A1	Prevention	M24
Studies, Assessments & Plans	5.1	Investigation	A1 & A4	Recovery & Review	M53
	5.2	Risk Assessments	A1. A2 & A4	Preparedness	M44
	5.3	Strategy Plan	A1	Preparedness	M44
	5.4	Local Property Level flood mitigation - resilience	A1, A2 & A3	Preparedness	M35
	5.5	Local Property Level flood mitigation - resistance	A1, A2 & A3	Protection	M35
	5.6	Pre-Feasibility Studies / Feasibility Studies	A1 & A4	Protection	M24
	5.7	Project Plans - Option Appraisals	A1 & A4	Protection	M24
	5.8	Flood Risk Management Plans	A1 & A4	Protection	M24
High Level Awareness & Engagement	6.1	Partnership Working	A1, A2 & A4	Preparedness	M44
Monitoring	7.1	Monitoring - Waves, Beaches, Aerial Photography and Topographical Surveys	A1 & A2	Preparedness	M44
	7.2	Habitats Monitoring	A1	Protection	M31

The Figure below shows the number of Measures in each of the Welsh Government main Objectives

Figure 7.2 Measures by Objective



7.2.2 Implementation of Measures

Many of the measures are either ongoing or completed and as can be seen for the work to be done in each Community many are planned or in progress. Further detail on others is set out here to clarify how all the measures are to be met. Table 7.3 below provides more detail on progress. It should be noted that all of the Objectives and Measures were the subject of an SEA and HRA assessment. However some of the individual actions identified may need to have appropriate consultations and assessments including, but not limited to, nature conservation designations, biodiversity and protected species issues, countryside access, building conservation, heritage and landscape designations and impact.

Table 7.3 Measure Implementation Progress

Delivery Theme	Ref	Measure	Implementation Progress
Development Planning & Adaptation	1.1	Sustainable & Strategic Development Planning, LDP	Completed as part of LDP
	1.2	SFRA / SFCA	Completed as part of LDP
	1.3	Water Cycle Strategy	Planned for next plan cycle 6 -12 years
	1.4	Relocation	Long term measure for 50-100 years
	1.5	Minerals & Waste as part of the LDP	Completed – now incorporated into the LDP
	1.6	Sustainable Urban Drainage (SUDS)	Being applied but awaiting Welsh Government legislation for full implementation
Flood Forecasting & Response	2.1	Flood Awareness	Ongoing
	2.2 & 2.3	Flood Forecasting And Warning	Ongoing
	2.4	Emergency Response Plans	Completed and updated regularly
	2.5	Community Flood Plans	Ongoing
	2.6	Multi Agency Flood Plans	Completed and updated regularly
Land, Cultural & Environmental Management	3.1	Land Management	Limited opportunities to date but this will feature in future schemes and for new developments through the planning process as part of integrating flood management with development and through reducing hard defence structures
	3.2	Resilience	
	3.3	Resistance	
	3.4	Restoration	A3
	3.5	Environmental Enhancement	Limited opportunities to date but this will feature in future schemes and for new developments through the planning process as part of integrating flood management with development and through reducing hard defence structures A4
	3.6	Habitat Creation	
Asset Management & Maintenance	4.1	Asset Management Plans	Ongoing
	4.2	Defence / Structure Management	Ongoing
	4.3	Channel Maintenance	Ongoing
	4.4	Culvert Maintenance	Ongoing
Studies, Assessments & Plans	5.1	Investigation	Ongoing
	5.2	Risk Assessments	Dealt with through production of this Flood Risk Management Plan
	5.3	Strategy Plan	Strategy completed and approved in 2013
	5.4	Local Property Level flood mitigation - resilience	Ongoing and to be encouraged where flood defence schemes would be inappropriate or where the benefit / cost ration is very low
	5.5	Local Property Level flood mitigation - resistance	
	5.6	Pre-Feasibility Studies / Feasibility Studies	Ongoing

	5.7	Project Plans - Option Appraisals	Ongoing
	5.8	Flood Risk Management Plans	Dealt with through production of this Flood Risk Management Plan
High Level Awareness & Engagement	6.1	Partnership Working	Ongoing
Monitoring	7.1	Monitoring - Waves, Beaches, Aerial Photography and Topographical Surveys	To be met through working with the Coastal Groups and establishment of the Welsh Coastal Monitoring Centre and work undertaken through the Countryside team
	7.2	Habitats Monitoring	

7.2.3 Core Measures.

All of the Objectives and Measures are set out in Table 6.1 in Section 6. There are however 4 Measures that will be applied to all 33 Town and Community Areas these are termed as Core Measures. Implementation of these Core Measures and the remaining Measures will be prioritised based on the Towns & Communities with the greatest risk. More detail on these is set out in the Community Areas in Section 7.

Core Measure 2.1 - Flood Awareness

Raise awareness with landowners about their riparian responsibilities in regarding watercourses and culverts on their land.

Core Measure 2.5 - Community Flood Plans

Engage with Communities to promote and encourage the development of Community Flood Plans for all Communities at risk of Surface Water flooding in residential, commercial and industrial areas jointly with NRW and the Community.

Core Measure 4.1 - Asset Management Plans

The collection of asset data to improve knowledge of Monmouthshire's assets, to identify more clearly the possible risks, investigations and key watercourses & culverts including localised modelling of watercourses and critical culverts.

Core Measure 6.1 - Partnership Working

We will work with other risk management partners such as NRW (Including the IDD's) and Welsh Water to implement the Measures.

7.3 Prioritising Funding

7.3.1 Monmouthshire will ensure that investment decisions for the implementation of flood risk management schemes are made on a consistent, defendable basis and are subject to cost benefit analysis.

7.3.2 A consultation by Welsh Government on the possibility of establishing a single capital investment programme for flood and coastal erosion risk management in Wales took place in late 2014 / early 2015. Welsh Government states that investment in flood and coastal erosion risk management will need to be more rigorously prioritised in future. In determining the type of risk management intervention required, the scale of

investment and the share to be met by government, a range of factors would need to be considered.

7.3.3 Welsh Government intend that this will result in the establishment of a single Welsh Government funding scheme for all flood and coastal erosion risk management projects in Wales. As part of establishing this single funding scheme the Welsh Government intends to produce a prioritised list of projects, along with an indication of both the funding to be provided by the Welsh Government and the timescale for that investment. Included with this they will also review the method for determining the grant rate for local authority capital schemes and whether a fixed grant rate is more appropriate.

7.3.4 The estimated costs of the measures identified in the Core Measures and those Specific Measures in Community Areas amounts to some £140,000 per year for the six year period identified within the FRMP. This includes both staff time and external costs of specialist contractors for work such as camera surveys, etc. Funding for this will be a mix of the current Land Drainage budget, Welsh Government Grants and other funding sources. This estimate excludes capital works such as replacement, structures etc.

7.4 Communities and Flood Risk Areas

Ref	Community Area	Ref Code
7.3.1	Abergavenny Town Council	AB
7.3.2	Caerwent Community Council	CAE
7.3.3	Caldicot Town Council	CAL
7.3.4	Chepstow Town Council	CH
7.3.5	Crucorney Community Council	CR
7.3.6	Devauden Community Council	DE
7.3.7	Goetre Fawr Community Council	GF
7.3.8	Grosmont Community Council	GR
7.3.9	Gwehelog Fawr Community Council	GW
7.3.10	Llanarth Community Council	LLA
7.3.11	Llanbadoc Community Council	LLB
7.3.12	Llanelly Community Council	LLE
7.3.13	Llanfoist Fawr Community Council	LLF
7.3.14	Llangattock Vibon Avel Community Council	LVA
7.3.15	Llangwm Community Council	LLG
7.3.16	Llangybi Community Council	LLY
7.3.17	Llanhennock Community Council	LLH
7.3.18	Llanover Community Council	LLO
7.3.19	Llantilio Crossenny Community Council	LLC
7.3.20	Llantilio Pertholey Community Council	LLP
7.3.21	Llantrisant Fawr Community Council	LLT
7.3.22	Magor with Undy Community Council	MU
7.3.23	Mathern Community Council	MA
7.3.24	Mitchell Troy Community Council	MT
7.3.25	Monmouth Town Council	MO
7.3.26	Portskewett Community Council	PO
7.3.27	Raglan Community Council	RA
7.3.28	Rogiet Community Council	RO
7.3.29	Shirenewton Community Council	SH
7.3.30	St Arvans Community Council	STA
7.3.31	Tintern Community Council	TI
7.3.32	Trellech United Community Council	TR
7.3.33	Usk Town Council	US

7.4.1 Abergavenny Town Council Area

Abergavenny today is a busy market town and one of the five main towns in Monmouthshire. It had a population of 10,078 in the 2011 census with 4635 properties. It is on several major trunk roads, The A40 trunk road passes through the town and the A465 Heads of Valley road passes south of the town and then to Hereford to the East. The trunk road A4042 also joins the A40 and A465 to the south of the town at a major intersection. In Roman times it was known as Gobanium and has a long history with its Norman castle perched on the ridge of glacial deposits with commanding views over the Usk valley. Abergavenny is known as the gateway to Wales with the A40 London to Fishguard trunk road passing through the centre of the town. There are hills on most sides of the town with the Sugar Loaf to the north west, the Skirrid to the north, the Little Skirrid on the east and the Blorenge to the south all providing source flows for local brooks and rivers.

Abergavenny sits on a main river, the R Usk, which runs west to east on the Southern side of the town. A smaller main river, the R Gavenny runs north south on the east side of the town joining the R Usk on the south west area of the town and from which it takes its name. The Afon Cibi, also a main river runs, diagonally across the centre of the town from north west to south east with a catchment to the north around the Sugar Loaf and joins the R Gavenny close to its confluence with the R Usk. The watercourse Nant Iago also joins the R Usk west of the Usk Bridge. There are also a number of other unnamed ordinary watercourses on the north east side of the town draining from the Little Skirrid which also contribute to the flood risk.

In terms of flood risk from surface water a number of roads and residential areas are at risk, much of it along the route of the Afon Cibi. Residential areas at Ysbytty Farm estate, Plas Derwen, Park Lane and the east end of Park Avenue, west end Park Avenue & Skirrid Road, Nevill Hall north side and Union Road West to Hatherleigh Road, Knoll Road west end and Haven Road to Cresta Road and the upper area of Chapel Lane. In addition the Bus Station and Car Park areas are at risk.

For roads, the A40 at Lower Cross Street, Monk Street, Park Road, Brecon Road and alongside Nevill Hall would be affected. Mill Street, Lower Monk Street, Lion Street, King Street, Queens Street, Pen Y Pound, Frogmore Street, Old Hereford Road, Union Road West, Hatherleigh Road, Haven Road, Chapel Road, Cantref Road, Stanhope Street and Harold Road would also be affected.

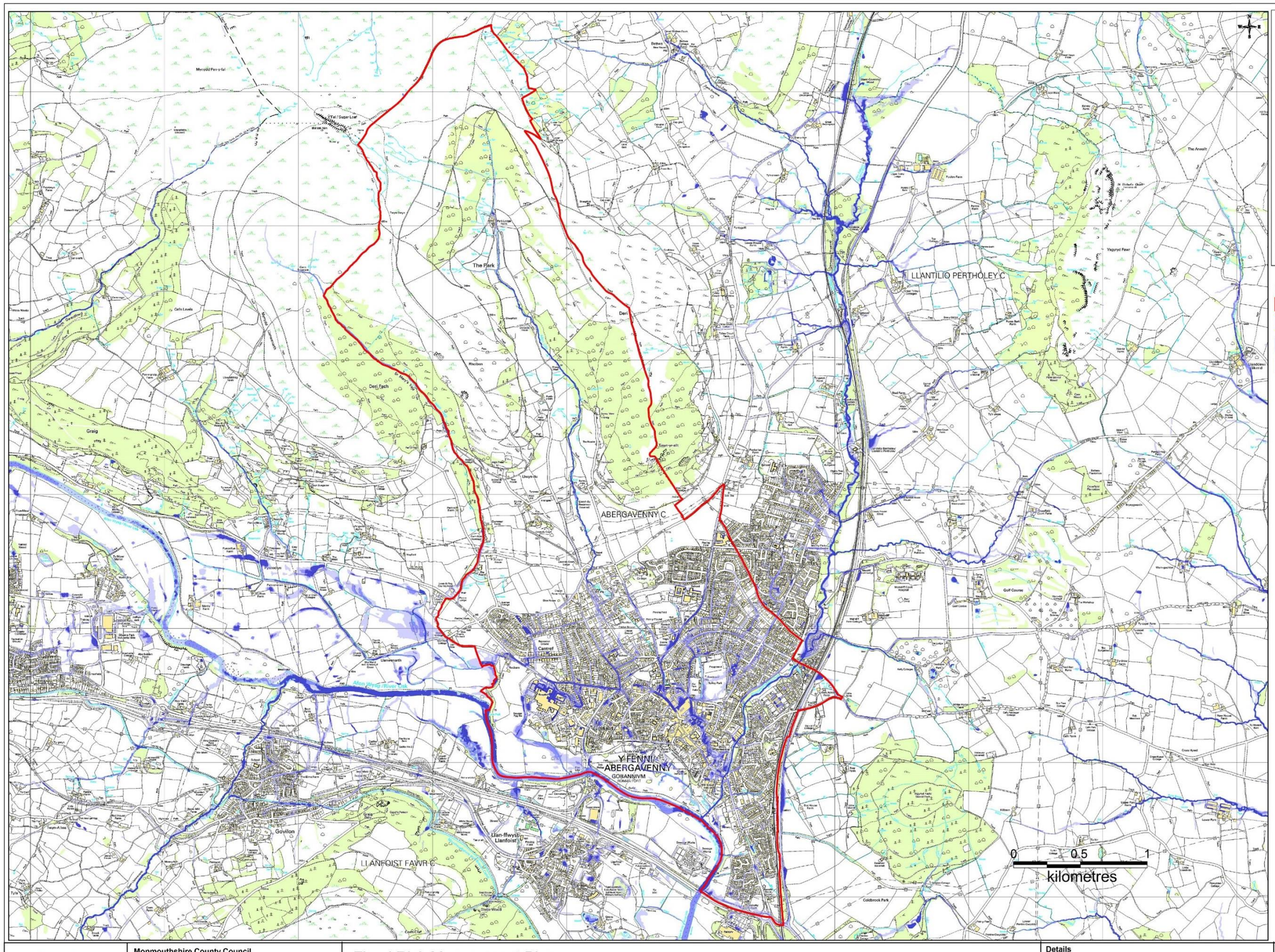
For Rivers, significant flooding occurs from the R Usk but mainly affects the low lying castle meadows area to the south and west. There is however a risk of flooding from the upper sections of the Cibi Brook in the Cantref area. Most of the main town is above the River Usk flood level... The Cibi Brook also passes right through the town, much of it culverted under buildings and roads and in the past there have been some localised flooding issues in the centre of town from this brook.

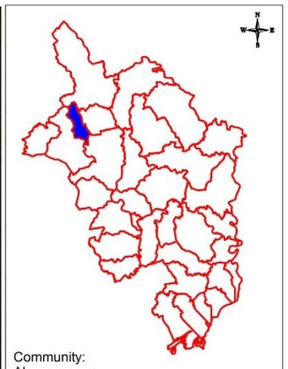
Peak Flood on River Usk in 2003 at Llanfoist Bridge

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Abergavenny Town Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	59	167	909
	Residential Properties at risk of flooding		
Residential Properties (n)	15	45	137
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	1010 (2374)

Measure to Mitigate Flood risk in Abergavenny Town Area					
Measures Already Implemented					
Ref	**Details**				
AB01	Flood alleviation scheme at Station road completed				
AB02	Investigation of flooding at Ysbytty estate, Plas Derwen and A40 Trunk Road. Identified issues with trash screen clearance. Trunk Road Agency & residents made aware of riparian responsibilities				
AB03	Flooding of two properties at Dan Y Deri investigated – culvert issue referred to Monmouthshire Housing Association as responsible body.				
AB04	Surface water flooding issues at Hardwick Roundabout in 2000 & 2002. Referred to Trunk Road Agency to investigate and take action.				
AB05	Surface water flooding at Richmond Road in 2013. Referred to Welsh Water (DCWW) as source of flooding is from DCWW public sewer.				
AB06	DCWW working with the Council are undertaking work in 2015 to remove surface water from the combined sewerage system in Grosvenor Road area to reduce flooding risks. Additional surface water culverts are being added to discharge the surface water flows to the River Gavenny.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
AB101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
AB102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
AB103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
AB104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
AB.105	Investigate and survey condition of culverts on Cibi Brook jointly with NRW	0 - 6	£15k	M53	5.1





Community:
Abergavenny

Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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NP26 9AN

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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Abergavenny

Details	Rev No.
Surface Water Flood Hazard Map	
Drawn By: RAP | Scale: See Scale Bar | Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan	

7.4.2 Caerwent Community Council Area

Caerwent is a community in the South East of Monmouthshire and well known as a former Roman town. The main road A48 passes just north on the main settlement and the village of Llanvair Discoed lies to the North East. The hamlet of Crick lies to the east. The M48 motorway provides part of the southern boundary. Caerwent is famous as the former Roman Town of Ventra Silurum and has substantial roman remains in the centre of the village looked after by CADW and open to the public.

The Neddern Brook is a main river here and passes just south of the village in a west to east direction with its catchment to the north in the hills of the Wentwood area. It then runs south towards Caldicot where it discharges to the Severn Estuary. The Castroggi Brook is a main tributary of the Neddern, also with a catchment in the Wentwood hills area and joining the Neddern west of the village. There is also an unnamed brook passing through Crick and joining the Neddern south of Caerwent. The St Brides Brook also runs along part of the western boundary of the community. Caerwent had a population of 1791 in the 2011 census with 728 properties.

The main surface water flood issues here are localised areas and from areas near the Neddern Brook and its tributaries. Flooding arises to the south of Caerwent from the Neddern which is partly flood plain and include; Canon Lane, Vernon Grove, Centurion Court, Five Lanes Cottages, the area north of the A48 at Ash Tree Road & Merton Green, and Llanvair Farm at Llanvair Discoed. There are areas at risk from surface water flooding at Llanvair Discoed, the east side of Caerwent and parts of Crick. Roads at risk are the A48 at Slough Farm, at Five Lanes Cottages and at The Arches. St Brides Road, the R136 at Carrow Hill and the C62.3 up to Llanvair Discoed.The Caldicot Road is also at risk where it crosses the Neddern Brook.

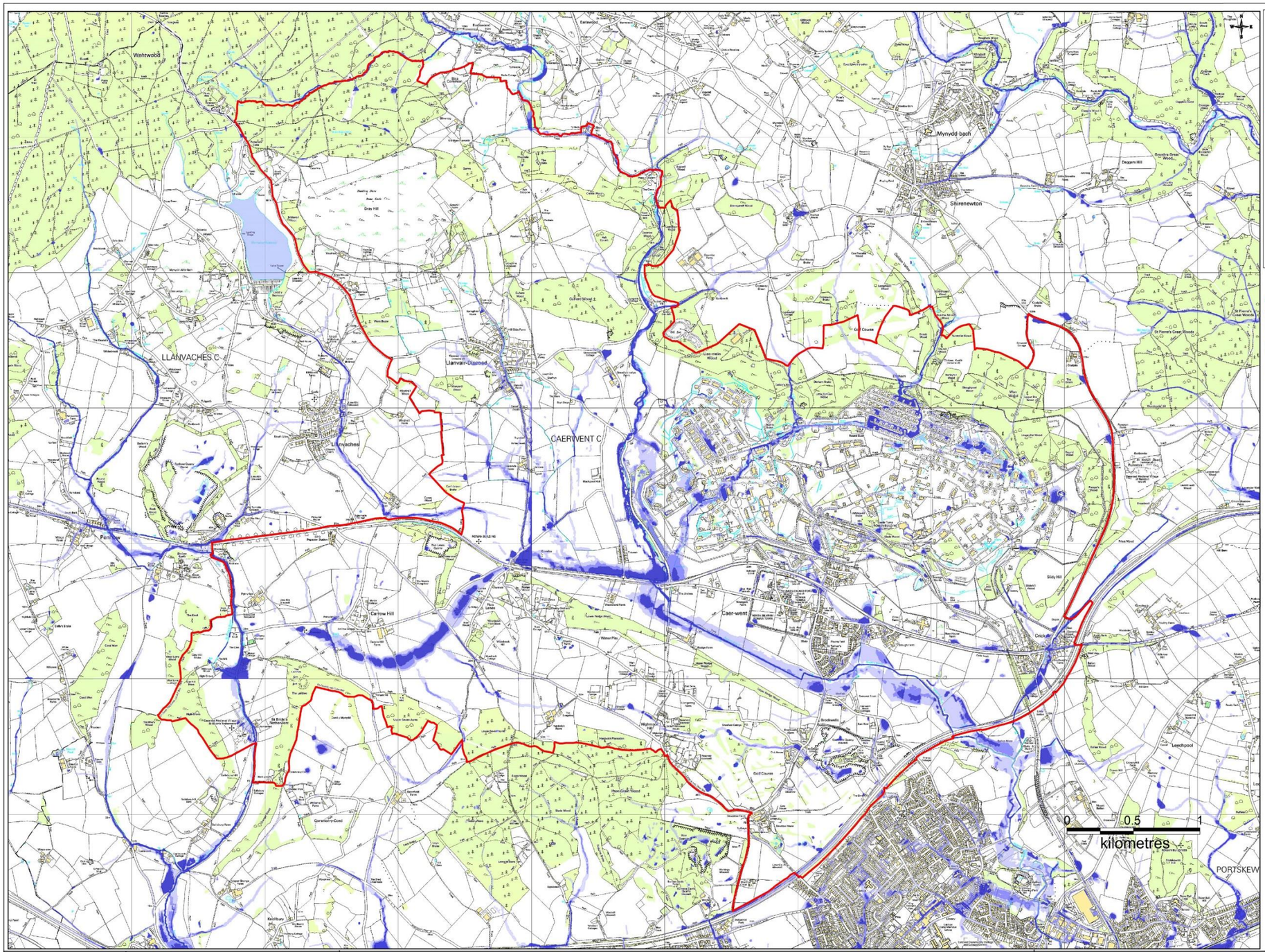
The river flooding risks are similar to the surface water and follow the Neddern Brook and its flood plain. Again the A48 is affected west of the village from The Arches to Five Lanes. Also the C62.1 north to Llanvair Discoed, the C72.2 Five Lanes to Carrow Hill, the St Brides Road and Caldicot Road south of Caerwent.

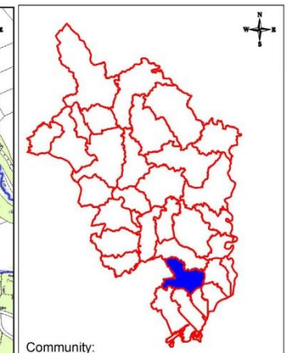
Castrogi Brook

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Caerwent Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	19	5	82
	Residential Properties at risk of flooding		
Residential Properties (n)	6	1	10
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	26 (61)

Measures to Mitigate flood risk in Caerwent Community Area					
Measures Already Implemented					
Ref	**Details**				
CAE01	Investigation of flooding to route R135 at Black Pool, Carrow Hill. Road here is in low spot - proposed that road be raised locally to resolve.				
CAE02	Investigation of flooding issues at The Cwm, Llanvair Discoed in 2000 have been resolved through changes in highway drainage				
CAE03	Investigation of flooding of Five Lanes Cottages, St Brides, in 2003 identified cause as overflows from Wentwood Reservoir. Issue passed to Welsh Water to resolve as owners & managers of the reservoir.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
CAE101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
CAE102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
CAE103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
CAE104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
CAE105	Review options for dealing with highway flooding at Black Pool, Carrow Hill.	0 - 6	£5k	M24	5.6
CAE106	Investigate flooding issues at Crick Road, Crick.	0 - 6	£2	M53	5.1





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Caerwent

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.3 Caldicot Town Council Area

Caldicot is one of the five main towns in Monmouthshire, located on the southern boundary of the County and facing the Severn Estuary. It had a population of 9,604 in the 2011 census with 4,011 properties. It is bounded by the M48 to the north and to the South by the M4 Motorway and the main S Wales to London Railway. The Welsh portal of the Severn Tunnel is in this area as well. The main river here is the Neddern Brook that runs mainly down the east side of the town through the Country Park and Castle area and down through Deepweir and the Severn Bridge Industrial Estate. The Neddern suffers low flows in summer, partly due to the underlying limestone rock and swallow holes in the bed of the brook. The flows in the limestone rock feed the Great Spring that affected the Severn Tunnel construction and is now pumped out at Sudbrook. As a Main river the Neddern is the responsibility of Natural Resources Wales. The NRW (through the Caldicot & Wentlooge IDD) are responsible for flood management of most of the areas at risk of river and sea flooding and have been investigating the potential for some re-naturalisation of the lower Neddern in association with its flood defence aspects.

Flooding at Caldicot Country Park in Dec / Jan 2012/13

Surface Water flood risks arise around the Neddern Brook flood plain on the east side of Caldicot but also in localised areas of the town. Some of the residential areas at risk are: St Marys School and adjacent Church Road area around to Castle Lea and across to Chepstow Road. Woodland View and around Green Lane School, Ferney Cross area such as Kipling Road and Dewstow Road and Close, Longfellow Road area from Severn View south including West End School across to B4245 Newport Road, Deepweir and Severn Industrial Estate. It also includes the Country Park and areas east of Chepstow Road / Church Road and areas on the east side of the northern section of Church Road. There has been flooding in the country park, Chepstow Road and along the Neddern brook previously. Roads at risk of flooding are: Church Road,

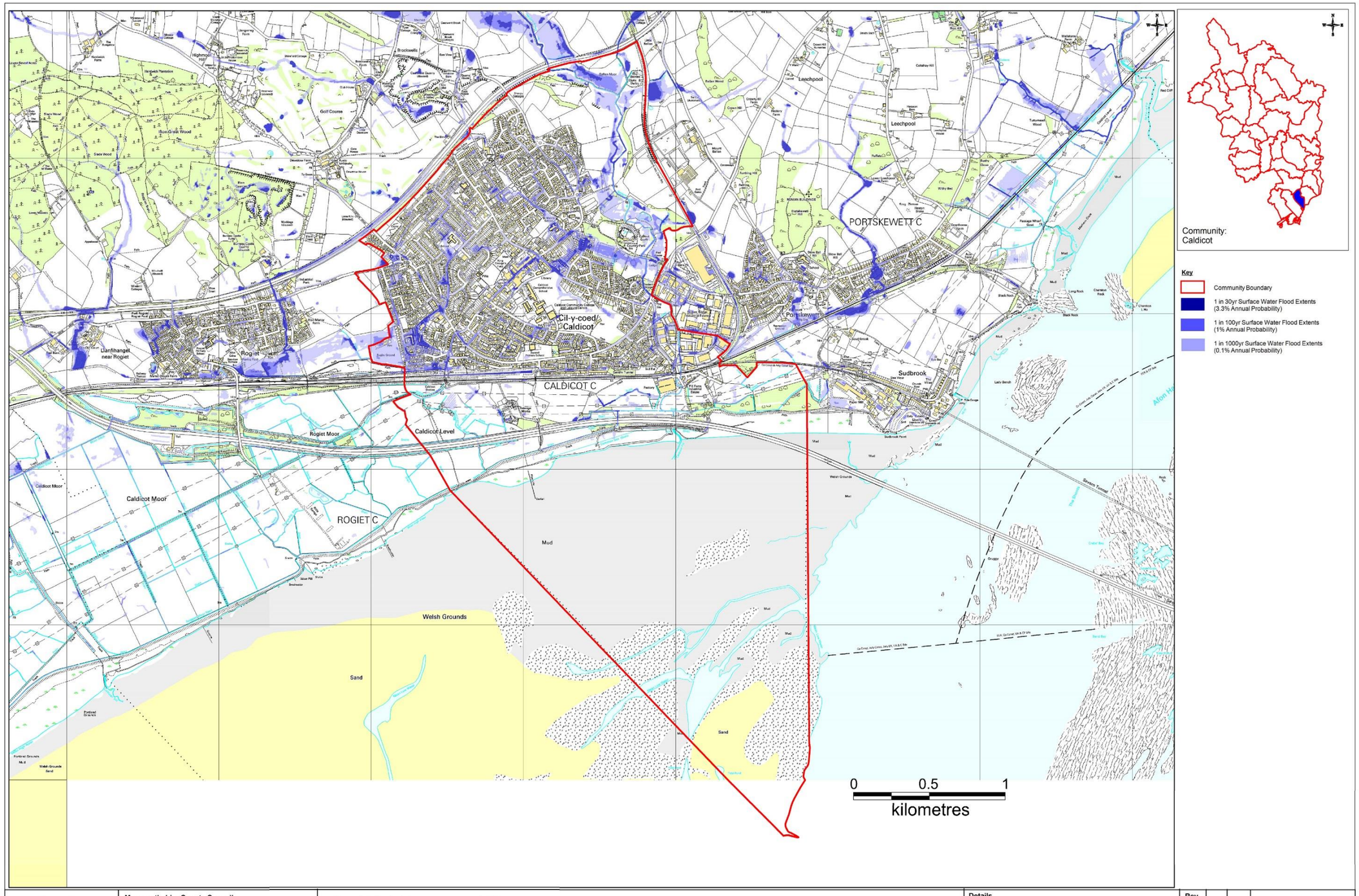
Wood View, Budden Crescent, Elan Way, B4245 Ferney Cross and Newport Road sections, Green Lane, Fernleagh Road, Westfield Avenue, Newport Road and Jubliee Way

In terms of flood risk from rivers and the sea these arise mainly from the Estuary to the south and from the Neddern Brook on the east side. At worst case some 586 residential properties are at risk of flooding. The current sea defences generally provide 1:200 level of protection but with climate change, potential surges and waves, overtopping could occur at higher probabilities. It should be noted that some existing sections may provide a lower level of protection. Flooding from the sea would encroach generally up to the railway line (the embankments providing a form of secondary defence) in the south but also into the Longfellow Road and Severn View area in the S West. It would also flood the Deepweir and Severn Bridge Industrial Estate in the South East. The B4245 at Neddern Bridge would be flooded as would Caldicot Road out to Portskewett as well as other roads in the area affected.

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Caldicot Town Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	204	155	799
	Residential Properties at risk of flooding		
Residential Properties (n)	25	88	207
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	586 (1377)

Measures to mitigate flood risk in Caldicot Town Area					
Measures Already Implemented					
Ref	**Details**				
CAL01	Caldicot is covered by forecasting warnings from the NRW for sea and coastal floods				
CAL02	Works have been carried out on the Neddern Brook Channel to improve flows and also at the sea doors where it discharges into the estuary				
CAL03	Welsh Water in conjunction with MCC have upgraded surface water drainage at Castle Lea to reduce local flooding risks				
CAL04	MCC Highways have carried out works in Chepstow Road to improve highway drainage				
CAL05	Severn View, Caldicot - Drainage investigation / survey carried out				
CAL06	Investigation of localised surface water flooding of Firs Road and Cae Mawr Road in 2000/01. Clearance and alterations made to highway drainage.				
CAL07	Localised surface water flooding of Fairfield Close, Dewstow Road in 2013. Highway drainage cleared.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
CAL101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
CAL102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
CAL103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
CAL104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



Monmouthshire County Council PO BOX 106 Caldicot NP26 9AN www.monmouthshire.gov.uk	Flood Risk Management Plan Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water) Community: Caldicot	Details: Surface Water Flood Hazard Map Drawn By: RAP; Scale: See Scale Bar; Date: Dec 2014 File / Pathname / Project / Drawing No.: Flood Risk Management Plan	Rev No.

7.4.4 Chepstow Town Council Area

Chepstow is one of the five main towns in Monmouthshire located in the S East corner and also a gateway to Wales. It overlooks the R Wye on its east side and is the historic Welsh boundary town with England on the east bank. The R Wye here is in a deep gorge with the Norman Chepstow Castle controlling the crossing point. The old cast iron bridge, the latest of several, was built in 1816. It had a population of 12,350 in the 2011 census with 5,168 properties.

It is bounded by the M48 to the South, the A466 Trunk road to the west and the A48 passes through the centre of the town approximately west to east before crossing into England over the R Wye. The main railway from Wales through to Gloucester also passes to the South and then east side of the town before crossing the R Wye.

Apart from the R Wye and Wye / Severn Estuary there are no watercourses in the main town area but the geography is such that there are natural valley routes that that surface water will follow in heavy rain. One is from the St Kingsmark Estate down through to the Dell and the Castle area. Another is from Hardwick Avenue down to the railway. There is also a route from Bulwark to Thornwell and down to the Severn Estuary.

In terms of surface water flooding there are several particular residential areas at risk, as well as localised flooding, these include: St Kingsmark Ave at its junction with Welsh Street up to and including Huntfield Road and the north east ends of Lancaster, Oakfield & Dean Avenues as well as St Johns Gardens. Castle Dell, lower part of Bridge Street, St Ann Street, The Back, Lower Church Street, Church Street, St Marys Street and High Street. Hardwick Ave north end and west end, Caird Street. St Marys RC Primary School, Several parts of Bulwark and Thornwell from the School and south around the roundabouts and further south under the motorway and the Newhouse industrial estate. A number of roads including the above are at flood risk, the A48 from The Dell up the Comprehensive School, the A466 north of St Lawrence Roundabout as well as the roundabout itself.

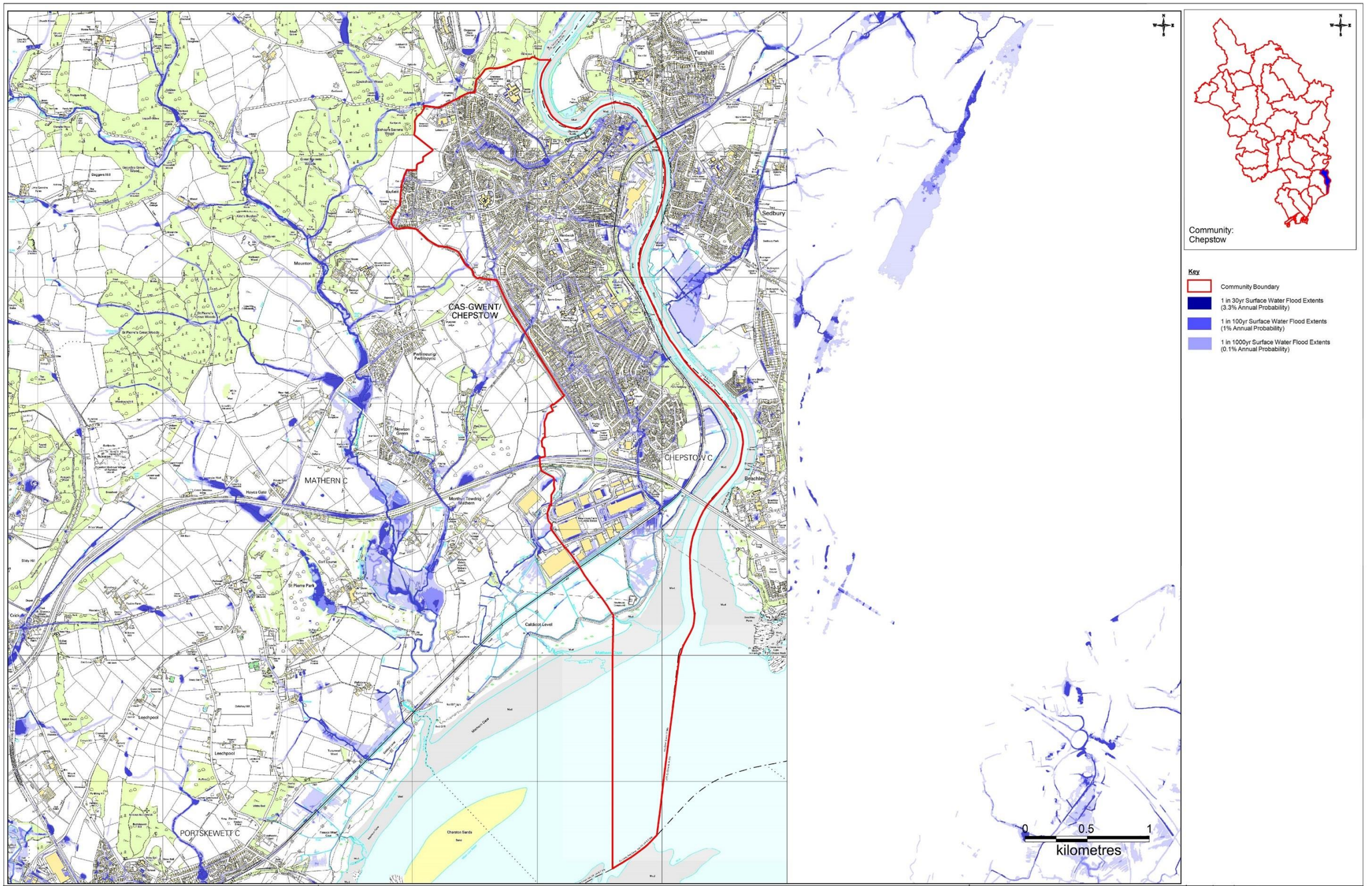
The main areas at risk of river and sea flooding are the Newhouse Industrial Estate that is generally, but not all, defended to a 1 in 200 standard of protection. However with climate change, potential tidal surges and waves, overtopping could occur at higher probabilities. Lower Chepstow around St Ann's street is also at risk of flooding from tidal surges but is now defended to a 1 in 100 standard of protection. These were built in 2003 by the Environment Agency (now NRW) with part funding from Monmouthshire CC. As for Newhouse Estate, climate change and tidal surges will increase the risks of flooding, direct wave issues are less likely here but wave issues in the main estuary could influence the risks. The NRW (through the Caldicot & Wentlooge IDD) are responsible for flood management in the areas south of the M48 and east of the railway up to Bulwark and provides a form of secondary defences to some extent.

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Chepstow Town Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	59	162	726
	Residential Properties at risk of flooding		
Residential Properties (n)	6	13	93
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	157 (369)

Tidal Flooding at Chepstow

Measures to mitigate flood risk in Chepstow Town Area					
Measures Already Implemented					
Ref	**Details**				
CH01	Chepstow is covered by forecast flood warnings by the NRW for sea and river floods				
CH02	Chepstow Riverside – Flood Alleviation scheme jointly between MCC and NRA (now NRW) been carried out in 2003 at Lower Chepstow to defend this area to 1:100 standard from coastal flooding.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
CH101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
CH102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
CH103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
CH104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Chepstow

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By RAP	Scale See Scale Bar	Date Dec 2014	
File / Pathname / Project / Drawing No. Flood Risk Management Plan			

7.4.5 Crucorney Community Council Area

The Crucorney area includes the famed Llanthony Valley and the communities of Cwmyoy, Pandy, Llanvihangel Crucorney and Forest Coalpit. Crucorney is part of the Crucorney Ward along with Grosmont Community and the joint population was 2121 in the 2011 census with 857 properties. The A465 Trunk Road passes north south through the communities of Llanvihangel Crucorney and Pandy and the Cardiff to Manchester railway runs parallel to but west of the A465.The northern part of the Sugar Loaf mountain with its peak of 598 m also sits within this community.

The main river here is the Afon Honddu that rises in the Llanthony valley with a substantial catchment and turns east where it meets the A465 where it turns north and joins the upper part of the R Monnow at the north eastern boundary of the Community. The Honddu has a number of tributary brooks including the Nant Y Gwyddel, Nant y Carnau, Nant Vision, Nant Y Ffin and the Cwm Siarpai. There is also an un-named brook that has its catchment on the Skirrid and passes through Wern Gifford and an un-named watercourse from the Cwm Coed Cerrig road. To the West of the community the Grwyne Fawr River forms the boundary and also has a number of tributary brooks including the Nant Y Gwerydd, Nant Mair and Nant Bran as well as an un-named brook in the Cwm Coed Cerrig valley which flows west to join it near Forest Coal Pit. The River Grwyne flows west to join the River Usk. The River Gavenny has its source at the southern end of the community and then flows south through Llantilio Pertholey and Abergavenny communities before joining the River Usk.

There have been localised instances of flooding in the Llanthony valley and more frequent surface water flooding at Wern Gifford and area from tributaries of the Afon Honddu. In terms of surface water flood risk it relates mainly to the corridor of the Afon Honddu, including the western area of Wern Gifford, the A465, the Pandy Inn and Caravan Park and properties within 50 to 100m of the river. There are also localised areas of surface water flooding.

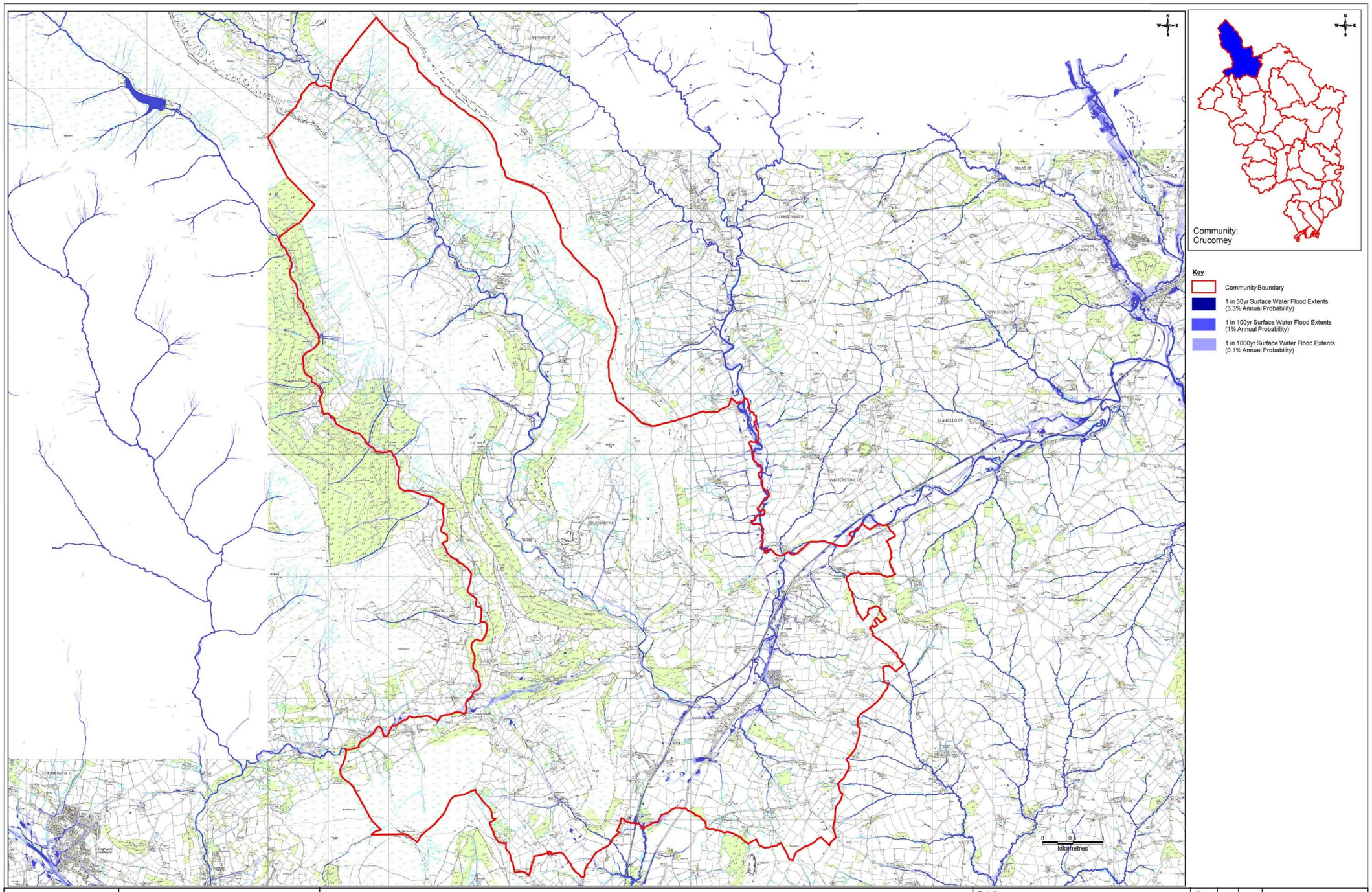
Afon Honddu Bridge

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Crucorney Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	5	19	54
	Residential Properties at risk of flooding		
Residential Properties (n)	2	2	11
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	99 (233)

Measures to mitigate flood risk in Crucorney Community Area					
Measures Already Implemented					
Ref	**Details**				
CR01	Werngifford, Pandy, internal property flooding investigated – with owner & local farmer to realign watercourse				
CR02	Investigation of flooding at The Mill, Llanthony valley. Neighbour and owner of adjacent Mill Race requested to clear silt and debris to resolve issue.				
CR03	Tredunno, Cymyoy, affected by flooding of R Honddu. Investigation identified Main River issue and with owner to protect property.				
CR04	A section of the Llanthony road washed out from the R Honddu in 1998 floods at Capel Y Fin. This was reconstructed using gabions and reopened to use.				
CR05	Glandwr Close, Pandy, flooding from surface water and R Honddu. Some additional drainage provided but risk from R Honddu remains				
CR06	Route R2 at Crucorney floods from surface water under railway bridge				
CR07	Llanerch House on Route R21 flooded from surface water drainage issue. Additional highway drainage installed to resolve problem				
CR08	Brooklyn and Rose Cottage, Werngifford flooded in 2000 from obstruction in brook. Obstructions removed and flooding resolved.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
CR101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
CR102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
CR103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
CR104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1

CR105	Glandwr Close, Pandy, flooding risk from R Honddu. Consider promoting option of Property Level Protection by owner.	0 - 6	£5k	M35	5.4 /5.5
CR106	Route R2 at Crucorney floods from surface water under railway bridge due to dip. Investigate any options to resolve.	0 - 6	£5k	M53	5.1
CR107	Pandy Inn flooded from surface water in 2000 and at risk from flooding from surface water and R Honddu. Consider promoting option of Property Level Protection by owner.	0 - 6	£2k	M35	5.4 /5.5
CR108	Caravan Park adjacent Pandy Inn at risk of flooding from R Honddu and surface water. Check if site has flood emergency plan in place.	0 - 6	£1k	M53	2.1
CR109	Lancaster Arms flooded historically and at risk from R Honddu and surface water flooding, as are adjacent properties. Consider promoting option of Property Level Protection by owners.	0 - 6	£5k	M35	5.4 / 5.5
CR110	Route R3 near Trewyn Mill, Crucorney at risk from River's Monnow and Honddu, Consider options.	0 - 6	£5k	M53	5.1



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Crucorney

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.6 Devauden Community Council Area

Devauden Community lies upon the ridge above the Wye Valley and includes the communities of Devauden, Itton, Kilgwrrwg and Wolvesnewton. Devauden is part of the Devauden Ward with Llangwm Community and the joint population in the 2011 census was 1,480 with 598 properties. The community is served by the B4293 Monmouth to Chepstow road and the B4235 Usk to Chepstow road runs close to the south west border.

The Mounton Brook forms part of the south west boundary and is joined by its tributary the Glyn Brook. The Angiddy Fawr runs along the North Western boundary and is joined by its tributary the Gofer Pantygollen. The central north is drained by the Pill Brook which subsequently joins the Olway Brook. There are a few recorded flood issues within the Devauden community from the brooks, and a number of recorded requests for sandbags due to surface water flooding. The flood risk areas all relate to the immediate areas adjacent to these brooks and their tributaries.

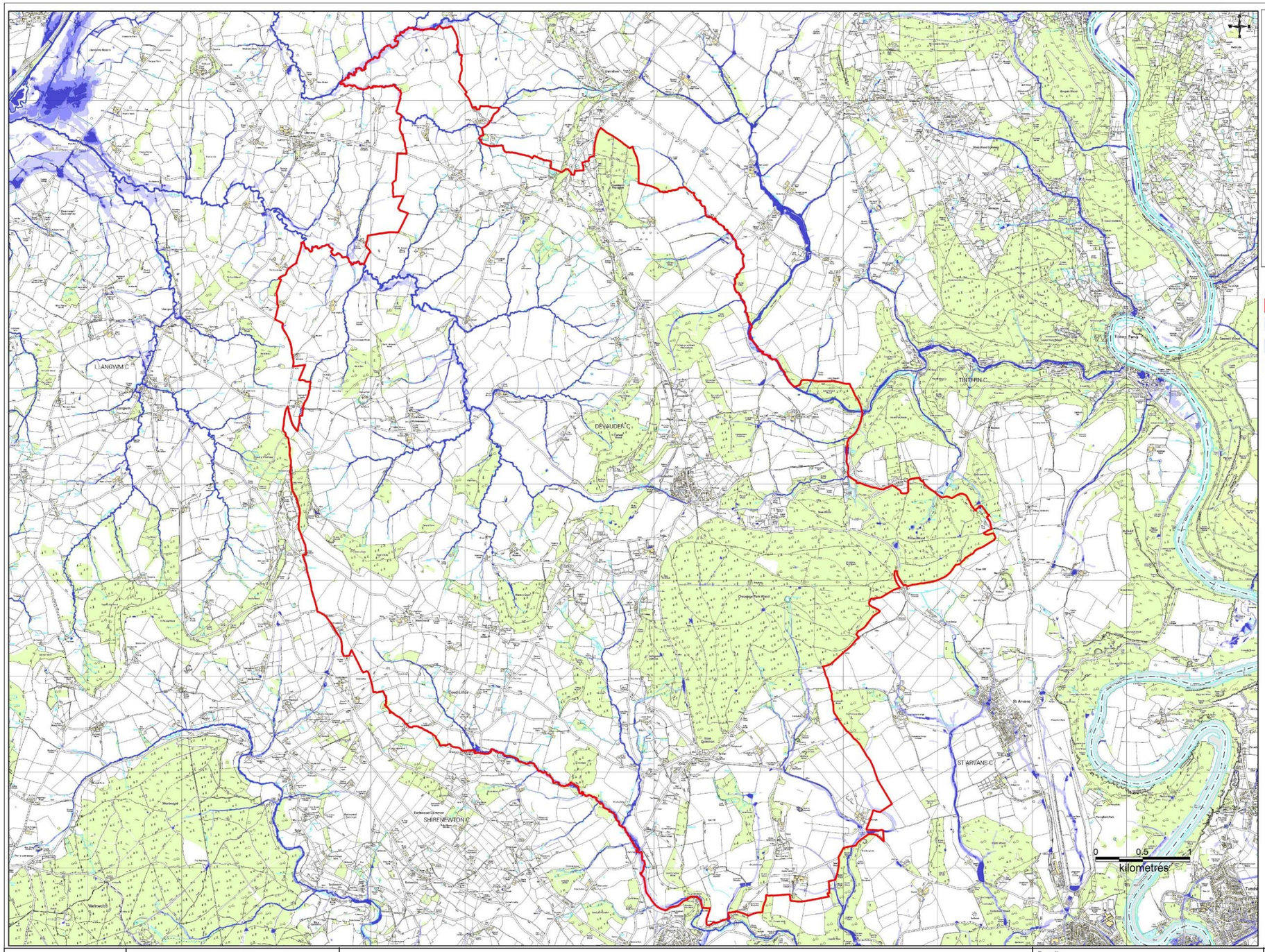
A number of highways are at risk including the B4293 at Howick and also at Croes Bleddyn for some 600m, the R80 at Great House and the unclassified routes of C53.3, C60.3 Well Lane just west of Devauden, C64.1 at Goytre Farm, C57.3 at Rhyd Y Fedw and the C58.6 at Pont Faen.

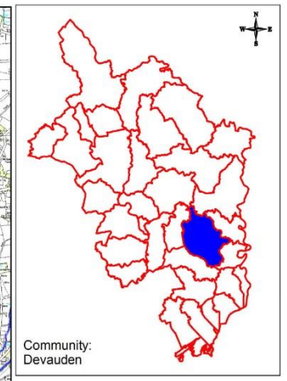
Masonry arch over the Pill Brook

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Devauden Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	0	0
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	0
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	1 (2)

Measures to mitigate flood risk in Devauden Community Area					
Measures Already Implemented					
Ref	**Details**				
DE01	Investigation of flooding of route C57.8 near Glyn, Itton, where it crosses the brook (OSGR4750/9691) relates to culvert capacity. Erect flood warning signs as interim solution at times of flood risk and consider options for long term				
DE02	Investigation of flooding at Croes Bleddyn, Itton – surface water goes to sink holes. Maintenance will be needed at intervals to clear silt.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
DE101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
DE102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
DE103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
DE104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
DE105	Consider options for resolution of flooding on C57.8 at brook crossing near Glyn, Itton. Relating to culvert capacity	0 - 6	£10k	M24	5.6
DE106	Investigate flooding issues at Castle Farm on Route R84 and identify any actions required.	0 - 6	£5k	M24	5.6





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Devauden

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.7 Goetre Fawr Community Council Area

Goetre Fawr Community lies to the west of the County and includes the communities of Penperlleni, Goetre, Nant Y Derry and Little Mill. The Monmouth & Brecon canal runs north south on the western side and the western boundary is the ridge from the Blorenge to Mynydd Garn Wen. The A4042 trunk road bisects the area east and west and the eastern boundary is provided by the R Usk. The Cardiff to Manchester railway also runs north south to the east side of the A4042. Goetre Fawr had a population of 2,393 in the 2011 census with 993 properties.

The northern boundary mainly follows the Gwenffrwd and then Nant Rhyd Y Meirch brooks which discharge into the R Usk. The main brook in the Goytre area is the Nant Y Robwl and its tributaries which run west to east and drain into the R Usk near Chain Bridge. The Little Mill area is served by the Berthin Brook and its tributaries the Fynon Ddu and Nant Pia which run south then west to east and again join the R Usk. Flood risks arise from the corridors of these brooks and tributaries. At Little Mill properties east of Ty Draw and at Ty Gwyn are at risk from surface water flooding. Sections along Nant Y Derry road are at risk and some sections of the railway fall into the areas affected.

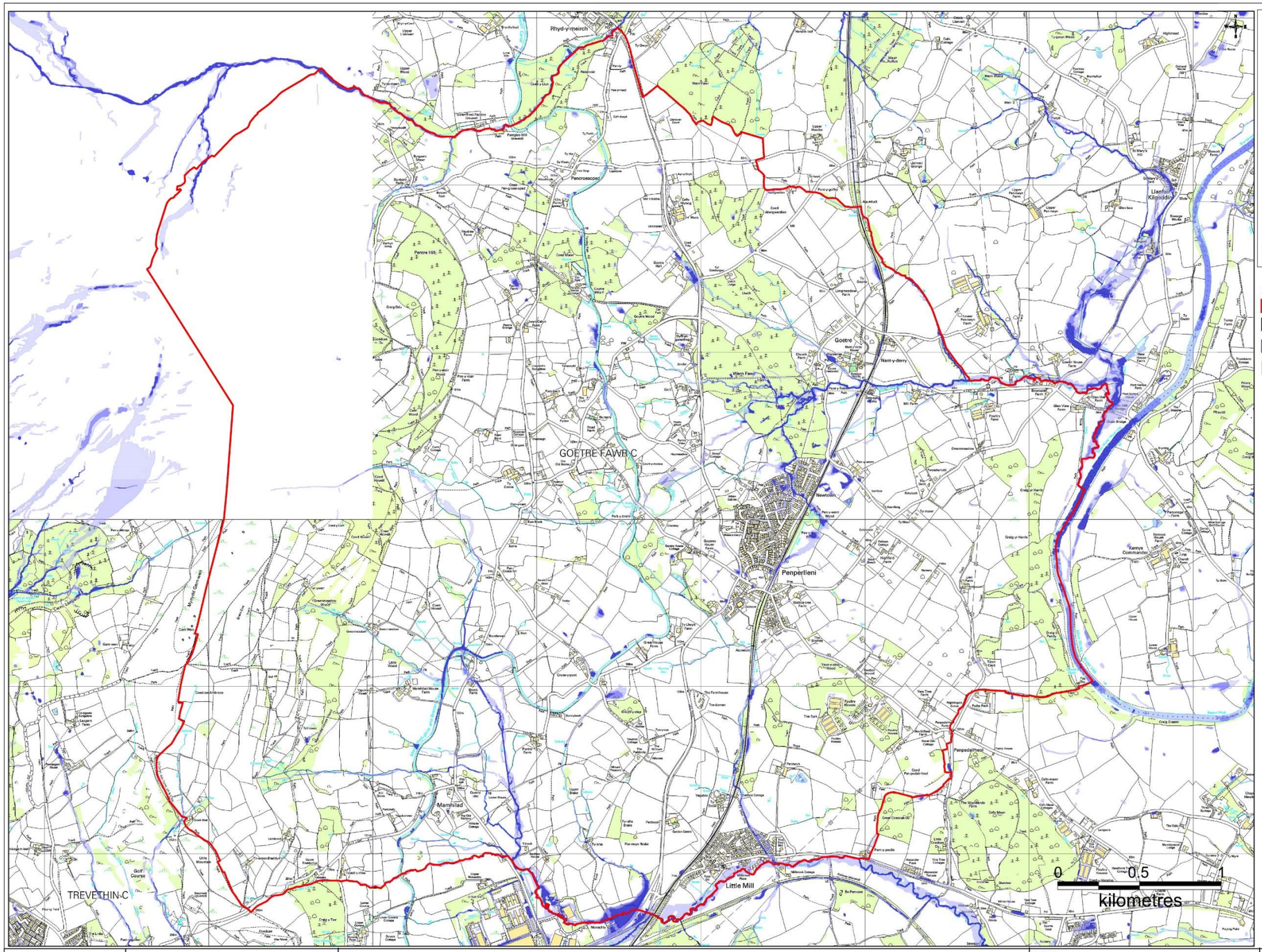
There have been flooding incidents from surface water drainage within some of the residential areas but generally caused by blockages or pipe failure. Some areas of Little Mill are also at risk from surface water flooding from adjacent higher ground. Some roads will be at risk of flooding from surface water and includes the A4042 at Goytre and at Little Mill where the Berthin Brook crosses, A472 at Little Mill, R56 at Pont Y Robwl, R51 Waun Y Clare Road, R57 Cefn Mawr Road, Newtown Road, Chain Bridge Road, Nant Y Derry Road, Saron Road, Newtown Road, Parklands, C210.4 Parc Y Brain Road, C208.6 at Mamhilad, C207.3 Rumble Street.

Croes-y-Pant – culvert outlet beneath Monmouth & Brecon Canal. Canal

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Goetre Fawr Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	2	14	66
	Residential Properties at risk of flooding		
Residential Properties (n)	0	2	12
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	20 (47)

Measures to mitigate flood risk in Goetre Fawr Community Area					
Measures Already Implemented					
Ref	**Details**				
GF01	Cottage at Croesypant, highway culvert issues identified – subsequently drainage survey carried out & installation of relief culvert				
	Laburnum Cottage				
GF02	Two properties in Newtown Rd, Goytre – foul sewer issue resolved by DCWW				
GF03	Longhouse Barn, Goytre, surcharging surface water sewer – obstruction removed and system cleared by MCC Highways.				
GF04	Cae Mellin, Little Mill - Drainage Investigation into surface water flooding completed				
GF05	Cottage in Star Road, Goytre flooding from culvert beneath property, culvert diverted to resolve problem.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
GF101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
GF102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
GF103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
GF104	Work with risk management partners such as NRW (including IDDs)	Ongoing	£1k	M44	6.1
GF105	Flooding at brook off Wern Lane, Glascoed, (C203.3) believed to be from blocked trash screen, further investigation required.	0 - 6	£1k	M53	5.1
GF106	Investigate surface water flooding at Little Mill and identify actions that can be taken to reduce flood risk.	0 - 6	£5k	M53/M24	5.1/5.6



Community:
Goetre Fawr

Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Goetre Fawr

Details	Rev No.		
Surface Water Flood Hazard Map			
Drawn By: RAP / Scale: See Scale Bar / Date: Dec 2014			
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.8 Grosmont Community Council Area

The community of Grosmont is in the North West corner of the County bordering Herefordshire. The A465 Trunk road lies on the western boundary as does the Abergavenny – Hereford railway. The main community is the historic town of Grosmont with its ancient castle and links to the border battles and Owain Glyndwr and when Grosmont was the second largest town in Wales. Grosmont Community is part of the Crucorney Ward and the joint population was 2,121 in the 2011 census with 857 properties.

The village of Llangua lies to the west and Llangattock Lingoed to the south. It is bounded by the R Monnow to its North West and North east with the R Dore from Herefordshire joining the Monnow at Pontrilas. The River Trothy rises at Campston Hill in the north of the community and leaves near Llanvetherine finally joining the R Wye at Monmouth. Other watercourses include, the Tre Rhew Brook, the Full Brook, the Bont Brook, Nant Y Carw and Nant Y Bwch brooks, all joining the Trothy. The Tresenny Brook runs north and passes through Grosmont before discharging to the R Monnow. There are also several un-named brooks running north from Campston Hill which join the Monnow direct.

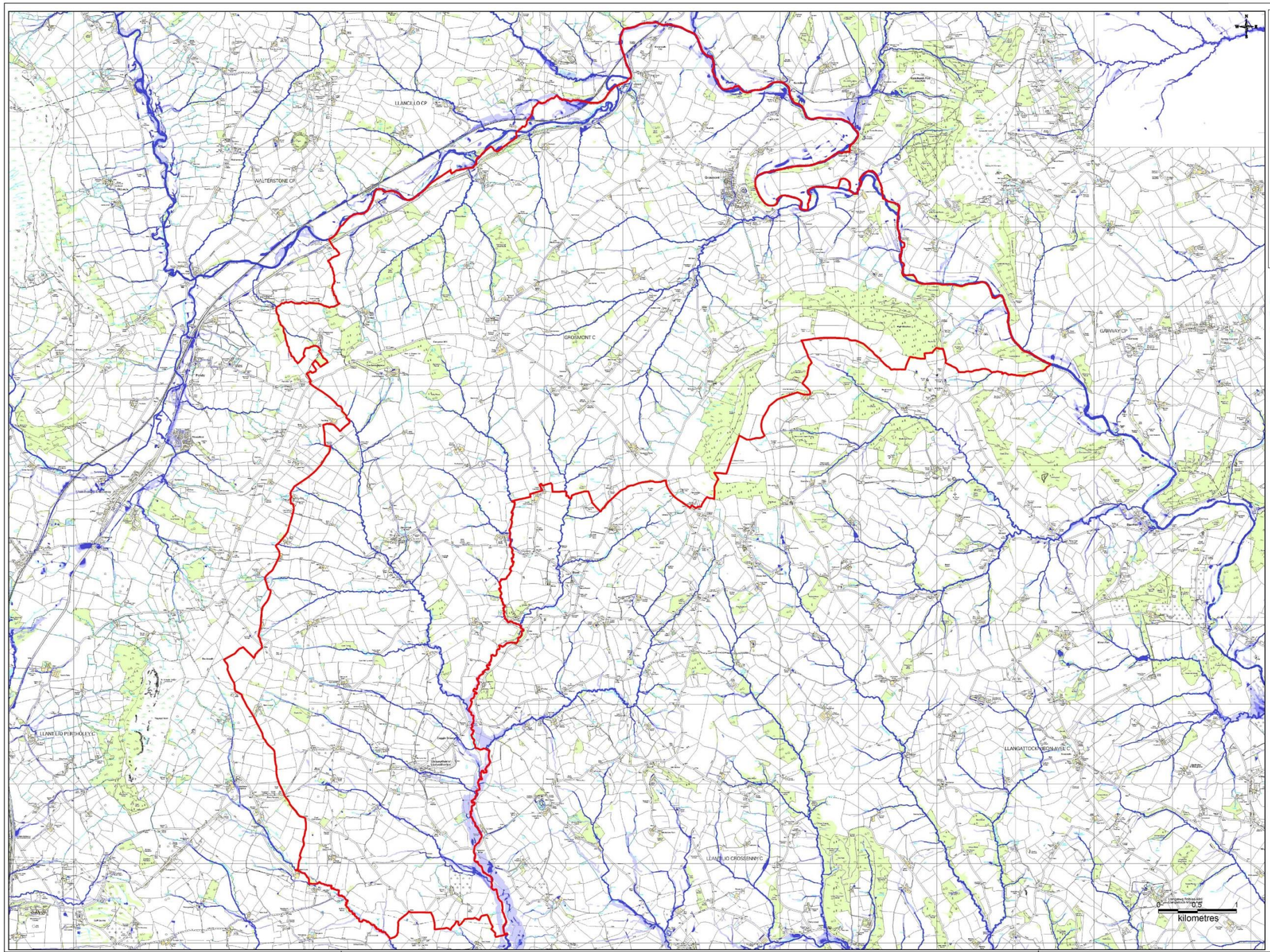
In terms of flood risk the R Monnow does cause some localised issues but most of Grosmont is above the flood risk area. The flood risk areas generally follow the Monnow valley and the smaller watercourses. The A465 is at risk of flooding at Triley, Great Triley and also nearer Llangua where local watercourses cross the route. The Abergavenny to Hereford Railway has some sections within the flood risk area. There are also some localised areas at risk of surface water run-off from heavy rainfall including roads at Panta Colyn Bridge, C14.7 Old Court Road, C14.6 Penrhos Road. The C14.1, C14.3 & C14.2 at Llangattock Lingoed are at risk of flooding. Also the R20 at Ashwood Farm and Little Marlborough, the R22 at Great Tresenny and Hoaldalbert is at risk. The B4347 at Cross Cottages, Kentchurch Bridge and in Grosmont is at risk.

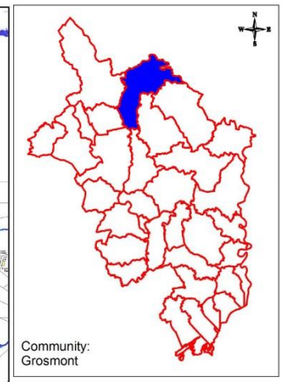
Trash Screen at Lower Tresenny

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Grosmont Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	2	0	24
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	2
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	13 (31)

Measures to mitigate flood risk in Grosmont Community Area					
Measures Already Implemented					
Ref	**Details**				
GR01	Surface water flooding at Ty Rhosyn Ddraig, Llangattock Lingoed, in 2000, some local changes made to drainage to assist.				
GR02	R20 at Grosmont Road and near Little Marlborough Farm flooded in 2000/2001. Watercourses cleared and highway drainage cleaned to resolve issue.				
GR03	B4347 and Lower Tresenny flooded in June 2007 from a culvert blocked by debris following storms. The culvert was cleared and subsequently replaced with a larger culvert and a trash screen.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
GR101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
GR102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
GR103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
GR104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Grosmont

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.9 Gwehelog Fawr Community Council Area

The Community of Gwehelog is in central Monmouthshire bounded on the west by the R Usk. It includes the villages of Gwehelog, Kemys Commander, Llancayo and Trostrey. Gwehelog Fawr is part of the Llanbadoc Ward and jointly with Llanbadoc Community had a population of 1,299 in the 2011 census with 514 properties. The B4598 County Road runs north / south through the community from Usk, through Llancayo to Chain Bridge in the north where it crosses the R Usk. Local watercourses include the Cayo Brook which discharges into the R Usk. The A449 Trunk Road is close to the eastern border.

In terms of flood risk, that lies mainly with the low areas adjacent to the R Usk and some surface water flooding from the Cayo brook and tributaries. The Wechfa Brook runs along the north eastern boundary and The Olway brook lies to the east and forms the south eastern boundary of the community and tends to flood the south eastern corner of the community. Properties at Llancayo are in the flood risk area as is the Llancayo Business Park.

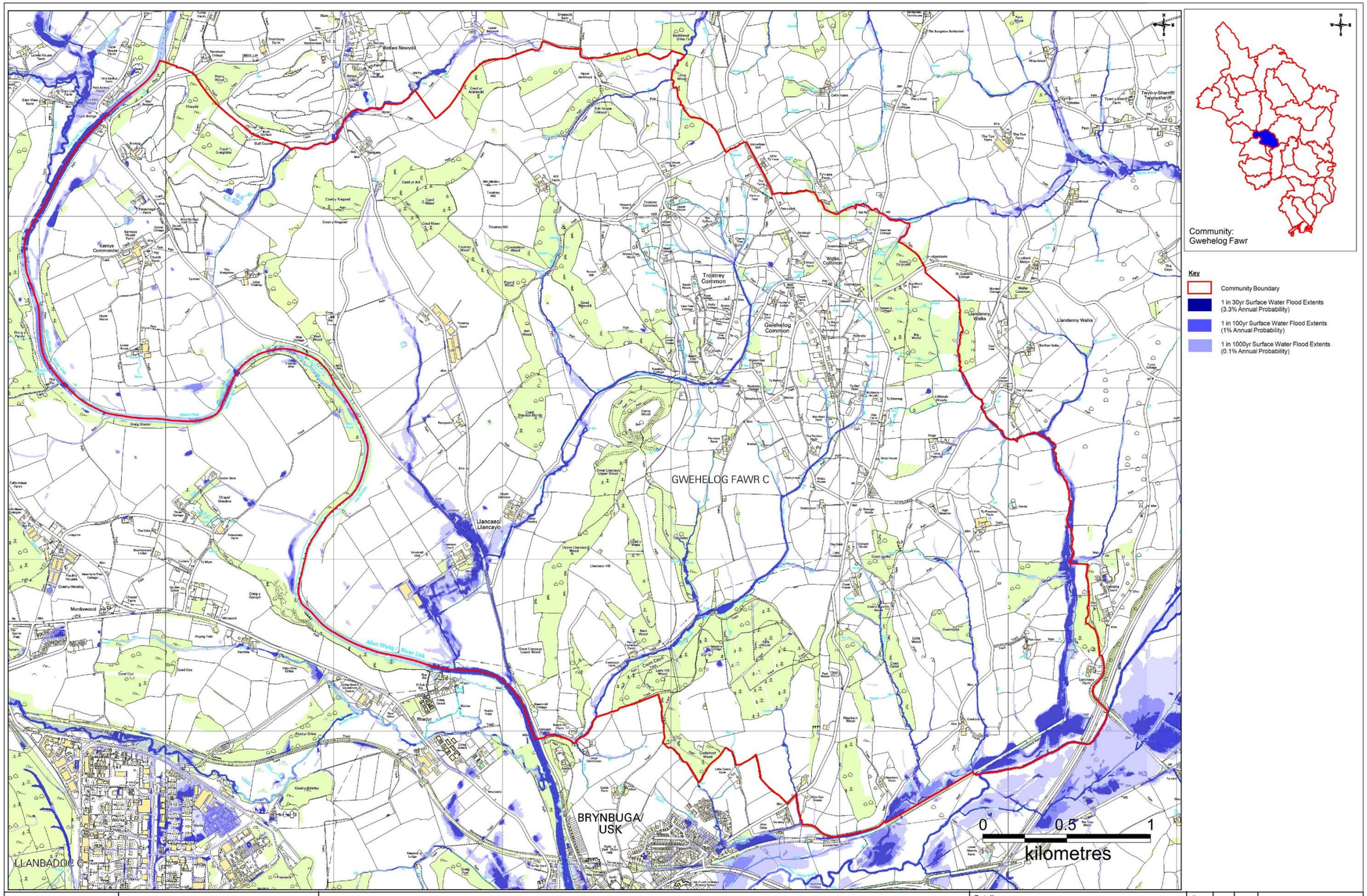
Some roads are at risk including the B4598 from the Usk boundary to Llancayo, The R61 from Lancayo to Trostrey Common and the C53.4 & C215.4 at Trostrey Common.

Cayo Brook Culvert, Usk Road, Llancayo

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Gwehelog Fawr Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	9	9	7
	Residential Properties at risk of flooding		
Residential Properties (n)	4	0	6
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	11 (26)

Measures to mitigate flood risk in Gwehelog Fawr Community Area					
Measures Already Implemented					
Ref	**Details**				
GW01	Flooding of road and properties at B4598 in Kemys Road, Llancayo, in 2000, additional drainage and new outfall installed to resolve issue.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
GW101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
GW102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
GW103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
GW104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



Monmouthshire County Council PO BOX 106 Caldicot NP26 9AN www.monmouthshire.gov.uk	Flood Risk Management Plan Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water) Community: Gwehelog Fawr	Details: Surface Water Flood Hazard Map Drawn By: RAP Scale: See Scale Bar Date: Dec 2014 File / Pathname / Project / Drawing No.: Flood Risk Management Plan	Rev No.

7.4.10 Llanarth Community Council Area

Llanarth Community lies centrally in Monmouthshire and is bisected east west by the A40 Trunk Road. It includes the villages of Llanarth, Llanvapley and Bettws Newydd. The 2011 census data is based on Llanover Ward and includes Llanover Community. The joint population was 2,284 persons with 922 households. The R Trothy runs along the north east boundary. The R Usk forms much of the western boundary. The Llanmynach Brook rises in the north then passes through Llanvapley and is joined by the Pant Brook which rises in the west; both then discharge into the R Trothy south east of Llanvapley.

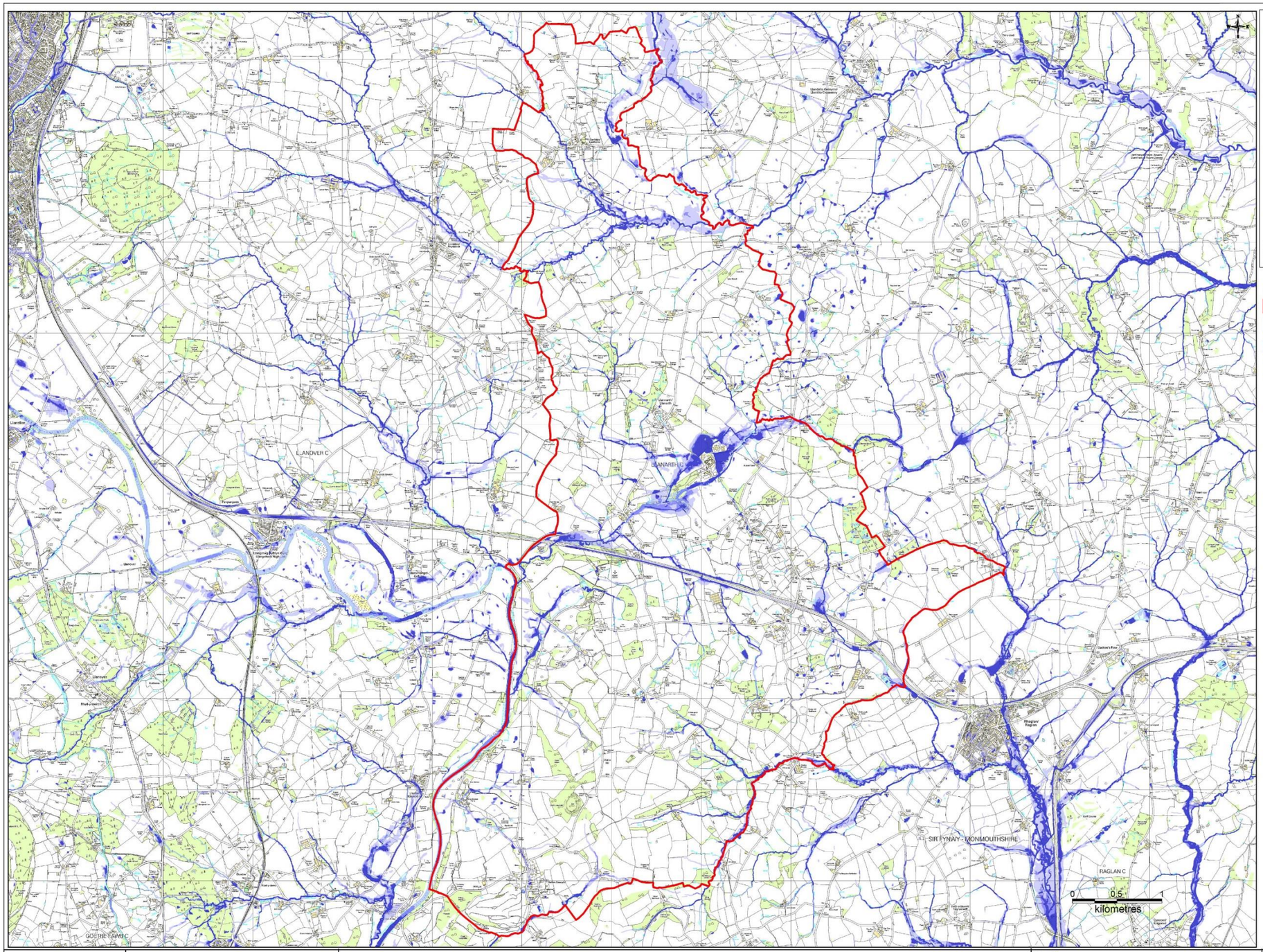
The Clawdd Brook rises in the north east running north east to south west then discharging into the R Usk near Clytha Park. Part of the South east boundary is formed by the Nant y Wilcae Brook. Some roads area at risk of flooding from surface water and watercourses including the B4233 at Llanvapley and Trothy Bridge, A40 between Bryngwyn to New House Farm and the R64 at Clytha Park as well as at Bryngwyn to High House Farm. Parts of Bettws Newydd are also at risk.

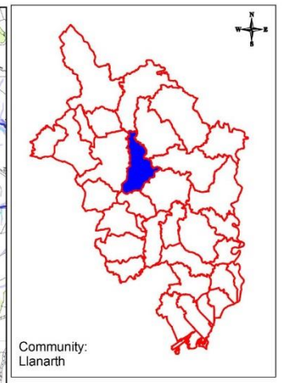
Bryngwyn Culvert

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llanarth Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	0	19
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	1
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	23 (54)

Measures to mitigate flood risk in Llanarth Community Area					
Measures Already Implemented					
Ref	**Details**				
LLA01	Flooding of road Route R40 near Pystill Farm, Llanvapley, damaged outfall repaired.				
LLA02	Flooding of B4233 due to debris blocking highway drainage, systems cleared and improved.				
LLA03	Flooding of R40 / R41 Cefn Coch crossroads due to surface water, some local drainage measures installed to mitigate.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLA101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLA102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LLA103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLA104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Llanarth

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.11 Llanbadoc Community Council Area

Llanbadoc community covers quite a large and mainly rural area just west of Usk. It is bounded on the east by the R Usk and its southern boundary follows the Dowlais Brook. The main settlements are Llanbadoc, Woodside (Usk), Monkswood, Glascoed and Rhadyr. The major route, the A472, crosses the area centrally east west. There are a number of significant features in this Community's area, including Monmouthshire's County Hall and Coleg Gwent both at Rhadyr, The Glascoed Works near Monkswood, the Prescoed Young Offenders Institution and the majority of Llandegveth Reservoir on the west side. Llanbadoc is part of the Llanbadoc Ward together with Gwehelog Fawr and their joint population in the 2011 census was 1,299 with 514 properties.

The R Usk is the main river here and its flood plain provides the most significant source of flood risk. This includes Llanabdoc and Woodside. The flood banks in this area were built in the late 1980s to a 1 in 100 standard providing a good level of protection against fluvial flooding. Other watercourses include the Sor brook on the west side, the Berthin Brook running through Monkswood and Rhadyr. This has the potential to cause flooding at the Coleg Gwent and MCC County Hall sites and parts of the A472 at Monkswood & Rhadyr. The Dowlais Brook corridor provides a further source of flood risk and the unnamed brook at Llanbadoc as well. There is also a surface water flooding risk to the A472, Cefn Mawr Lane, Estervarney Lane, the Glascoed Works, Monkswood sewage works and Beaufort Crescent at Monkswood

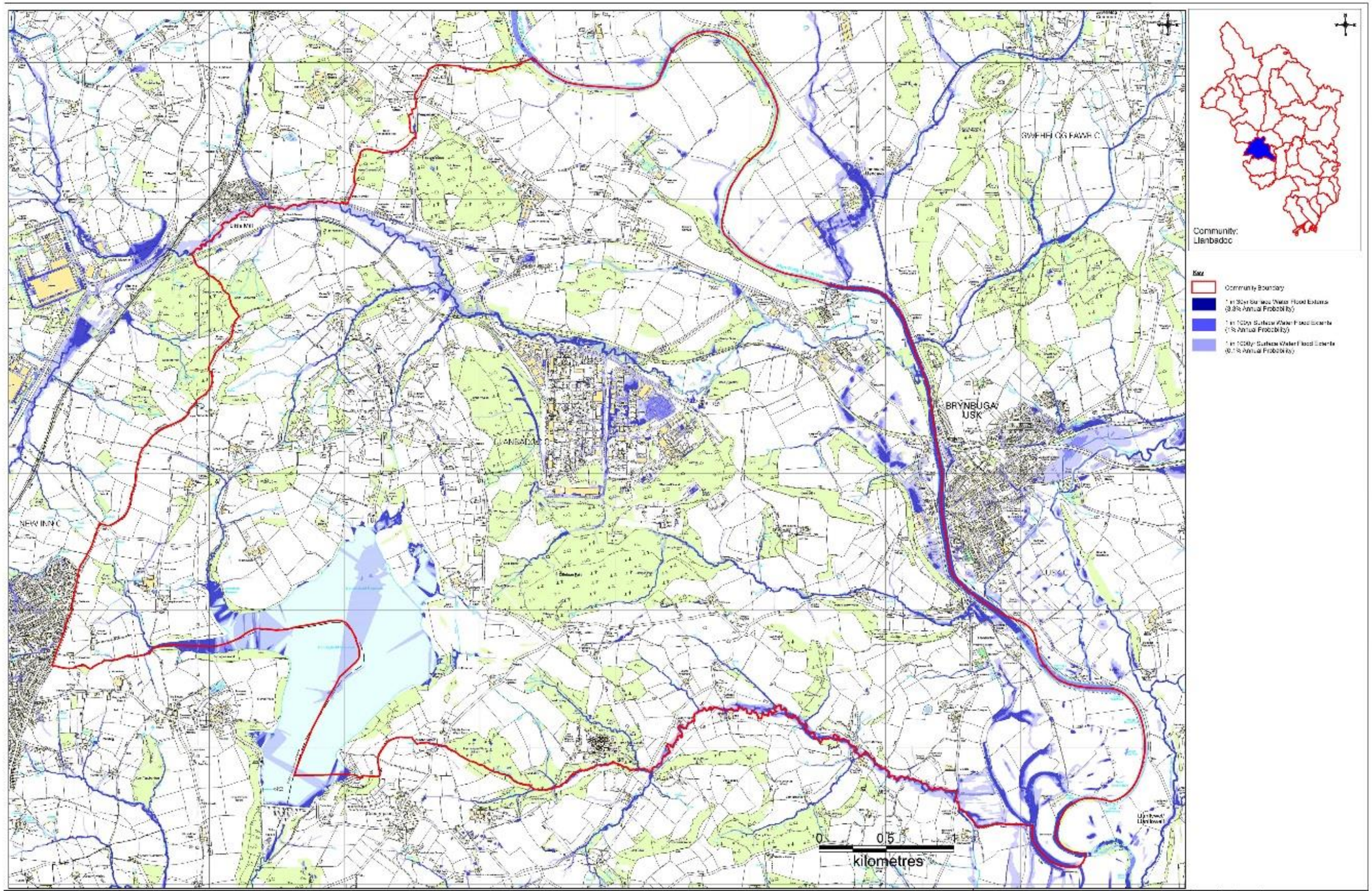
Ordinary Watercourse Outfall to River Usk at Llanbadoc Church

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llanbadoc Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	2	12	19
	Residential Properties at risk of flooding		
Residential Properties (n)	0	6	6
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	61 (143)

Measures to mitigate flood risk in Llanbadoc Community Area					
Measures Already Implemented					
Ref	**Details**				
LLB01	Adjacent to Llanbadoc Church - Drainage investigation & reinstatement of historic drainage relief ditch				
LLB02	Woodside, (Usk), Pre-Feasibility and Full Study for Flood Alleviation Scheme submitted to Welsh Government but high costs and low cost benefit.				
LLB03	Flooding of Cottage at Llanbadoc in 2014 , investigation identified watercourse channel needed clearance and culvert under property to be repaired by owner				
LLB04	Flooding of R106, Usk-Caerleon Road opposite Usk rugby ground, in 2000 from blocked surface water system and outfall to river, system cleared.				
LLB05	Flooding of R106 Usk-Caerleon Road near Ty Coch, drainage improved to resolve but is at risk from Dowlais Brook crossing.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLB101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLB102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LLB103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLB104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
LLB105	Flooding of A472 near Coleg Gwent / County Hall, further investigations required	0 - 6	£5k	M53	5.1
LLB106	Re-visit Woodside, (Usk), Study for Flood Alleviation	0 - 6	£15k	M24	5.7

	Scheme that was submitted to Welsh Government in 2007. Carry out new study seeking a more economical solution.				
LLB107	Revisit culvert capacity on Dowlais Brook at R106 crossing and potential upgrade	0 - 6	£5k / £30k	M53	5.1



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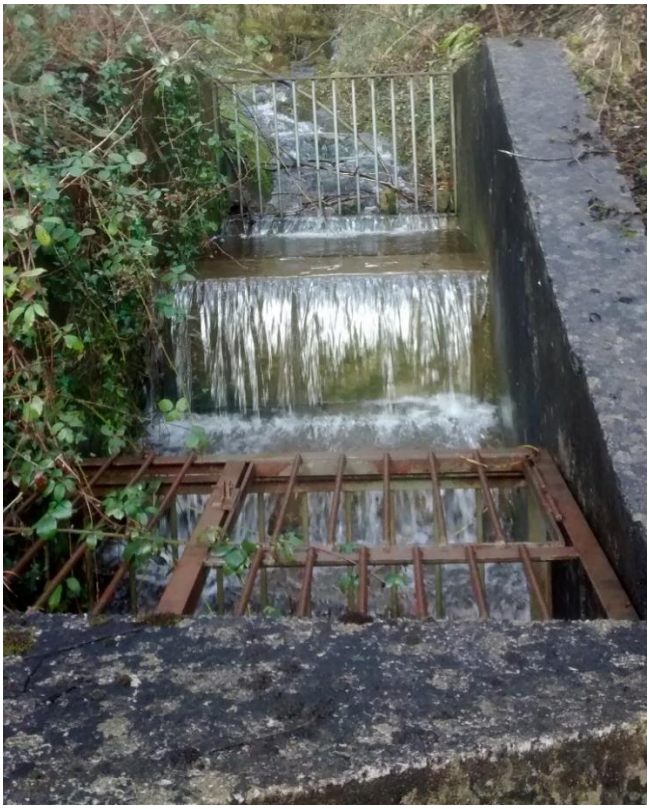
Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Llanbadoc

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.12 Llanelly Community Council Area

Llanelly community is on the western border of Monmouthshire and was formerly part of Brecknockshire until re-organisation of the County boundaries in 1974, at that time then part of Blaenau Gwent District. In 1996 with further changes it became part of the new County of Monmouthshire. This area has a long and rich history of Iron making, quarrying and lime making, part of which is epitomised in the books of Alexander Cordell. The area is also part of the Brecon Beacons National Park. The northern boundary is formed by the R Usk. The A465 Heads of Valleys road built in the 1960s passes through the area and through the Clydach Gorge. The Monmouthshire & Brecon Canal, built in the 1780s to carry lime, stone and iron, also passes through the Gilwern settlement and the wharf area. The population in the 2011 census was 3,899 with 1,716 properties.

The main settlements are Llanelly Hill, Clydach, Maesygwartha and Gilwern. The main watercourses are the R Usk, the R Clydach and the Nant Dyar, plus the Canal itself. In terms of flood risk the R Clydach, Nant Dyar, Sychnant River, Nant yr Hafod, Nant Gwyn and the unnamed brook through Llanelly Hill all pose a risk along their corridors. The Monmouthshire & Brecon Canal provides a risk from bank collapses, such as the one in 2007. The areas at risk from both watercourses and surface water are quite wide and include the A465 & Old Trap Road near Twyn Yr Hebog, A465 & A4077 junction, Abergavenny Road and Dan Y Bryn estate, parts of Malford Grove estate and Orchard Close estate, Cae Meldon, Tyr Common and The Shires.



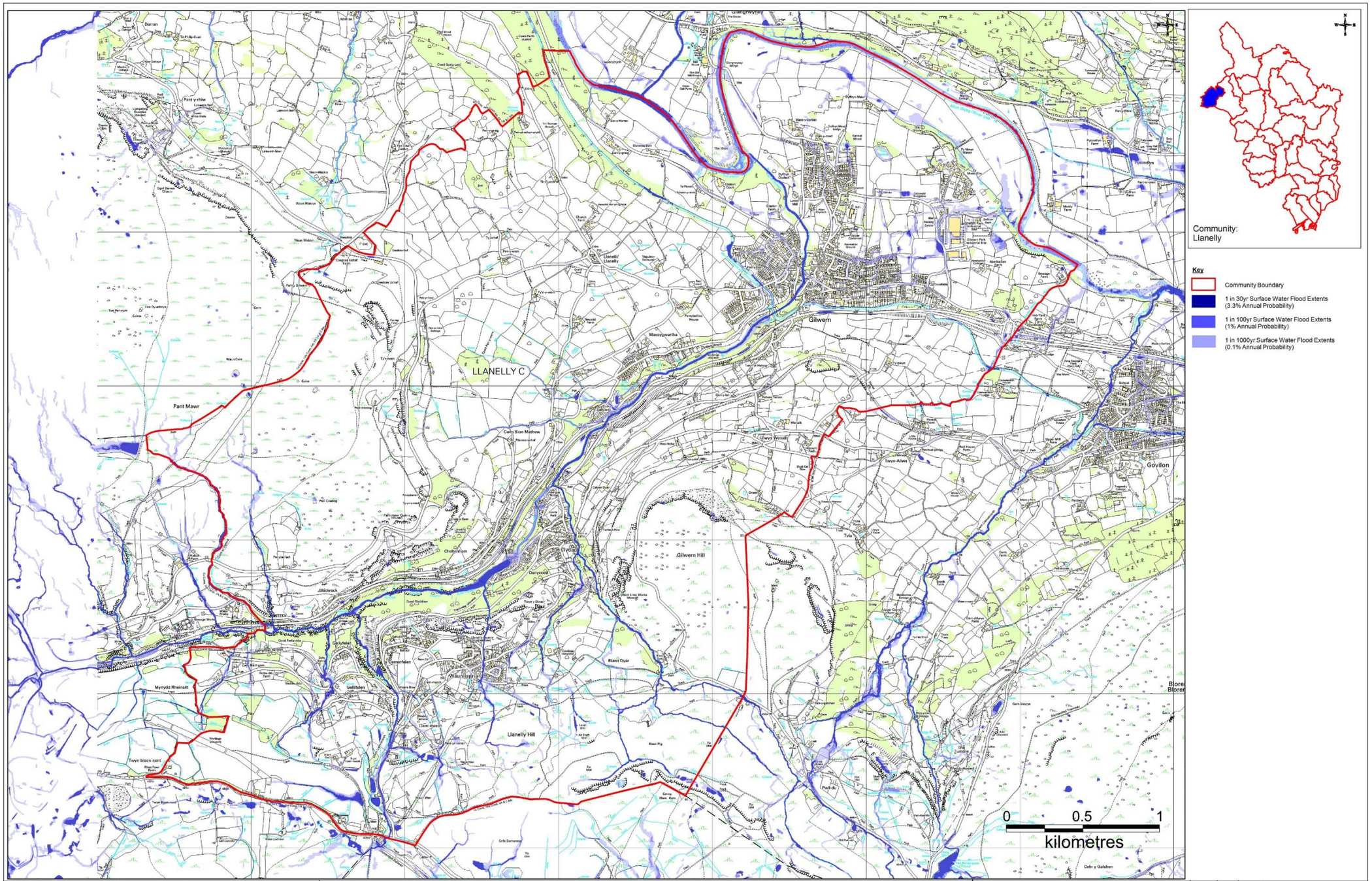
Trash Screen near the Rock & Fountain

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llanelly Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	7	14	118
	Residential Properties at risk of flooding		
Residential Properties (n)	3	1	16
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	19 (45)

Measures to mitigate flood risk in Llanelly Community Area					
Measures Already Implemented					
Ref	**Details**				
LLE01	Investigation of flooding at Orchard Close & installation of drainage works to resolve this.				
LLE02	Major works to restore road and embankment at Maesygwartha following landslip caused by flooding				
LLE03	Major works to restore embankment at Clydach following severe flooding and undermining of residential properties				
LLE04	Installation of drainage works in lane above Old Rectory Close after flooding and landslip				
LLE05	Installation of new drainage through Maesygwartha Village to deal with surface water and highway flows				
LLE06	New culvert at Forge Row to overcome flooding of local properties				
LLE07	Reinstatement works to properties, banks and drainage works following flooding from disused coal mining adit at Gellifellen				
LLE08	Removal of flood debris and reinstatement of highway (A4077) following collapse of Brecon and Monmouthshire Canal bank				
LLE09	Major works of reinstatement of Glangrwney Road following severe damage by floods from R Usk.				
LLE10	Flooding of two properties at Rhonos Road, Clydach, in 2000/2002, some local works undertaken to mitigate issue.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLE101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLE102	Raising awareness with landowners	0 - 6	£1k	M43	2.1

LLE103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLE104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Llanelly

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.13 Llanfoist Fawr Community Council Area

Llanfoist Community area lies just south and west of Abergavenny. It includes the villages of Llanfoist and Govilon south of the R Usk and the settlement of Llanwenarth on the north side of the R Usk. The settlement of Llanellen is also part of this Community and is on the R Usk south of Abergavenny. The Llanwenarth area extends to the peak of the Sugar Loaf Mountain, whilst on the south side the area extends to the ridge of the Blorenge at Keepers Pond along Mynydd Y Garn Fawr. The area at Keepers Pond is also the start point of the Cwm Shenkin Brook that flows down through Cwm Llanwenarth and into the R Usk at Govilon. There are also two un-named brooks from the Blorenge flowing down into Llanfoist and discharging into the R Usk. The Nant Iago brook takes flows from the Sugar Loaf and connects to the Usk on the north side of Llanfoist Bridge. The Monmouth and Brecon Canal also runs mainly east west and then south through the community, broadly parallel to, and south of, the R Usk. The Ochram Brook and its tributary the Nant y Llanellen Brook run from Cwm Mawr, the eastern side of Mynydd Y Garn Fawr ridge down to the R Usk. There is also an un-named brook that runs from the Devils Punch Bowl down through the farms at Lower and Middle Ninfa into the Usk. The main trunk roads, the A465 Heads of the Valleys route and the A40 follow the Usk valley with the A40 on the north side of the river and the A465 on the south. The A4042 trunk road runs south through the community from its junction with the A40 and A465 at It is also partly in the Brecon Beacons National Park. Llanfoist Fawr Community had a population of 3,315 in the 2011 census with 1,425 properties.

Flooding of roads in Llanfoist

From the flood risk aspect the R Usk is the major issue and the floor of the valley is the R Usk flood plain. The areas at risk from this include Llanwenarth settlement and the A40 from Pyscodlyn to Abergavenny. Llanfoist Bridge is the boundary between this community and Abergavenny and crosses the R Usk here and also acts as a weir and restriction to flows with upstream flows higher than downstream. However the

meadows on both sides are under water in severe floods. The Cwm Shenkin brook has quite significant flows at peak times with a steep catchment. Properties adjacent to the brook are at risk and surface water flooding from run off arises at the School Lane area of Govilon and properties in the shoulder on the hillsides of the Blorenge and Sugar Loaf. The R Usk at Llanellen Bridge is another flood risk area and the river here floods the surrounding area quite frequently, causing the A4042 to be closed to traffic, often for several days. The alternative route for traffic is then via Gypsy Lane to Llanfoist. Gypsy Lane is itself at risk of flooding from the un-named brook that runs down from the Devils Punch Bowl. The A4042 south of Llanellen is also at risk of flooding from the Ochram Brook.

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

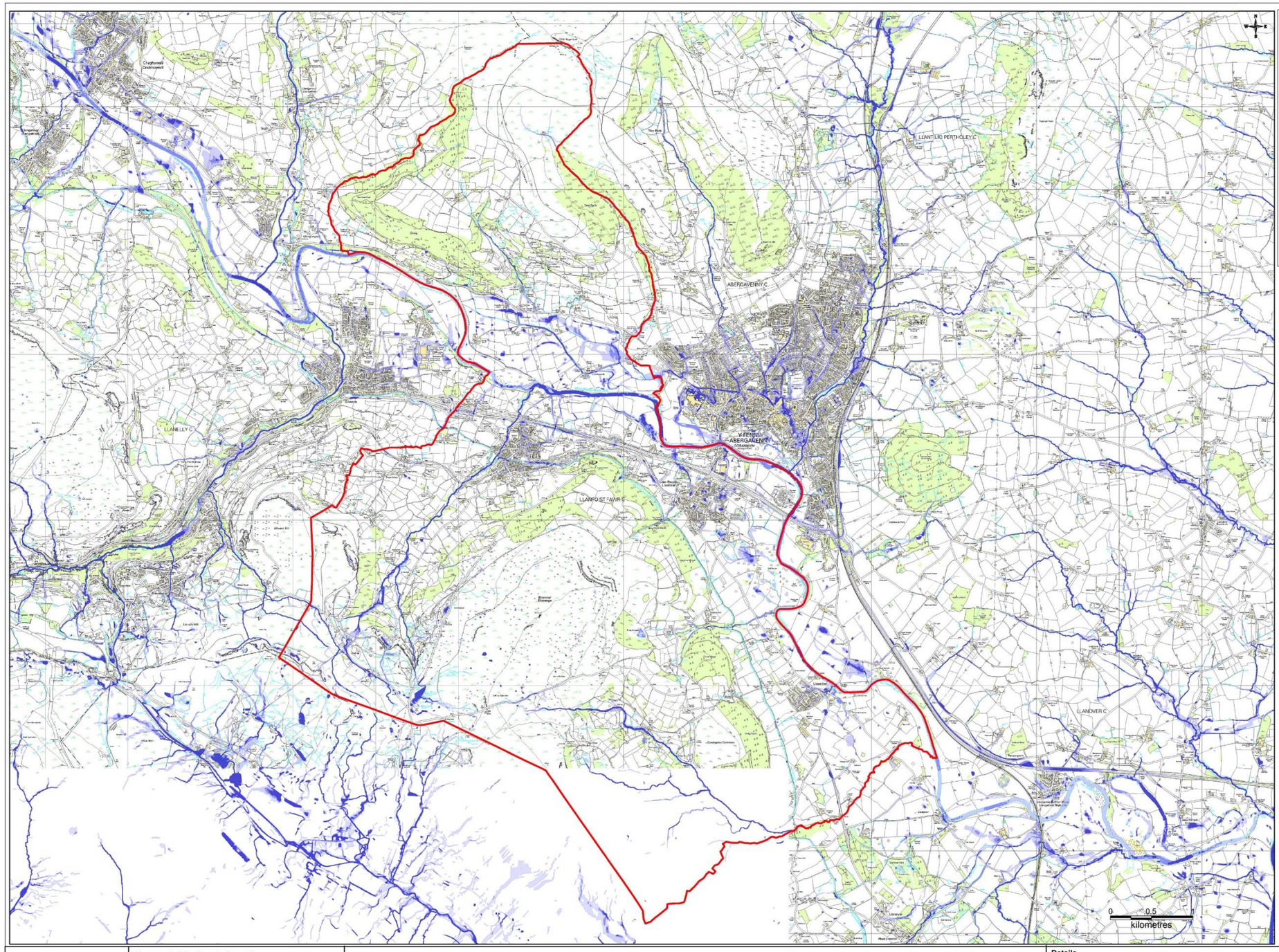
Counts For Llanfoist Fawr Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	9	26	134
	Residential Properties at risk of flooding		
Residential Properties (n)	3	6	16
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	67 (157)

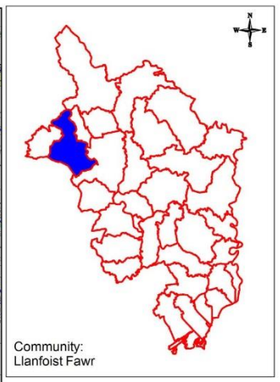
Measures to mitigate flood risk in Llanfoist Fawr Community Area	
Measures Already Implemented	
Ref	**Details**
LLF01	Investigation and works to culvert at Church Lane crossing of B4246
LLF02	Cherry Cottage, Mill Lane, Govilon, additional gullies and channel works carried out
LLF03	Investigation of flooding at the Forge, Govilon following storm flood in Cwm Shenkin Brook. Damage to privately owned brook retaining wall. No action required by MCC.
LLF04	Church Road, Llanwenarth, Route R9, flooded from R Usk, in 2000 & 2002, road cleared and swept after flood.
LLF05	B4246, Llanfoist Old Rail Bridge, flooding of road. Local works and A465 widening has resolved main issue. Highway culvert (200mm diam) may need to be replaced in future.
LLF06	Investigation of surface water flooding at Whitehaven, Blaenafon Road, Autumn 2000. Issue with works by adjacent private land owner resolved.
LLF07	Culvert at Church Lane / B4246 becoming blocked by debris from unmade private lane. Lane now surfaced and grid on culvert.
LLF08	R53 Llanover Road at Llanellen floods from R Usk. No economic solution but warning signs erected when in flood.

LLF09	A4042 Trunk Road floods from R Usk and traffic diversion set up when necessary by Trunk Road Agency. Planned scheme for autumn 2015 to resolve by Trunk Road Agency.
LLF10	Investigation of flooding of property at Elm Drive, Llanellen. Extension built over surface water sewer causing damage. Alternative connection arranged.
LLF11	B4269 flooded at Heol Gerrig Road in 2001, additional gullies and drainage installed to resolve.
LLF12	Flooding at Charles Edward Close, Llanfoist from surcharging surface water system. Highways to cleansed system.
LLF13	Culvert at Red Barn Lane (C6.14) & Church Lane, Llanwenarth (R9) – known as Cherry Orchard culvert replaced in 2001

Measures Proposed to Mitigate Flood Risk

Ref	Detail	Timescale (Years)	Estimated Costs	EU Reporting Code	Measure Ref
LLF101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLF102	Raising awareness with landowners	0 - 5	£1k	M43	2.1
LLF103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLF104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
LLF105	B4246, Llanfoist Old Rail Bridge, flooding of road. Local works and A465 widening has resolved main issue. Highway culvert (200mm diam) further investigation and possible future replacement.	0 - 6	£10k plus works costs £30k	M24	5.7
LLF106	Consider investigation of culvert at Church Lane / B4246 and potential re-alignment if future flooding arises.	0 - 6	£5k	M53	5.1
LLF107	Properties near Llanfoist Bridge are at risk of flooding from R Usk. Consider Property Level Protection schemes to owners	0 - 6	£5k	M35	5.4





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Llanfoist Fawr

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.14 Llangattock Vibon Avel Community Council Area

Llangattock Vibon Avel Community area lies west of Monmouth and covers a large rural area. The main settlements are L Vibon Abel, Cross Ash, Skenfrith, Rockfield, Hendre, St Maughns Green, Newcastle, and Maypole. The R Monnow provides the northern and eastern boundary which is also the County boundary. There are three main highway routes in this community, the B4233 from Abergavenny to Monmouth which also provides part of the southern boundary, the B4521 from Abergavenny to Cross Ash and then Skenfrith and the B4347 that runs parallel to the R Monnow from Monmouth to Skenfrith. Llangattock Vibon Abel Community is part of the Llantilio Crossenny Ward jointly with Llantilio Crossenny Community and had a joint population of 1,755 with 697 properties.

The flood plain areas around the R Monnow and R Trothy create flood risks to properties, particularly Skenfrith, which has been flooded frequently, as well as from its tributary here the Norton Brook. The Monnow also affects Rockfield and the B4347 there. The Trothy provides part of the Southern boundary and its tributary, the Llymon Brook also forms part of the south and south western boundary. The Llymon Brook potentially floods the B4233 highway at Llymon Bridge. The Croft Hir Brook affects the highway at Croft Hir Bridge. The Tre Rhew Brook forms a section of the western boundary.

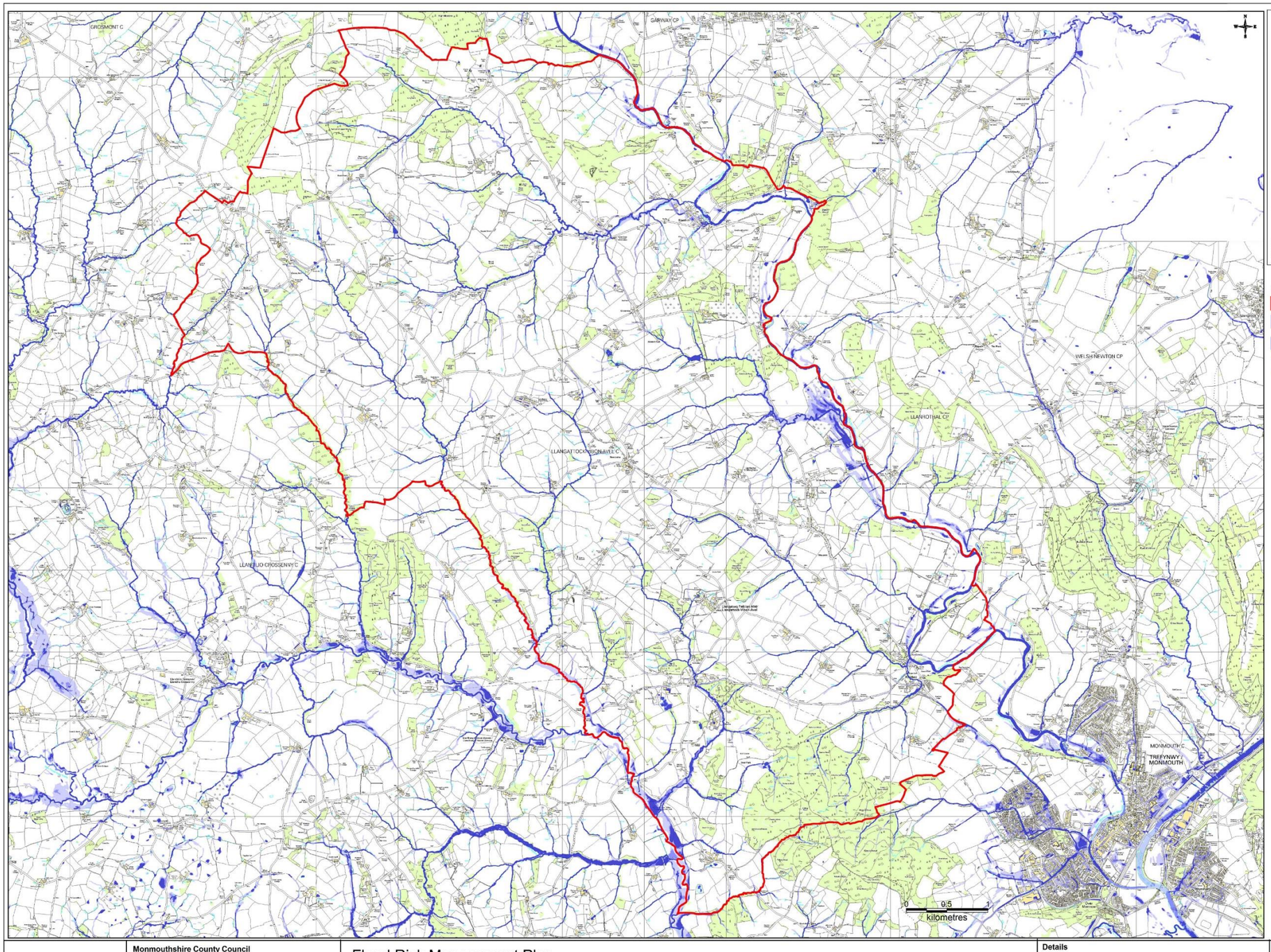
Skenfrith Bridge

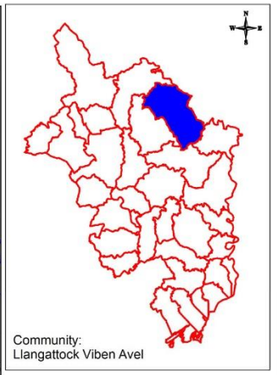
The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llangattock Vibon Avel Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	0	19
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	1
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	36 (85)

Measures to mitigate flood risk in Llangattock Vibon Avel Community Area					
Measures Already Implemented					
Ref	**Details**				
LVA01	Cae Capel, Great Oak, investigation of surcharging culvert in private garden – identified as owners responsibility				
LVA02	Investigation of highway flooding at Craig View, local drainage systems cleared.				
LVA03	Investigation of flooding at Llymon Bridge, on route B4233 where it crosses the Llymon Brook. Erect flood warning signs during flood risk periods.				
LVA05	Investigation of flooding at Croft Hir Bridge, Newcastle, on route C20.3 caused by blockages to culvert. Consider options with intermediate solution to erect flood warning signs when flood risk arises.				
LVA06	Investigation of flooding of Skenfrith has been undertaken by MCC and with Natural Resources Wales as the flooding arises from the River Monnow, a main river. The partial collapse of the weir has added to problems at this location. To date NRW have advised that a flood alleviation scheme does not generate a positive benefit to cost ratio. MCC will continue to support residents via the issue of sandbags on request.				
LVA07	Investigation of flooding causing substantial landslip in 2001/2 onto route C22.2 at Lint Hill, Skenfrith identified cause as surface water pipe on private land bursting and undermining the slope. Slip was cleared and road re-instated.				
LVA08	Investigation of flooding of route R39 at Tregate Bridge from the River Monnow when it is in flood. Options here are very limited with an historic bridge. Erect flood warning signs during flood risk periods as an intermediate solution.				
LVA09	Investigation of flooding of B4347 at Rockfield Church identifies it in the flood plain of River Monnow and outside any defended area.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**

LVA101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LVA102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LVA103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LVA104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
LVA105	Property flooding at Skenfrith in 2014 needs further investigation	0 - 6	£10k	M53	4.1
LVA106	Consider options to resolve flooding at Llymon Bridge, Newcastle, on route B4233 from Llymon Brook	0 - 6	£15k	M24	5.6
LVA107	Consider options to resolve flooding at Croft Hir Bridge, Newcastle, on route C20.3 caused by blockages to culvert	0 - 6	£15k	M24	5.6
LVA108	Consider raising with property owners the option of property level protection until a more permanent solution is developed by NRW.	0 - 6	£10k	M35	5.4 / 5.5
LVA109	Consider options to resolve flooding at Tregate Bridge, on route R39 from River Monnow	0 - 6	£15k	M24	5.6
LVA11o	Flooding of B4347 at Rockfield Church as in flood plain of River Monnow. Erect flood warning signs at times of flood risk.	0 - 6	£1k/a	M43	2.2 & 2.3





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan

Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)

Community: Llangattock Viben Avel

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.15 Llangwm Community Council Area

Llangwm community is a very rural area close to the centre of Monmouthshire, east of Usk and south of Raglan. The main settlements are Llangwm, Llansoy and Llangwm Isaf. The Olway Brook, which is a main river runs through this area at the north end. Other watercourses include, Pantyrhydan Brook, Pill Brook, Dyffryn Brook, Llangwm Isaf Brook and Nant Y March Brook. The last two join at Llangwm. The village of Llangwm sits on the B4235 Usk to Chepstow road. Llangwm Community is part of the Devauden Ward and jointly with Devauden Community the population in the 2011 census was 1,480 with 857 properties.

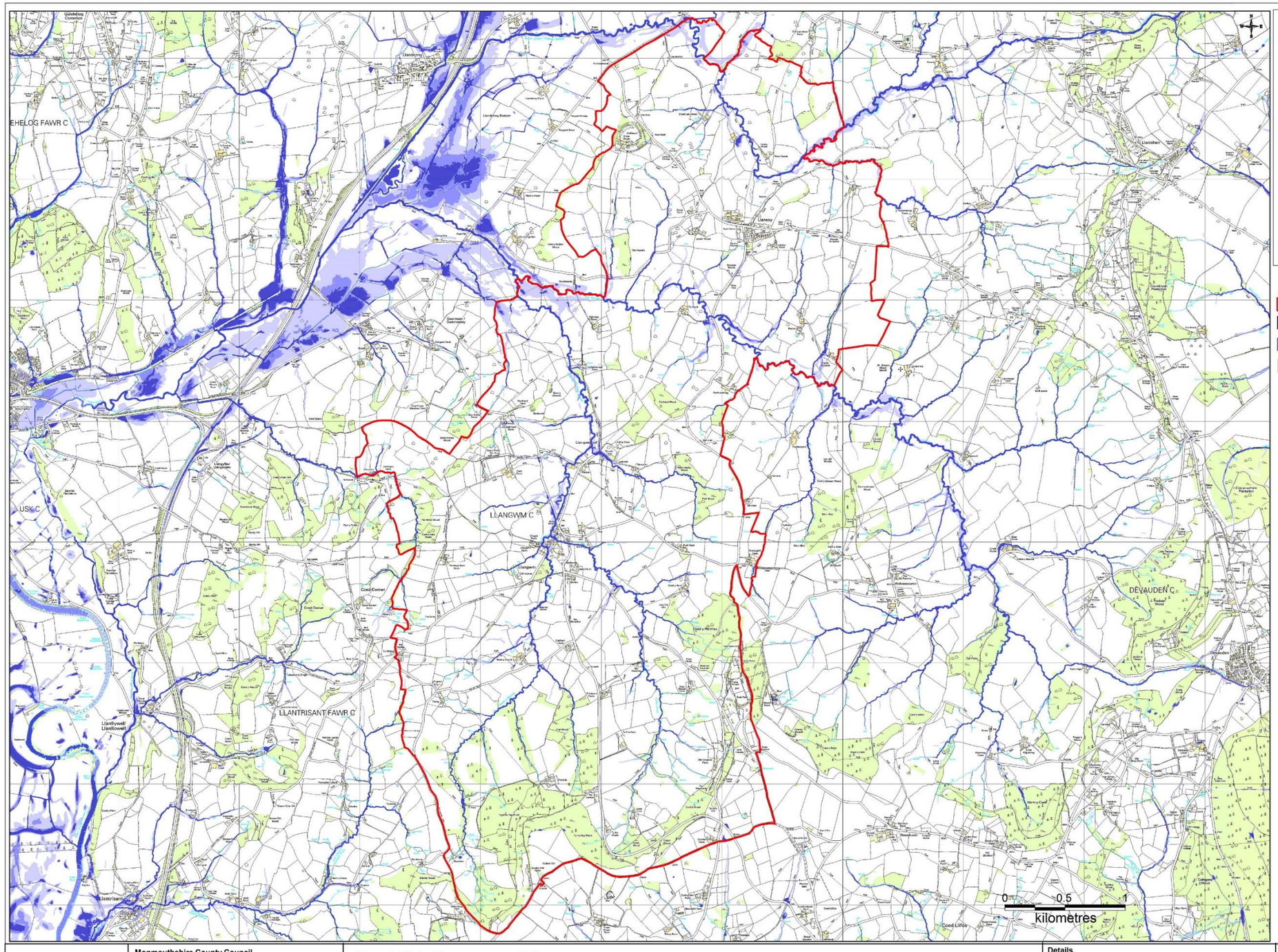
In terms of flood risk the western part of Llangwm is at risk from the Nant y March and Dyffryn Brooks. The B4235 is also at risk of flooding north and south of Llangwm. Several other roads are also at risk, the C211.15 and C211.6 at Gwernesney as well as the C63.1 at Llangwm. Other isolated properties are at risk where they lie close to the brooks named above. The Olway Brook is also a SINC and SINC's at Rhydwern Wood and Flat Wood are at risk from the brooks that run through them.

Culvert beneath the B4235

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llangwm Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	0	19
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	3
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	9 (21)

Measures to Mitigate Flood Risk in Llangwm Community Area					
Measures Already Implemented					
Ref	**Details**				
LLG01	Pre-Feasibility Study and Full Report for Flood Alleviation scheme on Nant Y March and Dyffryn Brooks completed and submitted to Welsh Government. Not approved to date due to low benefit / cost ratio.				
LLG02	Investigation of flooding of route C63.1 at Llangwm – cause from adjacent brooks. Use of flood warning signs during floods planned as a precaution.				
LLG03	Investigation of flooding to route R81 at Dyffryn Brook culvert identified blockages of highway gullies. System cleared and additional gullies installed.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLG101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLG102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LLG103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLG104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
LLG105	Consider raising with affected householders the option of property level protection as a way forward	0 - 6	£5k	M35	5.4/5.5
LLG106	Investigate further at Dyffryn Brook culvert on R81 PAR or possible debris screen	0 - 6	£15k	M53/M54	5.1/5.6



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Llangwm

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.16 Llangybi Community Council Area

Llangybi Community lies to the west of the County and borders Croesyceiliog. The River Usk forms much of the eastern boundary. There are a number of villages within the community, Llangybi itself, Coed Y Paen and Llandegveth. The 2011 census data is based on the Llangybi Ward which also includes Llanhennock and Llantrisant Communities with a joint population of 1,861 and 719 households.

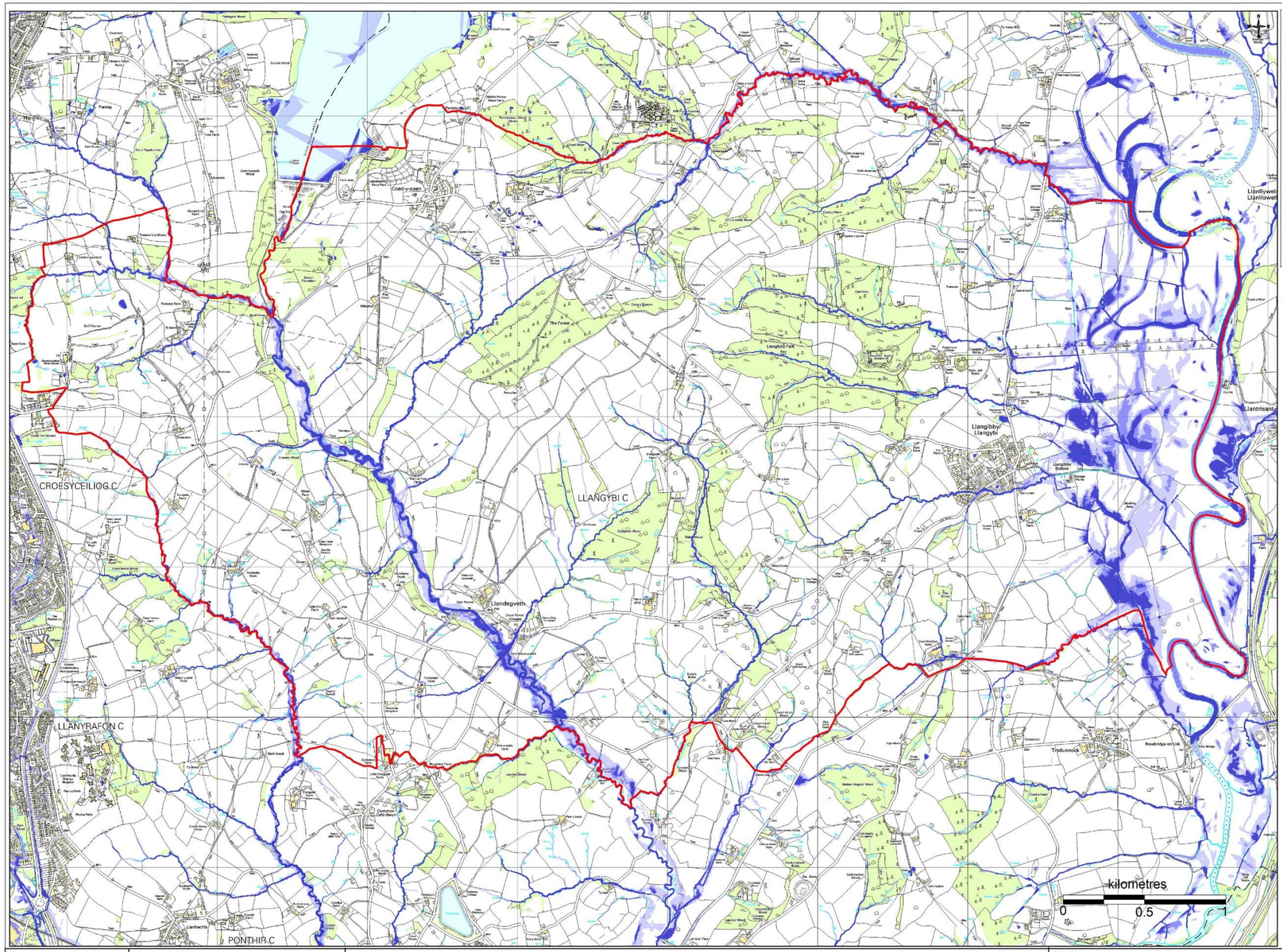
From the drainage aspect most of the community's area is part of a north-south ridge with the R Usk on the east side being the major river with the Sor Brook passing north south on the west side of the ridge, passing through the community, and draining the Llandegveth Reservoir in the north. The Candwr Brook runs along part of the south western boundary and the Dowlais Brook runs along part of the northern boundary. There is an unnamed brook running west to east through Llangybi. The main flood risk comes from the R Usk and its flood plain which extends close to Llangybi and the road south. A further corridor of flooding follows the Sor Brook. All the other watercourses and their tributaries have flood corridors but no significant developed areas are at risk. Roads will also be affected where these brooks cross them, particularly the R103 and R104 at Llandegveth and R106 and R108 in the Cwrt Bleddyn area. Also, the R106 & R104 at Llangybi Walks and, The Chase area of Llangybi.

Ton Road Culvert, Llangybi

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llangybi Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	2	0	28
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	6
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	6 (14)

Measures to Mitigate Flood Risk in Llangybi Community Council Area					
Measures Already Implemented					
Ref	**Details**				
LLY01	Flooding of road Route R102 at Pentre Waun culvert, Coed Y Paen, on Dowlais Brook in 2000, new 600mm diam culvert installed to improve situation.				
LLY02	Flooding of road Route R104 and property at Bell House culvert, on brook at Llangybi, culvert replaced to resolve problem.				
LLY03	Flooding of R106 Caerleon Road near Llangybi Lodge from surface water associated with local brook crossing.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLY101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLY102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LLY103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLY104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



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7.4.17 Llanhennock Community Council Area

Llanhennock Community lies in the South West corner of the County bounded by the R Usk to the east and the Candwr Brook to the west. The community includes the villages of Tredunnock, Llanhennock, Newbridge on Usk and Roughton. The trunk route A449 also runs close to, but outside of, the eastern boundary. Llanhennock Community is part of Llangybi Ward along with Llangybi and Llantrisant Fawr Communities with a joint population in the 2011 census of 1,861 with 719 properties.

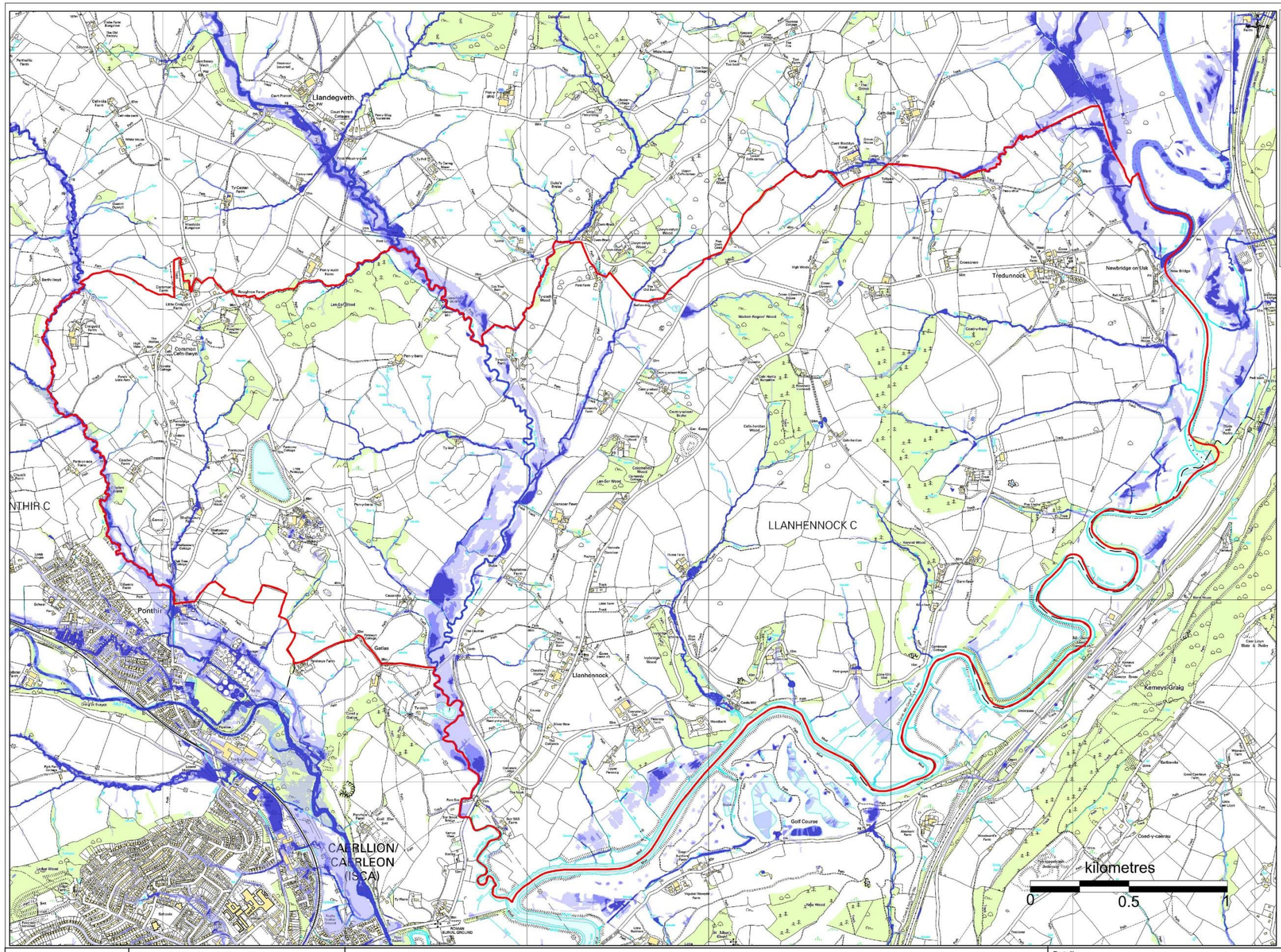
Watercourses include the Sor Brook, running north-south joining the Usk north of Caerleon. The Candwr Brook along the western boundary joins the Afon Llwyd and then the R Usk, also at Caerleon. From the flood risk aspects the R Usk flood plain is the most significant with similar risks along the corridors of the Candwr and Sor Brooks and roads will be affected where these cross them, particularly the R105 Roughton Rd near Caerleon, the R107 near Great House and R106 at Garth & Garth Brook Road.

Culvert on unnamed watercourse

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llanhennock Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	0	2
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	0
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	8 (19)

Measures to Mitigate Flood Risk in Llanhennock Community Area					
Measures Already Implemented					
Ref	**Details**				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLH101	Support & encourage development of a Community Flood Plan	0 - 5	£1k	M43	2.1, 2.2 & 2.5
LLH102	Raising awareness with landowners	0 - 5	£1k	M43	2.1
LLH103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLH104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Llanhennock

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.18 Llanover Community Council Area

Llanover Community is in central Monmouthshire just east of Abergavenny and covers a large rural area with many small settlements. These include, Llandewi Rhydderch, Llanvihangel Gobion, Penpergwm, Croes Hywel, Llanover, Coed Morgan, The Bryn, Llanvair Kilgeddin, and Upper Llanover. The R Usk is central to the area and includes much of its flood plain in this area, also dividing the area north and south of its line. Two major trunk roads pass through, the A40 north of the R Usk runs east west from Monmouth to Abergavenny and the A4042, south of the R Usk, runs north south from Abergavenny to Newport. There are also two B class routes passing through this area, the B4598 (Abergavenny to Usk) and B4233 (Abergavenny to Monmouth). The Brecon and Monmouthshire Canal also passes through the area and runs broadly parallel to the A4042 and part of the western area is within the Brecon Beacons National Park. As well as the River Usk there are a number of watercourses, including the Llanmynach Brook which forms part of the northern boundary, Pant Brook which joins the Mynachdy Brook in this area. Also there is the Ffrwd Brook and the Gwenffrwd Brook which joins the Nant Rhyd Y Meirch Brook at Llanover before flowing into the R Usk. Also the Nant Y Robwl brook which runs along the southern boundary and joins the Usk at Chain Bridge. The population of Llanover Community was 2,284 in the 2011 census with 922 properties.

In terms of flood risk the R Usk and its flood plain create a significant risk to adjacent areas and The Bryn and Llanvihangel Gobion are amongst these. The A4042 is also affected by the R Usk at Llanellen Bridge and regularly closed to traffic when the R Usk is very high. The A4042 is also at flood risk at Llanover from the Nant Rhyd Y Meirch brook. Some sections of the A40 could be affected from the Ffrwd Brook and Llanvair Kilgeddin and the R53 route is at risk from the un-named brook that runs through it as well as from surface water run-off. The area north of Llandewi Rhydderch is also a flood risk area from the Mynachdy Brook.

Surface Water & Carriageway Flooding near Pant-y-goitre

Surface Water Runoff & Carriageway Flooding, Llanvair Kilgeddin

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llanover Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	2	9	28
	Residential Properties at risk of flooding		
Residential Properties (n)	0	1	5
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	49 (115)

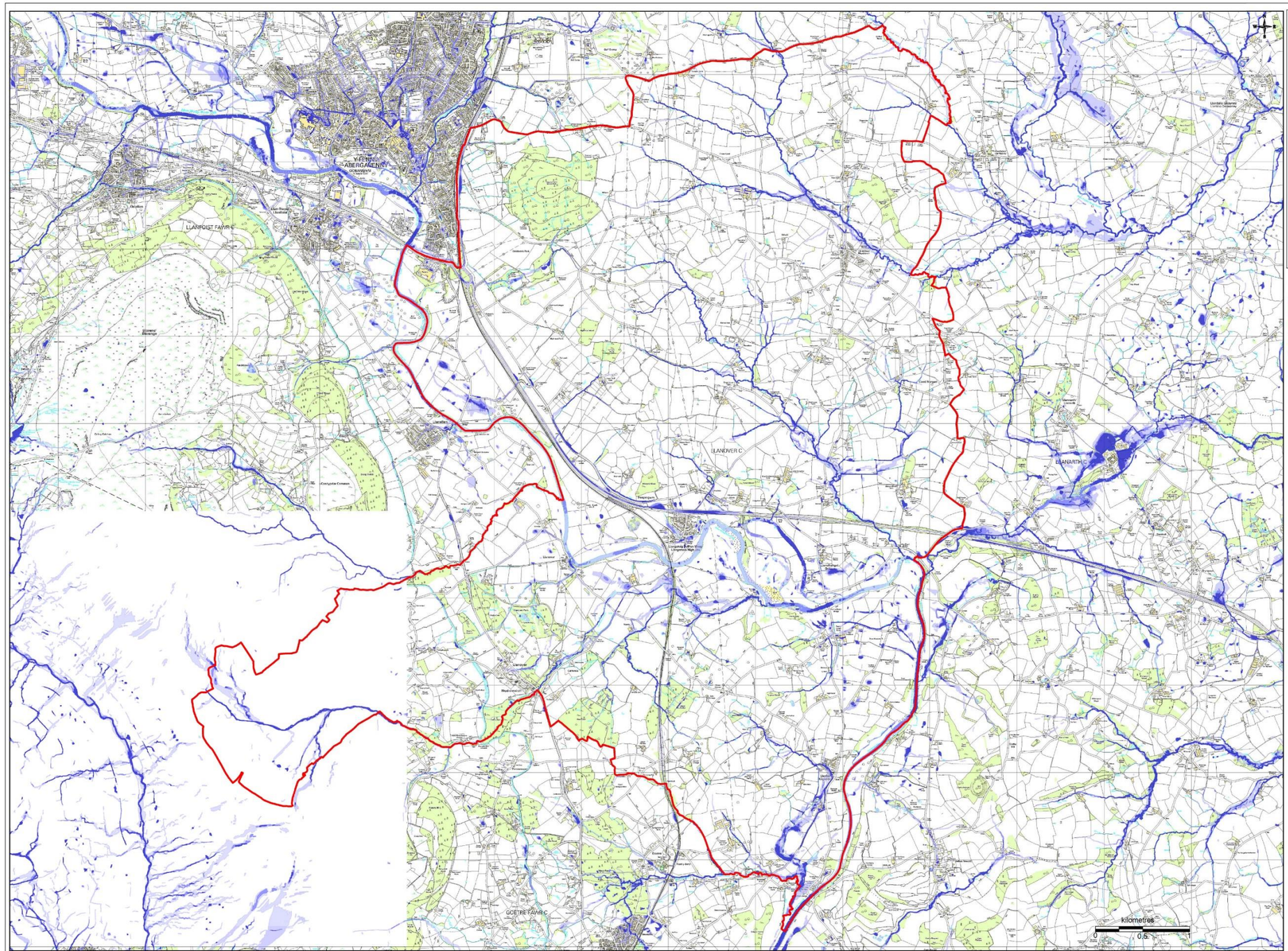
Measures to Mitigate Flood Risk in Llanover Community Area	
Measures Already Implemented	
Ref	**Details**
LLO01	Pant-y-Goitre – Drainage investigations/survey completed, private drainage issues under consideration.
LLO02	Llanfair Kilgeddin - Drainage investigations/survey and clearance works completed and surface water system cleared to river.

LLO03	Flooding of road B4298 and King of Prussia in 2000/01. Investigation identified that local landowner had diverted surface water onto C24.1 and from there to B4298. Action taken against landowner and issue resolved.
LLO04	Church Lane, Llanvihangel Gobion – Clearance of watercourse, surface water drainage including grips on B4598. One property may be eligible for property level protection via NRW

Measures Proposed to Mitigate Flood Risk

Ref	Detail	Timescale (Years)	Estimated Costs	EU Reporting Code	Measure Ref
LLO101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLO102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LLO103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLO104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
LLO105	Consider Project Appraisal for re-aligning watercourse at Llanfair Kilgeddin	0 - 6	£15k	M24	5.7
LLO106	Gethin Place and St Mary's Yard, Llanvair Kilgeddin flooded in 2000/2002 and again in 2013/14 still some risk of surface water flooding. Include in appraisal for realignment of watercourse or as part of any local development.	0 - 6	£15k	M24	5.7
LLO107	B4598 floods from R Usk at Pantygoitre Bridge and near Llanviangel Gobion Church. Consider fixed signs to be deployed in flooding and identify suitable diversion route	0 - 6	£3k	M53	2.1
LLO108	Routes R64 and R41 flood from R Usk at Clytha. Consider fixed signs to be deployed in flooding and identify suitable diversion routes.	0 - 6	£3k	M53	2.1
LLO109	Llangwilliam Lane C26.11 floods from R Usk when R64 and R41 flood. Sign as 'Road Liable to Flooding'	0 - 6	£3k	M53	2.1

LLO110	St Davids Crescent, Llandewi Rhydderch surface water flooding. Consider Property Level Protection options with owners.	0 - 6	£5k	M35	5.5



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Llanover

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.19 Llantilio Crossenny Community Council Area

Llantilio Crossenny area includes a number of settlements including, Caggle Street, Tre Adam, White Castle, Bont, Penrhos, Wernrheolydd, Onen and Llanvihangel Ystern Llevern. It is located south west of Monmouth. The main highway link is the B4233 which runs from Abergavenny to Monmouth. The main river here is the Trothy and many small tributaries, the main ones in this area are the Tre Rhew Brook, the Nant Washan Brook, the Bont Brook the White Castle Brook and an un-named smaller brook from Tal Y Coed wood. The Clawdd Brook also runs through this area. The River Trothy provides the boundary on part of the west and south sides, The Llymon Brook forms part of the east boundary and the Nant Washan Brook provides the southern eastern boundary. Llantilio Crossenny is part of the Llantilio Crossenny Ward with Llangattock Vibon Abel and the joint population in the 2011 census was 1.755 with 697 properties.

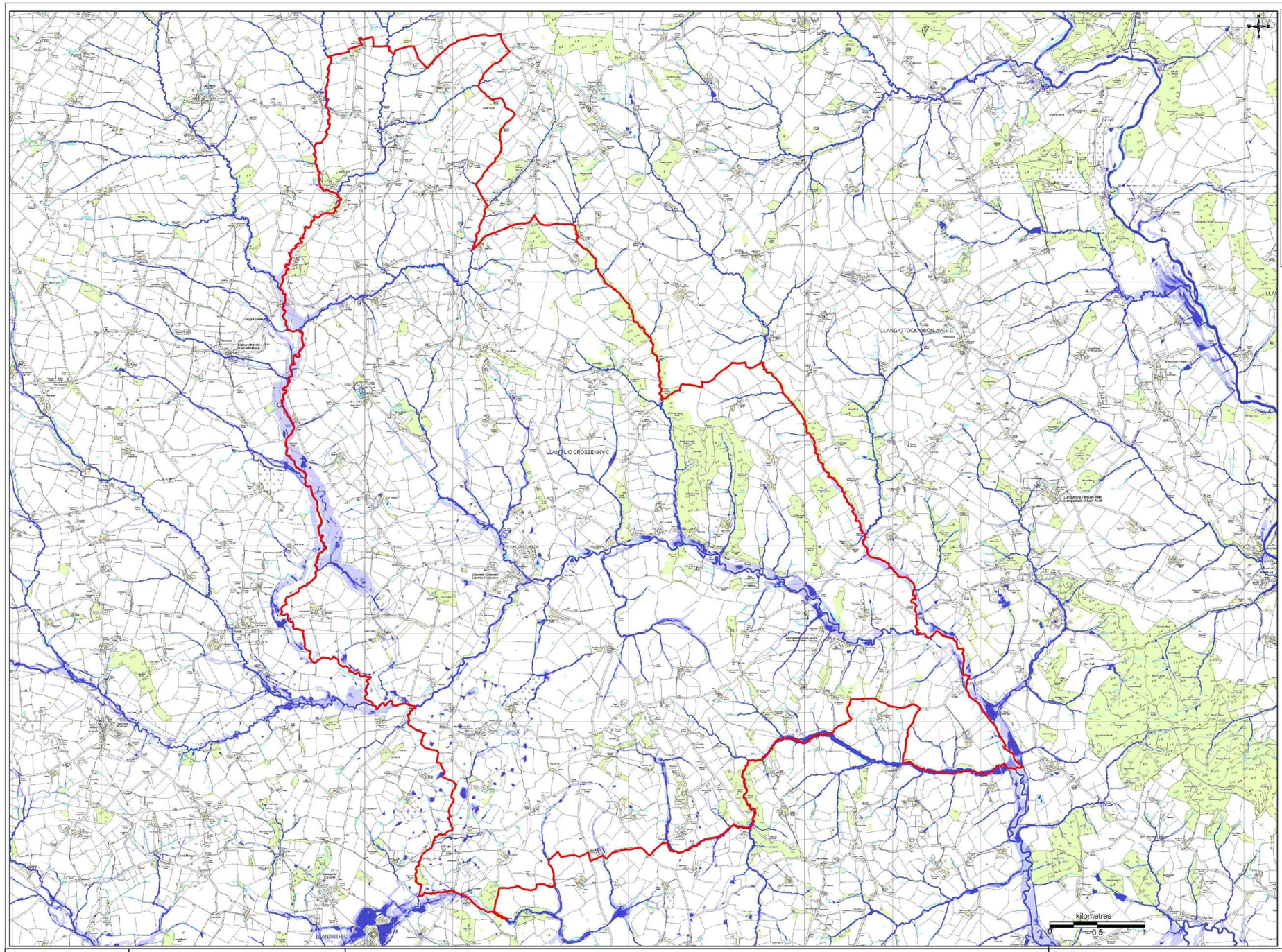
Flood risks arise to properties near the River Trothy and its tributaries. In addition the B4233 is at risk of flooding in several places; near Llanvapley, from Tal Y Coed to Onen and at Llantilio Crossenny from a tributary.

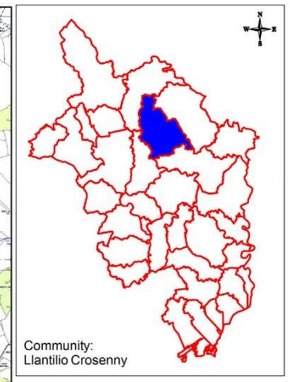
Masonry Arch Bridge over White Castle Brook

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llantilio Crossenny Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	5	7
	Residential Properties at risk of flooding		
Residential Properties (n)	0	2	1
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	8 (19)

Measures to Mitigate Flood Risk in Llantilio Crossenny Community Area					
Measures Already Implemented					
Ref	**Details**				
LLC01	Investigation of flooding of the R34 Whitecastle Road near Croft Farm from surface water partly due to adjacent Tre Rhew Brook. – debris cleared to resolve problem				
LLC02	Investigation of flooding of routes C30.1 & C30.2 at the Onen from the River Trothy. Local repairs carried out to resolve issue.				
LLC03	Investigation of flooding at Abbey Bridge, Llanvihangel Ystern Llewern on route C30.4.where it crosses the Llymon Brook. Erect flood warning signs during flood risk periods.				
LLC04	Investigation of flooding at Llymon Bridge, on route B4233 where it crosses the Llymon Brook. Erect flood warning signs during flood risk periods.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLC101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLC102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LLC103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLC104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Community: Llantilio Crosenny

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.20 Llantilio Pertholey Community Council Area

Llantilio Pertholey community area lies just north of Abergavenny. It includes Mardy, which acts a suburb to Abergavenny and a large rural area including settlements at Brynygwenin, Pantygelli, Llandewi Skirrid and Llantilio Pertholey. The A465 trunk passes through in a north south direction, as does the main railway to Hereford. The B4521 and B4233 run west to east to Hereford and Monmouth respectively. The Skirrid, also known as the Holy Mountain, sits centrally in the community area, with a peak of 486m, and the eastern slopes of the Deri also sit within the boundary. This area is also the main catchment of the River Gavenny from which Abergavenny takes its name. The population at the time of the 2011 census was 3,906 with 1,673 properties.

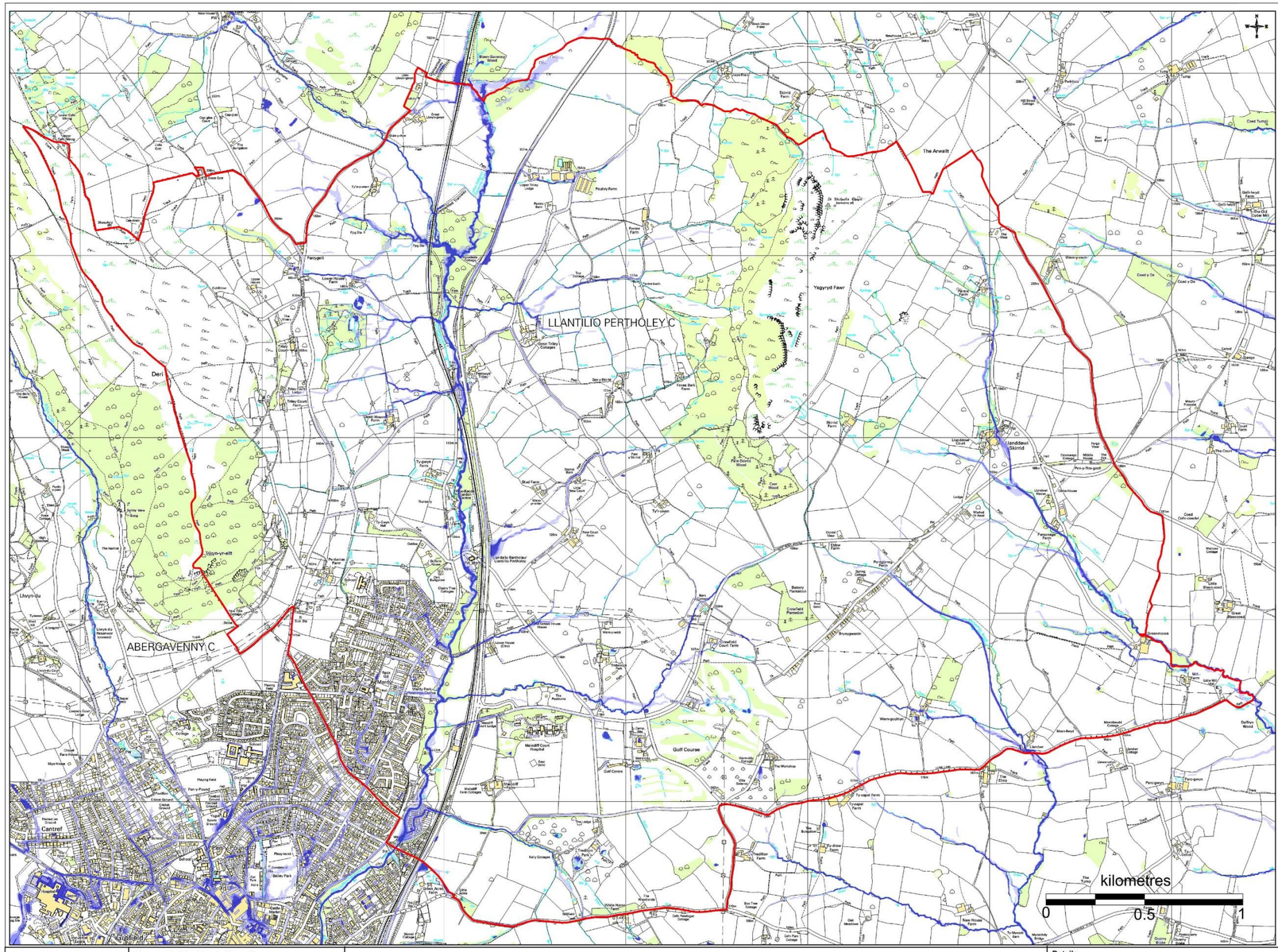
The main river here is the Gavenny that runs parallel to the railway and A465, with several crossings. The Bryn Arrw is a tributary of the Gavenny, drawing its flows from the east side of the Sugar Loaf and joining it north of Pantygelli. A flood risk area lies at its junction potentially affecting both railway and A465. To the east the Mynachdy Brook runs north south and joins the Pant Brook south of this community. Further east the Llanmynach Brook also runs north south, through Llandewi Skirrid and also joining the Pant Brook further south east. Flood risks lie along all of these corridors and their tributaries potentially affecting the B4233, which also provides part of the southern boundary. There are also surface water flood risks in a number of locations, notably the Greystones area of Mardy.

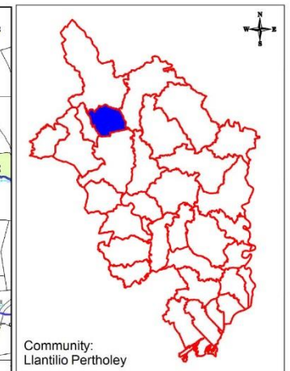
Ordinary Watercourse & Culvert at St Teilio's Church

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llantilio Pertholey Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	12	195
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	53
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	32 (75)

Measures to Mitigate Flood Risk in Llantilio Pertholey Community Area					
Measures Already Implemented					
Action Ref	**Details**				
LLP01	Investigations of flooding issues at Midway Lane, Mardy. Resolution with private land owners.				
LLP02	Investigations of flooding at Mitre Cottages, part resolution by highway works, further liaison with Trunk Road Agency re upstream culvert and channel now completed.				
LLP03	Culvert under road and road at New Court Lane severely damaged by flooding in 2000. Culvert replaced and road reconstructed.				
Measures Proposed to Mitigate Flood Risk					
Action Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLP101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLP102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LLP103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLP104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan

Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)

Community: Llantilio Pertholey

Details	Rev No.		
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.21 Llantrisant Fawr Community Council Area

Llantrisant Fawr community is in the south west corner of Monmouthshire bordering Newport County to the south, while its western boundary follows the R Usk. The A449 trunk road runs north south through the area, close to the western boundary and the A472 link to Usk. The B4235 Usk to Chepstow Road crosses the area east west at the northern end. The Olway Brook forms part of the northern boundary, flowing into the R Usk at Llanhowell. The Pill Brook joins the Olway just north of Gwernesney. Other watercourses include the Llantrisant Brook and Llwynau Brook both running east to west and flowing into the R Usk. Other settlements include Llanhowell, Llantrisant, Llangeview and Coed Cwnwr. Llantrisant Fawr is part of Llangybi Ward along with Llanhennock and Llangybi Communities and had a joint population of 1,861 in the 2011 census with 719 properties.

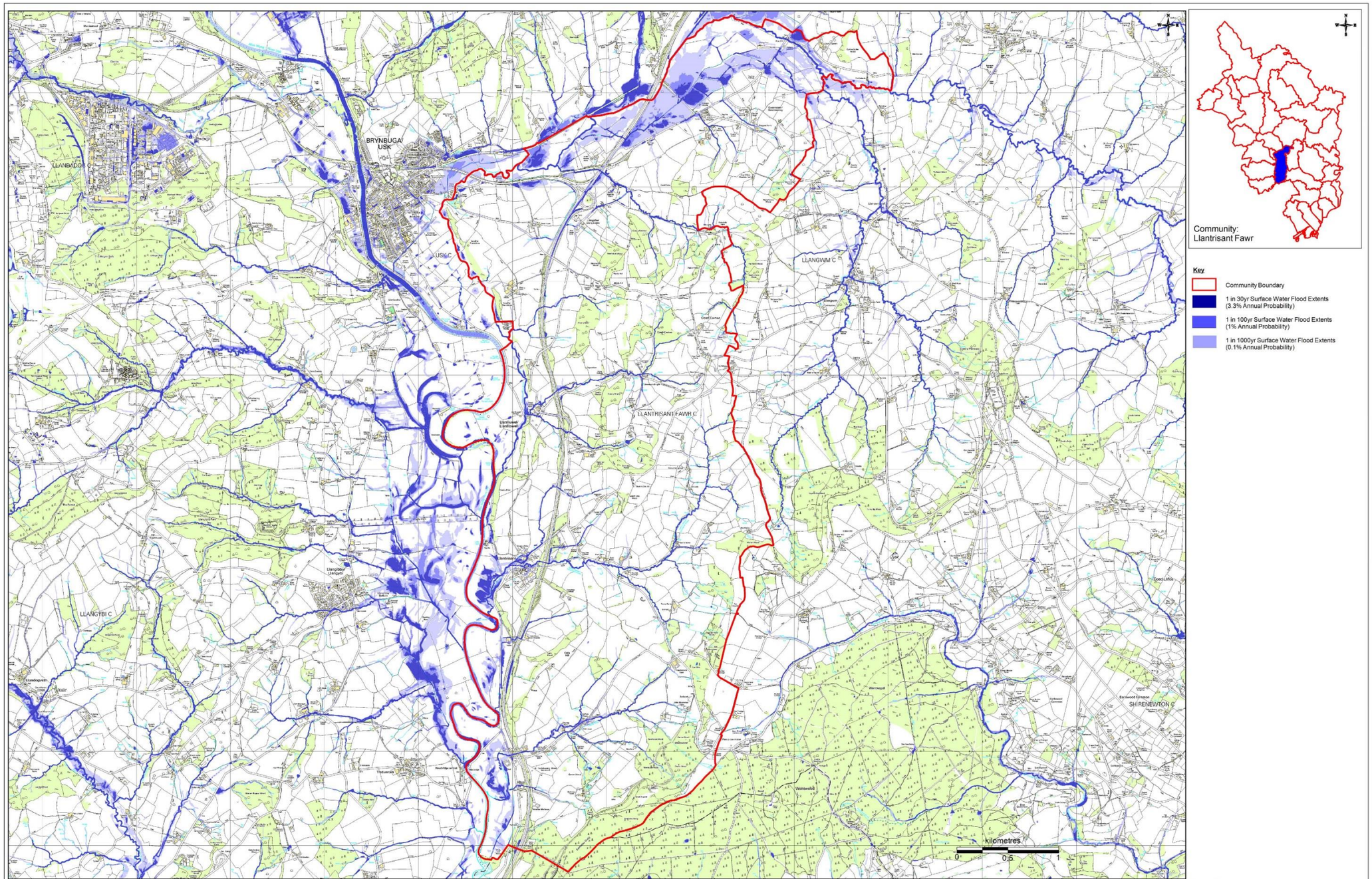
Flood risks arise all along the R Usk and Olway Brook. These also affect the B4235 near the Gliding Club and the Usk Showground as well as Chepstow Road, Usk and the properties there. The area around the confluence of these two at Llanllowell is also a risk area including Llanhowell Bridge and the R113 Usk to Wentwood road, and the R110 and R108 from Llantrisant to Newbridge. Llantrisant itself is at risk from surface water flooding and from the River Usk /Llantrisant Brook as are two roads, the R110 and C232.2. The R75 north of Gwernesney is also at risk of flooding. The A449 is also at risk south of the A472 junction. There is a local road route termed the *'Usk Flood Route'* and signed as such to avoid the flooding at Llanhowell Bridge. It runs from Llanhowell on the C214.1Maerdy – Pentwyn road and C214.3 Red Hill to the Olway Inn near Usk.

Llantrisant Brook, Llantrisant

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Llantrisant Fawr Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	7	0	7
	Residential Properties at risk of flooding		
Residential Properties (n)	0	3	1
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	15 (35)

Measures to Mitigate Flood Risk in Llantrisant Fawr Community Area					
Measures Already Implemented					
Ref	**Details**				
LLT01	Flooding pf properties at Llantrisant from Brook in 2000/2001 & 2007. Investigations and study of capacity issues of culverts on Llantrisant Brook, near Brook House were completed –No further works undertaken at owner's request.				
LLT02	R110 flooded from River Usk in 2000 / 2002. Area not currently covered by flood defences so risk remains.				
LLT03	R113 flooding at Llanllowell Bridge from the Olway Brook– currently outside defended area				
LLT04	Flooding of route R75 near Orchard Cottages, Gwernesney, additional drainage measures installed.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
LLT101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
LLT102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
LLT103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
LLT104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
LT105	Review capacity of culverts at Llantrisant and consider any alternative options to reduce flood risk.	0 - 6	£5k	M44/M24	5.2/5.6



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Llantrisant Fawr

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.22 Magor with Undy Community Council Area

Magor with Undy community is on the southern boundary of Monmouthshire bounded on the south by the Severn estuary and Newport City to the west. The settlement of Llandevenny is also part of the community area as well as Magor and Undy. The M4 and M48 cross the area east-west just above main residential areas. The Steelworks Access Road passes north south to the west side where it joins the M4 at J23A. The B4245, also east - west bisects the community as well as being its main access and the London South Wales Railway also passes east - west just south of the main community. The railway is also very close to the Caldicot & Wentlooge IDD (now through NRW) boundary and also the northern extent of the flood risk area from the sea. Almost all of the area south of the railway line is at risk of flooding from the sea. The population at the time of the 2011 census was 6,140 with 2,377 properties. The NRW have been undertaking sea defence improvement works at Portland Grounds bringing the protection levels up to a 1:1000 standard.

The main watercourse here is the St Brides Brook which runs south from the northern boundary near Knollbury and becomes the Mill Reen once south of the M4 and discharges into the estuary at Magor Pill. There are a number of other reins draining the levels including Prat Reen, Bridewell Reen, Green Wall Reen and Sea Wall Reen. The coastal flooding risks extend north of the railway near Magor School and West End. Flooding from the St Brides Brook occurs along much of its length and affects the St Brides Road as well.

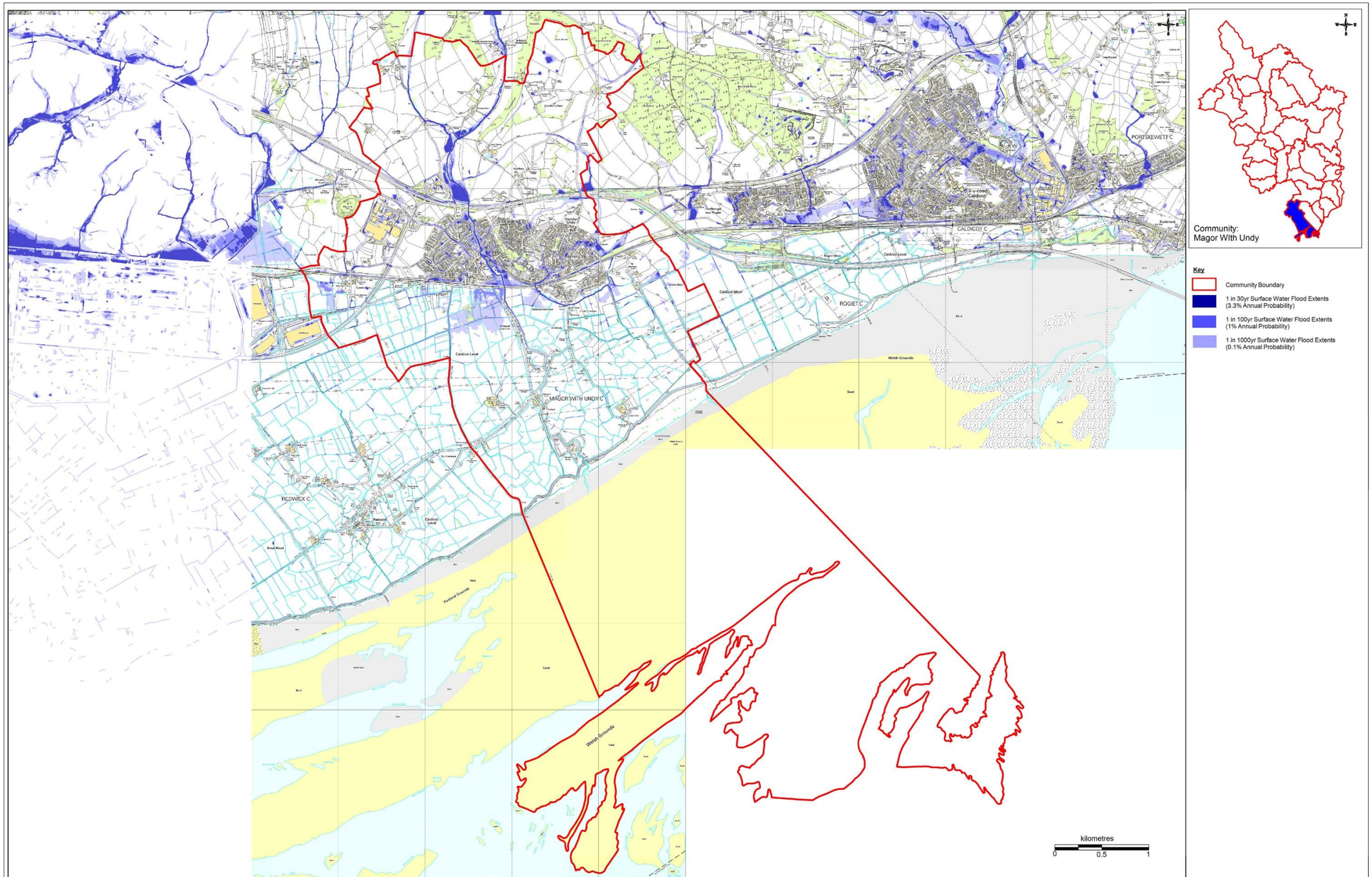
Twin culvert on the Mill Reen

Woodcut of Flooding to Gwent Levels in 1607

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Magor and Undy Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	33	54	385
	Residential Properties at risk of flooding		
Residential Properties (n)	6	11	85
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	404 (949)

Measures to Mitigate Flood Risk in Magor with Undy Community Area					
Measures Already Implemented					
Ref	**Details**				
MU01	Investigation of flooding at West End Magor in 2013 – followed by local works to resolve.				
MU02	Investigation of flooding of route R133 St Brides Road from adjacent watercourse. I 2000/2002 72013/14. Newport City Council subsequently carried out work on A48 crossing of the brook which should reduce the risks.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
MU101	Support & encourage development of a Community Flood Plan Community Flood Plan for areas at risk	0 - 6	£1k	M43	2.1, 2.2 & 2.5
MU102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
MU103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
MU104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



Monmouthshire County Council PO BOX 106 Caldicot NP26 9AN www.monmouthshire.gov.uk	Flood Risk Management Plan Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water) Community: Magor WIth Undy 	Details: Surface Water Flood Hazard Map Drawn By: RAP Scale: See Scale Bar Date: Dec 2014 File / Pathname / Project / Drawing No.: Flood Risk Management Plan	Rev No.	N

7.4.23 Mathern Community Council Area

Mathern Community abuts the Severn Estuary to the south with Chepstow to the east and Caerwent to the west. It includes the settlements of Mathern, Newton Green, Pyllmeyric and Mounton. It has some significant historic buildings and settlements including Moynes Court, Mathern Palace and the site of the medieval village of Runston. The St Pierre Golf Club lies to the south west of the community together with its historic Manor and park. It also has some major transport links with the M48 east west, the A48 broadly east west and the Gloucester to South Wales railway also east west and close to the estuary. The southern part of the community is also within the Caldicot & Wentlooge IDD area, now managed by Natural Resources Wales. In addition the B4235 route forms part of the northern boundary and the B4245 from Caldicot joins the A48 near St Pierre. The A466 also forms part of the eastern boundary. Mathern Community is part of Shirenewton Ward along with Shirenewton Community and had a joint population of 2,201 in the 2011 census with 868 properties.

The main watercourse here is the Mounton Brook running north south and discharging into the estuary at St Pierre Pill. There are also a number of unnamed watercourses, some as tributaries of the Mounton Brook and others that join and discharge at Mathern Pill, again into the estuary.

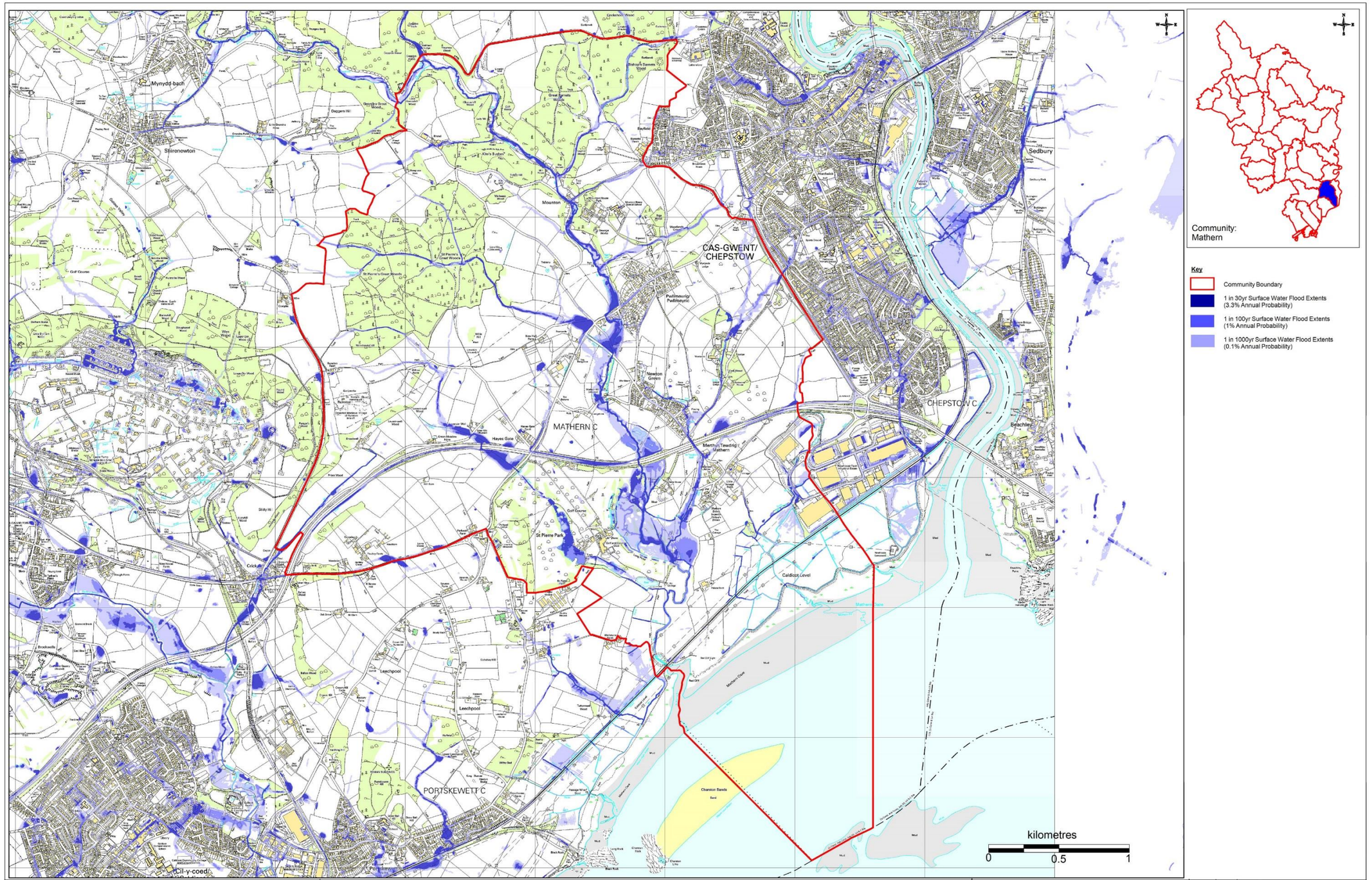
In terms of flood risks the major elements are from the sea where flooding would extend inland to St Pierre and close to Mathern and includes most of the Newhouse Farm Industrial Estate. The whole of the railway lies in the flood risk area. The extent mirrors the IDB boundary. The Mounton Brook also adds a flood risk to parts of Mounton village and the west side of Pyllmeyric. The A48 is also at risk at Pyllmeyric and at Hayes Gate. The R122 is at risk near Coalpits. The main road through Newton Green / Mathern village is at risk from surface water flooding.

Flooding of Roads in Mathern 2012

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Mathern Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	5	5	49
	Residential Properties at risk of flooding		
Residential Properties (n)	0	1	11
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	16 (38)

Measures to Mitigate Flood Risk in Mathern Community Area					
Measures Already Implemented					
Ref	**Details**				
MA.01	Investigations and works on culverts at Mounton Brook, Mounton after flooding in 2000. Culvert under Lions roundabout inspected regularly.				
MA.02	Investigation of flooding at Wyelands View, Mathern in 2008. Local works done to remedy problems.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
MA.101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
MA.102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
MA.103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
MA.104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
MA105	Investigate potential solutions to the problems of surface water flooding beneath the motorway at Mathern.	0 - 6	£5k	M53	5.1



Community:
Mathern

Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Mathern

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.24 Mitchell Troy Community Council Area

Mitchell Troy community lies just west of Monmouth and covers a wide mostly rural area. The main settlements are, Mitchell Troy, Dingestow, Wonastow, Tregare, and Cwmcarvan. The A40 Trunk Road passes through the area east west from Newport to London close to the route of the R46 Old Monmouth Road. Part of the A40 follows the old railway line that ran from Usk up to Monmouth. The R Trothy, a main river, also runs through the area entering from the north and leaving to the east where it joins the R Wye. There are a number of watercourses that are tributaries, including the Garthy Brook, Cwmcarvan Brook, an un-named brook from the south, Nant Ffin, Nant yr Aelles and the Nant Wachan. The Clawdd Brook also rises in this area but flows west to join the R Usk. The population at the time of the 2011 census was 1,253 with 500 properties.

In terms of flood risk properties and roads near the R Trothy are at risk. The R46 is at risk of flooding at Croft Y Lloi Cottage, Mitchell Troy and at Red House Farm. The B4293 at Troy Depot is at risk and the R42 at the A40 near Dingestow.

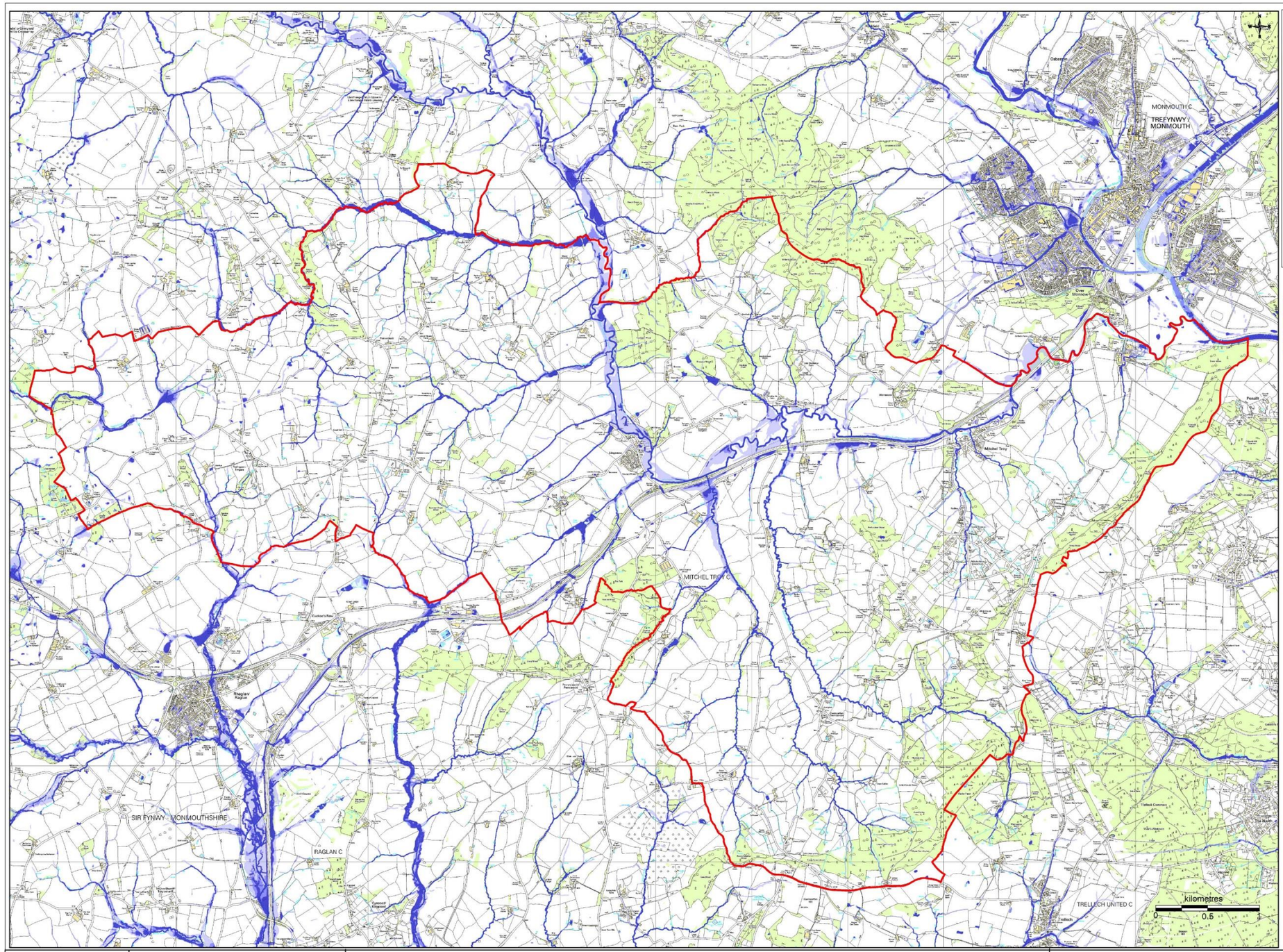
Garthy Brook Culvert – Mitchell Troy

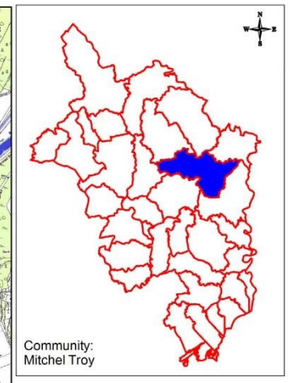
The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Mitchell Troy Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	0	7
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	1
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	12 (28)

Measures to Mitigate Flood Risk in Mitchell Troy Community Area					
Measures Already Implemented					
Ref	**Details**				
MT01	Pre-Feasibility Study of culverts at Parc Pentre and included in Conversion Funding Bids to Welsh Government				
MT02	Investigation of highway flooding in 2001 / 2 on route C29.5 at Tregare– identified additional drainage systems needed				
MT03	Investigation of flooding on highway routes R42 and R45 at Dingestow from River Trothy. Both routes are in flood plain of river with limited options for resolution. Flood warning signs to be erected when flood risks arise. Consider options for longer term.				
MT04	Investigation of flooding of route C29.9 at Jingle Street where the road crosses the River Trothy. Limited options for resolution. Some repairs undertaken to banks to protect the bridge. Flood warning signs to be erected when flood risks arise. Consider options for longer term.				
MT05	Flooding of R46 at Troy Bridge and St Dials Farm from River Trothy. Limited options available, flood warning signs to be erected when flood risks arise. Consider options for longer term.				
MT06	Flooding of C29.5 at Tregare. Debris cleared and problem resolved				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
MT101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
MT102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
MT103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1

MT104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
MT105	Bridge Farm, Dingestow – investigate if flooded in 2014	0 - 6	£1k	M53	5.1
MT106	Investigate options to resolve highway flooding of R42 and R45 from River Trothy	0 -12	£20k	M53/M24	5.1 / 5.6
MT107	Investigate options to resolve highway flooding of C29.9 at Jungle Street from River Trothy	0 -12	£20k	M53/M24	5.1 / 5.6





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Mitchel Troy

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.25 Monmouth Town Council Area

Monmouth is a busy market town and one of the five main towns in Monmouthshire. It had a population of 10,508 in the 2011 census with 4,520 properties. It is on a major trunk road, the A40, which passes to the east side of the town, bisecting it from the Wyesham and Mayhill areas. The A466 joins the A40 here and is the main route from Monmouth to Chepstow to the south following the Wye Valley and to Hereford in the north. In addition the A4136 joins the A466 here and is the main route to the Forest of Dean and Gloucester. It sits on the confluence of two main rivers, the R Wye and R Monnow and the town is defended to a 1:100 standard. These defences were built in the late 1980's after the major flooding which affected the town in 1979. The Mayhill & Redbrook Road areas east of the R Wye are undefended and have flooded several times in recent years, notably 2000, 2001 and 2002. The Forge area alongside the R Monnow at Osbaston is also undefended and floods more frequently, including Osabaston Road itself. The confluence of the two rivers causes some interaction and if heavy rainfall occurs during a flood period there can be extended peak flows in both rivers increasing the flood risk to the town. There is a third main river, the R Trothy, which passes to the south of the town, joining the R Wye just south of the R Monnow.

Flooding at Drybridge Street

There are a number of ordinary watercourses, at Watery Lane and Wonastow Road that have also contributed to flooding in the past as they both connect to the R Monnow, and at high flows cannot discharge. A pumping station was constructed around 2007-8 to manage the flows in the Wonastow Brook and pump excess flows into the R Monnow. There is also an un-named brook along Rockfield Road. Part of this area is within the former Lower Wye IDD area now being managed through Natural Resources Wales and they are responsible for Ordinary watercourses in that area.

There are also a number of brooks in the more rural parts around the Town, including the Mally Brook and the Leas Brook. Significant flooding at Buckholt, a settlement to the north of the town occurred from the Mally Brook in 2008.

Flooding at Drybridge Street, 1947

In terms of areas at risk Osbaston Road and the Forge area, Rockfield Road area including Watery Lane and the Fire and Ambulance Stations located there. Much of Overmonnow and Wonastow Road including the industrial estate (west), are at risk as are Chippenham and Monnow Street, and areas along and around Dixton Road such as the School and Leisure centre, as well as the Mayhill and Redbrook areas. All of these are from the R Monnow and Wye but many would also be from surface water flooding as well. Wyesham is at risk from surface water run-off from the surrounding hills. Parts of Wonastow Road, particularly above the Link Road are at risk from surface water flooding from adjacent higher ground. Flooding has also occurred at the Rockfield Estate.

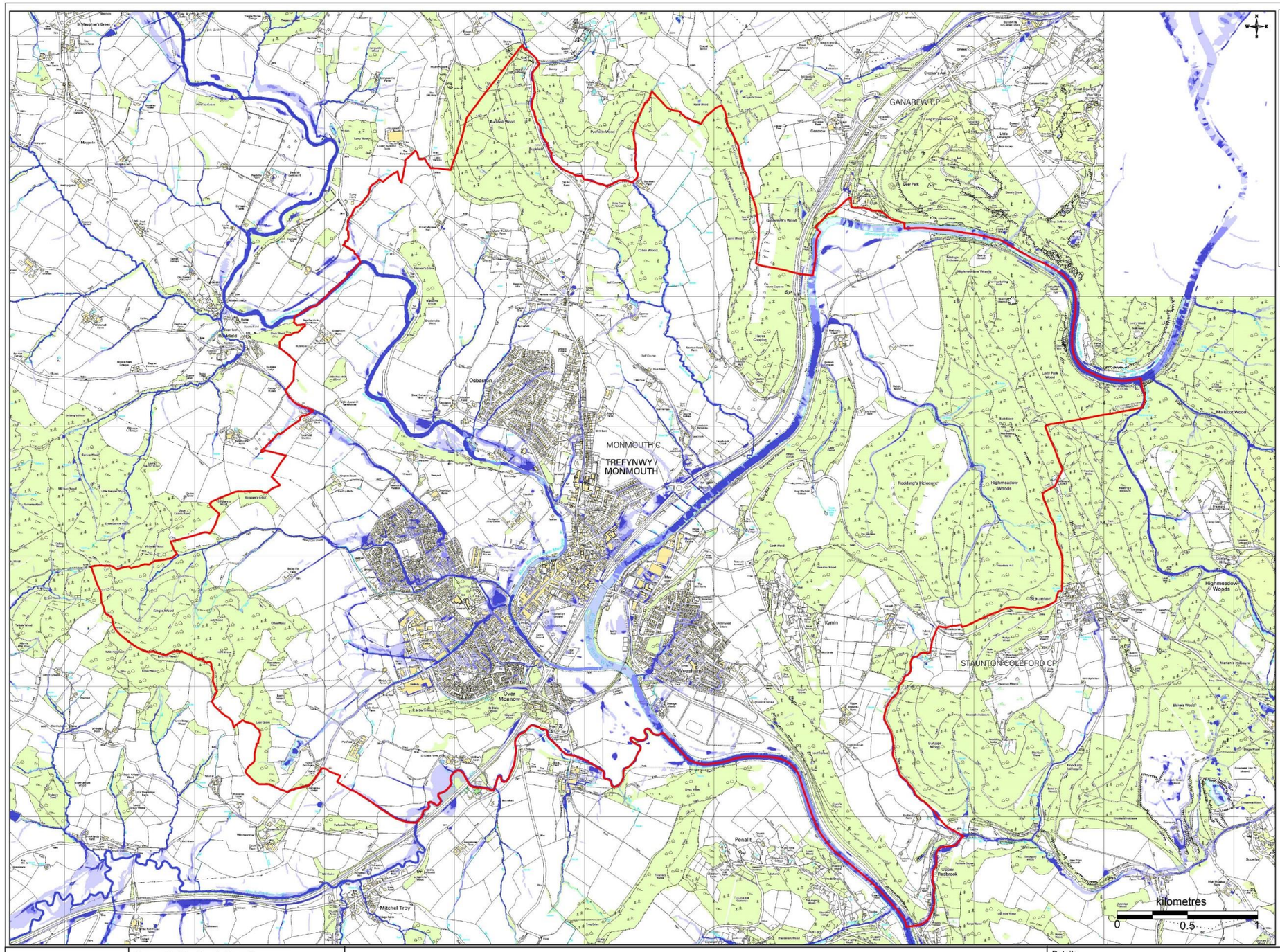
The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Monmouth Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	45	71	548
	Residential Properties at risk of flooding		
Residential Properties (n)	6	12	80
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	1465 (3443)

Debris Accumulations at Wye Bridge in 2013 /14

Measures to Mitigate Flood Risk in Monmouth Town Area					
Measures Already Implemented					
Ref	**Details**				
MO.01	Flooding of Drybridge Street, Cinderhill Street and Wonastow from Wonastow Brook in 2000 and 2002. Resolved by construction of new pumping station at Drybridge.				
MO.02	Flooding of properties at Wyesham, Wyesham Flood Alleviation Scheme completed in 2013 to resolve the issues.				
MO.03	May Hill Industrial Est. - Drainage Investigation				
MO.04	Rockfield Wildlife Corridor -Channel maintenance works & trash screen amendments				
MO.05	Pre-Feasibility Study of flooding issues at Buckholt in 2008 and submission for funding bids to Welsh Government. Roads and culvert subsequently reinstated.				
MO.06	Pre-Feasibility Study of flooding issues at Forge Road / Osbaston Road and submission for funding bids to Welsh Government				
MO.07	Rockfield - Drainage investigation & survey completed and some additional works implemented				
MO.08	Flooding of A466 in 2000 / 2002 at Redbrook Road and adjacent properties from River Wye, part of Main River and Monmouth Undefended area at present and NRW responsibility. Road closures set established when flood risk arise.				
MO.09	Flooding of Mayhill area including Hadnock Road from River Wye in 2000/ 2002 and subsequently as this lies within the Rover Wye Undefended Area. There is an Emergency Plan in place to support and assist the occupants of the residential Caravan Park.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
MO.101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5

MO.102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
MO103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
MO104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
MO105	Rockfield Wildlife Corridor - New Trash screens & channel maintenance work	Ongoing	£15k	M23	3.3
MO106	Investigate further the surface water flooding in Wonastow Road, including White Hill and Red Hill and identify actions that can be taken to reduce flood risk.	0 - 6	£5k	M53	5.1
MO107	Investigate the surface water flooding events that occurred in the Osbaston area over Christmas / new year period of 2015/2016, including Berryfield Estate and Duchess, Prospect and Beaufort Road	0 - 6	£5k	M53	5.1



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Monmouth

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.26 Portskewett Community Council Area

Portskewett community lies at the southern part of Monmouthshire bounded by the Severn Estuary on the south with Caldicot to its west. The A48 forms part of the northern boundary and the community is served by the B4245 route from Magor & Caldicot to its junction with the A48 at the northern boundary. The community includes the settlements of Portskewett, Sudbrook, Leech pool and Mount Ballan. The main South Wales to Gloucester Railway passes through close to the coastal boundary and the Severn Tunnel runs beneath the community at Sudbrook, this settlement being created when the tunnel was constructed in the 1880's. The pumping Station for the tunnel is located at Sudbrook using one of the shafts built to construct the tunnel. There is an un-named watercourse at the east side near Elm Tree farm and a number of reens that all then discharge into the River Severn at Passage Wharf Pill near Blackrock. The population at the time of the 2011 census was 2,133 with 884 properties.

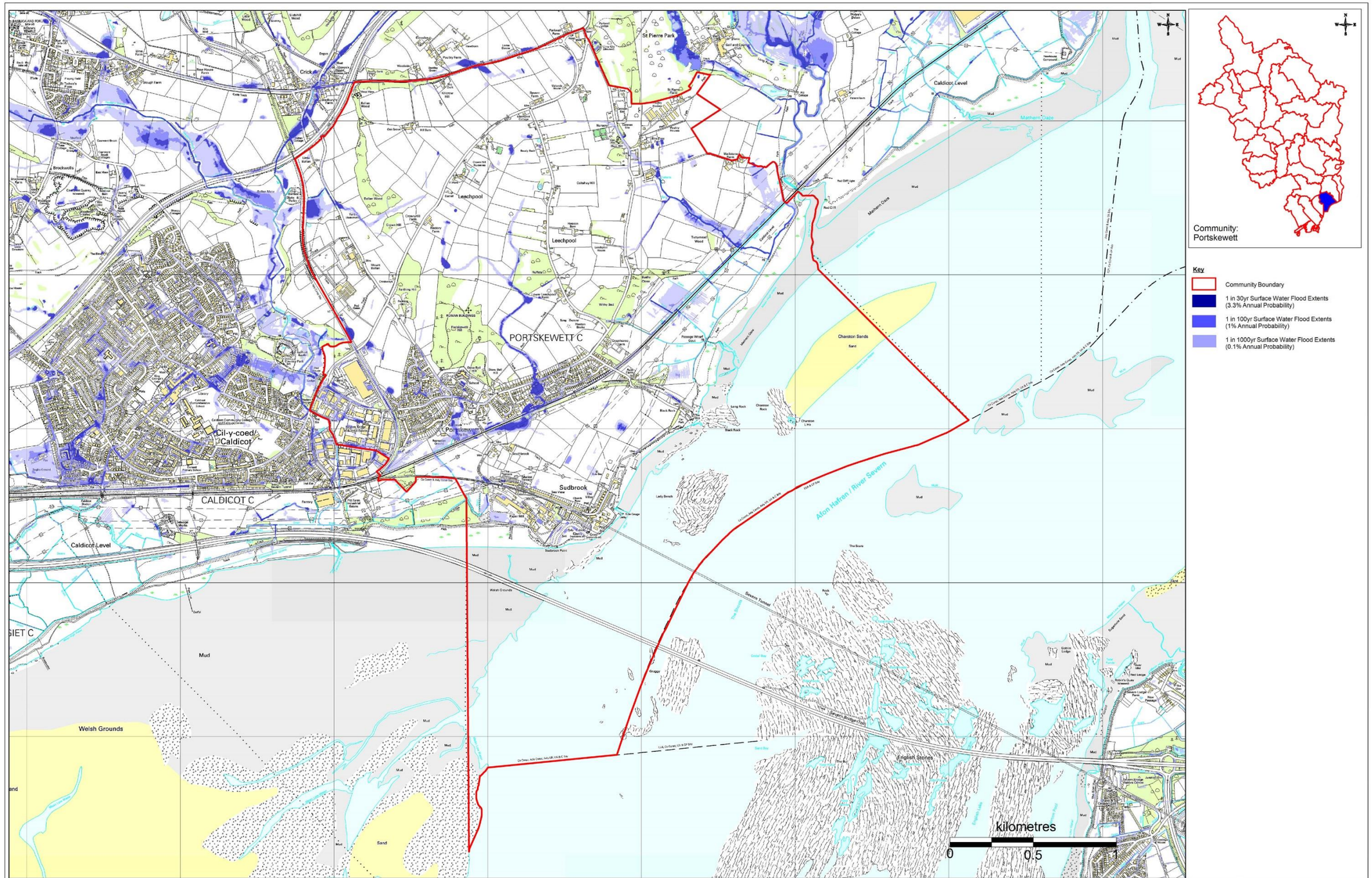
In terms of flood risk the area west of the old paper mill is at risk from the sea and extends inland to the recreation field between Manor Way and Sudbrook Road, including the railway line. This also affects the Lodge Way, Castle Way and Caldicot Road parts of the Severn Bridge Industrial Estate. Also affected is the area east of Blackrock inland for around 0.5km including the main railway line. Surface water flooding is limited to a number of small localised areas but includes a larger area from the Neddern Brook catchment near Little Ballan.

Flood bund north of Main Road

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Portskewett Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	24	19	78
	Residential Properties at risk of flooding		
Residential Properties (n)	5	3	26
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	27 (63)

Measures to Mitigate Flood Risk in Portskewett Community Area					
Measures Already Implemented					
Ref	**Details**				
PO01	Investigation of flooding issues at Main Road/Manor Way junction				
PO02	Investigation and resolution of flooding issues on Crick Road / Tree Tops. A filter drainage system & bund was installed along edge of the playing fields at the rear of properties along Main Road				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
PO101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
PO102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
PO103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
PO104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



Community: Portskewett

Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Portskewett

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.27 Raglan Community Council Area

Raglan Community lies central to Monmouthshire and Raglan village is bounded by the A40 Trunk Road east west and the A449 Trunk road north south with their intersection on the north east side. Parts of the A449 run along the old railway line from Newport to Monmouth.

The Community includes the settlements of Raglan village, Kingcoed, Llangovan, Pen y Clawdd, Twyn Y Sheriff and Llandenny. There are a number of watercourses with Barton Brook through Raglan village and Nant Y Wilcae along its southern side, both joining the Olway Brook further south. The Wecha Brook, Pantyrhydan Brook, Llangwm Isaf Brook and Llangofen Brook are further but all join the Olway Brook. The population at the time of the 2011 census was 1,928 with 853 properties.

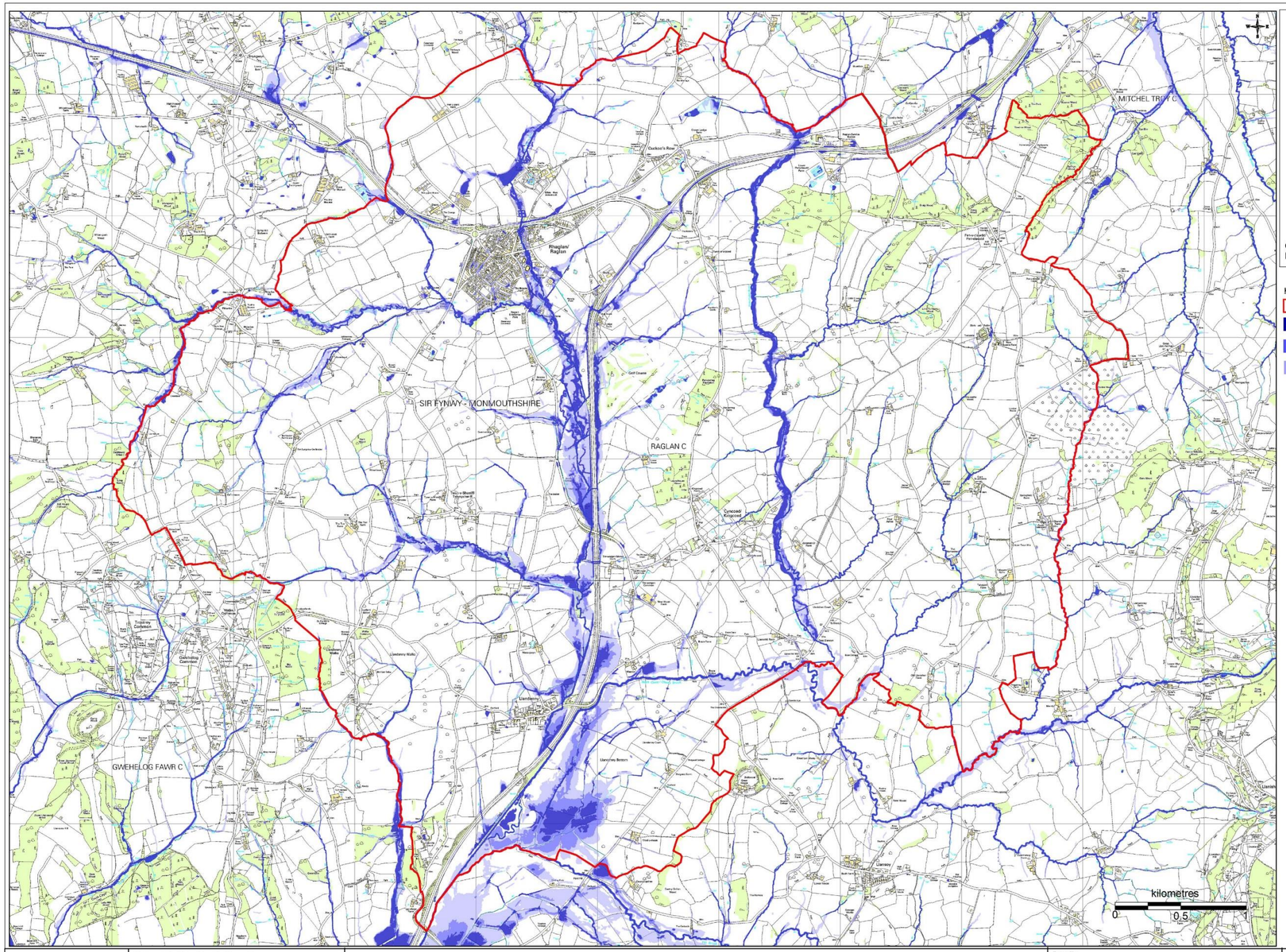
In terms of flood risk areas those adjacent to the above brooks area at risk, and parts of Barton Brook Close have been affected and the rear of properties in Castle Street. The A449 at the intersection with the A40 and the A40 west of Raglan are at risk, as is Chepstow Road south of Raglan and the R62 Usk Road at Wilcae Bridge. Barton Bridge Close, Etherley Drive and parts of Wilcae Terrace and Sunny Vale are at risk. Glan Y Nant is also at risk and the east side of Llandenny are at risk.

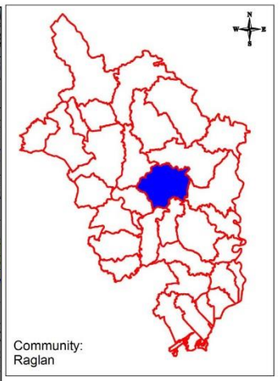
Flooding of rural road between Raglan & Llandenny

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Raglan Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	14	5	80
	Residential Properties at risk of flooding		
Residential Properties (n)	3	1	15
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	41 (96)

Measures to Mitigate Flood Risk in Raglan Community Area					
Measures Already Implemented					
Ref	**Details**				
RA01	Investigation and Study Reports regarding flooding at Barton Bridge Close.				
RA02	Caestory Avenue, Raglan, investigation of blocked chamber, passed to DCWW				
RA03	Flooding of route C41.2 at Morstan Cottage, Llandenny Walks, local drainage works done to improve situation.				
RA04	Flooding of route R62, Raglan to Usk road at the crossing of the Wilcae Brook and one adjacent property in 2000 / 2001.				
RA05	Flooding at Little Castle Farm and C28.3 / R64 junction. New drainage link installed to local watercourse in 2013/14				
RA06	Flooding of R71 Chepstow Road and properties near Brooks Farm from the Wilcae Brook & Barton Brook.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
RA101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
RA102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
RA103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
RA104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
RA105	Raise possibility of property level protection with owners re properties affected by Wilcae Brook	0 - 6	£5k	M35	5.5





Key

- Community Boundary
- 1 in 30yr Surface Water Flood Extents (3.3% Annual Probability)
- 1 in 100yr Surface Water Flood Extents (1% Annual Probability)
- 1 in 1000yr Surface Water Flood Extents (0.1% Annual Probability)

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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Raglan

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.28 Rogiet Community Council Area

Rogiet community lies next to the Severn Estuary with Undy to its west and Caldicot on its east side. The M48 Motorway passes north of the main settlements and the M4 to the south. The S Wales to London main line also passes south of the settlements. The main highway access for the community is the B4245 running east west and parallel to the M48. The main settlement is Rogiet with a smaller settlement to the west of Llanvihangel Rogiet. The railway station of Severn Tunnel Junction is located here, an important commuter connection. There are several watercourses in the community, all as reens, including Virlong Reen, Towyn Pill Reen, Ifton Bank Reen, Ifton Reen, and West Pill Reen. Most of these reens merge and then discharge in the estuary at one of two locations, Collister Pill and West Pill. The area south of the railway is part of the Caldicot & Wentlooge IDD now managed through Natural Resources Wales. The population at the time of the 2011 census was 1,813 with 698 properties.

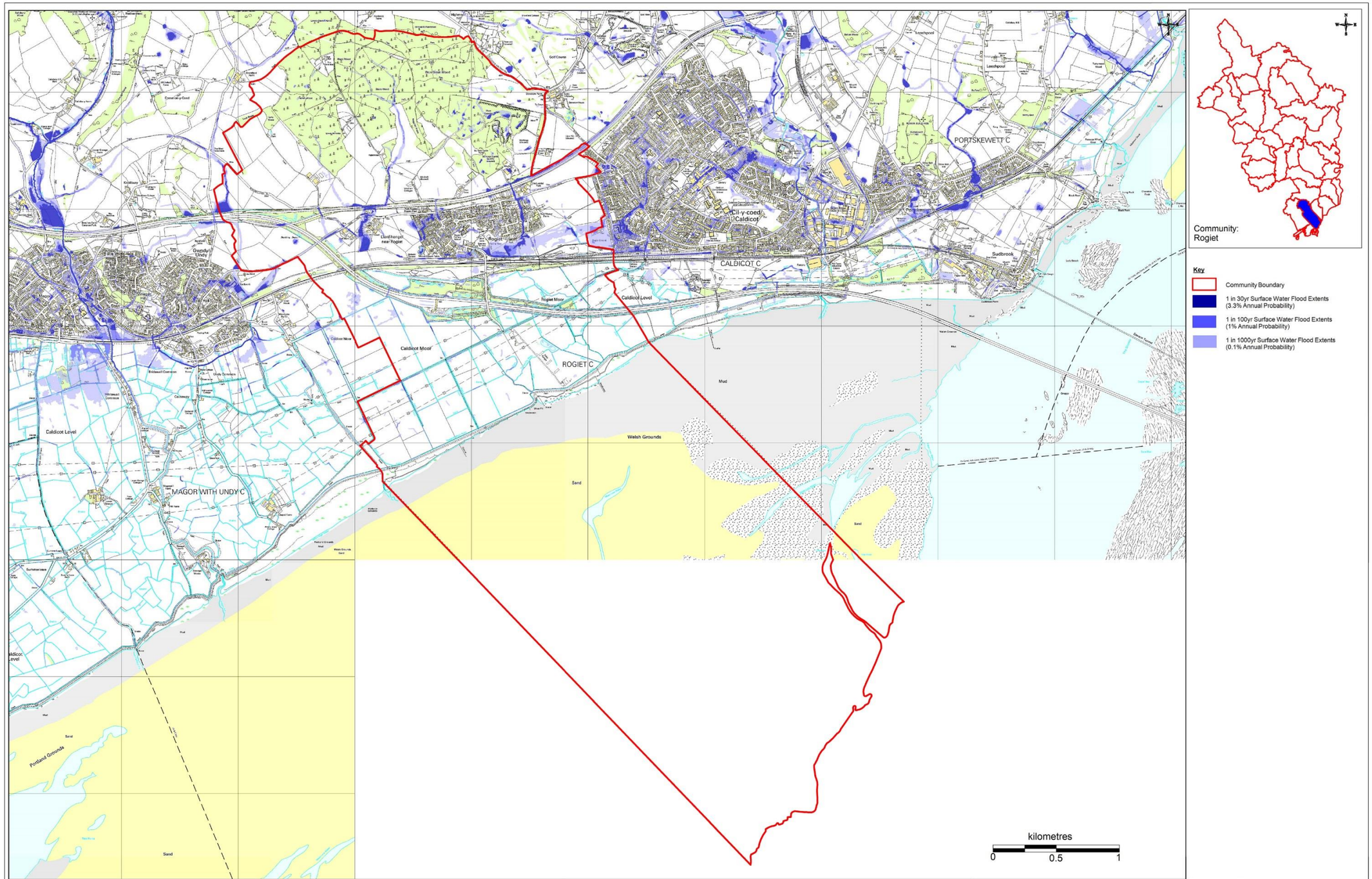
In terms of flood risk all of the area south of the railway is at risk from sea / estuary flooding. The coastal flood defences here vary between 1:100 and 1:200 year protection standard. A small area north of the railway at the east side is also at risk. Surface Water flooding is a risk at the railway station and playing fields behind and also on the west side of the Ifton Manor estate.

Culvert under station access road

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Rogiet Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	2	7	108
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	23
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	123 (289)

Measures to Mitigate Flood Risk in Rogiet Community Area					
Measures Already Implemented					
Ref	**Details**				
RO01	Resolution of issues with private pumping station adjacent to allotments/ railway station				
RO02	Buzzard Close, Rogiet, highway and garden flooding investigated and system cleared.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
RO101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
RO102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
RO103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
RO104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Rogiet

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.29 Shirenewton Community Council Area

Shirenewton community lies to the south of the County and is mainly rural around the main settlements of Shirenewton and Mynyddbach. Other settlements are Gaerlwyd & Earlswood. The Castrogi Brook forms much of the south western boundary and the Mounton Brook much of the North eastern. The area includes Wentwood and much of its forested area to the west with its higher land and viewpoints where the Severn estuary and North Somerset can be viewed. The B4235 Usk to Chepstow road passes through the community North West to south east, roughly parallel to the Mounton Brook. Two other named watercourses are the Waun Fawr Brook and the Gill Brook. Shirenewton Community is part of Shirenewton Ward which includes Mathern Community. The joint population was 1,618 in the 2011 census with 659 properties.

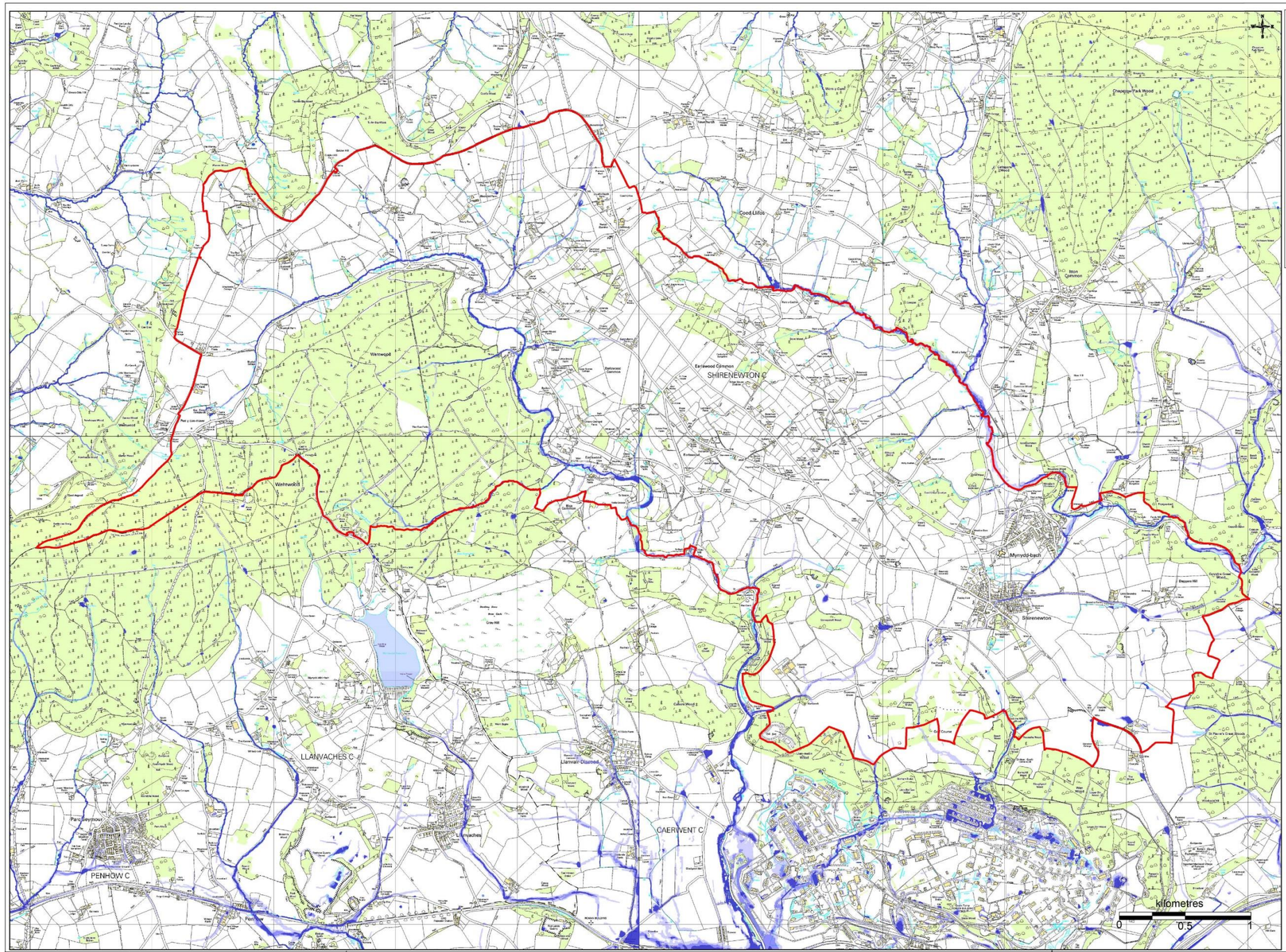
In terms of flood risk areas adjacent to the main brooks, the Mounton and Castrogi are at risk, as well as some of tributaries. The B4293 is at risk at Mynyddbach and parts of the Mounton Valley, also the C62.10 Red House Lane, C65.1, C57.7 Home Farm Road and C57.6 Itton Court Road.

Masonry arch bridge over the Mounton Brook

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Shirenewton Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	0	2	12
	Residential Properties at risk of flooding		
Residential Properties (n)	0	0	3
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	7 (16)

Measures to Mitigate Flood Risk in Shirenewton Community Area					
Measures Already Implemented					
Ref	**Details**				
SH01	Investigation of flooding of B4235 at Pen Y Lan, Earlswood in 2000/01 resolved through improved highway drainage works.				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
SH101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
SH102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
SH103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
SH104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Shirenewton

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.30 St Arvans Community Council Area

St Arvans community is on the eastern side of the County, where the R Wye provides the eastern boundary, with the town of Chepstow to its south and Tintern to the north. The A466 passes north to south through the community and is the major link to Monmouth from Chepstow following the Wye Valley. The B4235 Chepstow to Usk road forms part of the southern boundary and adjacent to the Mounton Brook. The B4293 Chepstow to Monmouth route also passes through the community. Chepstow Racecourse is located inside the community area at the Chepstow border. There are a few un-named watercourses but most drop down into swallow holes. In times of heavy rain however these will be overcome by flows and be routes that cause surface water flooding. St Arvans is part of St Arvans Ward along with Tintern Community and their joint population at the time of the 2011 census was 1,618 with 659 properties.

Areas at risk include some roads including, the A466 near the racecourse and again further north near Oakgrove Lodge and at St Arvans village. The B4235 is at risk in the Cockshoot Wood & Long Orchard areas, the B4293 is also at risk at Cockshoot Wood and at Howick. All three areas are at risk at Lion Roundabout at the racecourse entrance.

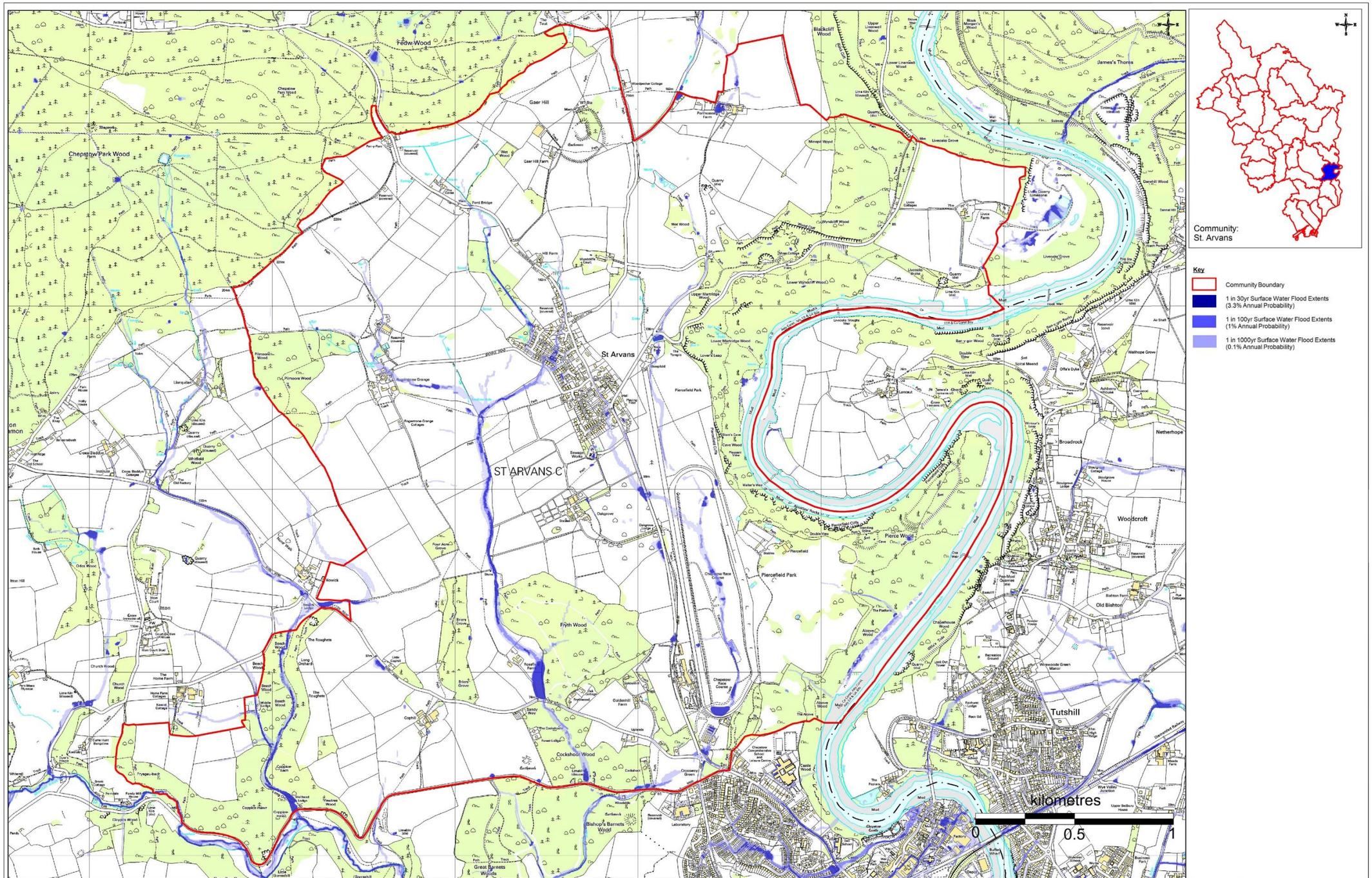
Other areas include Rogerstone Grange, the Grange Park estate, Porthcasseg Farm, St Arvans east side at Fordwich Close and the along the Devauden Rd from the A466 to Court Gardens, the A466, The B4293, R83, C53.21 and B4235. The sewage works is also in a flood risk area.

Masonry arch conveying unnamed watercourse beneath Devauden Road

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For St Arvans Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	7	5	33
	Residential Properties at risk of flooding		
Residential Properties (n)	2	1	1
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	2 (5)

Measures to Mitigate Flood Risk in St Arvans Area					
Measures Already Implemented					
Ref	**Details**				
STA.01	Surface water flooding of Grange Road, St Arvans in 2008. Local drainage works undertaken to remedy.				
STA.02	Flooding of Route R83 through Fedw Wood 2000/2002. Local drainage works carried out to remedy				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
STA101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
STA102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
STA103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
STA104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



Monmouthshire County Council PO BOX 106 Caldicot NP26 9AN www.monmouthshire.gov.uk	Flood Risk Management Plan Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water) Community: St. Arvans © Hawlfraint y Goron a hawliau cronfa ddata 2014 Arolwg Ordnans 100023415 © Crown copyright and database rights 2014 Ordnance Survey 100023415	Details: Surface Water Flood Hazard Map Drawn By: RAP Scale: See Scale Bar Date: Dec 2014 File / Pathname / Project / Drawing No.: Flood Risk Management Plan	Rev No.	N

7.4.31 Tintern Community Council Area

Tintern community lies in the Wye Valley on the eastern side of the County. It is probably best known for the 12th century Cistercian Abbey and its links to the poet William Wordsworth. The Angiddy Valley was also an early site of iron making and wire manufacture which used water power from the river for its manufacture. The River Wye forms the eastern boundary with England and the A466 Chepstow to Monmouth road follows the river valley and passes through the community. There are several main watercourses, the Anghidi with its tributaries of Anghidi Fawr, Fedw Brook, Gofer Pantygollen, Nant Y Gaer & Anghidi Fechan. The Cat Brook also runs through the community from the Trellech area and the Limekiln Brook runs in from the St Arvans area to the south. All three discharge into the R Wye.

A significant flooding event occurred in 1993 with widespread damage following a severe rainstorm over the catchments of the Cat Brook, Limekiln Brook and Angiddy River. A flood alleviation scheme was carried out in 1996-7 to provide a 1 to 100 standard of defence form the River Wye up to the bridge crossing at Chapel Hill. It was not possible to include the areas of the Cat Brook or Angiddy above the Chapel Hill area as the benefit to cost ratio of works were too low to qualify for grant funding. The A466 and adjacent properties also flood regularly from high tides and the road is closed to traffic on such occasions. Tintern is part of the St Arvans Ward along with St Arvans Community and their joint population at the time of the 2011 census was 1,618 with 659 properties.

Flooding of Road in Angiddy Valley 1993

Areas at risk from the R Wye and both tidal surges and fluvial floods are the areas east of the A466 which include the Abbey, public house and domestic properties and along the A466 from the Anghidi crossing to the Cat Brook road. In the Angiddy Valley, properties from Chapel Hill upstream area at risk. Those properties along the Trellech Road from the A466 upstream to the Catbrook Road and downstream are also at risk.

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Tintern Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	16	5	26
	Residential Properties at risk of flooding		
Residential Properties (n)	0	3	11
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	113 (266)

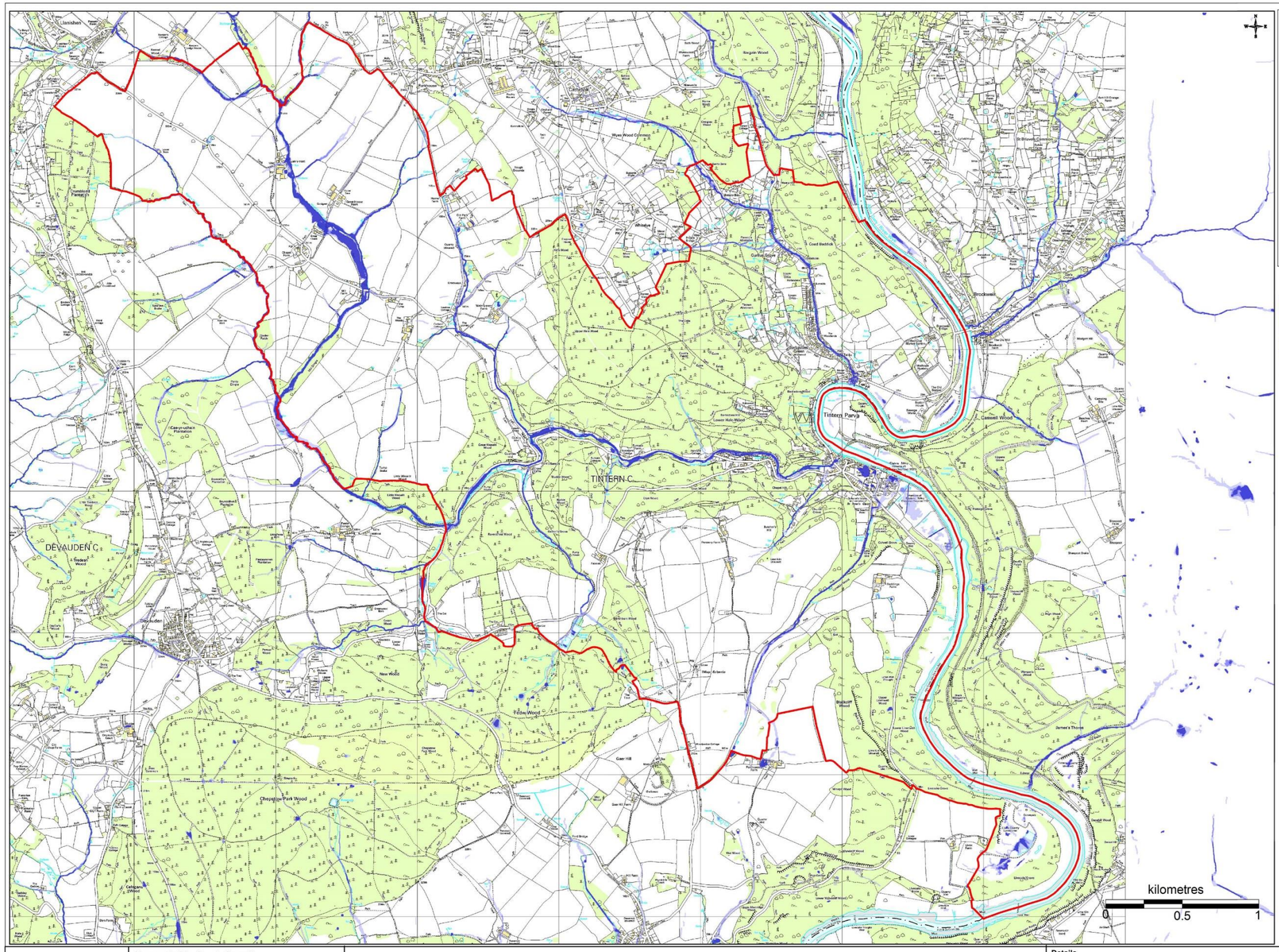
Tidal Flooding at Tintern

Measures to Mitigate Flood Risk in Tintern Community Area	
Measures Already Implemented	
Ref	**Details**
TI.01	Following severe floods in 1993 Tintern Flood Alleviation Scheme involving works on Angiddy adjacent to and under the A466 carried out and completed in 1996/7
TI.02	Tintern Flood Alleviation Scheme involving works on the Lime Kiln Brook and subsequent additions to deal with high volumes of debris. CCTV Camera now installed to view screens electronically
TI.03	Pre -feasibility study Angiddy culverts (private) near 'Rushbrook' and included in list of potential schemes to Welsh Government
TI.04	Fountain Inn, Trellech Grange, flooding investigation of culvert & water course alignment. Now resolved following local works.
TI.05	Manor Cottage, Main Road, Tintern, cellar flooding identified to be from high tides
TI.06	Investigation of culverts including under Gothic Cottage, Trellech Road, where flooding arose from private culvert beneath property

TI.07	Trellech Road – new trash screen, clearance and re-establishment of 2 others, additional grips, vegetation clearance and boulder removal from watercourse.
TI.08	CCTV camera installed to show screen on culvert at Trellech Road to allow remote checking of any blockages.
T1.09	Pont Y Saeson Dam outlet blocked by silage bales washed in by surface water causing flooding. Cleared by MCC. Ownership not identified and dam is listed. See TI.105 below.
TI.10	Flooding of properties along A466 frontage with River Wye a main river and NRW responsibility. Emergency Plan in place for road closures and sandbagging when high tides or tidal surges forecast.

Measures Proposed to Mitigate Flood Risk

Ref	Detail	Timescale (Years)	Estimated Costs	EU Reporting Code	Measure Ref
TI.101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
TI.102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
TI.103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
TI.104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
TI.105	Need to check Pont Y Saeson Dam, Tintern in times of forecast flood for potential blockages. Dam ownership not yet identified, fishing pond managed by local Angling Club.	Ongoing	£1k/a plus any actions	M24	4.2
TI.106	Investigate option of promoting local property protection scheme for Tintern Riverside areas jointly with NRW and property owners	0 - 6	£5k	M24	5.7
TI.107	Properties upstream from Chapel Hill remain at risk of flooding from the Angiddy River. Investigate options of developing a scheme in this area.	0 - 6	£15k	M24	5.7



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Tintern

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.32 Trellech United Community Council Area

The community area is on the east side of the County and its eastern boundary is formed by the R Wye, whilst the Llangovan brook forms part of the western boundary. The area is mainly elevated around 200-250 metres above sea level but drops sharply on the east side into the Wye Valley. The main settlements are Trellech, Llandogo, Penallt, The Narth, Llanishen, Cleddon & Tregagle. The A466 is a main access route following the valley from Chepstow to Monmouth. The B4293 provides the main route along the ridge, again from Chepstow to Monmouth. There are a number of watercourses: the Black Brook, the White Brook, Manor Brook, Trippa Brook, Cadora Brook, Cleddon Shoots all draining to the R Wye, The Llangovan Brook and Penarth Brook running west and joining the Olway Brook at the south west corner. The Cwmcarvan Brook runs north to Mitchell Troy and the Cat Brook runs south to Tintern. The Anghidi Fawr also rises in the south of the community flowing south through Tintern along with the tributary Nant Y Gaer. The population in the 2011 census was 2,759 with 1,064 properties.

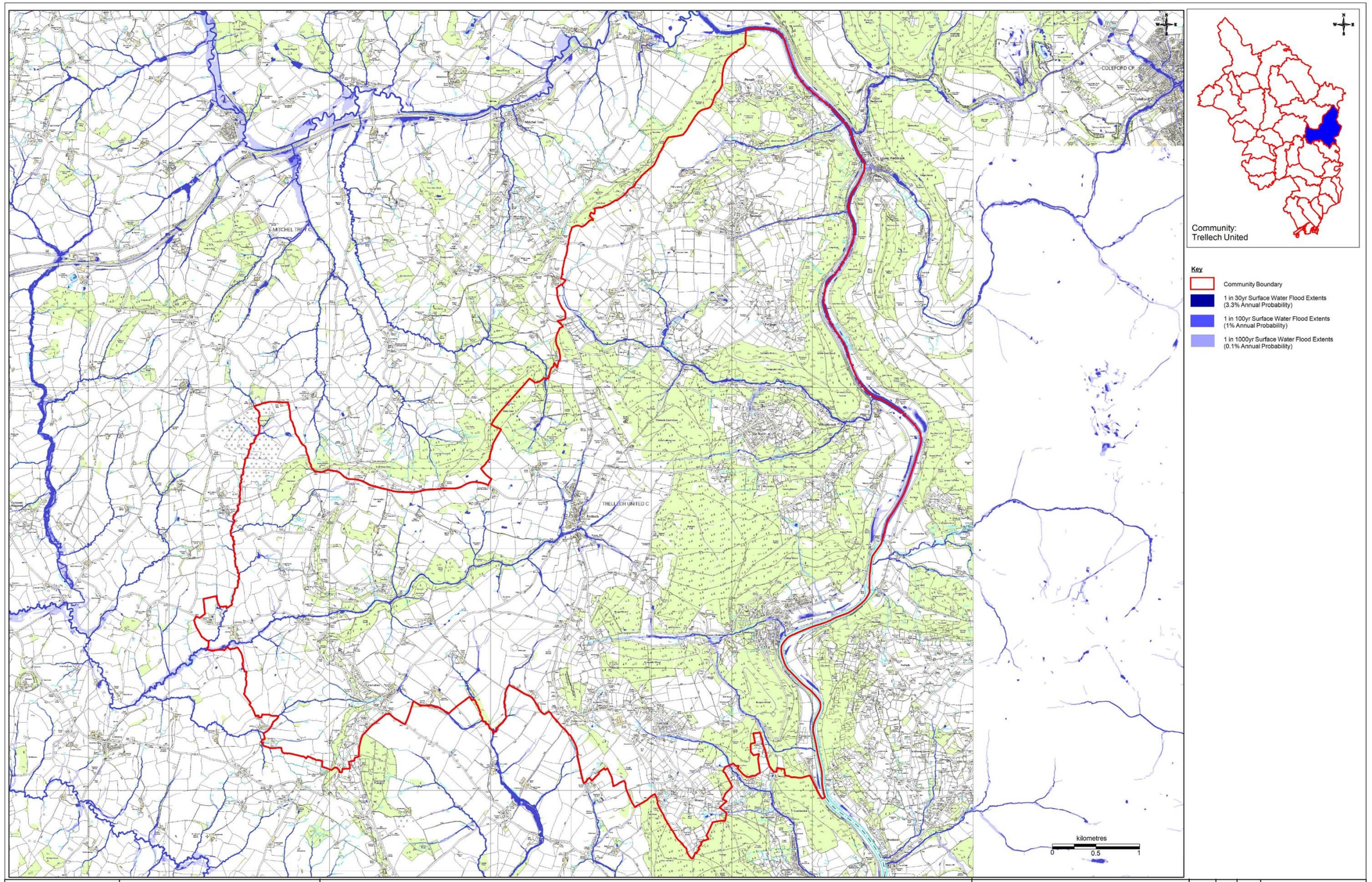
In terms of flood risk areas adjacent to the main watercourses particularly the Black Brook, White Brook and Cleddon Shoots are at risk. Penallt Road / Lone Lane (C48-1) will flood for most of its length, the Cleddon area and also surface water from the Cleddon flows south to the A466 at Catchmays Court.

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Trellech United Community Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	5	9	40
	Residential Properties at risk of flooding		
Residential Properties (n)	0	3	11
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	24 (56)

Trash screen at Llandogo

Measures to Mitigate Flood Risk in Trellech United Community Area					
Measures Already Implemented					
Ref	**Details**				
TR.01	Trellech Road - New trash screen installed & watercourse maintenance completed				
TR.02	Pre-Feasibility study of Black Brook culverts (private) near Brook House and included in list of potential schemes to Welsh Government.				
TR.03	Flooding of property at Trellech in 2000 from surface water culvert adjacent to B4293 and Catbrook Road junction. Culvert replaced and upgraded.				
TR.04	Flooding at Newmills Road Culvert on White Brook washing out Route C49.4 road over large area in 2000/01. Road reinstated and culvert replaced as part of County wide works after floods.				
TR.05	Section of A466 south of Llandogo washed out in floods and landslip Nov 2000. Road closed and subsequently reinstated.				
TR.06	Culvert carrying the Cleddon Shoots brook under the A466 and The Sloop Inn caused flooding in 2000. New culvert constructed and by-passed the Inn.				
TR.07	Culvert on private property at Blackbrook, Penallt blocked and flooded the property in February 2002. Advice and support given to owner to deal with issue on his own land.				
TR.08	R90 Whitebrook Road and C48.1 Lone Lane washed away and land slip in 2000/01 floods. Reconstruction and reinstatement of road and culvert				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
TR101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
TR102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
TR103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
TR104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1



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Flood Risk Management Plan
Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Trellech United

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

7.4.33 Usk Town Council Area

Usk Town community is central to the County and sits on the R Usk. The river provides the western boundary. The A472 running east west passes through the centre of the town and joins the A40 Trunk road on its east side. The B 4598 from Abergavenny joins the A472 in the town centre and the B4235 leaves on the east side to Chepstow. As well as the R Usk the Olway Brook runs to the east side of the town, joining the R Usk further south. The Cayo Brook provides part of the Northern boundary. The population in the 2011 census was 2,834 with 1,155 properties.

In terms of flood risk in Usk, the eastern side of Ladyhill and parts of Burrium Gate and the southern end of Mill Street are at risk from surface water flooding as are a few other localised areas. These include west of Porthycarne Street, parts of Bridge Street, Baron Street, Manor Court, southern Mill Street, Chepstow Road & east part of Black Barn Lane.

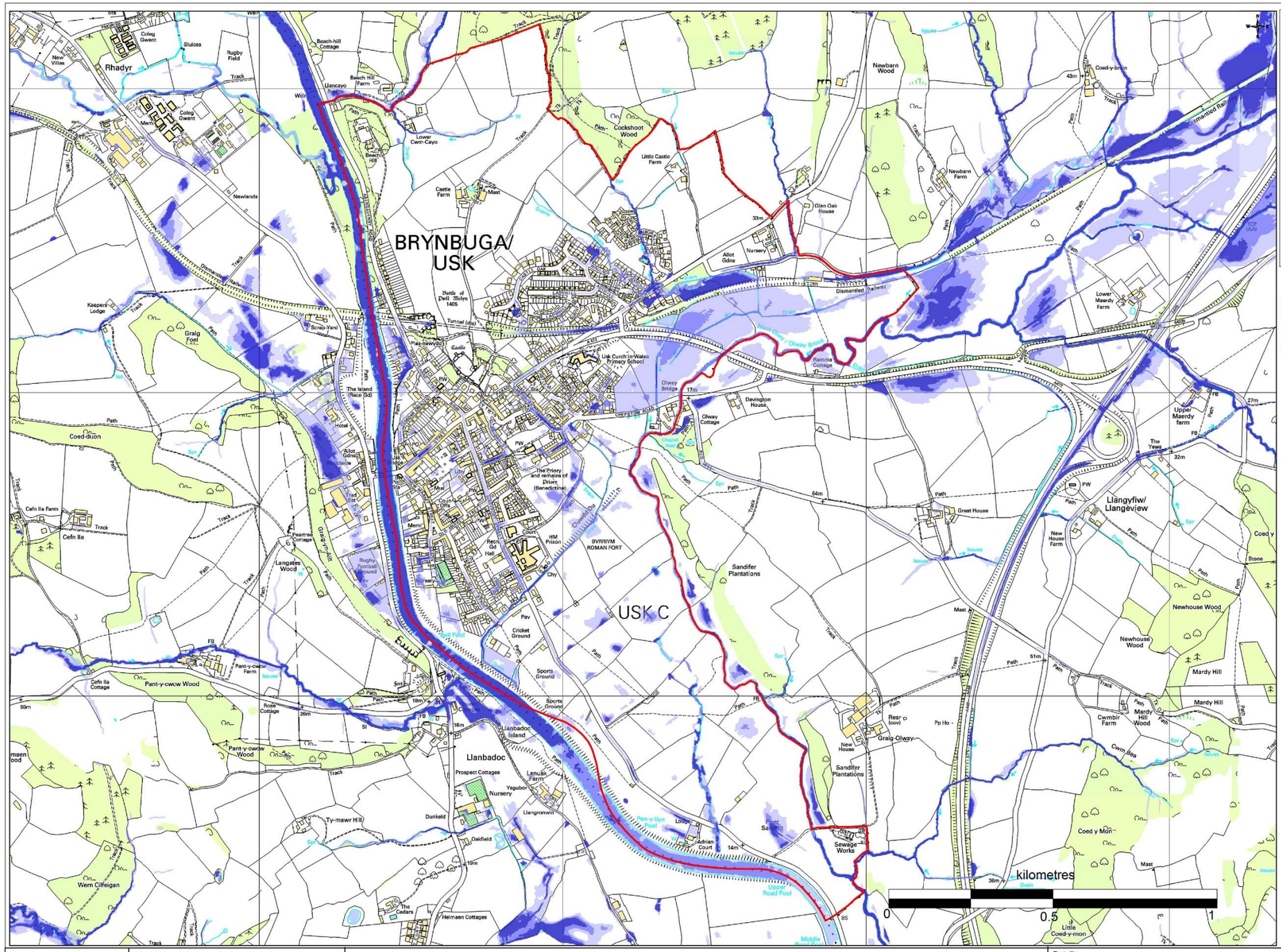
In terms of risk from the rivers, the town was severely flooded in 1979 from the R Usk and new flood defences were constructed in the 1980s to a standard of 1:100 by the Natural Resources Wales predecessors. The area remains at risk from more severe river floods and localised flooding occurs from the Olway Brook, notably at the Olway Bridge area on Chepstow Road and near Llanhowell Bridge. Much of the town is at risk from floods exceeding the 1 in 100 year particularly the west of Porthycarne Street and Maryport Street and south of Priory Street & Chepstow Road from the R Usk. The eastern side of the town is at risk from the main river of the Olway Brook and its flood plain, including the highways. The area south of the main town including the sports field and athletics field are also at risk. There is a local road route termed the *'Usk Flood Route'* and signed as such to avoid the road flooding at Llanhowell Bridge. It runs from Llanhowell on the C214.1Maerdy – Pentwyn road and C214.3 Red Hill to the Olway Inn near Usk.

The table below shows the counts taken from the Environment Agency's Flood Risk Maps.

Counts For Usk Town Area			
Surface Water			
	High (1:30)	**Medium** (1:100)	**Low** (1:1000)
Risk to People and Property	Residents in areas at risk of flooding		
People (n) (multiplier 2.35)	2	12	155
	Residential Properties at risk of flooding		
Residential Properties (n)	0	1	23
Rivers & Sea			
Residential Properties (Residents) (n)	-	-	706 (1659)

Usk Town Bridge & upstream flood defence wall along far bank

Measures to Mitigate Flood Risk in Usk Town Area					
Measures Already Implemented					
Ref	**Details**				
US01	Investigations of flooding issues near the Olway Inn in 2000/2002 on Old Chepstow Road from Olway Brook				
Measures Proposed to Mitigate Flood Risk					
Ref	**Detail**	**Timescale (Years)**	**Estimated Costs**	**EU Reporting Code**	**Measure Ref**
US101	Support & encourage development of a Community Flood Plan	0 - 6	£1k	M43	2.1, 2.2 & 2.5
US102	Raising awareness with landowners	0 - 6	£1k	M43	2.1
US103	Collection of asset data to improve knowledge of assets and possible risks	Ongoing	£2k /a	M35	4.1
US104	Work with risk management partners such NRW (including IDDs)	Ongoing	£1k	M44	6.1
US105	Further Investigations of flooding issues at the Olway Inn, on Old Chepstow Road	0 - 6	£5k	M53	5.1
US106	Investigation at bottom of Mill Street	0 - 6	£5k	M53	5.1



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Flood Hazard Map - Surface Water Extents (Based on Environment Agency updated Flood Maps for Surface Water)
Community: Usk

Details			Rev No.
Surface Water Flood Hazard Map			
Drawn By: RAP	Scale: See Scale Bar	Date: Dec 2014	
File / Pathname / Project / Drawing No.: Flood Risk Management Plan			

8. Public Consultation

The Table below sets out the Draft Programme for consultation and finalising the report before publishing. The dates are indicative and are dependent on responses from external bodies.

Preparation of Draft FRMP	Apr to Sep 2015
Strong Communities Select Committee	Sept 2015
Revise draft from Select	Sep 2015 2015
Internal Consultation	Sept / Oct 2015
Final Draft to Strong Communities Select Committee	Dec 2015
Public Consultation Stage + WG/EA/CCW/ etc.	Jan / Feb 2016 6 weeks min
Revise Draft with comments from public consultation	Feb/Mar 2016
Submit to Cabinet for approval	March / Apr 2016
Submit to NRW /WG for approval	Apr 2016
Revise following NRW /WG approval – if necessary	May 2016
Publish	Jun 2016

9. Monitoring and review

Proposed plan for monitoring progress

Actions will be reviewed annually, full review in 2021. Ad hoc addition of actions if emergency works needed.

The National Strategy will be formally reviewed on a six-yearly cycle, mirroring the requirements of the Flood Risk Regulations 2009. This will enable the Welsh Government to consider the information being produced from the mapping and planning exercises that the Environment Agency and LLFA will complete.

This information will also continue to inform the development of Local Strategies and Flood Risk Management Plans on-going and so it seems logical for the Local Strategies and FRMP to reflect this six yearly review cycle.

However, Local Strategies and the Plan will be subject to continuous improvement and not be necessarily completed as one off exercises. Regular reviews should be built in to allow an alternative approach to be adopted with all of the relevant data being taken into consideration.

MCC have therefore decided that a review of this Flood Risk Management Plan will generally take place every 6 years, although the first review is proposed after the National FCERM Strategy for Wales is carried out in 2017.

Appendices

1. Risk Management Authorities & Their Functions
2. EU Codes
3. Extract from the Severn RBMP relating to Monmouthshire
4 Census Data
5. Table of Objectives and Measures from the LFRMS
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Appendix 1

Risk Management Authorities & Their Functions

Risk Management Authorities & Their Functions

Managing flood risk is the responsibility of each LLFA. The Local Strategy must set out who the risk management authorities are and their relevant functions. In developing Local Strategies a LLFA must consult with the public and other risk management authorities who are affected by the strategy.

Section 6(15) of the Act make specific reference to the Welsh Risk Management Authorities and list them in Table 2.1 as follows:

Table 2.1

Risk Management Authorities	Relevant Body(s) for MCC Area
The Environment Agency	Environment Agency - South East Area
The Lead Local Flood Authority	Monmouthshire C C
The Highway Authority	Monmouthshire C C for local roads and Welsh Assembly for Trunk Roads and Motorways
An Internal Drainage Board that is wholly or mainly in Wales	Caldicot & Wentlooge IDB and, Lower Wye IDB
Water Companies	Dwr Cymru/ Welsh Water

2.1. Environment Agency

2.1.1 Background

Historically the Environment Agency has led on the management of the risks of flooding from rivers and the sea. However, as a consequence of the Flood and

Water Management Act 2010 certain changes have been made to the role and remit of the Environment Agency. In addition to flooding from main rivers and the sea, the Environment Agency has new operational responsibilities in relation to coastal erosion and a wider oversight role for all flood and coastal erosion risk management in Wales.

This change means that the Environment Agency has a dual role:

• Operational responsibilities for flooding from rivers, the sea and coastal erosion

• Oversight responsibilities in relation to all flood and coastal erosion risk management in Wales

The operational change has been undertaken in recognition of the links between coastal flooding and coastal erosion, particularly in terms of consequences. Importantly from October 2011 Lead Local Flood Authorities will require Environment Agency approval for coast protection works.

Furthermore, as the Welsh Government move to introduce a national policy in relation to coastal change, including erosion, accretion, squeeze and managed realignment, the allocation of operational responsibility to the Environment Agency is intended to enhance existing partnership arrangements such as those seen in the coastal groups and through the establishment of the Shoreline Management Plans.

The oversight change is integral to the delivery of national policy on flooding and coastal erosion risk management and has been taken forward to ensure that the Environment Agency has the remit to support the Welsh Government across the full range of flood and coastal erosion risks affecting Wales.

As part of their oversight role the Environment Agency will lead on the provision of technical advice and support to the other Risk Management Authorities. They will also lead on national initiatives such as Flood Awareness Wales, the national raising awareness programme, and the single point of contact for enquiries and information on flood risk, currently being piloted via their Floodline Warning Service with input from Local Authorities.

2.1.2 EA Role

The Flood and Water Management Act 2010 places a number of statutory duties on the Environment Agency including:

- Co-operation with other Risk Management Authorities, including sharing Data,
- Reporting to the Welsh Ministers on flood and coastal erosion risk in Wales
- the application of the National Strategy; and
- Establishment of Regional Flood and Coastal Committees.

The Environment Agency will be the sole Risk Management Authority charged with monitoring and reporting on the National Strategy's implementation. In under taking this role they will:

• Collect data on progress from risk management authorities using existing avenues wherever possible and,

• Report factual information to Welsh Government.

2.1.3 EA Powers

It will be for the Welsh Government to determine what if any action should be taken if the reports from the Environment Agency suggest the National Strategy is not being implemented or that actions being taken are increasing levels of risk.

In addition to their statutory duties, the Environment Agency has a number of what are called permissive powers. These are powers that allow them to do something, but do not compel them to and include:

- powers to request information;
- the ability to raise levies for local flood risk management works, via Flood Risk Management Wales and its Regional Flood and Coastal Committees;
- powers 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 conditions.

This new allocation of responsibilities is also consistent with the Environment Agency's role in relation to the Flood Risk Regulations 2009. These Regulations allocate specific responsibility for conducting assessments in relation to mapping and planning for the risks of flooding from main rivers, the sea and reservoirs. The Environment Agency is also required by the Regulations to provide guidance to Local Authorities on these matters for flooding from other sources. Under the Regulations the Environment Agency also take on a review and co-ordination role at a national level, ensuring the correct information is reported to the European Commission.

2.2. Natural Resources Wales

The Welsh Government has reviewed the role of the environmental public bodies operating in Wales; these are primarily the Environment Agency, The Countryside Council for Wales and the Forestry Commission. It has decided to merge these bodies in Wales through the establishment of a Natural Resources Body for Wales.

From the 1st April 2013 this body will take on the functions of these three organisations in Wales. This new body will take on all of the responsibilities of the

Environment Agency in relation to flood and coastal erosion risk management in Wales and will undertake all of the functions described within the National strategy.

2.3. Monmouthshire County Council (MCC)

2.3.1 MCC as Lead Local Flood Authority

Under the terms of the Flood and Water Management Act 2010, MCC as a

Lead Local Flood Authority will be responsible for what are termed local flood risks. These include the risks of flooding from ordinary watercourses, surface water and ground water.

As a Local Authority the Council has always had certain responsibilities in relation to ordinary watercourses, and in practice has taken the lead in dealing with most flooding incidents prior to the changes contained within the Flood and Water Management Act 2010. This is, however, the first time responsibility for the risks of flooding from surface water has been allocated to anybody in law. The Flood and Water Management Act 2010 places a number of statutory duties on us as a Local Authority in our new role as a Lead Local Flood Authority including:

- the preparation of Local Flood Risk Management Strategy;
- a duty to be consistent with the National Strategy;
- cooperation with other authorities, including sharing data;
- a duty to investigate flooding within our area, insofar as appropriate;
- a duty to maintain a register of structures and features likely to affect flood risk; and
- a duty to contribute to sustainable development.

In addition to these, MCC as a LLFA have a number of what are called permissive powers. These are powers that allow us to do something but do not compel us to do and include:

- powers to request information;
- powers 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 conditions.

In its role as a LLFA MCC will also take on the role of the SuDS Adopting and Approving Body in relation to sustainable drainage systems. In this role we will be responsible for both approving the original design of the SuDS and adopting and maintaining those adopted systems on completion.

The minimum statutory content of Local Flood Risk Management Strategy (LFRMS) is set out in Section 10 of the FWMA 2010 and MCC as a LLFA are required to consult with the public in preparing it. The LFRMS must set out the objectives and measures for managing local flood risks along with the timescales and costs of implementation. To enable us to fully implement this new role and responsibility in respect of local flood risk certain functions previously held by the Environment Agency have been transferred. This includes taking responsibility for consenting works on ordinary watercourses (from April 2012).

The allocation of responsibility for local flood risks is replicated in the Flood Risk Regulations 2009. These Regulations allocate specific responsibility to Lead Local Flood Authorities for conducting assessments in relation to flood risk from everything other than main rivers, the sea and reservoirs. Following those assessments, and only where flood risk areas are identified under the Regulations LLFA's are also required to map the risks and plan for their management. The Preliminary Flood Risk Assessment was carried out in 2011 and reported to and approved by Cabinet. There are no areas in Monmouthshire that met the threshold set for flood risk areas.

MCC are also a designated Coastal Erosion Risk Management Authority under the Coast Protection Act 1949, providing us with certain responsibilities in respect of coastal erosion and coastal protection. We were previously referred to as a Coast Protection authority we are also referred to as a Coastal Local Authority or Maritime Authority and we retain the permissive powers in relation to coastal erosion risk management. From October 2011 we will require Environment Agency approval for any coast protection works.

2.3.2 MCC as Highway Authority

MCC is the Highways Authority for all highways in Monmouthshire apart from those managed by the Welsh Government. However Highways Authorities are also Risk Management Authorities in their own right according to the FWMA 2010 and must adhere to all the responsibilities of risk management authorities. Highways Authorities also have further responsibilities:

Under the Highways Act 1980, the Highways Authority has a duty to maintain the highway. This includes ensuring that highway drainage systems are clear and that blockages on the highway are cleared, where reasonably practicable. As part of this duty, roads are regularly inspected and maintained and highways structures are inspected on a regular year cycle.

Fig 2.1 - Highway Flooding at Llanfoist after Heavy Rainfall

Highways Authorities currently have the power to adopt drainage systems and SUDs that serve the highway through Section 38 of the Highways Act but are under no obligation to do so. Under the Flood and Water Management Act, highways authorities will be required to adopt any SUDs approved by the SUDs Approval Body which exist within the highways boundary.

The highway authority can deliver works that they consider necessary to protect the highway from flooding. These can be on the highway or on land which has been acquired by the highway authority in the exercise of highway land acquisition powers for that purpose.

Highway Authorities may divert parts of a watercourse or carry out any other works on any form of watercourse if it is necessary for the construction, improvement or alteration of the highway or provides a new means of access to any premises from a highway.

2.3.3 MCC as Public Open Spaces body

County Councils in Wales are responsible for maintenance of some parks and public open spaces. Good maintenance practices can help to reduce flood risk, for instance by ensuring that rubbish and leaves are not tidied into watercourses or drains. For new public spaces which are under the control of a management company, the control of these activities should be included in the management contract.

County Councils may also be riparian owners of both ordinary and main watercourses and as such must carry out the duties imposed on riparian owners by the Land Drainage Act. They should also maintain all assets in their ownership. See also Section 2.8 re Riparian Owners.

2.3.4 MCC as Planning Authority

The Council's planning function affects Flood Risk Management in a number of key ways:

- Consider flooding concerns in developing local plans;
- Working with the SUDs Approval Body - once enacted - in ensuring that planning applications and drainage applications are complementary;
- Consider flood risk assessments submitted in support of applications;
- Developing proactive strategies to mitigate and adapt to climate change which take full account of flood risk;
- When flooding concerns are considered in developing local plans the Planning Authority needs to do the following:
- Ensure flood risk is taken into account at all stages in the planning process
- Avoid locating inappropriate development in areas at risk of flooding and direct development away from areas at highest risk by applying the Sequential Test.

The Local Development Plan (LDP) carefully considers flood risk. This is a statutory planning document which takes account of flood risk in the allocation of development land. Consequently the LDP should embed the Strategic Flood Consequences Assessment (SFCA), the Preliminary Flood Risk Assessment, this Strategy and any Surface Water Management Plans (where applicable). This should allow the LDP to assess and record the flood risks for new developments and steer development to areas of lowest flood risk. In the preparation of the current Monmouthshire LDP a Strategic Flood Consequences Assessment was carried out which considered not just fluvial and coastal flooding but also local flood risk issues.

The Council's LDP Strategic Policy S12 requires that inappropriate development is not sited in areas at risk of flooding. LDP Policy SD3 expands on this requirement and aims to prevent development in areas that would be at high risk from river or coastal flooding or where it would increase the risk of flooding or additional run-off from development elsewhere.

The degree of flood risk is set out in Welsh Government guidance through Technical Advice Note, TAN 15, and that provides guidance through zones and what development is or is not appropriate in each of those zones. Where new development is permitted in areas of flood risk, the Planning Authority should ensure that it is safe and does not increase flood risk elsewhere. In addition it should ensure, where possible, that all new development that has to be located in flood risk areas is appropriately flood resilient, flood resistant and includes for safe access and escape routes (should these be required for the nature of the development), and that any remaining risk can be safely managed.

Work with developers to locate new development and regeneration according to the flood vulnerability category of the intended use. Avoid creating additional risk by not developing in areas served by critical infrastructure which is in a flood vulnerable location.

2.3.5 MCC as Emergency Planning Authority

MCC are responsible under the Civil Contingencies Act 2004, in relation to a major incident as defined by the Act and along with other 'category 1' responders to:

- Assess local risks and use this to inform emergency planning;
- Put in place emergency plans;
- Put in place arrangements to make information available to the public about civil protection matters and maintenance arrangements to warn, inform and advise the public in the event of an emergency;
- Share information with other local responders to enhance co-ordination;
- Co-operate with other local responders to enhance co-ordination and efficiency; and,
- Provide advice and assistance to businesses and voluntary organisations about business continuity management. (Local Authorities only).

2.4. Caldicot & Wentlooge &, Lower Wye Internal Drainage Districts

The former Internal Drainage Boards in Wales have been transitioned into Internal Drainage Districts as part of Natural Resources Wales. The IDD's are still independent bodies responsible for land drainage in areas of special drainage need...

A few changes have been made to the core operational arrangements for Internal Drainage Districts as part of the transition. They will continue to act as the lead operational authority for ordinary watercourses and for drainage and water level management within their drainage areas.

The Flood and Water Management Act 2010 duties formerly with the IDB's will now be met by NRW and the IDD's which include:

- a duty to be consistent with the National Strategy and the relevant local flood risk management strategies;
- co-operation with other authorities, including sharing data; and
- a duty to contribute to sustainable development.

In addition the above IDD's through NRW have a number of permissive powers. These are powers that allow them to do something but do not compel them to and include:

- powers 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 conditions.

2.5. Dwr Cymru / Welsh Water

Water and sewerage companies are responsible not only for the provision of water but also for foul sewers, surface water sewers, combined surface water and foul sewers and, the treatment of sewage waste. They have primary responsibility for floods from water and sewerage systems, which can include sewer flooding, burst supply pipes, water mains or floods caused by system failures.

No changes have been made to the operational arrangements for water and sewerage companies in respect of flood risk. However the FWMA 2010 places a number of statutory duties on water and sewerage companies including:

- a duty to act consistently with the National Strategy;
- a duty to have regard to the content of the Local Flood Risk Management Strategies; and
- cooperation with other Risk Management Authorities, including sharing data.

Water and sewerage companies often hold valuable information which could greatly aid the understanding of flood risks faced by communities across Wales. Water and sewerage companies will also need to contribute to the preparation of Local Flood Risk Management Strategies prepared by the LLFAs.

All undertakers with reservoirs over 25,000m³ (which may change to 10,000m³ in future) must register their reservoirs with the Environment Agency as they are subject to regulation;

All undertakers must prepare a reservoir flood plan;

All incidents at reservoirs must be reported;

The water industry is highly regulated and the quality of customer service and the prices they are able to charge their customers are regulated by the Water Services Regulation Authority (WSRA), commonly known as Ofwat.

Water and sewage companies are responsible for responding to flooding incidents involving their assets.

2.6 Town & Community Councils

2.6.1 Powers and Responsibilities of Town & Community Councils and Communities

Flooding events can affect whole communities, including households which do not suffer from internal flooding, potentially being trapped on flooded roads or having to help support and provide shelter to their neighbours who have suffered from flooding. Communities have vital knowledge about the history of flooding in their areas and can make important contributions to helping manage the levels of flood risk by reporting flood incidents

Officers from risk management authorities are not in a position to know about every flooding incident that occurs, particularly those which do not lead to flooding within properties. However records of flooding incidents which affected roads or entered the curtilage of people's properties are important to record. They can indicate that there has been extensive flooding in relatively regular rainfall events which would warn that the properties are at risk in more extreme rainfall events. This information is crucial in building up cases for flood defence and flood resilience schemes which will require strong evidence of the flood risk to properties.

Town and Community Councils will be contacted as part of the consultation process on this Strategy and will be asked to identify any flooding events they are aware of. There are good links already for reporting of issues but these will be revisited to ensure the appropriate data reaches the Land Drainage Team and is added to the overall database of flooding events for future use. Community groups in areas which suffer from local flooding (i.e. surface runoff, groundwater and ordinary watercourses) can contact the Land Drainage team at Monmouthshire County Council to discuss how best they can record and report flooding incidents when they occur.

Appendix 2

EU Standard Codes for Measures

Appendix 2

EU Codes – Extracted from Severn FRMP
M11 - No action; No action; Action no measure is proposed to reduce the flood risk in the APSFR or other defined area.
M21 - Prevention: Avoidance; Measure to prevent the location of new or additional receptors in flood prone areas, such as land use planning policies or regulation
M22 - Prevention; Removal or relocation; Measure to remove receptors from flood prone areas, or to relocate receptors areas of lower
M23 - Prevention; Reduction; Measures to adapt receptors to reduce the adverse consequences in the event of a flood actions or buildings, public networks, etc...
M24 - Prevention; Other prevention; Other measures to enhance flood risk prevention (may include, flood risk modelling and assessment, flood vulnerability assessment, maintenance programmes or policies etc...)
M31 - Protection; Natural flood management / runoff and catchment; Measures to reduce the flow into natural or artificial drainage systems, such as overland flow interceptors and or storage, enhancement of infiltration, etc and including in- channel, flood plain works and the reforestation of banks, that restore natural systems to help slow flow and store water.
M32 - Protection; Water flow regulation; Measures involving physical intervention to regulate flows, such as construction modification or removal of water retaining structures (e.g. dams or other on-line storage areas or development of existing flow regulation rules and which have significant impact on the hydrological regime.
M33 - Protection; Channel, Coastal and floodplain works; Measures involving physical interventions to freshwater channels, mountain streams estuaries coastal waters and flood prone areas of land, such as construction, modification or removal of structures or the alteration of channels, sediment dynamics management, dykes etc.
M34 - Protection; Surface water management; Measures involving physical interventions to reduce surface water flooding, typically , but not exclusively, in an urban environment, such as enhancing artificial drainage capacity or through sustainable drainage systems (SuDS).
M35 - Protection; Other protection; Other measures to enhance protection against flooding, which may include flood defences asset maintenance programmes or policies.
M41 - Preparedness; Flood forecasting and warning; Measures to establish or enhance a flood forecasting or warning system
M42 - Preparedness; Emergency Event; Measures to establish or enhance flood event institutional emergency response planning.
M43 - Preparedness; Public awareness and preparedness; Measures to establish the public awareness or preparedness for flood events.
M44 - Preparedness; Other preparedness; Other measures to establish or enhance preparedness for flood events to reduce adverse consequences.
M51 - Recovery and Review; Individual and societal recovery; Clean up and restoration activities (buildings, infrastructure, etc) Health and mental health supporting actions, including managing stress disaster financial assistance (grants, tax) including disaster legal assistance, disaster unemployment assistance, temporary or permanent relocation, other
M52 - Recovery and Review; Environmental recovery; Clean up and restoration activities (with several sub topics as mould protection, well-water safety and securing hazardous material containers)
M53 - Recovery and Review; Other recovery and review; Other recovery and review, lessons learnt from flood events insurance policies.
M61 - Other; Other; Other

Appendix 3

Extract from the Severn River Basin Flood Risk Management Plan Relating to Monmouthshire

Appendix 3

1 Extracts from the Severn River Basin Flood Risk Management Plan relating to Monmouthshire - Wye Catchment

1.1 Introduction to the catchment

The Wye catchment extends from Chepstow in the south east up to Rhayader in the north west covering an area of 4,180 km². The landscape is mainly rural, made up of a mixture of woodland and open farmland varying from the steep upland of the Cambrian Mountains in the upper part of the catchment. Below Hay on Wye the landscape changes to a flatter lowland characteristic as the River Wye floodplain widens. Letton Lakes provides natural water storage that helps attenuate river flows and during flood events reduces peak flow downstream in Hereford. Past Ross on Wye the floodplain begins to narrow again as the Wye cuts through the surrounding limestone to form a steep sided gorge/valley from Symonds Yat all the way to Chepstow where the Wye joins the Severn Estuary.

1.2 Land use and management

The land use within the catchment is mainly agricultural, with a mixture of arable managed grassland and rough grassland farming. Much of the upper area of the catchment above Rhayader is covered by heath land and scrub with some forestry. Within the lowland areas of the Wye Valley between Leominster, Ross on Wye and Hay on Wye the land use is mostly intensive agriculture with some market gardening. There are a number of urban centres including Hereford, Leominster, Ross on Wye, Monmouth and Chepstow. Elsewhere tourism is key to the financial well-being of smaller rural communities especially in the lower reaches of the Wye Valley from Symonds Yat to Chepstow. Watercourses within the catchment are used for a variety of activities including recreation, public water supply, fisheries and conservation. The area is rich in landscape and wildlife.

1.3 Geology

Geology in the Wye catchment is dominated by Old Red Sandstone. Within the Upper Wye catchment fine grained siltstones and mudstones/shales are also present. Along the eastern boundary and at the very southern extent there are areas of limestone and measures of coal (the western edge of the Forest of Dean). Within the upper catchment soils are relatively poorly drained which can result in rapid runoff.

1.4 National and international designation

There are a number of designated areas of nature conservation importance located within the catchment, including the Severn Estuary which is also a Ramsar site. There are a number of Special Areas of Conservation (SAC) within the catchment along with numerous Sites of Special Scientific Interest (SSSIs) and some National Nature Reserves (NNR). These designated sites are located throughout the catchment and the way in which they are managed can have an effect on the risk of flooding (by affecting the surface run-off into the River Severn and its tributaries). The Wye catchment includes the Wye Valley Area of Outstanding Natural Beauty (AONB) and is partially within the Brecon Beacons National Park

1.5 Partnership working

Within the Wye catchment the Environment Agency and Natural Resources Wales have developed good working relationship with our partners. These include, but are not limited to, local councils. The catchment is covered by four unitary authorities and part of two local councils, including Herefordshire Council, Powys, Monmouthshire, Newport, Forest of Dean District and Malvern Hills District. We also work closely with the Regional Flood and Coastal Committees, Local Resilience Fora, Severn Trent Water plc, Dwr Cymru\Welsh Water and Natural England.

1.6 Historic flooding

There is a long history of fluvial flooding within the catchment. The most significant flooding event recorded occurred in 1947 affecting large numbers of properties in Hereford and isolating the town of Monmouth. This was catchment wide in its impacts. More recently flooding has occurred to varying degrees in 2012, 2007 and 2000 impacting on many communities including Lydbrook, Ross on Wye and Hampton Bishop, though the extents were not so great. Other notable events happened in 1929, 1960, 1979 and 1998.

In the lower reaches of the River Wye tidal flooding has also impacted on communities around Chepstow such as Brockweir and Tintern. The most recent events occurred in 2014 with the previous highest recorded event occurring in December 1981.

1.7 Current flood risk

There is frequent, low level flooding in the Wye Valley, with agricultural and rural floodplain affected. Flooding from the River Wye at Monmouth is a regular occurrence and while the more commonly occurring events are disruptive to local communities, the number of properties directly affected is relatively low. During larger events such as that experienced in 1947 there are significant numbers of properties affected throughout the catchment. National and regional infrastructure, including utility sub stations and major transport routes, are also affected resulting in many rural communities becoming isolated. The main fluvial flood risks on the Wye are in Hereford and Monmouth.

The highest areas of tidal risk are at Chepstow, Tintern and the Caldicot Levels. A number of properties flood and the main road at Tintern is closed for the hours around high tide. Chepstow is at risk from high tides at Elmdale on the English side of the Wye and the area upstream of the railway bridge on the Welsh side.

The Caldicot Levels are an area of very flat reclaimed land served by flood defences that would become compromised should there be any overtopping, and the effect would be similar to those experienced elsewhere in the country, such as the Somerset Levels during the winter of 2013/14.

Surface water and sewer flooding occurs throughout the catchment, most commonly in the urban areas such as Monmouth. A number of communities are also at risk from ordinary watercourse flooding. Most of the main population centres along the Wye have flood alleviation measures in place which reduce flood risk to property and infrastructure which includes at Monmouth

The upper Wye, in Wales, has a new flood forecasting model in development which will benefit all the communities which have a flood warning service and will also help improve the forecasting for the mid and lower parts of the Wye catchment. In addition to these flood risk management actions, there has also been a great deal of flood awareness work in the catchment consisting of door knocking, drop in sessions in conjunction with partner organisations and development of personal, community, school and business flood plans. We have also worked on increasing the sign-up for our free flood warning service to ensure the correct actions can be taken to protect people and property.

1.8 Key statistics

Table 12.7.2. Summary of flood risk from reservoirs to people, economic activity and the natural and historic environment across the Wye catchment.

Reservoirs	Total in Catchment	Maximum extent of flooding
Risk to people:		
Number of people in area:	261392	4208
Number of services:	1244	45
Risk to economic activity:		
Number of non-residential properties:	87808	1604
Number of airports:	0	0
Length of roads (km):	532	26
Length of railway (km):	134	2
Agricultural land (ha):	176539	5644
Risk to the natural and historic environment:		
Number of EU designated bathing waters within 50m:	0	0
Number of EPR installations within 50m:	84	1
Area of SAC within area (ha):	10388	1442
Area of SPA within area (ha):	19970	215
Area of RAMSAR site within area (ha):	99	4
Area of World Heritage Site within area (ha):	0	0
Area of SSSI within area (ha):	35755	1716
Area of parks and gardens within area (ha):	5152	120
Area of Scheduled Ancient Monument within area (ha):	977	8
Number of listed buildings within area:	7579	265
Number of licensed water abstractions within the area:	774	132

Note:
SAC - Special Area of Conservation
SPA - Special Protection Area
SSSI - Site of Special Scientific Interest
Ramsar - wetland site of International Importance
EPR Installations - those registered under the Environmental Permitting Regulations

The reservoirs flood map has been developed and published by the Environment Agency.

1.9 Conclusions

The Wye catchment has a wide variation of fluvial flooding issues ranging from extended periods of elevated levels within the River Wye Valley that affect many communities, flooding from tributaries of the River Wye, flooding from quickly responding catchments and tidal flooding from the Severn Estuary. In addition climate change is likely to increase the pressure on existing locations where surface water/sewer flooding occurs. The greatest threat to the lower catchment is from sea level rise which could increase flood risk significantly in Chepstow and surrounding low-lying areas, potentially changing the character of low-lying land which is currently designated as three separate SSSIs across the Caldicot Levels.

There is a continued need to work in partnership with others, where possible, to achieve flood risk management measures which will alleviate flooding from multiple sources, as well as providing wider environmental and other benefits to improve the natural, rural and built environment consistent with the principles of sustainable development.

1.10 Objectives

The following objectives apply to this management catchment, where possible:

Social:

- *reduce or prevent an increase in harm to life as a result of flooding*
- *improve flood warning services on catchments that react rapidly to rainfall*

- *minimise community disruption by reducing impact of flooding by increasing preparedness through improved flood warning service and public awareness*
- *locate development in areas at lowest risk of flooding*
- *increased understanding and management of flood risk impacts*
- *continue to work with utility providers to improve resilience of infrastructure and services*
- *continue to work with other bodies to improve resilience to the communication network and transport links*
- *contribute to recreational amenity & cultural heritage conservation through managing flood risk*
- *maintain existing assets where economically viable that protect people or find suitable alternatives by working in partnership with communities*

Economic:
- *reduce economic damage to commercial properties*
- *reduce flood risk to private properties*
- *reduce flood risk to agricultural land*
- *reduce risk of flooding to major infrastructure*
- *ensure current and future investment in the catchment is proportional to flood risk*
- *contribute to integrated catchment water management &/or sustainable drainage approach*

Environmental:
- *take opportunities to restore sustainable natural storage of floodwater in the upstream area, in order to offset increasing flood risk from trends including climate change*
- *improve water environment through flood risk management activities*
- *improve hydro-morphology of rivers*
- *minimise impacts of flooding on designated sites or areas of environmental interest*
- *create habitat through flood risk management activities*
- *achieve WFD objectives through flood risk management*

1.11 Measures in Monmouthshire specific to the Wye catchment
Measures that are relevant to this catchment are included in the RBD, Severn England and Severn Wales level measures shown in Sections 9, 10 and 11. In addition, there are measures specific to this catchment as follows:

These can be further broken down into ongoing, agreed and proposed measures as set out below.

1.12 Ongoing measures in the Wye catchment -Preparing for risk:
There are 6 measures already in place to prepare for flood risk that are specific to Monmouthshire in this catchment.

- *develop a flood awareness plan for the Lower Wye;*
- *improve the existing flood warning service at Monmouth;*
- *maintain the completed community flood plan at Monmouth;*
- *undertake hydrometry and telemetry improvements at Chepstow and Tintern Parva (2 measures);*

- *undertake hydrometry and telemetry improvements in Chepstow.*

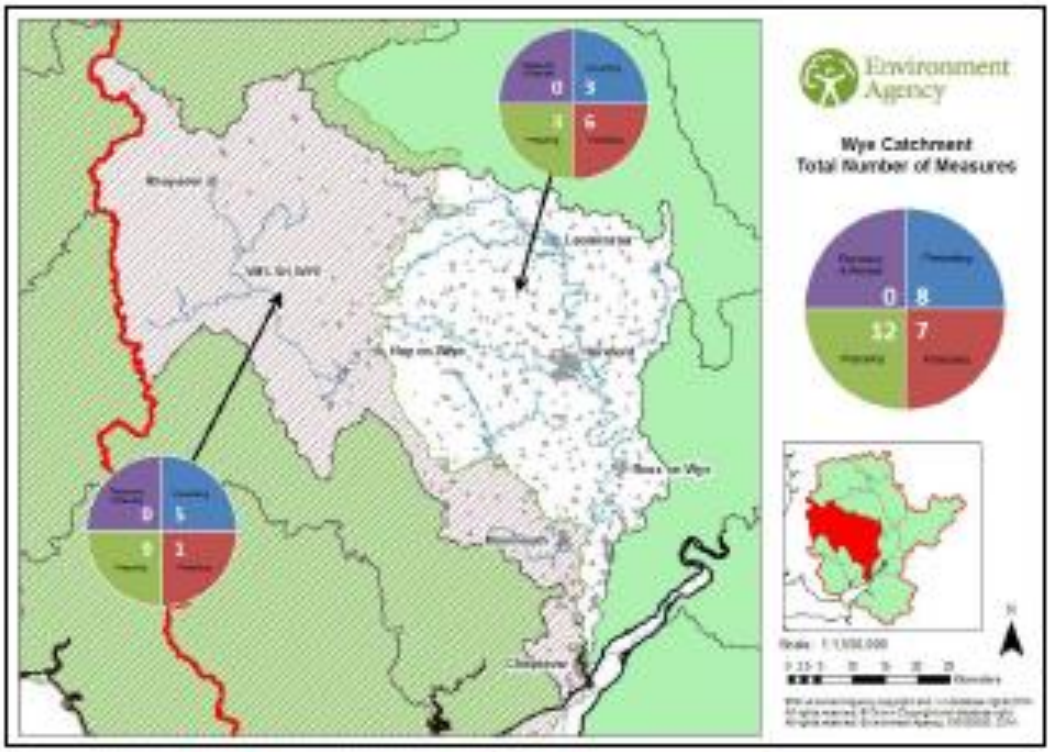


Figure 12.7.1 Total number of specific measures in the Wye catchment with England/Wales split

Measures that are relevant to this catchment are included in the RBD, Severn England and Severn Wales level measures shown in Sections 9, 10 and 11. In addition, there are measures specific to this catchment as follows:

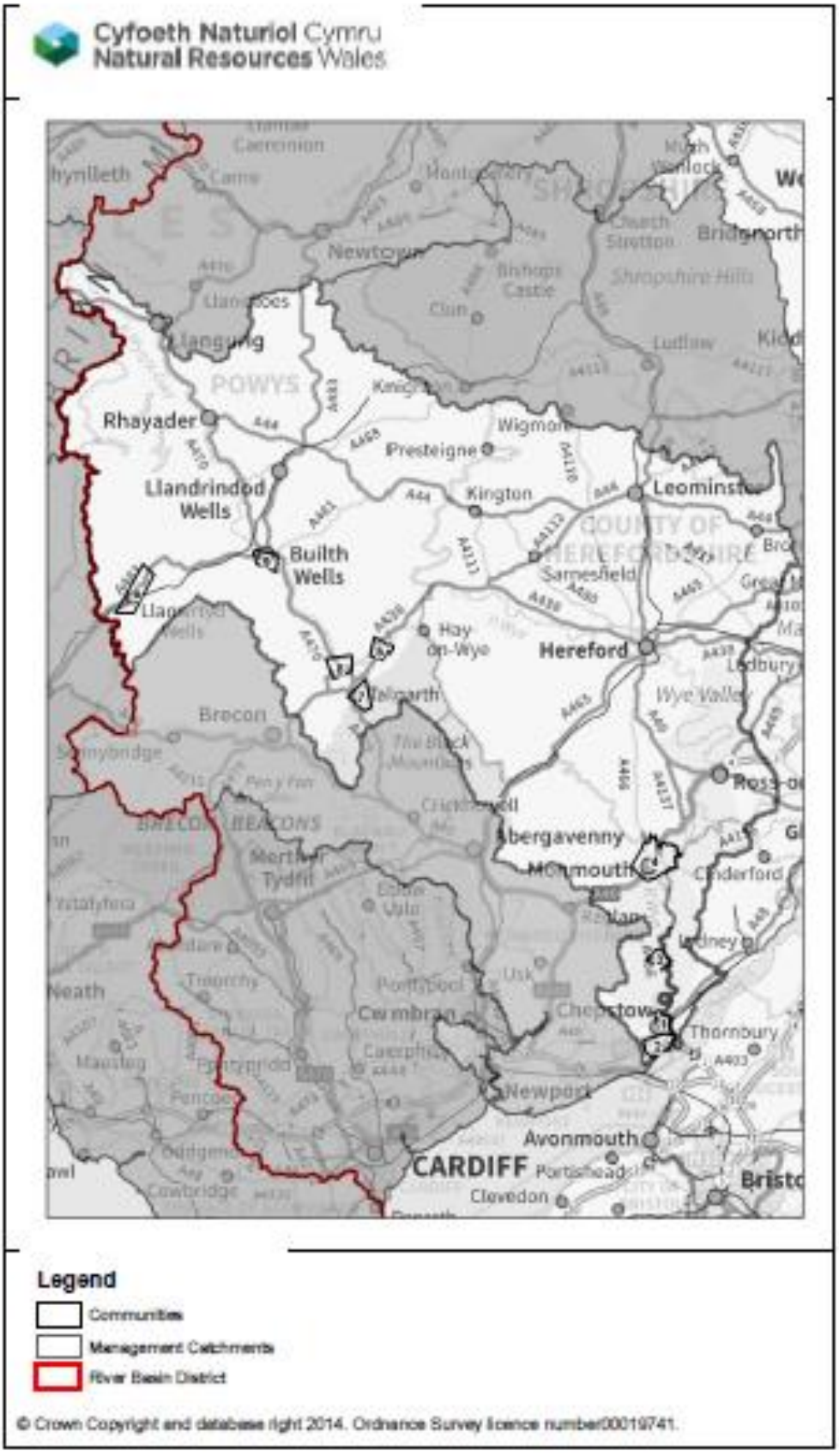
1.13 Proposed measures to manage risk in the Welsh Wye catchment
In the Welsh Wye catchment there are 7 measures proposed to manage flood risk from 2015 and beyond. These include:

> ***Preventing risk:*** *there are 3 measures proposed to prevent flood risk that are specific to this catchment. These are:*
> - *to undertake an initial assessment for reducing flood risk at Monmouth,*
> - *to carry out an assessment on existing structures at Chepstow,*
> - *design and construct flood risk asset improvements at Mathern*
>
> **Protecting from risk:** there is 1 measure proposed that protects from flood risk that is specific to this catchment. This is: the design and construction of flood risk asset improvements at Chepstow.

1.14 Key communities where we are planning actions *(Bold Communities are in Top 50 Wales)*

There are a number of communities within the catchment where we feel there is still more to be done to manage and reduce the risk of flooding. Section 3 of this report sets out how we prioritise our work on a risk basis so that those communities that are most at risk are addressed first.

Label	*Community*
1	*Chepstow*
2	*Mathern*
3	*Tintern Parva*
4	*Monmouth*


Cyfoeth Naturiol Cymru
Natural Resources Wales
Rhayader
Llandrindod Wells
Builth Wells
Presteigne
Kington
Leominster
Hay on-Wye
Hereford
Brecon
Abergavenny
Monmouth
Ross-on
Cinderford
Thornbury
Newport
Avonmouth
CARDIFF
Portishead
Clevedon
Legend
Communities
Management Catchments
River Basin District
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1.15

Table 12.7.4. The Welsh Wye catchment – measures

The following catchment delivery plan sets out on a community basis, the measures that we have already undertaken; are in the process of undertaking; or plan to undertake to help manage the risk of flooding to that community. This provides a list of measures we intend to undertake within this catchment over the coming years, subject to assessment and funding justification.

Location	Source	Measure Name	Measures	Link to FRMP Objective	Timing	Priority	Measure Status	Responsible Authority
Monmouth	Main River	Improve Existing flood warning service	M4 - Preparedness	1.2.4	Current	High	Ongoing	Natural Resources Wales
		Maintain completed community flood plan	M4 - Preparedness	1.4.5	Current	High	Ongoing	Natural Resources Wales
		Undertake initial assessment and feasibility work	M2-Prevention	1.2.3	Current	High	Not started - proposed	Natural Resources Wales
Chepstow	Main River / Sea	Design & construction of flood risk asset improvements	M3-Protection	1.2	Current	High	Not started - agreed	Natural Resources Wales
		Carry out assessment on existing structures to ensure they are fit for purpose	M2-Prevention	1.2.3	Current	Very High	Not started - proposed	Natural Resources Wales
		Undertake hydrometry & telemetry improvements	M4-Preparedness	1.3.4	Current	High	Ongoing	Natural Resources Wales
Mathern	Main River / Sea	Design & construction of flood risk asset improvements	M2-Prevention	1.2	Current	High	Not Started - Proposed	
Tintern Parva	Main River / Sea	Undertake hydrometry & telemetry improvements	M4-Preparedness	1.3.4	Current	High	Ongoing	

2 Extract from the Severn RBMP relating to Monmouthshire -Usk Catchment

2.1 Catchment description / overview

The River Usk rises on the northern slopes of the Black Mountains and flows in a long narrow catchment of great scenic beauty for approximately 125km south easterly through the towns of Brecon, Crickhowell, Abergavenny and Usk, before discharging to the Usk estuary at Newbridge and then to the Severn estuary at Newport. The catchment includes the Gwent Levels to the south; a large area of reclaimed coastal grasslands of historical and nature conservation importance. Tourism is important to the local economy, with the Brecon Beacons National Park and the Monmouthshire and Brecon Canal attracting visitors in search of outdoor recreation. The Usk catchment is rich in wildlife, including three species of lamprey and bullhead and a variety of habitats. This high ecological value is recognised through national and international designations.

Land is predominantly used for agriculture, with sheep farming in the northern and western uplands, and beef, dairy, mixed and arable farming in the lowlands of the south and east. As a result, pollution from rural sources is a major threat to the quality of wildlife and plants living in the water environment. There is some limited industry in the major towns, and Newport has a commercial port. Pollution from sewage and contaminated run-off is a pressure in the urban areas.

The headwaters and some of its tributaries are modified by dams to create the Usk, Crai, Talybont and Grwyne Fawr reservoirs. At Brecon some of the river's flow is diverted to feed the Monmouthshire and Brecon Canal and water from the lower River Usk is pumped to Llandegvedd water storage reservoir. On the Gwent Levels flows are regulated by the Caldicot and Wentlooge Internal Drainage Board. Water is taken from rivers and underground sources to use in agriculture, industry, hydropower and fish farms. It is necessary to continue work with Dwr Cymru Welsh Water and others to minimise the impact on the natural environment caused by the physical modifications and abstraction, while securing this valuable resource and maintaining flow levels.

2.2 Historical flooding in the catchment

- *May 1931: Abergavenny suffered with flooding from the Usk causing one recorded death.*
- *1979 saw flooding at Llanfaes and Brecon town centre to a depth of 1.5 metres, with damages estimated at greater than one million pounds. The water levels remain the highest on record in most locations along the Usk. Usk Town itself was badly flooded as well)*
- *April 1998 saw the Usk flood the Elvicta Business Park in Crickhowell*
- *December 2000: the Malpas Brook in Newport flooded 130 properties with the Usk flooding an additional 9 properties*
- *February 2002 saw flooding at Crickhowell and Brecon causing 100 people to be isolated in Crickhowell and substantial road flooding along the A40 between Brecon and Llandovery*
- *Christmas 2013 saw the highest recorded level along the Usk in recent years, but there was very little recorded flooding to properties*
- *January 2014 saw the highest Tides recoded at Newport in several years and saw 6 properties flood in the Crindau area*

2.3 Current flood risk in the catchment

The Flood risk in the Usk catchment varies as the topography and source of risk changes. The areas of highest hazard are in the Usk Estuary and the more developed towns such as Brecon, Usk and Crickhowell. 6 of the top 100 risk communities in Wales are to be found in the Usk catchment, these are predominantly at risk from tidal flooding, around the Newport area. The hazard in the aforementioned towns is similarly managed via schemes built from the 1960's through to recent times and the residual risk is from failure or overtopping. All key locations of

high risk benefit from a flood warning service and have been targeted by flood awareness and other engagement activities.

2.4 Future flood risk and issues in the catchment

In the future, the increased frequency and intensity of rainfall events in combination with fast responding catchments will be the greatest threat to the upper areas where a relatively large number of small to medium sized communities are distributed over a wide area.
The greatest threat to the lower catchment is from sea level rise which could increase flood risk significantly in Newport and surrounding low-lying areas, and potentially change the character of more than 2,000 hectares of low-lying land which is currently designated as three separate SSSIs across the Caldicot Levels.

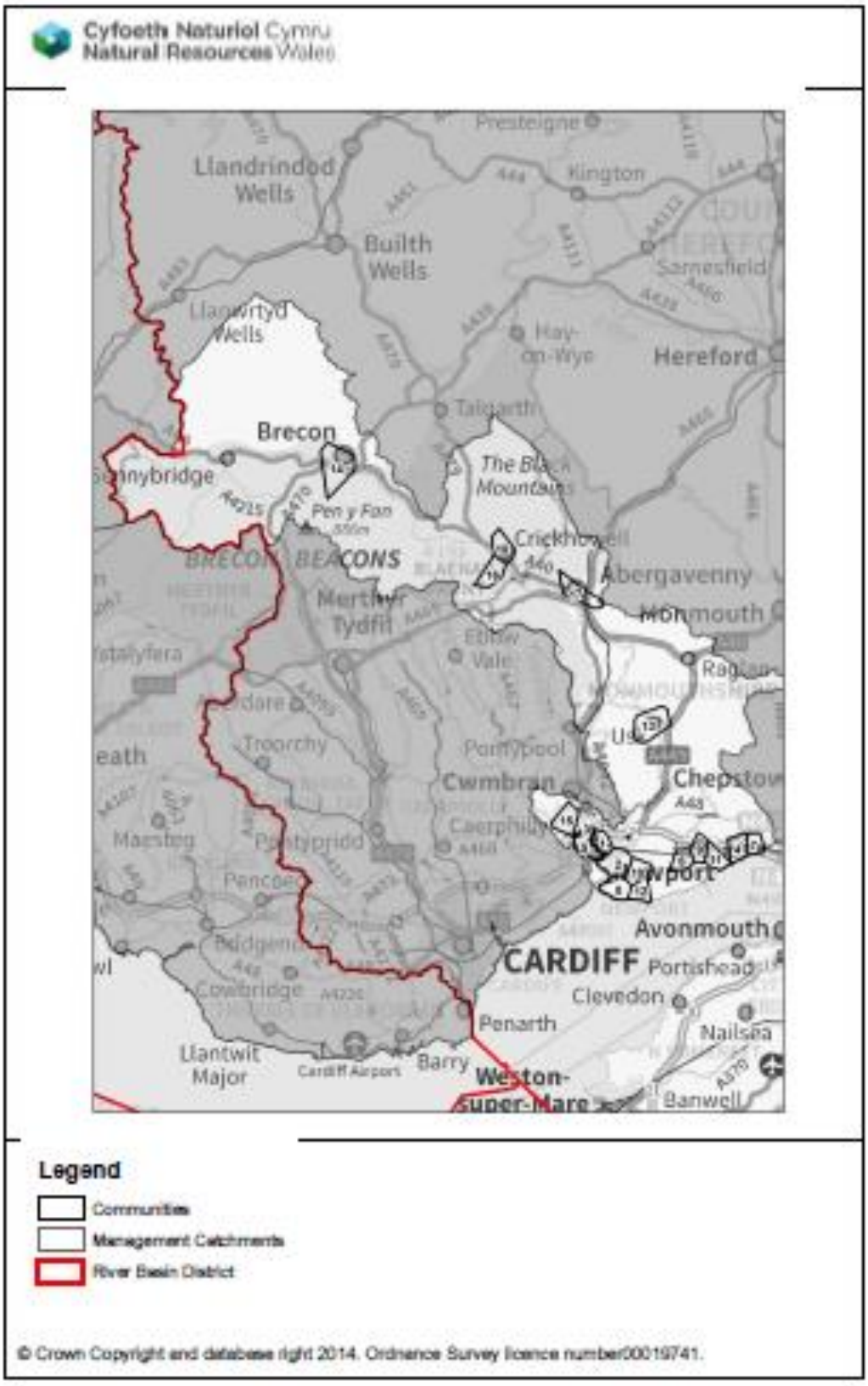
2.5 Recent flood risk management activity in the catchment

A flood forecasting model was delivered for the Usk catchment in early 2014. In addition to this a major data collection exercise during and after the floods experienced over the Christmas and new year of 2013/4 has generated a major calibration and threshold review for the flood warning service in the Usk catchment.

There is a major modelling exercise being undertaken that will look to improve our knowledge of all the coastal risk along the South East of Wales, this includes all tidal risk along the Usk coastal reaches.

Rogiet, Caldicot and Nash communities all benefited from recent sea door CCTV surveys that have helped inform the sea door maintenance programme.

Label	***Community***
4	***Rogiet***
7	*Caldicot*
9	*Magor*
11	*Undy*
13	***USK***
17	*ABERGAVENNY*


Cyfoeth Naturiol Cymru
Natural Resources Wales
Llandrindod Wells
Builth Wells
Kington
Presteigne
Hay-on-Wye
Hereford
Brecon
Pen y Fan
BRECON BEACONS
Crickhowell
Abergavenny
Monmouth
Merthyr Tydfil
Pontypool
Cwmbran
Chepstow
Newport
Avonmouth
CARDIFF
Portishead
Clevedon
Penarth
Nailsea
Barry
Cardiff Airport
Weston-super-Mare
Banwell
Legend
Communities
Management Catchments
River Basin District
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2.6

Table 12.8.1. Key communities where we are planning actions (Bold Communities are in Top 50 Wales)

Location	*Source*	*Measure Name*	*Measures*	*Link to FRMP Objective*	*Timing*	*Priority*	*Measure Status*	*Responsible Authority*
Magor	*Sea*	*Design & construction of flood risk asset improvements service*	*M3-Protection*	*1.2*	*Current*	*High*	*Ongoing*	*Natural Resources Wales*
Caldicot	*Sea*	*Design & construction of flood risk asset improvements service*	*M3-Protection*	*1.2*	*Current*	*High*	*Ongoing*	*Natural Resources Wales*
Rogiet	*Sea*	*Design & construction of flood risk asset improvements*	*M3-Protection*	*1.2*	*Current*	*High*	*Ongoing*	*Natural Resources Wales*
		Design & construction of flood risk asset improvements	*M3-Protection*	*1.2*	*Current*	*Very High*	*Not started - agreed*	*Natural Resources Wales*
Usk	*Main River*	*Undertake initial assessment and feasibility work for reducing flood risk*	*M2-Prevention*	*1.2.3*	*Current*	*Very High*	*Not started - agreed*	*Natural Resources Wales*

Appendix 4
Census Data

Appendix 4

2011 Census Data

Ref	Community	Population Total	Household Total	Ward	Population	Households
7.2.1	Abergavenny Town Council	10,078	4,635	Cantref	2,036	904
				Castle	1,797	821
				Grofield	1,853	911
				Lansdown	2,196	952
				Priory	2,196	1,047
7.2.2	Caerwent Community Council	1,791	728	Caerwent	1,791	728
7.2.3	Caldicot Town Council	9,604	4,011	Caldicot Castle	1,919	791
				Dewstow	1,983	824
				Green Lane	2,069	860
				Severn	1,689	751
				West End	1,944	785
7.2.4	Chepstow Town Council	12,350	5,168	Larkfield	2,014	820
				St Christophers	2,582	1,028
				St Kingsmark	3,158	1,198
				St Marys	1,847	964
				Thornwell	2,749	1,158
7.2.5	Crucorney Community Council	2,121	857	Crucorney	2,121	857
7.2.8	Grosmont Community Council					
7.2.6	Devauden Community Council	1,480	598	Devauden	1,480	598
7.2.15	Llangwm Community Council					
7.2.7	Goetre Fawr Community Council	2,393	993	Goetre Fawr	2,393	993
7.2.9	Gwehelog Fawr Community Council	1,299	514	Llanbadoc	1,299	514
7.2.11	Llanbadoc Community Council					
7.2.12	Llanelly Community Council	3,899	1,716	Llanelly Hill	3,899	1,716
7.2.13	Llanfoist Fawr Community Council	3,315	1,425	Llanfoist Fawr	1,868	803
				Llanwenarth Ultra	1,447	622

7.2.16	Llangybi Community Council	1,861	719	Llangybi Fawr	1,861	719
7.2.17	Llanhennock Community Council					
7.2.21	Llantrisant Fawr Community Council					
7.2.10	Llanarth Community Council	2,284	922	Llanover	2,284	922
7.2.18	Llanover Community Council					
7.2.14	Llangattock Vibon Abel Community Council	1,755	697	Llantilio Crossenny	1,755	697
7.2.19	Llantilio Crossenny Community Council					
7.2.20	Llantilio Pertholey Community Council	3,906	1,673	Croesonen	2,437	1,041
				Mardy	1,469	632
7.2.22	Magor with Undy Community Council	6,140	2,377	Mill	2,482	961
				The Elms	3,658	1,416
7.2.24	Mitchell Troy Community Council	1,253	500	Mitchell Troy	1,253	500
7.2.25	Monmouth Town Council	10,508	4,520	Dixton with Osbaston	2,569	1,034
				Drybridge	3,432	1,426
				Overmonnow	2,388	1,100
				Wyesham	2,119	960
7.2.26	Portskewett Community Council	2,133	884	Portskewett	2,133	884
7.2.27	Raglan Community Council	1,928	852	Raglan	1,928	852
7.2.28	Rogiet Community Council	1,813	698	Rogiet	1,813	698
7.2.23	Mathern Community Council	2,201	868	Shirenewton	2,201	868
7.2.29	Shirenewton Community Council					
7.2.30	St Arvans Community Council	1,618	659	St Arvans	1,618	659
7.2.31	Tintern Community Council					
7.2.32	Trellech United Community Council	2,759	1,064	Trellech	2,759	1,064
7.2.33	Usk Town Council	2,834	1,155	Usk	2,834	1,155
	Totals	**91,323**	**38,233**		**91,323**	**38,233**

Appendix 5.

Table of Objectives and Measures from the Local Flood Risk Management Strategy

Delivery Theme	Ref	Measure	Proposals	Benefits	Implementation Responsibility
Development Planning and Adaptation	1.1	Sustainable & Strategic Development Planning, LDP	The current MCC LDP which will run until 2021 states "Proposals for highly vulnerable development or emergency services will not be permitted in areas which may be liable to flooding, from all sources, unless the residential development is for the conversion of upper floors within defined settlement boundaries or the proposal is to extend an established tourism, leisure or educational establishment. Less vulnerable built development will be permitted within defined settlements or on sites allocated for uses such as employment. Development proposals within a flood plain will be required to demonstrate that: a) the development is or can be protected by approved engineering works and / or other flood protection measures; b) such remedial measures would not cause flooding or significantly increase the risk of flooding elsewhere; c) the development, including any remedial measures, can be sympathetically assimilated into the environment in terms of its siting, scale, design and landscaping; d) the development does not interfere with the ability of the Environment Agency or other bodies to carry out flood control works or maintenance; and e) The nature conservation interest of the water source corridor is protected and, where practicable, enhanced." Similar policies are included within the BBNP"s Deposit LDP. In the light of further work and the new roles in dealing with surface water Flooding, groundwater and watercourses, the next version of the MCC LDP and the BBNP"s LDP will need to reflect the information in this strategy. It should also consider that where development in flood risk areas is permitted that it be designed to be flood resilient.	Local Development Plans (LDPs) provide a strategic policy framework which facilitates the effective management of flood risk by directing most new development away from those areas which are at the highest risk of flooding. The above proposal adds surface water, local watercourse and groundwater flood risk areas to that framework. The benefit will be to reduce further the risks of flooding to new development. New developments will be at lower risk of flooding and better prepared should flooding occur Improved soils, reduction in soil wash off land and increased soil permeability.	Planning / EP /EA
	1.2	SFRA / SFCA	Strategic Flood Consequence Assessments (SFCA/SFRA) were undertaken as part of the LDP process in the Council and BBNP areas	The SFCA allowed the consequences of flooding to inform the location of new development in the LDP. 2 The SFCA also enabled consideration of potential increases in surface water runoff arising from new development, including the potential application of sustainable drainage systems.	Planning

1.3	Water Cycle Strategy	A Water Cycle Strategy is an opportunity for MCC and all our partner organisations to work together to identify the water services infrastructure needed to support and enable sustainable development in the County. The strategy will identify what infrastructure is needed, when it is required, how much it will cost, and who should pay.	1.To ensure the management of water resources in a sustainable way 2. To manage and develop sewage systems for future developments	LLFA & Planning
1.4	Relocation	MCC do not have a policy relating to the relocation of residents living in housing which is subject to flood risk, other than on an emergency basis and it is not anticipated that significant numbers of properties, if any, will be identified which will require the relocation of residents. If houses are identified as being in areas of significant flood risk, which would endanger life, then the procedure set out below will be followed to endeavour to reduce flood risk:-Provide an early warning system to allow residents time to move to a safe area. -Encourage the residents to produce their own Flood Plan to reduce danger to themselves and damage to their property and its contents and provide advice on resilience measures -Consider providing systems to prevent floodwater entering the property -Endeavour to reduce flood risk by reducing the volume of water being generated by the upstream catchment. -Consider introducing new flood relief systems such as culverts or drainage ditches -Consider building new flood defences or raise the level of existing flood defences. -Only when these aspects have been tried would relocation need to be considered.	Reduce the risk to residents by relocating them from housing in areas which are subject to severe flood risk to areas with lower risk when the alternative options have been exhausted	LLFA / EP/Police / EA
1.5	Minerals & Waste as part of the LDP	The LDP identifies there is a sufficient land bank of permitted aggregate resource in the County for the duration of the LDP period, i.e. up to 2021. If any planning application for new or extended minerals workings were submitted then any such proposal would be considered under national policies contained in Minerals Planning Policy Wales and Minerals Technical Advice Note (Wales) 1: Aggregates. In respect of waste, LDP Policy W3 identifies that proposals for waste management facilities, except those involving the final deposit of waste on land at the site or open windrow composting, will be permitted within industrial sites (Class B2 of the Town and Country Planning Use Classes Order 1987) The LDP acknowledges that there are areas within existing B2 employment sites that fall within DAM zone C2 which are unlikely to be suitable for certain waste facilities. Developers are encouraged to consult the Local Planning Authority or the Environment Agency for further information on any site that is potentially at risk from flooding.	Planning Policy framework contributes to managing flood risk and protecting the water environment	Planning

	1.6	Sustainable Urban Drainage (SUDS)	Development proposals will be expected to incorporate water management measures, including Sustainable Urban Drainage Systems (SUDs), to reduce surface water run-off and minimise its contribution to flood risk elsewhere. Monmouthshire County Council as the LLFA for its administrative area will take on the role of the SUDs Adopting and Approving Body in relation to sustainable drainage systems. In this role MCC will be responsible for both approving the original design of the SUDs and adopting and maintaining the finished system.	The policy framework contributes to managing flood risk, protecting water quality and reducing environmental damage as well as improving the quality of surface water	Highways Development & Planning

Flood Forecasting & response	2.1	Flood Awareness	Continue collaboration with the EA, and other risk management bodies, to develop further programmes of awareness in communities about local flood risk and measures to mitigate these risks through local support and resilience measures. Support the E.A. to re-establish Flood Warden	Raise awareness of flood risk within local areas to reduce and mitigate the consequences of flooding from all sources and its impact upon communities	EA/LLFA
	2.2 & 2.3	Flood Warning & Forecasting	The Council will continue to make arrangements to receive and cascade across service areas as required Flood Guidance Statements, Flood Warnings and Severe Weather Warnings relating to all flood risks so it can be prepared to respond to local needs. That the EA will be supported in its role of providing Flood line information to all residents at risk of flooding from main rivers and the sea.	To give the Council and local communities as much warning of potential flooding as possible to allow the Council to make preparations and residents to take appropriate action.	EA / LLFA/EP
	2.4	Emergency Response Plans	To meet its obligations Monmouthshire has established a series of response arrangements to deal with flooding issues and wider incident response and recovery. These are set out in Local Resilience Forum multi-agency plans, together with internal corporate and directorate response plans. Particular arrangements in relation to Adverse weather, Flood Warning Dissemination, Response to Flood Incidents and a specific procedure for Flooding & Evacuation of Riverside Park, Monmouth are all currently maintained. Monmouthshire County Council will continue to review and update these and the need for any additional specific procedures.	To manage the response of MCC and its Risk Partners to various emergencies including flooding To give support to the communities during and after flooding emergencies	EP/EA/LLFA
	2.5	Community Flood Plans	Support the EA in the development of further Community Flood Plans and seek to develop other plans for local flooding sites	The local communities will be made more aware of the risks of flooding to their properties The plans will allow individual house holders to prepare their own Flood Risk Plans The social, and economic effects of any likely flooding will be reduced	EA to lead/EP/LLFA
	2.6	Multi Agency Flood Plans	MCC will continue through its partnership within the Gwent Local Resilience Forum to maintain its involvement with the Gwent LRF and in particular with the Risk group and Severe Weather group. MCC will work with the LRF to review and update the series of plans for preparing, responding to and supporting recovery from flood incidents and develop additional ones as necessary to meet the issues arising and recognised risks.	To manage the response of MCC and its Risk Partners to various emergencies including flooding. To give support to the communities during and after emergencies.	Emergency Planning

Land, Cultural & Environmental Management	3.1	Land Management	Where there are opportunities to influence land managers, such as through current grant funded initiatives, or through land drainage bye-laws, then it will be possible to encourage continuation or changes in land management where land managers are supportive. In order to reduce surface water runoff and/or control peak flows from catchments, in areas identified as being subject to flood risk, MCC will consider introducing various methods of catchment management. MCC will enter into discussions with land owners and partner risk management bodies to discuss habitat creation and management, to minimise increases in runoff after tree felling, ploughing and other land management practices that impact on surface water run-off. MCC will consider whether the introduction of bye laws could help in reducing flood risks and support habitat maintenance and generation. An Eco Systems approach will also be considered as a way of maximising the co-ordination benefits with other bodies	Integrated land management opportunities benefitting a range of themes simultaneously, potentially broadening the scope and increasing the likelihood of funding for projects that will improve land & water management. Reduction of surface water runoff and peak flows Reduction of contamination to surface water runoff Flood reduction and habitat generation. Soil Management Plans to reduce run off and improve soil permeability	EA/LLFA to lead
	3.2	Resilience	Within MCC a culture of resilience to climate change and flooding will be adopted in relation to property and land in the Council's ownership, subject to flood risk. This will entail the restoration of land and property as quickly as possible following a flood event. The standard of restoration will be set appropriately to return habitats to their previous condition without significant change unless enhancement / improvement can be achieved. We will work with other bodies responsible for heritage sites, special landscapes, designated sites and critical assets to minimise the risks of flooding through use of resilience measures.	To maintain, enhance and increase the resilience of existing habitats particularly heritage assets and designated sites, such as SSSIs, BAP habitats, SINCs and critical assets. To restore habitats and assets to their original condition as soon as possible	EA/LLFA & Planning & B Regs
	3.3	Resistance	MCC will pursue a culture of resistance to flood risk in relation to property and land subject to flood risk. This will entail the implementation of detailed measures to reduce the risk of flood water entering properties and land which would be adversely affected by flooding	To maintain, enhance and increase the resistance of existing habitats particularly SSSIs BAP habitats and SINCs	EA/LLFA to lead
	3.4	Restoration	Most restoration is envisaged to be dealt with via the Planning system; as such there will be opportunities for relevant statutory bodies to contribute. Notwithstanding this matter there will be a preference for using „soft" engineering solutions (rather than „hard") for the management of water on restoration sites. Only when there is clear evidence that such solutions are not appropriate due to site specific or localised issues will „hard" landscaping options be considered	To create semi-natural environments To restore land to prior use or sustainable communal use wherever possible.	EA/LLFA to lead

	3.5	Environmental Enhancement	Environmental enhancements schemes are either linked to development sites or are publicly funded grants to improve existing, predominantly urban, areas. MCC will: Include improvements in surface water management in all publicly funded schemes Request demonstration of water management techniques in all Landscaping Masterplans submitted as part of Planning Conditions together with the potential for Soil Management Plans. Request the removal of all invasive non-native species from/bordering enhancement/development sites and watercourses followed by secondary planting to minimise re-growth and erosion Consider an eco-systems approach when working with others.	Decreased surface water runoff on new developments and publicly funded environmental enhancements To improve soil condition, reduce soil wash from surface water run-off and improved soil permeability.	Countryside & Planning
	3.6	Habitat Creation	MCC will seek to create additional or replacement habitat through its land management and planning operations. MCC will seek to create new habitats having characteristics that can help reduce the total runoff or reduce the peak level of surface water discharge from the sites. Note the Caldicot & Wentlooge IDBs Water Level Management Plan	Improvements to water management including reduced surface water runoff and increased water retentive capacity	Countryside & Planning
Asset Management & Maintenance	4.1	Asset Management Plans	MCC as an LLFA will develop and maintain a register of structures or features, which in the opinion of the authority, are likely to have a significant effect on a flood risk in the County. Information will be recorded about each of the structures and features including ownership and the state of repair. MCC will also collect data of its own and third party assets, including other risk management bodies and critical assets that are related to drainage and flooding and which could become a flood risk in the future. MCC will keep records of its maintenance and cleaning of culverts, screens and gullies	Provide details of all existing drainage structures which are likely to affect flood risk Give easy and efficient access to available information Provide condition surveys and maintenance records for all appropriate drainage structures Maintain records of cleaning and inspection of grids, gullies and other assets where possible & practical.	LLFA/Drainage Team
	4.2	Defence / Structure Management	MCC will identify and record on its database all formal and informal defences, structures, storage and retention facilities, etc, over time	To exclude flood water from areas identified as subject to flood risk	LLFA / EA
	4.3	Channel Maintenance	It is proposed as part of this strategy that surveys will be carried out of all channels, which are considered to be significant in terms of flood risk. The surveys will identify details of the construction materials, size and shape of the channel and its condition. From this survey information a detailed programme of work will be drawn up for the maintenance and/or replacement of all existing channels in the ownership or control of MCC. Develop a BAP for maintenance and new construction, including when and how to seek consents from appropriate bodies. Develop an Environmental Management Plan to encompass relevant work	To bring all channels on significant watercourses to a standard fit for purpose To ensure that all channels are well maintained and managed for both flood and habitat purposes. To maintain and enhance the water environment	LLFA/Highways

	4.4	Culvert Maintenance	Culverts and pipes, which have been identified as being significant to flood risk, are being included in the MCC database of drainage structures and on the GIS layers. Where these structures are in the ownership of MCC or have been classified as being of strategic importance they are maintained by the relevant MCC team. Develop a BAP for maintenance and new construction, including when and how to seek consents from appropriate bodies. Consider developing and implementing a culverting policy to minimise use of new / additional culverts and the potential to reinstate open watercourses where practical. Develop an Environmental Management Plan to encompass relevant work	To bring all culverts on significant watercourses to a standard that is fit for purpose To ensure that all culverts are well maintained and managed for both flood and habitat issues. To reduce the need for new culverts and restore more open watercourses with maintenance, flood reduction and habitat generation benefits.	LLFA / Highways
Studies, Assessments & Plans	5.1	Investigation	There is a significant lack of information currently available within MCC on drainage assets. It is proposed that surveys and investigations will be carried out in order to supplement the information already available.	To have information available to identify where measures may be required To have information available to design new measures	LLFA/Drainage Team / Highways
	5.2	Risk Assessments	As part of the requirements of the Flood Risk Regulations the Flood Risk in MCC will be reassessed and the time scale will be in line with the PFRA requirements, developing Flood Risk Management Plans by June 2015. This process will result in a more detailed and accurate picture of the flood risk in MCC.	To provide a more accurate measure of the flood risk within MCC To set a benchmark of flood risk for the County, which will be used to establish the reduction of flood risk as a result of implementing additional measures	LLFA/Drainage Team
	5.3	Strategy Plan	This Local Flood Risk Management Strategy for MCC will provide the framework for the preparation of the Flood Risk Management Plans to be delivered by June 2015. The strategy will ensure that the plans will all be prepared on an equitable basis and will govern the process which will establish what measures are to be implemented in order to achieve the goal of reducing flood risk in all of the areas within MCC where significant flood risk has been identified. The strategy will set in place a system for the prioritisation of measures to be implemented, based on the highest level of flood risk and most appropriate results from the cost benefit analysis process.	Ensure that Flood Risk Management Plans are all prepared in a consistent way	LLFA/Drainage Team
	5.4	Local Property level flood mitigation - resilience	When existing properties are due for refurbishment two quotations will be obtained, one designed with flood resilience in mind and one designed to “normal” building standards. A cost benefit analysis will then be carried out to decide if the additional cost of building in flood resilience is deemed beneficial in that case. Funding will have to be identified to cover the additional cost. There is also potential to use individual property protection measures when considering single or small groups of existing properties Where new buildings and property is planned it will seek to avoid building in flood risk areas. Where this is unavoidable MCC will adopt a policy of using building standards which are resilient to water inundation.	Less damaged will be caused to properties subject to flooding Buildings will be renovated and brought back into use more quickly. The overall cost of the building life cycle will be reduced	EA / Emergency Planning/B Regs / Planning

	5.5	Local Property level flood mitigation - resistance	Where areas of flood risk are identified giving flood water levels below 600mm in depth then measures will be considered which will prevent the ingress of water into individual properties.	Where areas of flood risk are identified giving flood water levels below 600mm in depth then measures will be considered which will prevent the ingress of water into individual properties.	LLFA/Drainage Team
	5.6	Pre-Feasibility Studies / Feasibility Studies	When the Flood Risk Management Plans are being prepared various options will be identified of measures to be implemented. At this stage pre-feasibility studies will be carried out which will identify the measures most likely to achieve the desired reduction in flood risk at appropriate cost.	Ensure that the most appropriate measures are put forward for implementation	LLFA/Drainage Team
	5.7	Project Plans - Option Appraisals	On completion of a pre-feasibility study referred to in Measure 5.6 each measure / scheme will be subjected to an appraisal based on the following criteria: i) Does it contribute the MCC high level strategy of reducing flood risk? ii) What measurable effect does the scheme have on reducing flood risk? iii) Is the scheme within a high priority flood risk area? iv) Does the cost benefit analysis show the scheme to be value for money? v) Is funding available to implement the scheme/ If the scheme satisfies these conditions then it will be forwarded to the Welsh Government for further appraisal.	To identify flood risk in a more precise way Allows the preparation of measures to reduce flood risk	LLFA/Drainage Team
	5.8	Flood Risk Plans	Following the delivery of the updated Flood Maps for Surface Water and the preparation of Flood Hazard and Flood Risk Maps MCC will develop Flood Risk Management Plans for surface water, ordinary watercourses and ground water.	To identify flood risk in a more precise way Allows the preparation of measures to reduce flood risk	LLFA/Drainage Team
High Level Awareness & Engagement	6.1	Partnership Working	Closer working with the other risk management authorities will be pursued together with local communities and relevant partnerships	Collaborative working and integration to prioritise, plan and implement projects that will positively impact upon aims of this strategy. These include not only the implementation of physical projects but education and awareness raising (a Monmouthshire Biodiversity Action Plan Theme)	All
Monitoring	7.1	Monitoring - Waves, Beaches, Aerial Photography and Topographical Surveys	MCC will work with other coastal authorities in Wales and the South West of England, through the Coastal Monitoring Centres to collect data in collaborative ways to maximise data collections at minimum costs in a manner that allows full data sharing. Topographical surveys will be carried out where required to allow construction schemes to be designed as part of the Flood Risk Management Plans Monitoring sites/habitats via aerial photography is possible via the 5 yearly MCC aerial photography undertaken by the Council. This also provides a good historical record for analysis	To enable corrective action to be taken if the effect of flooding Is causing restrictions in channels and water courses. To allow measures to be designed in detail for specific sites. Ability to monitor certain changes without site visit.	LLFA/Drainage & Coastal Team
	7.2	Habitats Monitoring	The monitoring of Sites of Importance for Nature Conservation (SINCs) forms part of LDP monitoring. As SINCs contain the vast majority of quality natural habitats. Local BAP habitats of most relevance include: wetland, rivers and streams, (marshy) grassland; however other habitats will also have major impact such as broadleaved and coniferous woodland.	Monitoring of change (reduction, increase, improvement of natural habitats	

Appendix 6

Monmouthshire Draft Culverting Policy

Appendix 6

Monmouthshire Draft Culverting Policy

Policy statement

We are generally opposed to the culverting of watercourses because of the adverse ecological, flood risk, human safety and aesthetic impacts. Watercourses are important linear features of the landscape and should be maintained as continuous corridors to maximise their benefits to society.

We will consider each application to culvert a watercourse on its own merits and in accordance with our risk-based approach to permitting. We will only approve a culvert if there is no reasonably practicable alternative, or if we think the detrimental effects would be so minor that a more costly alternative would not be justified. In all cases where it is appropriate to do so, applicants must provide adequate mitigation measures, accept sole ownership and responsibility for future maintenance.

We will normally object to proposals to build over existing culverts because of health and safety considerations, increased maintenance costs, and because this would preclude future options to restore the watercourse.

We will actively pursue the restoration of culverted watercourses to open channels.

Objectives

This policy will help us to:

a) provide clarity on our position with respect to culverting in a single statement for both internal and external use;
b) demonstrate how we will take action to protect the continuity and integrity of watercourses;

c) recommend this approach to all parts of the Council, developers, etc. and provide guidance for developers and landowners;

d) make all staff aware of our policy and ensure a consistent approach to culverting.

Explanatory note

Background: why do we need this policy?

Watercourses are valuable features of the landscape for people and wildlife. We have legal duties under the Environment Act 1995 and the Water Framework Directive 2000 to ensure that they are protected and enhanced for the benefit of present and future generations. They provide vital water resources and recreational assets for people, help drain agricultural and urban land and support a diversity of wildlife.

For the purposes of this policy, a culvert is defined as an enclosed artificial channel or pipe that is used to continue a watercourse beneath the ground or a structure. The Flood and Water Management Act 2010 defines a culvert as “a covered channel or pipe which prevents the obstruction of a watercourse or drainage path by an artificial construction”. Culverting can exacerbate the risks of flooding, and increase maintenance requirements and costs. It also destroys wildlife habitats, damages an

attractive natural amenity and interrupts the continuity of the linear corridor of a watercourse. Detrimental effects of culverting are likely to include:

i) increased likelihood of flooding due to obstruction of flow and risk of blockages, and loss of floodwater storage leading to increased impact of flooding;
ii) loss of and adverse effects on natural morphology, fisheries and wildlife habitat including substrate;
iii) the creation of barriers to fish passage through increased water velocities, shallow depths and eroded culvert entrances;
iv) increased river bank and bed erosion downstream of culverted sections;
v) greater difficulties in providing for drainage connections;
vi) increased liabilities and costs due to the need to maintain, repair and replace culverts;
vii) increased health and safety hazards, notably for workers clearing blockages and for children in urban areas;
viii) locally reduced groundwater recharge;
ix) increased difficulty in detecting the origins of pollution and in monitoring water quality.

We will promote this policy to planners and developers, and use it to inform our response to applications to culvert watercourses. We will encourage and promote the removal of culverts where possible to restore a more natural river environment in both urban and rural settings

Legal requirements

Any culverting of an ordinary watercourse, or the alteration of an existing culvert, requires a flood defence consent: Written consent from Monmouthshire, as the Lead Local Flood Authority, is required under Section 23 of the Land Drainage Act 1991. Conditions can be imposed. Monmouthshire Highways and the Trunk Road Agency are required under Section 339 of the Highways Act 1980 to seek the consent of the drainage authority before carrying out any works affecting a watercourse.

On all other watercourses and main rivers, written consent is required under Section 109 of the Water Resources Act 1991 from Natural Resources Wales including an IDD area. In an IDB district, the consent of the IDB is required under the Land Drainage Act 1991.

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Exceptions

We recognise there are situations where culverting may be unavoidable in practice, such as short lengths for access purposes or where highways cross watercourses. In these cases, open span bridges or diversion of the watercourse must be considered first as alternatives to culverts.

Applicants will be required to prove why culverting is both necessary and the only reasonable and practicable alternative, and to provide information to show that it will not have a detrimental effect on flood risk and the habitat(s) and species present, or that mitigation measures can be put in place to reduce these effects.

Where a culvert is deemed to be acceptable, the design should follow the principles in the associated technical guidance:
http://intranet.ea.gov/static/documents/Policy/CulvertsTechnicalGuidance.pdf

The length of any culvert should be restricted to the minimum necessary to meet the applicant's objective. The proposal must include appropriate assessment of flood risk and environmental impact. The applicant should take into account the possible effects of climate change and future development in the catchment on the watercourse when calculating the capacity of the culvert. Mitigation measures such as mammal ledges must be incorporated within the design, and the work must be carried out using best working practice to minimise environmental impact.

References

This section describes the policy drivers.

Nature conservation

EU Habitats (Council Directive 92/43/EEC) and Water Framework Directives (WFD 2000/60/EC)

We are an authority involved with the implementation of the above Directives, which seek to protect water bodies and conserve and enhance habitats and species dependent on water. **Article 10** of the **Habitats Directive,** Paragraph 12 of **Technical Advice Note 5** (Welsh Government policy on biodiversity) encourage the protection and enhancement of natural corridors as they can link habitats and provide routes for the migration, dispersal and genetic exchange of species in the wider environment. The WFD requires us to restore watercourses to good ecological status or good ecological potential and to prevent their deterioration; the maintenance of sediment transport and morphological variability is a key component of this.

We and others should aim to **maintain networks of linked habitats** by avoiding or repairing fragmentation, protecting corridors from development, and, where possible, strengthening or integrating them within it. This will help wildlife to adapt to the inevitable effects of climate change.

Under the **Environment Act (1995), Wildlife and Countryside Act (1981) and the Natural Environment and Rural Communities Act (2006)** we have statutory duties to further and promote the conservation and enhancement of flora and fauna dependent on the aquatic environment.

Conservation of Biological Diversity

The UK is a signatory to the Rio Convention on the Conservation of Biological Diversity, which contains commitments towards the conservation of watercourses. Under the **UK Biodiversity Action Plan** (UK BAP), rivers are a priority habitat and we have lead responsibility for the water and wetlands workstream (England Biodiversity Strategy); and for delivering relevant actions in the Wales Environment Strategy.

Flood risk

The Welsh Assembly Government's **Planning Policy Wales Technical Advice Note (TAN) 15** Development and Flood Risk states that new development should use flood resistant design, should not increase the risk of flooding elsewhere, and that re-development should reduce run-off where possible.

The maintenance and enhancement of open watercourse corridors is a key requirement for achieving the aims of the above legislation and policy commitments such as Defra's Making Space for Water, 2005.

All staff, particularly in Planning, Highways Development and, Flood Risk &Flood and Coastal Erosion Risk Management should comply with and follow this policy.

They should promote the essence of the policy to planning, drainage and highways development, developers, consultants, landowners and the general public. External guidance literature should also be produced.

Appendix 7
Map Data and Analysis Process

Appendix 7

Map Data and Analysis Process

Flood Risk Maps at a County Wide Level and Conclusions drawn from the Analysis

1. Background

1.1 Production of the Maps

Under Part 3 of the Flood Risk Regulations 2009 (FRR 2009) Natural Resources Wales has the duty to prepare for each flood risk areas, flood hazard and flood risk maps related to the risk of flooding from the sea, main rivers and reservoirs while Lead Local Flood Authorities (LLFAs), have the duty to prepare flood hazard and flood risk maps related to surface water flooding for the flood risk areas identified in the PFRAs.

A service level agreement was signed between Welsh Government (WG), Natural Resources Wales (NRW) and the Environment Agency (EA) for the production of these maps and JBA Consultants were contracted to produce the maps on behalf of EA, NRW and LLFAs. The maps were completed last autumn and published as required under the FRR in December 2013.

1.2 The information in the maps

1 Data for each of the modelling probability of flooding – 1 in 30 (3.3%), 1 in 100 (1%) and 1 in 1000 (0.1%) – in any given year

2 Flood extent – the extent of the land that could be affected

3 Flood depth - the depth of flooding

4 Velocity – the velocity of flooding

5 Hazard – the flood hazard rating (defined as a function of the concurrent depth and velocity - see below)

6 Flow direction – the direction of flow, on a 2 metre grid

7 Flow direction – 25m – the direction of flow, displayed on a 25metre grid (to allow viewing a scale of 1:10,000

1.3 Hazard ratings

Hazard has been defined as a combination of velocity (v), depth (d) and a debris factor (DF).
The debris factor has been defined as DF = 0.5 for d < 0.25, DF = 1 for d >= 0.25
Hazard is then calculated using the following formula:
Hazard = ((v +0.5) * d) + DF

1.4 Viewing the maps

The Updated Flood Map for Surface Water (UFMfSW) can be viewed by the public

on:
http://watermaps.environmentagency.gov.uk/wiyby/wiyby.aspx?topic=ufmfsw#x=357683&y=355134&scale=2

The (UFMfSW) can be viewed and downloaded by LLFAs only using the password provided by EA on: http://www.geostore.com/environment-agency/

The risk maps have been generated from the updated Flood Map for Surface Water (uFMfSW) and the National Receptor Dataset (NRD). There are three types of map showing what is at risk of flooding:-

• Risk to People
• Risk to Economic Activity and
• Risk to Natural and Historic Environment

All three of these maps have been taken into account in the preparation of this FRMP.

2 Updated Flood Maps for Surface Water:
2.1 Data used
For the purpose of this Flood Risk Management Plan (FRMP), the Extents maps available from the Geostore website have been used. The extent map reflects the maximum flood extents, shown on the depth, velocity and hazard maps for each probability: 1 in 30, 1 in 100 and 1 in 1000 chance of flooding in any year.
For any one probability there are three sets of raw model outputs: from the 1, 3 and 6 hour rainfall duration model runs. The three sets of raw data for that probability have been combined to a 'critical storm duration' dataset, by adopting the set of results for each cell from whichever of the three runs gave the greatest maximum depth of flooding. This 'critical storm duration' data was then processed to remove:

• shallow/lowest hazard flooding: anywhere with a hazard rating less than 0.575 (equivalent to 150mm of still water, 100mm of water at around 0.5m/s, 50mm of water at 2m/s)

• 'speckles' of flooding: any flooded area of less than 100m2

• "tiny islands": and dry area surrounded by water less than 50m2
This resulted in a 'flood extent' which was used as a boundary to trim the depth, velocity and hazard data so that the datasets cover the same area and we don't get depth without velocity, etc.

This process was repeated for the 1 in 30, 1 in 100 and 1 in 1000, and the three extents published together to show areas at high, medium and low risk of flooding.

Further info can be found on:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/297432/LIT_8988_0bf634.pdf

The maps may be viewed via the following link:
http://www.geostore.com/environment-agency/

2.2 Counts included in this FRMP

1 Risk to people and properties

a. Number of people in areas at risk of flooding - depth >0mm
b. Number of residential properties at risk of flooding – depth >200mm

2 Risk to economic activity

a. Non-residential properties in areas at risk of flooding – depth >0mm
b. Airports
c. Primary/Trunk Roads
d. Main Line Railways
e. Agricultural land – Grades 1, 2 and 3

3 Risk to Natural and Historic Environment

a. Bathing Waters
b. Environmental Permitting Regulations (EPR) Installations
c. Special Areas of Conservation (SAC)
d. Special Protection Areas (SPA)
e. Ramsar Sites
f. World Heritage Sites
g. Sites of Special Scientific Interest (SSSI)
h. Parks and Gardens
i. Scheduled Ancient Monuments
j. Listed Buildings
k. Licensed Abstractions (LA)
l. Sites of Interest for Nature Conservation (SINC)

With the exception of 1b. Above, namely:- Number of residential properties at risk of flooding – depth >200mm, all the counts have been identified by EA/NRW as the relevant counts to be used in this FRMP to consider the flood risk from surface water. Monmouthshire has included this additional count as it seems to be the most appropriate measure of properties likely to be affected by internal flooding.

2.3 Location of information for LLFAs with Flood Risk Areas:

JBA produced these counts as part of the contract but only for the 8 LLFAs within Wales with Flood Risk Areas. The details and figures are available through the link below:

https://www.gov.uk/government/collections/river-basin-districts-flood-risk-maps

A zip file for each LLFA was also made available to download on the following link: https://ea.sharefile.com/d/s7d0d5a6cc894b20b

The zip file contains the data in ESRI Geodatabase shapefile and MapInfo file formats (for spatial querying), and Access database format (for non-spatial querying).

The download also includes the following documentation:

• uFMfSW Property Points Summary Note - explains what the dataset is and what it can be used for

• Detailed document about the uFMfSW Property Points dataset – contains further information about how it was created and how it can be used.

2.4 Analysing the data

Although the majority of the data has been provided by the EA, Monmouthshire has verified the accuracy of the information by carrying out our own counts for people, economic activity and Natural and Historic Environment. The counts were replicated to a very high degree of accuracy giving confidence in the data provided by EA and our own procedures.

2.5 Reference data

The Monmouthshire counts were carried out in accordance with the revised EA methodology and information provided in:

The updated Flood Map for Surface Water (uFMfSW) Property Points dataset.
The following dataset were used to generate the counts:

1 National Receptors Database (NRD) which contains data on listed buildings, scheduled ancient monuments, registered parks and gardens, environmental permitting sites, trunks/primary roads, railways, SSSI's.

2 uFMfSW Property Point Dataset containing residential and non-residential property point data within a defined LA's area. In addition to the standard OS address layer 2 property data, the dataset provides details of the percentage
of a perimeter that is wetted in a P30, P100, and P1000 rainfall event at 6
different depths: 0mm, 150mm, 200mm, 300mm, 600mm, 900mm.

3 Licensed Abstraction spreadsheet: Spreadsheet containing details of all active water extraction licenses within each LLFA.

4 Vector Map District is an open data from OS containing simplified background mapping for reference purposes.

Appendix 8
Glossary of Terms used

Appendix 8

Glossary of Terms used

A

Act – a Bill approved by both the House of Commons and the House of Lords and formally agreed to by the reigning monarch (known as Royal Assent).

AONB – Area of Oustanding National Beauty

B

Bill – a proposal for a new law, or a proposal to change an existing law that is presented for debate before Parliament.

BBNP – Brecon Beacons National Park

C

Catchment – An area that serves a river with rainwater that is every part of land where the rainfall drains to a single watercourse is in the same catchment.

CCW – Countryside Council for Wales

CFMP – Catchment Flood Management Plans – plans that provide an overview of the flood risk across each river catchment and estuary. They recommend ways of managing those risks now and over the next 50 – 100 years.

Climate Change – the change in average conditions of the atmosphere near the Earth's surface over a long period of time.

Coastal erosion – the wearing away of coastline, usually by wind and/or wave action.

Coastal erosion risk – measures the significance of potential coastal erosion in terms of likelihood and impact.

Coastal erosion risk management – anything done for the purpose of analysing, assessing and reducing a risk of the wearing away of coastline.

Coastal Flooding – Occurs when coastal defences are unable to contain the normal predicted high tides that can cause flooding, possible when a high tide combines with a storm surge (created by high winds or very low atmospheric pressure).

Culvert – a covered structure under road, embankment, etc, to direct the flow of water.

D

Defences – A structure that is used to reduce the probability of floodwater or coastal erosion affecting a particular area.

Draft Bill – a Bill published in draft before introduction before Parliament.

Drainage Authorities – Organisations involved in water level management, including IDBs, the Environment Agency and RFCCs.

E

EAW /EA – Environment Agency Wales and Environment Agency – a Welsh Government sponsored Public Body responsible to the Welsh Ministers and an Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs.

F

FCERM – Flood and Coastal Erosion Risk Management.

FCERM Function – defined by Sections 4 and 5 of the Flood and Water Management Act 2010 as being a function, which may be exercised by a risk management authority for a purpose connected with either flood risk management or coastal erosion.

Flood – any case where land not normally covered with water becomes covered by water.

Flood and Water Management Act 2010 – an Act of Parliament updating and amending legislation to address the threat of flooding and water scarcity, both of which are predicted to increase with climate change.

Flood risk – product of the probability of flooding occurring and the consequences when flooding happens.

Flood risk management – the activity of understanding the probability and consequences of flooding, and seeking to modify these factors to reduce flood risk to people, property and the environment. This should take account of other water level management and environmental requirements, and opportunities and constraints.

Flood risk management measures – The way in which flood risks are to be managed.

Flood Risk Management Wales (FRMW) – The Regional Flood and Coastal Committee (RFCC) for Wales

Flood Risk Regulations 2009 – Regulations which transpose the EC Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) into domestic law and to implement its provisions.

Floodline Warnings Direct – is a free service that provides flood warnings direct to you by telephone, mobile, email, SMS text message and fax.

G

Groundwater – water held underground in the soil or in pores and crevices in rock.

Groundwater Flooding – Occurs when water levels in the ground rise above the natural surface. Low lying areas underlain by permeable strata are particularly susceptible.

H

Habitats Regulation Assessment (HRA) – the Conservation of Habitats and Species Regulations (SI 490, 2010), Termed the 'Habitats Regulations', implements the EU 'Habitats Directive' (Directive 92/43/EEC) on the Conservation of natural habitats and of wild flora and fauna) and certain elements of the 'Birds Directive' (2009/147/EC). This legislation provides the legal framework for the protection of habitats and species of European importance in Wales.

I

IDB – Internal Drainage Board – Independent statutory bodies responsible for land drainage in areas of special drainage need in Wales and England. They are long established bodies operating predominantly under the Land Drainage Act 1991 and have permissive powers to undertake work to secure drainage and water level management of their districts.

L

LLFA – Lead Local Flood Authority – (Local Authority) the County Council or the County Borough Council for the area.

Local Flood Risk: defined within the Flood and Water Management Act 2010 as including surface runoff, groundwater and ordinary watercourses.

Local Flood Risk Strategy: required in relation to Wales by Section 10 of the Flood and Water Management Act 2010 local flood risk strategies are to be prepared by lead local flood authorities and must set out how they will manage local flood risks within their areas.

M

Main River – A watercourse shown as such on the Main River Map, and for which the Environment Agency has responsibilities and powers.

Main River Map – the definitive map showing which watercourses have been classified as a Main River.

N

National Strategy – the "National Strategy for Flood and Coastal Erosion Risk Management: Wales" produced by the Welsh Government in response to the requirement under Section 8 of the Flood and Water Management Act.

O

Ordinary Watercourse – all watercourses that are not designated Main River, and which are the responsibility of Local Authorities or, where they exist, Internal Drainage Boards.

P

PFRA – Preliminary Flood Risk Assessment as required by the Flood Risk Regulations 2009.

R

Reservoir – an artificial lake where water is collected and stored until needed. Reservoirs can be used for irrigation, recreation, providing water for municipal needs, hydroelectric power or controlling water flow.

Resilience – The ability of the community, services, area or infrastructure to avoid being flooded, lost to erosion or to withstand the consequences of flooding or erosion taking place.

RFCC – Regional Flood and Coastal Committee – an Environment Agency committee, responsible for consenting medium and long term plans and operational plans to the Agency's Board and Head Office. Monitors and reports on progress. In Wales there is only one RFCC and this is the FRMW (Flood Risk Management Wales) group.

Risk – measures the significance of a potential event in terms of likelihood and impact. In the context of the Civil Contingencies Act 2004, the events in question are emergencies.

Risk Assessment – A structured and auditable process of identifying potential significant events, assessing their likelihood and impacts and then combining these to provide an overall assessment of risk to inform further decisions and actions

.**Risk Management** – anything done for the purpose of analysing, assessing and reducing a risk

.**Risk Management Authority** – A Welsh risk management authority is defined in Section 6 of the Flood and Water Management Act 2010 as the Environment Agency, a lead local flood authority, a district council for an area for which there is no unitary authority, an IDB for an internal drainage district that is wholly or mainly in Wales and a water company that exercises functions in relation to an area in Wales.

Risk Management Schemes – a range of actions to reduce flood frequency and/or the consequences of flooding to acceptable or agreed levels.

River flooding – occurs when water levels in a channel overwhelms the capacity of the channel.

S

SEA – Strategic Environmental Assessment – A legal requirement in the UK for certain plans and programmes stipulated by the SEA Directive (2001/42/EC), to undergo Strategic Environmental Assessment (SEA). The SEA Directive is implemented in Wales by the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 (SI 2004No. 1656, W170). The purpose of SEA is to provide for a high level of protection of the environment, to ensure the integration of environmental considerations into the preparation and adoption of plans and programmes, and to contribute to the promotion of sustainable development and environmental protection.

Sewer – An artificial conduit, usually underground, for carrying off sewage off sewage (a foul sewer) or rainwater (a storm sewer) or both (a combined sewer).

SMPs – Shoreline Management Plans – A large-scale assessment of the risks associated with coastal processes and helps reduce these risks to people and the developed, historic and natural environments.

Squeeze – In relation to costal squeeze, is the term used to describe what happens to coastal habitats that are trapped between a fixed landward boundary, such as a sea wall and rising sea levels and/or increased storminess. The habitat is effectively 'squeezed' between the two forces and can diminish in quantity and or quality.

Surface Water Flooding – In the urban context, usually means that surface water runoff rates exceed the capacity of drainage systems to remove it. In the rural context, it is where surface water runoff floods something or someone.

Surface water runoff – This occurs when the rate of rainfall exceeds the rate that water can infiltrate the ground or soil.

Sustainable Drainage systems (SUDs) – Helps to deal with excesses of water by mimicking natural drainage patterns.

T

Technical Advice Note 15: Development and Flood Risk – TAN 15 supports Planning Policy Wales and makes it clear how local authorities should make decisions about different types of development on flood plains, providing clear tests for justification and acceptability of flooding consequences, and enabling the consideration of risks over the lifetime of the new development.

W

Watercourse – A channel natural or otherwise along which water flows.

Water Company – a company which hold an appointment under Chapter 1 of Part 2 of the Water Industry Act 1991 or a licence under Chapter 1A of Part 2 of that Act.

Welsh Local Government Association (WLGA) – represents the interests of Local Authorities in Wales. The three fire and rescue authorities, four police authorities and three national park authorities are associate members.

WFD – Water Framework Directive

Appendix 9
List of Documents Consulted

Appendix 9

List of Documents Consulted

1 MCC Information

1 Monmouthshire County Council – Adopted Local Development Plan

2 MCC Corporate Flood Response Arrangements

3 MCC Emergency Management Plan

2 Natural Resources Wales & Environment Agency Information

1 Land Management CFMP Tool – Development of a software tool to investigate the potential impact of changes in rural land use and land management on flood generation – Environment Agency

2 Improving the flood performance of new buildings Flood resilience construction – May 2007 – Consortium managed by CIRIA – Department for Communities and Local Government: London – Communities and Local Government, Environment Agency, DEFRA

3 Usk Catchment Flood Management Plan Summary Report - January 2010 Managing Flood Risk – Environment Agency Wales

4 Wye Catchment Flood Management Plan Summary Report - January 2010 Managing Flood Risk – Environment Agency Wales

5 Preparing your property for flooding – A guide for householders and small businesses – Environment Agency

6 Personal Flood Plan – Environment Agency

7 Flooding from groundwater – Practical advice to help reduce the impact of flooding from groundwater – Local Government Association – Environment Agency

8 Flood and Coastal Risk Management Appraisal Guidance (FCERM-AG)

9 Water for life and livelihoods – River Basin Management Plan Severn River Basin District – Defra – Welsh Assembly Government and Environment Agency

3 Welsh Government Information

1 National Strategy for Flood and Coastal Risk Management in Wales - November 2011 – Welsh Government

2 Local Flood Risk Management Strategies – Local Strategy – November 2011 – Welsh Government

3 Strategic Environmental Assessment – Statement of Environmental Particulars – Flood and Coastal Erosion Risk Management: Development of a National Strategy for Wales – June 2011 – Welsh Government

4 Flood Risk Management – Community Engagement Toolkit – October 2011 – Welsh Government

5 Adapting to Climate Change: Guidance for Flood and Coastal Erosion Risk Management Authorities in Wales – December 2011 – Welsh Government

6 Sustainable Development: Guidance to Risk Management Authorities Section 27 – Sustainable Development – November 2011 – Welsh Government

7 Planning Policy Wales Technical Advice Note 15: DEVELOPMENT AND FLOOD RISK – July 2004 – Welsh Assembly Government

8 Habitat Regulations Assessment: Flood and coastal Erosion Risk Management: Development of National Strategy for Wales – June 2011

9 Strategic Environmental Assessment – Environmental Report – Flood and Coastal Erosion Risk Management: Development of a National Strategy for Wales – Welsh Assembly Government – 10 May 2011

10 National Principles of Public Engagement in Wales – Participation Cymru – Welsh Government

11 Practitioner's Manual for Public Engagement - Participation Cymru – Welsh Government – March 2012

4 Legislation

Public Health Act (1936

Reservoirs Act (1975)

Highways Act (1980)

Wildlife and Countryside Act (1981)

Land Drainage Act 1991

Countryside and Rights of Way Act (2000)

The Strategic Environmental Assessment (SEA) Directive (2001)

The Civil Contingencies Act (2004)

Natural Environment & Rural Communities Act 2006
The Water Framework Directive (2007)

The Climate Change Act (2008)
Flood Risk Regulations 2009

Flood and Water Management Act 2010

The Conservation of Habitats and Species Regulations (2010)
Sustainable Development Bill (White Paper expected in Autumn 2012

5 Other

1 The Effects of Flooding on Mental Health – December 2011 – Health Protection Agency

2 Codes for Sustainable Homes – Technical Guide – November 2010 – Department for Communities and Local Government

3 Brecon Beacons National Park Deposit Local Development Plan

4 South Wales Regional Waste Plan

END OF FRMP