



## Local Flood Risk Management Strategy



April 2013



# CAERPHILLY COUNTY BOROUGH COUNCIL

## LOCAL FLOOD RISK MANAGEMENT STRATEGY

### Content

1	Executive Summary	4
2	Introduction	10
3	The Risk Management Authorities in the Local Authority's Area	17
4	The flood risk management functions that may be exercised by the Risk Management Authorities within Caerphilly County Borough Council	19
5	The objectives for managing local flood risk	23
6	The measures proposed to achieve objectives	37
7	How and when the measures are expected to be implemented	91
8	The costs and benefits of those measures, and how they are to be paid for	92
9	The assessment of local flood risk for the purpose of the strategy	97
10	How and when the strategy will be reviewed	100
11	How the strategy contributes to the achievement of wider environmental objectives	101

### Appendices

1	The Risk Management Authorities	106
2	National Strategy	114
3	Datasets available on the EA DataShare Website	116
4	Relevant Policy, Regulations and Legislation	117
5	Glossary of Terms used within the Guidance	119
6	List of documents Consulted	123
7	Consultations	125
8	Detailed Objectives and Measures Table	127

## THEMES AND MEASURES

		<b>Page</b>
<b>6.13</b>	<b>Development Planning and Adaption</b>	
6.13.1	Sustainable and Strategic Development Planning	44
6.13.2	Strategic Flood Risk Assessment (SFRA) / Strategic Flood Consequences Assessment (SFCA)	46
6.13.3	Water Cycle Strategies	47
6.13.4	Relocation	48
6.13.5	Mineral Plans	49
6.13.6	Waste Plans	50
6.13.7	Sustainable Drainage (SuDS)	51
6.13.8	Contaminated Land	53
6.13.9	Scheduled Ancient Monuments and Listed Buildings	55
6.13.10	Conservation Areas, Registered Historic Parks and Gardens and Historic Landscapes	56
<b>6.14</b>	<b>Flood forecasting, Warning and Response</b>	
6.14.1	Planning and Response Awareness	57
6.14.2	Flood Awareness	58
6.14.3	Flood Warning	59
6.14.4	Flood Forecasting	61
6.14.5	Emergency Response Plans	61
6.14.6	Community Flood Plans	62
6.14.7	Multi-Agency Flood Plans	63
6.14.8	Major Incident Plans	64
<b>6.15</b>	<b>Land, Cultural and Environmental Management</b>	
6.15.1	Land Management	65
6.15.2	Resilience	66
6.15.3	Resistance	67
6.15.4	Restoration	68
6.15.5	Environmental Enhancement	69
6.15.6	Water Bodies	70
6.15.7	Habitat Creation	71
6.15.8	Control of Invasive Species	73
6.15.9	Soil Management Plans	74
<b>6.16</b>	<b>Asset Construction Management and Maintenance</b>	
6.16.1	System Asset Management Plans	75
6.16.2	Defence/Structure Management and New Construction	76
6.16.3	Channel Maintenance and New Construction	76
6.16.4	Culverts, Gullies, Highway and Culvert Infrastructure Maintenance and New Construction	78

## THEMES AMD MEASURES (Continued)

	Page	
<b>6.17</b>	<b>Studies, Assessments and Plans</b>	
6.17.1	Investigation	80
6.17.2	Risk Assessment	82
6.17.3	Strategy Plan	82
6.17.4	Local Property - Flood Mitigation – Resilience	83
6.17.5	Local Property - Flood Mitigation – Resistance	84
6.17.6	Pre-feasibility Studies, Feasibility Studies	84
6.17.7	Project Plans	85
<b>6.18</b>	<b>High Level Awareness and Engagement</b>	
6.18.1	Partnership Working	85
<b>6.19</b>	<b>Monitoring</b>	
6.19.1	Erosion Monitoring	86
6.19.2	Habitats Monitoring	86
6.19.3	Topographical Survey	87
6.19.4	Aerial Photography	87



# CAERPHILLY COUNTY BOROUGH COUNCIL

## LOCAL FLOOD RISK MANAGEMENT STRATEGY

### 1 Executive Summary

1.1 The Flood Risk Regulation (The Regulations) came into force in December 2009 and the Flood and Water Management Act (The Act) became law in April 2010. Under this legislation Caerphilly Council Borough Council (CCBC) has been identified as a Lead Local Flood Authority (LLFA) and has been given a number of key responsibilities.

1.2 The purpose of The Regulations is to transpose the European Commission (EC) Floods Directive (2007/60/EC), on the assessment and management of local flood risk, into domestic law in England and Wales and to implement its provisions.

In particular, it places duties on the LLFA to prepare a number of documents including:-

- 1 **Preliminary Flood Risk Assessment Report – Approved 22<sup>nd</sup> June 2011**
- 2 **Flood Hazard and Flood Risk Maps to be completed, approved by Welsh Government and forwarded to the EU by 22<sup>nd</sup> June 2013**
- 3 **Flood Risk Management Plans to be completed, approved by Welsh Government and forwarded to the EU by 22<sup>nd</sup> June 2015**

1.3 In addition, CCBC must develop, maintain, apply and monitor a strategy for local flood risk management.

This document - **The Caerphilly County Borough Council – Flood Risk Management Strategy**, sets out to satisfy the requirements of The Act.

The Act identifies 9 issues that must be addressed within the Strategy. They are listed below and a section of the report is given to each one:

- 1 **The Risk Management Authorities in the Local Authority's area.**
- 2 **The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area.**
- 3 **The objectives for managing local flood risk.**
- 4 **The measures proposed to achieve those objectives.**
- 5 **How and when the measures are expected to be implemented.**

- 6 The costs and benefits of those measures, and how they are to be paid for.**
- 7 The assessment of local flood risk for the purpose of the strategy.**
- 8 How and when the strategy is to be reviewed.**
- 9 How the strategy contributes to the achievement of wider environmental objectives.**

#### 1.4 **Methodology**

The methodology to identify flood risk and the level of risk in CCBC was set out in the Preliminary Flood Risk Assessment (PFRA), which was approved by the Welsh Government on 22<sup>nd</sup> June 2011.

The methodology is based on using the flood maps produced by the Environment Agency Wales (EAW). These were used to identify 1km grid squares where flood risk exceeded a defined threshold. These squares are known as Areas Above Flood Risk Threshold (Blue Squares). The key flood risk indicators and their thresholds are as follows:-

- 1 A minimum of 200 people
- 2 A minimum of 20 businesses
- 3 2 or more critical services

The EAW has identified 59 Blue Squares within CCBC. Where clusters of these Blue Squares occur, it identifies an area of concentrated flood risk. Where four or more Blue Squares are contiguous within a 3km x 3km Square, the whole 3km x 3km square has been considered as an area that could form part of an indicative Flood Risk Area.

The key flood risk indicator for establishing an indicative Flood Risk Area is the numbers of people at risk of being affected by flooding. If there is a minimum of 5,000 people within a series of connecting 3km x 3km grids, as identified above, then an indicative Flood Risk Area has been identified.

#### 1.5 **Level of Flood Risk**

Of the 59 Blue Squares have been identified, using the methodology defined above, 47 of these squares are contained within the Flood Risk Area.

This is shown in Fig 2 CCBC Flood Risk Area and Blue Squares – Section 9 – The assessment of local flood risk for the purpose of the Strategy

The Key Flood Risk Indicators for the CCBC Flood Risk Area have been calculated as follows:-

1	Human health consequences – Number of people (2.23 multiplier)	16,141
2	Other human health consequences – Number of critical services flooded	69
3	Economic consequences – number of non-residential properties flooded	1,955



**Flooding from a Blocked Culvert in an Ordinary Watercourse**

**1.6 CCBC has set a high level strategy as follows:-**

**“To Reduce Flood Risk in every area where significant flood risk has been identified”.**

1.7 The National Strategy, prepared by the Welsh Government, has set out four Overarching Objectives for the management of flood risk. In considering its strategy CCBC has identified 19 Detailed Objectives that will seek to realise the Overarching Objectives. The Objectives are:

**Overarching Objective 1**

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

- 1 Reduce the number of people exposed to the risk of flooding.
- 2 Reduce the number of residential and commercial properties affected by the risk of flooding.
- 3 Reduce the number of people exposed to risk of flooding of significant depth and velocity.
- 4 Reduce disruption to critical infrastructure or prepare plans to allow the operations to be maintained.
- 5 Protect and enhance Natura 2000 (N2K Sites)
- 6 Protect and enhance Sites of Special Scientific Interest (SSSIs)
- 7 Protect and enhance Sites of Importance for Nature Conservation (SINCs)
- 8 Contribute to the delivery of Caerphilly Biodiversity Action Plan (BAP)
- 9 Minimise damage to known historic areas and sites: Scheduled Ancient Monuments, Listed Buildings, Conservation Areas, Registered Historic Parks and Gardens and Registered Historic Landscapes.

## **Overarching Objective 2**

### **Raising awareness of and engaging people in the response to flood.**

- 10 Provide systems to give early warning of potential flooding to individuals and communities.
- 11 Provide efficient systems for the management and maintenance of surface water assets and drainage systems .
- 12 Reduce economic damage
- 13 Endeavour to reduce cost of management

## **Overarching Objective 3**

### **Providing an effective and sustained response to flood events through.**

- 14 Creating natural channels and water bodies with minimal modifications
- 15 Improving water quality
- 16 Providing Flood Risk Management Plans for each area subject to flood risk
- 17 Ensuring that measures are designed and constructed in a sustainable way

- 18 Ensuring that CCBC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities

#### **Overarching Objective 4**

##### **Prioritising investment in the most at risk communities.**

- 19 Ensuring that investment decisions are prioritised in the most at risk communities on a consistent, defensible basis and are subject to cost benefit analysis.
- 1.8 The Welsh Government has given, for consideration, a list of measures under the following high level themes:
- 1 Development planning and adaptation (encompassing both new and adaptations to existing developments/landscapes).**
  - 2 Flood forecasting, warning and response.**
  - 3 Land, cultural and environmental management.**
  - 4 Asset management and maintenance.**
  - 5 Studies assessments and plans.**
  - 6 High level awareness and engagement (to increase individual and community resilience).**
  - 7 Monitoring (of the local flood risk issues).**
- 1.9 CCBC has identified a total of 43 detailed measures which will ensure the delivery of The Strategy and the Objectives contained in it.
- The measures have been identified within three categories:
- 1 Prevention of flooding**
  - 2 Preparedness for flooding**
  - 3 Protection against flooding**
- Each measure has been given a time scale for implementation as follows:
- 1 Short term 0 – 20 years**
  - 2 Medium term 20 – 50 years**
  - 3 Long term 50 – 100 years**

**1.10 This Strategy has been developed on the following principles:**

- 1 A high level objective has been set to reduce flood risk in the County Borough Area, as set out in the Local Flood Risk Management Strategy.**
- 2 The four overarching objectives, as defined in the National Flood Risk Management Strategy document, have been used as the framework on which the strategy has been developed.**
- 3 A series of low level objectives have been adopted in order to satisfy the requirements of the four overarching objectives.**
- 4 The seven themes identified in the Local Flood Risk Management Strategy Guidance for delivery of the strategy have been adopted by CCBC**
- 5 Measures, both hard and soft, have been identified in order to implement the objectives under each theme.**
- 6 In addition the strategy aims to satisfy additional requirements including collaborative working with other Risk Partners and Sustainable development.**
- 7 The strategy also aims to interface with other major strategies and plans developed by CCBC and various external bodies.**

**1.11 In order for The Strategy to be successful it is essential that significant funding be made available in addition to the normal funding arrangements from Welsh Government. This funding will be required to cover the following operations:**

- 1 Development of the Flood Risk Management Plans (FRMP) for each of the areas subject to significant levels of flood risk.**
- 2 Investigations to allow the Flood Risk Management Plans to be prepared**
- 3 Funding at a much more significant level will be required in order to implement the measures which will be identified as part of the Flood Risk Management Plans.**

## CAERPHILLY COUNTY BOROUGH COUNCIL

### LOCAL FLOOD RISK MANAGEMENT STRATEGY

#### 2 Introduction

2.1 The Flood Risk Regulations came into force in December 2009 and the Flood and Water Management Act became law in April 2010. Under this legislation Caerphilly Council Borough Council (CCBC) has been identified as a Lead Local Flood Authority (LLFA) and has been given a number of key responsibilities.

2.2 The purpose of the Flood Risk Regulations is to transpose the European Commission (EC) Floods Directive (2007/60/EC), on the assessment and management of local flood risk, into domestic law in England and Wales and to implement its provisions.

In particular it places duties on the LLFAs to prepare a number of documents including:-

- 1 **Preliminary Flood Risk Assessment Report - 22<sup>nd</sup> June 2011**  
(Completed, approved by Welsh Government and forwarded to the EU)
- 2 **Flood Hazard and Flood Risk Maps to be completed by 22<sup>nd</sup> June 2013**
- 3 **Flood Risk Management Plans to be completed by 22<sup>nd</sup> June 2015**

The Flood Risk Management Plans will be used to develop a list of measures, applicable to the area of the plan, which will endeavour to achieve the objectives set by this Strategy.

2.3 In addition CCBC must develop, maintain, apply and monitor a strategy for local flood risk management.  
This document –

#### **Caerphilly County Borough Council Local Flood Risk Management Strategy**

sets out to satisfy this requirement of the Flood and Water Management Act 2010.

2.4 Managing local flood risk is the responsibility of each LLFA. The Strategy sets out the Risk Management Authorities in CCBC and their relevant functions. In developing The Local Strategy CCBC has consulted with the public and the other Risk Management Authorities who are affected by the strategy.

2.5 Local flood risk is defined within the Act as being a flood risk from:

- 1 Ordinary watercourses (a watercourse that does not form part of a main river, includes a lake, pond or other area of water, which flows into an ordinary watercourse)
- 2 Surface runoff (rainfall or other precipitation which is on the surface or ground and has not entered a watercourse drainage system or public sewer)
- 3 Ground water (water that has percolated into the ground and may form underground ponds or streams, which may discharge above ground but lower down the catchment).

## 2.6 Catchment Characteristics

The terrain within CCBC is typical of all the valleys of South East Wales. The catchments consist of steep hillsides, which are generally formed of impermeable clay overlaying various rock strata, with steep flowing rivers in the valley floor. This combination of characteristics leads to the catchments being very “flashy”, meaning that runoff from storms is almost instantaneous giving rise to high flows, which generally subside very quickly in a time scale of minutes rather than hours or days. This is particularly relevant to surface water runoff and ordinary watercourses.

The Environment Agency have a supervisory duty on Main River Watercourses e.g. River Taff, under the requirements of the Water Resources Act 1991. Whilst these tend to be larger than the other “Ordinary” Watercourses within Caerphilly CBC, they still rapidly respond to rainfall within hours as opposed to days”.

## 2.7 Groundwater

Groundwater flow, although not a major problem in CCBC, is somewhat different to surface water runoff as rainwater has to penetrate through the clay before percolating through the rock strata and into the old mine workings. When the coalmines were operational groundwater was controlled by pumping excess water into local drainage systems. Existing culverts or ordinary watercourses were used before the water discharged into local rivers. Since the closure of the mines pumping has ceased and many of the mine workings have filled with water. The water generally escapes through old mine entrances such as adits and mine shafts. Occasionally water from old mine workings discharges in unexpected locations.

The Strategy will allow for investigation of the location of mine water flows and their likely volume, if there is evidence to indicate that such flows could present a flood risk.

It is also common for mine water to be coloured red, which is usually a sign that the water is ferruginous meaning that it contains iron salts, which are detrimental to the quality of the water below the discharge.



It is proposed that, if required, measures will be introduced that will remove the iron salts from the mine water and thus improve the quality of the water downstream of the discharge.

## 2.8 Surface Water Runoff

Flooding from surface water runoff is usually caused by intense rainfall either after periods of persistent rainfall, which has saturated the catchment, or following a period of dry weather causing the ground surface to become hard and impermeable. Both scenarios result in high runoff characteristics of the catchment leading to high peak flows.

Flooding in these circumstances is often exacerbated by lack of cut off ditches and drains, ditches being filled in or piped, or the poor maintenance of ditches and watercourses by riparian owners. Damage to stream and other drains may also be caused by developers or livestock.

Increases to the runoff characteristics of the catchment may be caused by farmers ploughing at right angles to contours rather than parallel to them, removal of top soil, removal of vegetation including the felling of trees or other site clearance. Runoff will be altered if an area is subject to a new development such as housing. These issues are all likely to give rise to increases in surface water flows. Controls will be imposed to restrict the maximum rate of runoff from these developments to a level no greater than the existing although the total runoff may increase.



**Surface Water Flooding**

## **2.9 Highway Drainage**

Flooding from highway drainage usually takes place as a result of short duration storms of very high intensity. Flooding often commences due to the inability of gullies to take the volume of water. This is usually as a result of gullies being blocked by debris washed off the roads into the gullies. CCBC mitigate the effects of gullies blocking by having an operational procedure that ensures all gullies are cleaned a minimum of once a year and in areas which have been identified as being at high risk of flooding up to three times a year.

Highway drainage may also be a source of pollution from hydrocarbons. This usually accrues when prolonged dry periods are followed by intense rainfall. This is particularly adverse for the first flush of runoff. The Management Plans will look at the possibility of installing measures such as swales and reed beds that will improve water quality.

## **2.10 Ordinary Watercourses**

The most frequent form of flooding in ordinary watercourse arises from the blockage of grids at the entrance to the culverts. This usually occurs when intense rainfall causes leaf fall and other vegetation to enter the watercourse resulting in a build up of debris at the front of the grids. CCBC have an operational procedure which is designed to minimise this risk by carrying out routine maintenance and pre-emptive cleaning prior to heavy rain when forecast.

Measures will be introduced to replace substandard grids with grids designed to modern standards including additional upstream sacrificial grids.

Flooding may also occur as a result of culvert failure due to the collapse of sidewalls and roofs or the scouring of culvert invert. This is particularly prevalent in older systems many of which have already exceeded their design life.

Flooding may also be caused by inadequate maintenance which is normally the responsibility of the riparian owners. Capacities of pipes are often significantly reduced by the build up of silt and debris within the culverts.

This is difficult to manage proactively as it requires a significant level of resources to effectively inspect all culverts, therefore inspections will be restricted to systems where there is evidence that the capacity has been adversely affected.

Although culvert capacity has not been found to be the most significant form of flooding within ordinary watercourses it will need to be considered as part of this Strategy. Surveys and calculations will be carried out to determine the maximum flow rates within significant culverts by consideration of intake conditions and hydraulic capacities. More detailed runoff calculations will be carried out to the same catchments and where pipes are shown to be of inadequate capacities consideration will be given to improving the intake. In exceptional circumstances replacement with suitably sized alternatives or

the construction of additional relief culverts and/or channels will be considered.

Illegal connections to existing culverts and the culverting of watercourses without consent could present a potential source of flooding. It is anticipated that if illegal works are identified the Council as the LLFA will utilise its recently acquired powers to remedy the situation.

## **2.11 Channels**

Flooding within channels is usually caused by lack of maintenance. Where channels are in the ownership of CCBC operational procedures are in place to ensure that the capacity of the channel is not impaired. Inspection of culverts is carried out on a regular basis and debris removed. The grass is not usually cut as this is helpful in the reduction of pollution. Trees and shrubs are not usually removed as their root system often helps to stabilise the ditches. However, where flows are impeded trees and shrubs will be cut back as appropriate.

## **2.12 Combined Sewers**

There are numerous combined sewers within the borough that take both foul sewage and surface water. These are all in the ownership of Dŵr Cymru / Welsh Water. Flows in these pipes are usually controlled through the installation of Combined Sewer Overflows (CSOs), which causes excess surface water to be removed from the system and discharged into natural drainage channels.

This method of controlling flows causes sewage to be discharged into the surface water drainage system and has an affect on the quality of the water.

CCBC will work collaboratively with our risk partner Dŵr Cymru / Welsh Water to identify all CSOs and to establish their efficiency and the quality of the water being discharged.

Where necessary CCBC will expect Dŵr Cymru / Welsh Water to introduce measures that will reduce the quantity of foul sewage being discharged from the Combined Sewer System.

2.13 Caerphilly County Borough Council, as a LLFA, has developed The Strategy taking account of the four overarching objectives for flood and coastal erosion risk management in Wales, as set out in the Welsh Government's National Strategy. (See clause 5.1)

2.14 The Environment Agency has developed a table in relation to the key sustainability pillars of social, economic and environmental risk objectives. As part of this strategy CCBC has considered objectives under each of the three pillars, where they are relevant to the authority.

- 2.15 The Act has placed a number of statutory duties on Local Authorities in their new role as LLFA including:-
- 1 A duty to prepare local flood risk management strategies.
  - 2 A duty to comply with the National Strategy.
  - 3 A duty to co-operate with other authorities, including sharing data.
  - 4 A duty to investigate all flooding within its area, insofar as the LLFA consider it necessary or appropriate.
  - 5 A duty to maintain a register of structures and features likely to affect flood risk.
  - 6 A duty to contribute to sustainable development.
  - 7 Consenting powers on Ordinary Watercourses
- 2.16 In addition to these duties, each LLFA has a number of permissive powers, which make provision for a LLFA to act in respect of flood risk management. These powers do not, however, require a LLFA to act; rather they allow action to be taken if required. The permissive powers include:-
- 1 Powers to request information.
  - 2 Powers to designate certain structures or features that affect flood or coastal erosion risk.
  - 3 The expansion of powers to undertake works to include broader risk management actions.
  - 4 The ability to cause flooding or coastal erosion under certain condition.
- 2.17 LLFA in Wales will also take on the role of the Sustainable Drainage System (SuDS) Adopting and Approving Body in relation to sustainable drainage systems. In this role they will be responsible for both approving the original design of the SuDS and adopting and maintaining the finished system. The consenting of works in ordinary watercourses has also been transferred to the LLFA from the Environment Agency.
- 2.18 The allocation of responsibility for local flood risk is replicated in the Flood Risk Regulations 2009. These Regulations allocate specific responsibility to LLFAs for conducting assessments in relation to mapping and planning for flood risk areas identified in the assessment and for the risks of flooding for everything other than main rivers, the sea and reservoirs.

2.19 Section 10(4) of the Act, sets out the following requirements for what must be included within a Strategy:-

- 1 The Risk Management Authorities in the Local Authority's area.
- 2 The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area.
- 3 The objectives for managing local flood risk.
- 4 The measures proposed to achieve those objectives.
- 5 How and when the measures are expected to be implemented.
- 6 The costs and benefits of those measures, and how they are to be paid for.
- 7 The assessment of local flood risk for the purpose of the strategy.
- 8 How and when the strategy is to be reviewed.
- 9 How the strategy contributes to the achievement of wider environmental objectives.

2.20 LLFAs must submit a signed-off draft of their Local Strategy and any associated guidance to the Welsh Government for review, allowing at least two months for a response.

The Strategies must to be submitted to, the Welsh Government for approval by the end of January 2013.

Upon receipt, the Welsh Government may approve the Strategy and any associated guidance, with or without modification, or reject it.

This document has been prepared by Caerphilly County Borough Council to meet this requirement

### **3 The Risk Management Authorities in the Caerphilly County Borough Council Area**

On the 1<sup>st</sup> April 2013 a new single body will bring together the functions of the Countryside Council for Wales, the Environment Agency Wales and the Forestry Commission Wales. On the 25<sup>th</sup> October 2012, Welsh Government announced that the single body is to be named National Resource Wales. However, as this Strategy predates the implementation of the new single body, the organisations involved will continue to be referred to individually.

#### **3.1 Environment Agency Wales (Part of National Resources Wales from 1<sup>st</sup> April 2013)**

#### **3.2 Lead Local Flood Authority Caerphilly County Borough Council**

#### **3.3 Water Company Dŵr Cymru – Welsh Water**

#### **3.4 Additional Risk Partners Internal Partners (Caerphilly County Borough Council)**

- Planning Department
- Emergency Planning
- Environmental Health
- Finance

#### **External Partners**

- Flood Risk Management Wales(RFCC)
- Emergency Services
  - South Wales Fire and Rescue Service
  - Welsh Ambulance Services NHS Trust
  - Gwent Police
- National Flood Forum
- National Farmers Union
- Welsh Office of NFU
- National House Builders
- Network Rail
- Community and Town Councils
  - Aber Valley Community Council
  - Argoed Community Council
  - Bargoed Town Council
  - Bedwas, Trethomas and Machen Community Council
  - Blackwood Town Council
  - Caerphilly Town Council
  - Darren Valley Community Council
  - Draethen, Waterloo and Rudry Community Council
  - Gelligaer Community Council
  - Llanbradach and Pwllpant Community Council
  - Maesycwmmer Community Council
  - Nelson Community Council
  - New Tredegar Community Council
  - Penyrheol, Trecenydd and Energlyn Community Council
  - Rhymney Community Council
  - Van Community Council

Gwent Local Resilience Forum  
Countryside Council for Wales (Part of National Resources  
Wales from 1<sup>st</sup> April 2013)

SWTRA – South Wales Trunk Road Agency  
Forestry Commission Wales (Part of National Resources Wales  
from 1<sup>st</sup> April 2013)

CADW

#### **4 The flood risk management functions that may be exercised by the Risk Management Authorities (RMA) in relation to Caerphilly County Borough Council**

- 4.0.1 When exercising their flood risk management functions, or in exercising any other function in a manner that may affect flood risk, all RMAs (except water companies), are required to act in a manner consistent with both the Local and National Strategies, and any associated guidance.
- 4.0.2 In exercising any other function in a manner which may affect a flood risk , a Welsh Risk Management Authority must have regard to both the National and Local Strategies and any associated guidance.
- 4.0.3 Effective joint working between RMAs is fundamental to the effective delivery of the obligations under the Act. This is appreciated within the Act itself, which imposes a duty on all RMAs to co-operate in order to facilitate partnership working, the sharing of information and enhance communications.

#### **4.1 Environment Agency Wales**

- 4.1.1 The Environment Agency Wales is a Welsh Government Sponsored Public Body, whose principal aims are to protect and improve the environment, and to promote sustainable development.
- 4.1.2 Historically the Environment Agency has led on the management of the risks of flooding from main 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 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.
- 4.1.3 This change means that the Environment Agency has a dual role:-
  - 1 Operational responsibilities for flooding from main rivers, the sea and coastal erosion.
  - 2 Oversight responsibilities in relation to all flood and coastal erosion risk management in Wales
- 4.1.4 The oversight responsibilities are integral to the delivery of a 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.



- 4.1.5 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, and the national raising awareness programme, acting as the single point of contact for enquiries and information on flood risk. This is currently being piloted via their Floodline Warning Service.
- 4.1.6 The Flood and Water Management Act 2010 places a number of statutory duties on the Environment Agency including:
- 1 Co-operating with other authorities, including sharing data.
  - 2 Reporting to the Minister on flood and coastal erosion risk in Wales including the application of the National Strategy.
  - 3 The establishment of Regional Flood and Coastal Committees.
- 4.1.7 The Environment Agency will be the sole Risk Management Authority charged with monitoring and reporting on the National Strategy's implementation. In undertaking this role they will:
- 1 Collect data on progress from Risk Management Authorities using existing avenues wherever possible.
  - 2 Report factual information to Welsh Government.
  - 3 As requested, provide interpretive advice to the Welsh Government.
- 4.1.8 In addition to their statutory duties, the Environment Agency has a number of what are called permissive powers, namely:
- 1 To request information.
  - 2 To raise levies for local flood risk management works, via the Regional Flood and Coastal Committees.
  - 3 To designate certain structures or features that affect flood or coastal erosion risk.
  - 4 To undertake works to include broader risk management actions.
  - 5 To cause flooding or coastal erosion under certain conditions.
- 4.1.9 This new allocation of responsibilities is also consistent with the Environment Agency's role in relation to The Regulations, which allocates specific responsibility for conducting assessments in relation to mapping and planning the risks of flooding from main rivers, the sea and reservoirs to the Environment Agency, as well as providing guidance to Local Authorities on these matters for flooding from other sources.

- 4.1.10 Under the Regulations the Environment Agency also take on an assessment and coordination role at a national level, ensuring the correct information is passed back to the European Commission.

## **4.2 Lead Local Flood Authority (LLFA) Caerphilly County Borough Council**

- 4.2.1 Within the Act, Caerphilly County Borough Council has been established as a LLFA for its administrative area. CCBC is also the highway authority for the area, having responsibility for managing all adopted highways that are not included within remit of the National Trunk Road Agency.
- 4.2.2 Under the term of the Act, a LLFA is responsible for local flood risk. This includes the risk of flooding from ordinary watercourses, surface runoff and ground water.
- 4.2.3 Local Authorities have always had certain responsibilities in relation to ordinary watercourses, and in practice most Local Authorities took the lead in dealing with surface water flooding incidents prior to the changes contained within the Flood and Water Management 2010. This is, however, the first time responsibility for the risk of flooding from surface runoff has been allocated to any body by law.
- 4.2.4 To fully enable a LLFA to implement their new roles and responsibilities in respect of local flood risk certain functions previously held by the Environment Agency have been transferred. This includes (from April 2012) taking responsibility for the consenting and licensing of all works on ordinary watercourses.
- 4.2.5 The allocation of responsibility for local flood risk is replicated in the Regulations. These Regulations allocate specific responsibility to LLFAs for conducting assessments in relation to, and mapping and planning (for flood risk areas identified in the assessment) for, the risk of flooding from everything other than the main rivers, the sea and the reservoirs.

## **4.3 Dŵr Cymru – Welsh Water**

- 4.3.1 Water companies, when exercising their flood or coastal erosion risk management functions in relation to an area within Wales, must have regard to the relevant Local Strategies and any associated guidance
- 4.3.2 Water and sewerage companies are responsible not only for the provision of water, but also for making appropriate arrangements for the drainage of foul water, the treatment of waste, surface water sewers and combined sewers. They have primary responsibility for floods from water and sewerage systems, which can include sewer flooding, burst pipes or water mains or floods caused by system failures.

- 4.3.3 No changes have been made to the operational arrangements for water and sewerage companies in respect of flood risk.
- 4.3.4 The Act places a number of statutory duties on water and sewerage companies including:
- 1 To act consistently with the National Strategy.
  - 2 To have regard to the content of the relevant Local Strategy.
  - 3 To co-operation with other Authorities, including sharing data.
- 4.3.5 Water and sewerage companies often hold valuable information that 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 the Local Strategies prepared by LLFAs.

## **5 The objectives for managing local flood risk**

5.1 In November 2011 the Welsh Government published the overarching strategy “The National Strategy for Flood and Erosion Risk Management in Wales”. This document identifies four Overarching Objectives that must be addressed within Local Strategies.

### **The four overarching objectives:**

- 1 Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion.**
- 2 Raising awareness of and engaging people in the response to flood and coastal erosion risk.**
- 3 Providing an effective and sustained response to flood and coastal erosion events.**
- 4 Prioritising investment in the most at risk communities.**

5.2 Further to this, in November 2011, the Welsh Government published its guidance document “Local Flood Risk Management Strategies” that lists the following 9 objectives grouped under the 3 sustainability pillars:-

### **Flood Risk Management Objectives**

#### **1 Social:**

Reduce distress (No. of people exposed to flooding).

Reduce community disruption (No. of residential and commercial properties).

Reduce risk to life (No. of people exposed to depth x velocity of flow).

Reduce disruption to critical infrastructure (or maintain operation of)

#### **2 Economic:**

Reduce economic damage (e.g. Annual Average Damages AAD).

Reduce cost of management (note: a risk management outcome for use in appraisal).

#### **3 Environmental:**

Reduce damages to Natura 2000 / SSSIs / BAP sites (or improve sites).

Improve naturalness (reduce modification of channels / waterbodies).

WFD objectives: improve water quality / ecological status (or not deteriorate) – hydromorph and diffuse pollution issues.



#### **Natural Watercourse and Culvert**

- 5.3 Clause 3.3.4 of the guidance document advises that high level strategic objectives should be developed around the reduction of potential adverse consequences of flooding for human health, the environment, cultural heritage, economic activity and, if considered appropriate on local community facilities, non-structural initiatives and/or on the reduction of the likelihood of flooding. By adopting this approach, the objectives will be consistent with those required under the Regulations and will assist in ensuring that this common approach is maintained across Wales.

**As previously indicated, in order to comply with these objectives and requirements of the National Strategy Caerphilly County Borough Council has set its high level strategy as follows:**

**“To Reduce Flood Risk in every area where significant flood risk has been identified”.**

With the level of information currently available it is not possible to give a more precise strategic objective but as further surface water modelling is completed, together with risk and hazard maps and flood risk management plans being produced, it is anticipated that a precise level of improvement will be set.

- 5.4 CCBC has considered three options for the implementation of The Strategy namely; 1) community involvement 2) reduction of the flood hazard and 3) enhancement of the flood defence system.

## **Option 1 - Community Involvement**

Engagement with the public as flood risk partners is an essential part of development, refinement and implementation of The Strategy. Cooperation has been encouraged through Local Flood Forums and via an on-line survey in order to ascertain the views of the public. In addition the responses from the public will be considered once they are received following the publication of the draft Strategy.

Part of this process involves making the public aware of the flood risk in their locality to enable them to understand the nature of the risk and for them to take personal ownership for their actions during a flood event.

It is essential that the public realise that flood risk cannot be eliminated in its entirety and that the strategy aims to reduce the effect rather than prevent flooding.

The public will be encouraged to establish joint local community groups focusing on flooding issues. Individuals will be requested to construct their own flood plans as well as linking up with other members of the community to develop Community Flood Plans.

The role of the LLFA will be to provide information through leaflet drops and the Council official webpage. In addition details of flood warnings will be disseminated through the community by means of telephone calls, texting and the use of community flood wardens.

Depending on the severity of the flood warning residents will be encouraged to move to a safe part of their homes or to move to a safe location.

Residents will also be encouraged to provide for themselves methods of resisting the flood by purchasing sand bags as a temporary measure and/or installing more flood resistant measures such as flood boards/gates, wherever practicable and cost effective to do so. Other measures that could be implemented by individuals and or organisations would include the installation of flood resilient fittings and finishes to reduce the impact that a flood would have on the property.

In this way the hazard would remain the same but the risk would be reduced.

## **Option 2 - Reduction of the Flood Hazard**

It is important to note that it is not possible to reduce the volumes of water precipitation from storms and with the effects climate change weather patterns are likely to generate storms which will be more intense and produce greater volumes of precipitation.

In order to reduce the flood hazard it will be necessary to reduce the peak runoff from a given storm and/or reduce the total runoff from a given catchment. This is possible through the use of land management techniques such as the introduction of forestry planting or changes to the

felling policies on existing plantations and modifications to farming operations.

New habitats could also be constructed incorporating wetlands or ponds to act as attenuation.

The overall impact would be to reduce the volume and intensity of the runoff. This in turn could reduce the depth of flooding and the depth and velocity of flows downstream thus reducing flood risk.

In addition consideration will be given to improving the maintenance of the existing natural watercourses, culverts and other drainage structures within the County Borough Area in order to reduce the potential for their capacity to be exceeded.

### **Option 3 - Enhancement of the Flood Defence System.**

Where existing flood defences and drainage structures are found to be inadequate to protect communities more structured measures could be introduced which would reduce the risk.

Existing flood defences in the form of earth embankments could be increased in height where additional land is available. It may also be possible to increase the height of existing walls, subject to detailed analysis.

New embankments or flood defence walls could also be constructed where flood modelling indicates a specific requirement and cost benefit analysis is positive.

Existing culverts could be made more effective through the construction of new intake grids as it has been found that flooding generally occurs as a result of inadequate intakes rather than lack of capacity in existing culverts.

Where modelling indicates that existing drainage systems lack capacity new larger culverts could be constructed.

Where appropriate, consideration will be given to the construction of attenuation ponds in order to reduce the peak water flows, lower maximum depths of flooding or to reduce velocities of flood water

Significant external funding would be necessary in order to implement any of these measures.





**Sub-standard culvert being replaced**

## **5.5 Approach to Strategy**

Using the three options given the following seven approaches have been considered for the implementation of The Strategy

- S1 Consider Option 1 alone - Community Involvement
- S2 Consider Option 2 alone - Reduction of the Flood Hazard
- S3 Consider Option 3 alone - Enhancement of the Flood Defence System
- S4 Consider Option 1 - Community Involvement in combination with Option 2 Reduction of the Flood Hazard – where the measures to implement Option 1 would be considered before the measures to implement Option 2
- S5 Consider Option 1 - Community Involvement in combination with Option 3 Enhancement of the Flood Defence System – where the measures to implement Option 1 would be considered before the measures to implement Option 3
- S6 Consider Option 2 Reduction of the Flood Hazard in combination with Option 3 Enhancement of the Flood Defence System – where the measures to implement Option 2 would be considered before the measures to implement Option 3



- S7 Consider Option 1 - Community Involvement in combination with Option 2 Reduction of the Flood Hazard and Option 3 Enhancement of the Flood Defence System – where the measures to implement Option 1 would be considered before the measures to implement Option 2 and finally measures to implement Option 3 would be considered

## **5.6 Appraisal of the seven Approaches to The Strategy**

### **S1 - Option 1 - Community Involvement**

Community Involvement on its own has the potential to reduce risk in each of the areas of significant flood risk in the short term. However, with climate change and the construction of new developments the volume of water and the peak flows in a storm of a fixed return period is likely to increase and thus increase risk over a period of time.

This option would not provide a satisfactory outcome where modelling indicates that flood water will be deep and /or fast flowing.

Option 1 on its own would therefore not provide a viable Strategy

### **S2 Option 2 Reduction of the Flood Hazard**

Reduction of the Flood Hazard by management of the catchment and the creation of new habitats which would reduce the peak flows from catchments is the most sustainable option and would provide numerous opportunities for bio-diversity and the environmental enhancement of the catchment. However there are likely to be some catchments where it will not be possible to introduce such measures.

Option 2 on its own would therefore not provide a viable Strategy

### **S3 Option 3 Enhancement of the Flood Defence System.**

Enhancement of the Flood Defence System could be used in most situations to reduce flood risk. This option, however, is likely to be the most expensive and funding would not be available for all measures. As the funding will be prioritised subject to a cost benefit analysis only a limited number of measures could be constructed leaving some areas of significant flood risk with ever increasing risk.

This option is also considered to be the least sustainable.

Option 3 on its own would therefore not provide a viable Strategy

### **S4 Combination of Option 1 - Community Involvement and Option 2 Reduction of the Flood Hazard**

This combination is likely to give the most sustainable Strategy however there are likely to be locations where Reduction of Flood hazard would not be possible and Community Involvement alone would not be able to reduce risk sufficiently to combat the ever increasing effect of climate change.

A combination of Option 1 and 2 would therefore not provide a viable Strategy

#### **S5 Combination of Option 1 - Community Involvement and Option 3 Enhancement of the Flood Defence System**

This combination would be capable of reducing flood risk in each of the areas where significant flood risk has been identified. However, it is unlikely that sufficient finance will be available in order to introduce measures and to enhance all existing flood defence systems found to be inadequate. This combination would also be less sustainable.

A combination of Option 1 and 3 would therefore not provide a viable Strategy

#### **S6 Combination of Option 2 Reduction of the Flood Hazard and Option 3 Enhancement of the Flood Defence System**

This combination would be capable of reducing flood risk in each of the areas where significant flood risk has been identified. However, it is unlikely that sufficient finance could be found in order to introduce measures to reduce flood hazard or enhance existing flood defence systems. This combination would also be less sustainable.

A combination of Option 2 and 3 would therefore not provide a viable Strategy

#### **S7 Combination of Option 1 - Community Involvement, Option 2 Reduction of the Flood Hazard and Option 3 Enhancement of the Flood Defence System**

By using a combination of all options it is likely that flood risk could be reduced in all areas where significant flood risk has been identified.

Having all measures available for implementation will give opportunity to use the most sustainable option and to make available less expensive measures which are likely to attract funding through a prioritised cost benefit analysis system.

A combination of Option 1, 2 and 3 would therefore provide the only viable option for our Local Flood Risk management Strategy.

#### **SEA – Analysis**

The SEA analysis has concluded that approach S2 as detailed above is the optimum strategy from an environmental perspective, with alternative 7 being a close second. This is in contradiction to the Authorities Flood Risk Management Team comments above.

In preparing The Strategy environmental issues represent only one perspective along with other major issues such as engineering solutions and value for money. Approach 2 would rule out the use of Community Involvement, which is regarded as being of paramount importance in the implementation of The Strategy and the preparation of The Plans and would in many cases be the most economic solution. Enhancement of the Flood Defence System would also be ruled out under approach 2 although there are some flood risk areas where improving the existing flood defences may be the only method of reducing flood risk.

It has therefore been concluded that approach 7 should be the adopted over approach 2 for the development of The Strategy

- 5.7 The Welsh Government Guidance further states that when developing Local Strategies, LLFAs may wish to consider both high level strategic objectives and more detailed objectives.

In considering its objectives CCBC, as the LLFA, has taken account of the requirements of the National Strategy. The strategic aims and objectives have been translated into meaningful objectives for Caerphilly County Borough Council, focusing on the **Prevention, Protection and Preparedness** (including Climate Adaption) elements.

## 5.8 Detailed Objectives

Caerphilly County Borough Council has set the following detailed objectives as part of the Local Flood Risk management Strategy

### Overarching Objective 1

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

- 1 Reduce the number of people exposed to the risk of flooding.
- 2 Reduce the number of residential and commercial properties affected by the risk of flooding.
- 3 Reduce the number of people exposed to risk of flooding of significant depth and velocity.
- 4 Reduce disruption to critical infrastructure or prepare plans to allow the operations to be maintained.



### **Highway Flooding**

- 5 Protect and enhance Natura 2000
- 6 Protect and enhance Sites of Special Scientific Interest (SSSIs)
- 7 Protect and enhance Sites of Importance for Nature Conservation (SINCs)
- 8 Contribute to the delivery of Caerphilly Biodiversity Action Plan
- 9 Minimise damage to known historic areas and sites: Scheduled Ancient Monuments, Listed Buildings, Conservation Areas, Registered Historic Parks and Gardens and Registered Historic Landscapes.

### **Overarching Objective 2**

#### **Raising awareness of and engaging people in the response to flood.**

- 10 Provide systems to give early warning of potential flooding to individuals and communities.
- 11 Provide efficient systems for the management and maintenance of surface water assets and drainage systems.
- 12 Reduce economic damage
- 13 Endeavour to reduce cost of management

### **Overarching Objective 3**

**Providing an effective and sustained response to flood events through.**

- 14 Creating natural channels and water bodies with minimal modifications



**Matured Drainage Channel**

- 15 Improving water quality
- 16 Providing Flood Risk Management Plans for each area subject to flood risk
- 17 Ensuring that measures are designed and constructed in a sustainable way



- 18 Ensuring that CCBC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities

#### **Overarching Objective 4**

##### **Prioritising investment in the most at risk communities.**

- 19 Ensuring that investment decisions are prioritised in the most at risk communities on a consistent, defensible basis and are subject to cost benefit analysis.

- 5.9 When considering the measures to be used to achieve the objectives the following list of goals has been developed in order to decide on the priority to be given to each measure.

Wherever appropriate soft engineering solutions will be given priority over projects designed using hard engineering. This will apply in particular where new drainage assets and defence structures are built or existing ones modified.

Whilst it is the aspiration of the Strategy to implement the full package of measures together, in reality constraints such as funding, ease of implementation etc will require measures to be implemented as stated below:

- 1 Provide an early warning system to allow residents time to move to a safe area.
- 2 Encourage the residents to produce their own Flood Plan to reduce danger to themselves and damage to their property and its contents
- 3 Provide systems to prevent floodwater entering the property
- 4 Endeavour to reduce flood risk by reducing the volume of water being generated by the upstream catchment
- 5 Introduce new flood relief systems such as culverts or drainage ditches
- 6 Build new flood defences or raise the level of existing flood defences

**5.10 In order for The Strategy to be successful it is essential that significant funding be made available in addition to the normal funding arrangements from Welsh Government. This funding will be required to cover the following operations:**

- 1 Development of the Flood Risk Management Plans for each of the areas subject to significant levels of flood risk.**
- 2 Within Section 6 - The measures proposed to achieve objectives, a number of investigations have been identified which will be necessary to complete the Plans. These investigations will allow detailed measures to be identified and outline schemes to be prepared to implement The Strategy.  
A provisional list of these investigations is given in measure 7.17.1 - Investigations**
- 3 Funding at a much more significant level will be required in order to implement the measures which will be identified as part of the Plans.**

**CAERPHILLY COUNTY BOROUGH COUNCIL**  
**LOCAL FLOOD RISK MANAGEMENT STRATEGY**  
**OVERARCHING OBJECTIVES AND DETAILED OBJECTIVES**

	<b>Objective</b>	<b>Social</b>	<b>Econ omic</b>	<b>Environ- mental</b>
	<b>Overarching Objective 1</b>  <b>Reducing the impacts on individuals, communities businesses and the environment.</b>			
1	Reduce the number of people exposed to the risk of flooding.	√	√	
2	Reduce the number of residential and commercial properties affected by the risk of flooding	√	√	
3	Reduce the number of people exposed to risk of flooding of significant depth and velocity.	√	√	
4	Reduce disruption to critical infrastructure or prepare plans to allow the operations to be maintained.	√	√	
5	Protect and enhance Natura 2000 Sites	√		√
6	Protect and enhance Sites of Special Scientific Interest (SSSIs)	√		√
7	Protect and enhance Sites of Importance for Nature Conservation (SINCs)	√		√
8	Contribute to the delivery of Caerphilly Biodiversity Action Plan	√		√
9	Minimise damage to known historic areas and sites: Scheduled Ancient Monuments, Listed Buildings, Conservation Areas, Registered Historic Parks and Gardens and Registered Historic Landscapes.	√	√	√
	<b>Overarching Objective 2</b>  <b>Raising awareness of and engaging people in the response to flood.</b>			
10	Provide systems to give early warning of potential flooding to individuals and communities.	√	√	
11	Provide efficient systems for the management and maintenance of surface water assets and drainage systems.	√	√	
12	Reduce economic damage	√	√	
13	Endeavour to reduce cost of management		√	



**LOCAL FLOOD RISK MANAGEMENT STRATEGY OVERARCHING OBJECTIVES AND DETAILED OBJECTIVES**

	<b>Objective</b>	<b>Social</b>	<b>Econ omic</b>	<b>Environ- mental</b>
	<b>Overarching Objective 3</b>  <b>Providing an effective and sustained response to flood events.</b>			
14	Creating natural channels and water bodies with minimal modifications	√		√
15	Improving water quality	√		√
16	Providing Flood Risk management Plans for each area subject to flood risk	√	√	√
17	Ensuring that measures are designed and constructed in a sustainable way		√	√
18	Ensuring that CCBC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities	√	√	√
	<b>Overarching Objective 4</b>  <b>Prioritising investment in the most at risk communities.</b>			
19	Ensuring that investment decisions are prioritised in the most at risk communities on a consistent, defensible basis and are subject to cost benefit analysis.		√	

## **6 The measures proposed to achieve objectives**

6.1 In order to ensure the deliver of The Strategy and the Objectives set out above, CCBC has identified a total of 43 measures. Details of the measures are given in this section.

A measure is defined as an activity, which will be undertaken to manage risk and achieve the agreed objectives.

6.2 A wide range of measures have been considered, both structural and non-structural, for the short (0-20 years), medium (20-50 years) and longer term (50-100 years). The benefits which will be achieved by each measure have also been considered. Measures which will achieve multiple benefits will be promoted wherever possible.

6.3 Through its legislative and guidance framework the Welsh Government has identified seven measures under the high level themes for LLFAs to consider in preparing their strategies. These measures are:

- 1 Development planning and adaptation (encompassing both new and adaptations to existing developments/landscapes).
- 2 Flood forecasting, warning and response.
- 3 Land, cultural and environmental management.
- 4 Asset management and maintenance.
- 5 Studies assessments and plans.
- 6 High level awareness and engagement (to increase individual and community resilience).
- 7 Monitoring (of the local flood risk issues).

All seven high level themes have been considered in the following section.

6.4 Both the current and potential future risks have been assessed and are understood to enable Caerphilly County Borough Council to manage and build in adaptation thinking and planning.

6.5 The following plans have been considered to ensure that the information provided within each can be aligned within The Strategy. They have also been used to help determine measures as they set the strategic context for overall flood risk management at catchment level.

- 1 Eastern Valley's Catchment Flood Management Plan Summary Report - January 2010 Managing Flood Risk – Environment Agency Wales

- 6.6 In the preparation of this report use has been made of existing policies, plans and strategies in identifying measures.  
These include:-
- 1 Caerphilly Local Development Plan up to 2021 (Adopted November 2010) (Caerphilly LDP)
  - 2 Caerphilly Local Development Plan up to 2021 – Strategic Environmental Assessment/Sustainability Appraisal Documents:  
Document 1 – Scoping Report  
Document 2 – Review of Relevant Plans, Programmes and Policies  
Document 3 – The Assessment of Preferred and Alternative LDP Strategies  
Document 4 – The Assessment of the Detailed LDP  
Document 5 – Habitats Regulations Assessment (Incorporating Appropriate Assessment) (October 2008)
  - 3 Water Framework Directive
  - 4 Seven River Basin Management Plan
- 6.7 Within the County Borough Area a significant Flood Risk Area has been identified within the PFRA. The measures to be identified in the subsequent Flood Risk Management Plan will compliment and accord with those within this Local Strategy.
- .
- 6.8 In order to identify the measures for the Strategy, CCBC has engaged with the community to outline the risks to affected communities both now and in the future. Community engagement has involved the attendance at local Flood Forum meetings and an on-line survey accessible through the CCBC webpage. Discussions will continue in order to agree any proposed measures to mitigate the risks and what communities and individuals can also do for themselves. Some measures will be introduced which will mitigate directly the flood risk to individual communities. Other measures proposed will not mitigate the risks directly, but will improve the knowledge and understanding of those risks in a given area and these measures will be clearly communicated to the communities affected.
- 6.9 In determining objectives and measures CCBC has worked with other Risk Management Authorities within its area, including Dŵr Cymru – Welsh Water and The Environment Agency, in order to realise the benefits of collaborative working, e.g. shared solutions and funding, and also to ensure that there is a shared vision and agreed outcomes.

- 6.10.1 In developing objectives and measures CCBC has also considered the impacts of climate change to ensure that the measures adopted 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 fulfilling its statutory duties.

Climate change and its impact on flooding has been, and will be, considered by each RMA and will be a factor in any flood alleviation plans. LLFA adaptation programmes are integral to The Strategy.

Climate change projections suggest that weather patterns will alter and that there will be an increase in the intensity of rainfall, the frequency of sudden storms and sea level rises across Wales. Taken together these factors are likely to increase the *likelihood* of flooding and coastal erosion.

The UK Climate Projections 2009 show that the key findings for Wales are:

- 1 By 2050 average annual temperatures are projected to increase by 2.3°C
- 2 Summer daily maximum temperatures are projected to increase by 3.4°C
- 3 Winter minimum temperatures are projected to increase by 2.5°C
- 4 Rainfall is projected to increase in winter on average by 14 per cent and decrease in summer by 16 per cent
- 5 Sea levels around Wales are predicted to rise by approximately 20cm by 2050
- 6 Storm intensity in summer and winter will increase, leading to more severe storms and larger waves attacking our shores

The evidence of the increasing risks from flooding is underpinned by a series of reports produced in the last few years including the *Foresight: Future Flooding Study*, the *Stern Review on the Economics of Climate Change* and most recently, *the Pitt Review into the Summer 2007 Floods*.

The Welsh Government is working with the Environment Agency to develop updated guidance on what Risk Management Authorities should plan for in relation to climate change when undertaking flood or coastal erosion risk management works. This guidance will be taken into account by CCBC in its preparation of Flood Risk Management Plans

Other guidance to aid the assessment of climate change is already available and these include the Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM-AG), Technical Advice Note 15 (Tan 15) and others which are listed within FCERM-AG.

## 6.10.2 CAERPHILLY CLIMATE ADAPTATION BUSINESS IMPACT PROCESS

CCBC has set up a Climate Adaption Business Impact Forum and the objective is given below.

### OBJECTIVE

To assess potential business impacts of projected Climate Change on the strategy and services of Caerphilly CBC - to meet the requirements of the Climate Change Act 2008.

Services are being asked to complete an assessment of climate impacts to determine priorities.

This work forms part of our commitment to sustainable development and combating climate change. In January 2012 the Minister for Environment & Sustainable Development published new statutory guidance, setting out what is required of us, in terms of reporting on climate change adaptation.

The Minister expects all key reporting authorities to make continued progress in preparing for a changing climate and identified the challenge as being to embed consideration of climate change impacts and possible responses into decision-making processes.

This business impact process is a key element in us fulfilling our requirement set out in the guidance

Services will consider this issue and undertake an assessment under the following headings:

- 1 Past severe weather impacts on the service
- 2 Built assets and premises
- 3 Infrastructure
- 4 Service Demand and Clients/Customers
- 5 Procurement and Supply Chains
- 6 Service Logistics
- 7 Strategy
- 8 Management and Governance
- 9 Key priorities

This approach builds on the experience of the WLGA *Changing Climate Changing Places Project* and has been developed with consultancy support from the WLGA Sustainable Development Framework.

6.11 Further information and advice on how to improve individual resilience to flooding is also available from the Environment Agency via their 'Floodline' service and this information has been considered in the preparation of this strategy.

6.12 The Guidance document sets out numerous pieces of advice relating to the identification of measures proposed to achieve the objectives given in section 5 of this report, as set out below.

Each measure has been considered in detail relating to the current situation and what is required in the future to achieve the objectives set out in this Strategy. The objectives related to each measure have been established together with benefits and time scale for implementation.

**THEMES AND MEASURES**

	<b>Page</b>	
<b>6.13</b>	<b>Development Planning and Adaption</b>	
6.13.1	Sustainable and Strategic Development Planning	44
6.13.2	Strategic Flood Risk Assessment (SFRA) / Strategic Flood Consequences Assessment (SFCA)	46
6.13.3	Water Cycle Strategies	47
6.13.4	Relocation	48
6.13.5	Mineral Plans	49
6.13.6	Waste Plans	50
6.13.7	Sustainable Drainage (SuDS)	51
6.13.8	Contaminated Land	53
6.13.9	Scheduled Ancient Monuments and Listed Buildings	55
6.13.10	Conservation Areas, Registered Historic Parks and Gardens and Historic Landscapes	56
<b>6.14</b>	<b>Flood Forecasting, Warning and Response</b>	
6.14.1	Planning and Response Awareness	57
6.14.2	Flood Awareness	58
6.14.3	Flood Warning	59
6.14.4	Flood Forecasting	61
6.14.5	Emergency Response Plans	61
6.14.6	Community Flood Plans	62
6.14.7	Multi-Agency Flood Plans	63
6.14.8	Major Incident Plans	64
<b>6.15</b>	<b>Land, Cultural and Environmental Management</b>	
6.15.1	Land Management	65
6.15.2	Resilience	66
6.15.3	Resistance	67
6.15.4	Restoration	68
6.15.5	Environmental Enhancement	69
6.15.6	Water Bodies	70
6.15.7	Habitat Creation	71
6.15.8	Control of Invasive Species	73
6.15.9	Soil Management Plans	74
<b>6.16</b>	<b>Asset Construction, Management and Maintenance</b>	
6.16.1	System Asset Management Plans	75
6.16.2	Defence/Structure Management and New Construction	76
6.16.3	Channel Maintenance and New Construction	76
6.16.4	Culverts, Gullies, Highway and Culvert Infrastructure Maintenance and New Construction	78

## **THEMES AMD MEASURES (Continued)**

		Page
<b>6.17</b>	<b>Studies, Assessments and Plans</b>	
6.17.1	Investigation	80
6.17.2	Risk Assessment	82
6.17.3	Strategy Plan	82
6.17.4	Local Property - Flood Mitigation – Resilience	83
6.17.5	Local Property - Flood Mitigation – Resistance	84
6.17.6	Pre-feasibility Studies, Feasibility Studies	84
6.17.7	Project Plans	85
<b>6.18</b>	<b>High Level Awareness and Engagement</b>	
6.18.1	Partnership Working	85
<b>6.19</b>	<b>Monitoring</b>	
6.19.1	Erosion Monitoring	86
6.19.2	Habitats Monitoring	86
6.19.3	Topographical Survey	87
6.19.4	Aerial Photography	87



## **6.13 Development Planning and Adaption**

### **6.13.1 Sustainable and Strategic Development Planning Prevention**

#### **Detailed Objectives 1, 2, 3, 4, 5, 6, 7, 8, 14, 15, 17**

Local authorities are required to prepare Local Development Plans (LDP) that set out the framework of policies against which proposals for development are considered. LDPs are required to be prepared in accordance with a raft of Welsh Government legislation and guidance. LDPs are also required to ensure that sustainable development, which includes addressing climate change and its effects, is the cornerstone of the policy framework. Consequently the Caerphilly LDP enshrines sustainable development within its policy framework.

The single biggest influence that the LDP has in respect of flood risk is in effective land management. LDPs effectively control land through making appropriate land allocations and through use of the policy framework. The Caerphilly LDP allocates sites for various landuses to meet the needs of the county borough for the plan period (up to 2021 for the LDP). The sites allocated in the LDP have been subject to rigorous assessment as part of the preparation of the LDP. As part of the assessment process flood risk issues were considered and sites with flood issues were not included in the Adopted LDP.

The LDP Policy framework includes polices that seek to control development in inappropriate locations and to encourage and facilitate development in appropriate locations. The LDP contains a suite of policies that assist in delivering such land management. However it should be noted that the issue of flood risk itself is not within the scope of the LDP. The Welsh Government requires that LDPs do not reiterate national policy or guidance, but should provide a policy framework that works together with it. The vast majority of planning policy relating to flooding and its mitigation are contained in two Technical Advice Notes published by the Welsh Government.

TAN 15 – Development and Flood Risk is the primary guidance document and directly addresses the issues of flood risk and flood consequence management in land use development. The principle element of the TAN is the identification of Flood Zones. Flood Zones are areas that are identified on their relative risk of flooding. There are three zones, A, B and C as follows:

Flood Zone C being the zone most at risk to flooding (0.1% [1 in 1000year] chance of extreme flooding).

Flood Zone B – areas known to have been flooded in the past.

Zone A – considered to be at little on no risk of flooding.

Zone C is further broken down into two sub-categories, C1 – areas at risk but served by significant infrastructure including flood defences, and C2 – areas at risk without flood defence infrastructure.

The TAN also sets out categories of development or landuse, which are defined by the significance that flooding would have on them. The TAN identifies the following groups

Emergency Services	Facilities that need to be operational and accessible at all times, e.g. police stations, hospitals, command centres, emergency depots
Highly Vulnerable development	Development where the ability of occupants to decide on whether they wish to accept the risks to life and property associated with flooding, or be able to manage the consequences of such a risk, is limited and industrial uses where inundation could lead to a risk to the public and the water environment, e.g. housing, public buildings, power stations, chemical plants
Less Vulnerable Development	Development where the ability of occupants to decide on whether they wish to accept such risks is greater than that in the highly vulnerable category, e.g. general employment, utilities

The TAN uses the Flood Zones to restrict the type of development that can take place within each zone. Development is normally targeted away from Zone C, unless the proposed development meets the justification tests and is subject to a flood consequences assessment whose findings are acceptable. It should be noted that, within Zone C2, Emergency Services and Highly Vulnerable development are not permitted.

Within Zones A and B development is generally acceptable subject to assessment of flood risk and, if required, acceptability of a Flood Consequences Assessment.

The allocations in the LDP comply with TAN15.

The second TAN that addresses flooding is TAN 12 – Design. Whilst not directly addressing the flooding issue, TAN 12 provides guidance on the design of development. It promotes the use of sustainable drainage systems and sets out guidance that seeks to reduce the causes, and mitigate the effects, of climate change.

As The Strategy is implemented through the Plans it may become evident that there is a potential conflict between the LDP and the Strategy. Areas of land identified within the LDP as being suitable for development may be deemed unsuitable when the detailed Plans are produced. The LDP cannot be altered until the next review but the Planning Department would be made aware of the potential conflict and at the next review the LDP will be amended to take the Plans into account.

**Benefits**

- 1 The Local Development Plan (LDP) provides a strategic policy framework which facilitates the effective management of flood risk by directing new development away from those areas which are at a high risk of flooding.
- 2 New developments will be at low risk of flooding

**Time Scale for Implementation**

2006 - 2021

**Short Term 0-20 Years**

### **6.13.2 Strategic Flood Risk Assessment (SFRA) /Strategic Flood Consequences Assessment (SFCA) Prevention Detailed Objectives 1, 2, 3, 4, 12**

The Welsh Government guidance document TAN 15 – Development and Flood Risk addresses the issue of flood risk and development (please see Sustainable and strategic development planning above). TAN 15 sets out the requirement for SFRA and SFCA to be part of the development plan process.

TAN 15 requires that councils preparing development plans undertake an assessment of the risk of flooding from its proposed land allocations. This assessment is undertaken on a strategic basis, i.e. considering the authority as a whole, and is termed Strategic Flood Risk Assessment. This assessment considers all of the allocations, their compliance with the Flood Zone requirements and will establish whether there are sites where there is a risk of flooding, which will then require an assessment of the consequences of the development and flooding downstream.

Where sites have been identified with flood risk they will need to be subject to an assessment of the consequences of the development in respect of flooding across the wider area. This assessment is undertaken at a strategic level, i.e. considering the development generically rather than in detail, and is termed Strategic Flood Consequences Assessments. The assessment considers the effects on flooding elsewhere in the flood area if the development were to take place. If the consequences of the development are acceptable the site is considered acceptable.

Each site in the LDP has been the subject of a SFRA and a small number of sites were subject to a SFCA.

#### **Benefits**

- 1 SFRA allows the consideration of flood risk to inform the location of new development in development plans.
- 2 SFCA allowed the consequences of flooding to inform the location of new development in development plans.
- 3 SFCA also enabled consideration of potential increases in surface water runoff arising from new development, including the potential application of sustainable drainage systems.

#### **Time Scale for Implementation**

2006 – 2021

#### **Short Term 0-20 Years**

### 6.13.3 Water Cycle Strategies

#### Prevention

#### Detailed Objective 15

A Water Cycle Strategy is an opportunity for CCBC and all its partner organisations to work together to identify the water services infrastructure needed to support and enable sustainable development in the County Borough Area. The strategy identifies what infrastructure is needed, when it is required, how much it will cost, and who should pay.

The overall objective of a Water Cycle Strategy is to provide a sustainable approach to the provision of water services infrastructure.

#### Water Cycle Strategy covers the following elements:

- 1 **Flood Risk Management:** Identifying areas where development is likely to increase flood risk (both on-site and downstream) and to suggest necessary improvement measures.  
The Strategy deals with this issue and the Flood Risk Management Plans will identify specific measures for individual sites.
- 2 **Water Supply:** Reviewing the existing water supply sources, and identifying any required upgrades to ensure adequate water provision for new developments.  
This will require ongoing dialogue with Dŵr Cymru/Welsh Water as one of our Risk Partners. They are required to take account of the Strategy in what they propose
- 3 **Drainage:** Reviewing the underlying geology for growth sites to understand the possible SuDS (sustainable drainage systems) to help minimise the environmental impacts of growth. This involves future implementation of SuDS, for which consultation is not yet available. Currently there is a link to Planning applications where drainage implications are considered by the Drainage and Highways Department.
- 4 **Waste Water:** Understanding the current capacity of sewage works and the sewer network to identify whether any upgrades are required to accommodate new developments.  
This requires dialogue with Dŵr Cymru/Welsh Water. They are required to take account of The Strategy in what they propose and this will take place through dialogue and collaboration as part of The Strategy process of consultation
- 5 **Ecology:** Identifying the impact of growth relating to water quality, nature conservation areas and protected species, then suggesting possible mitigation measures where required. The SEA as part of the FRM Strategy covers this.
- 6 **Sustainable Infrastructure:** Suggesting how water services infrastructure can contribute to sustainable development in terms of increased water efficiency and reduced water consumption in new developments.

There are obligations on the Planning process to consider sustainability. Dŵr Cymru/Welsh Water input will also be required as part of the dialogue between all parties.

**Benefits**

- 1 To ensure the management of water resources in a sustainable way
- 2 To ensure that water quality is improved

**Time Scale for Implementation**

**Short term 0 – 20 years**

**6.13.4 Relocation**

**Prevention**

**Detailed Objectives 1, 2, 3, 4, 12, 13**

CCBC do not have a policy relating to the relocation of residents living in housing which is subject to flood risk 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 following procedure will be followed to endeavour to reduce flood risk:

- 1 Inform and ensure residents are aware of the level of risk they are facing.
- 2 Where possible and practicable provide an early warning system to allow residents time to move to a safe area.
- 3 Encourage the residents to produce their own Flood Plan to reduce danger to themselves and damage to their property and its contents
- 4 Provide systems to prevent floodwater entering the property
- 5 Endeavour to reduce flood risk by reducing the volume of water being generated by the upstream catchment
- 6 Introduce new flood relief systems such as culverts or drainage ditches
- 7 Build new flood defences or raise the level of existing flood defences

If after implementing or assessing the effectiveness, including cost benefit analysis, these measures are considered impracticable for reasons of cost or engineering then CCBC will endeavour to relocate residents to the most convenient available vacant housing. If there are significant numbers of properties involved then CCBC will consider how alternative houses may be provided on locally available land which has been allocated for housing.

It is anticipated that the property owner would be responsible for the cost of relocation or that their properties would be compulsory purchased by CCBC at current market value.

**Benefits**

- 1 Reduce the risk to residents by removing them from housing in areas which are subject to severe flood risk

**Time Scale for Implementation**

**Long term 50 – 100 years**

**6.13.5 Mineral Plans**

**Prevention**

**Detailed Objectives 1, 2, 3, 4, 15**

Historically minerals and waste issues were addressed through specific minerals and waste plans, which were separate from general development plans. However the current Local Development Plans incorporate minerals and waste and as such they are subject to the same policy framework as other development (Please refer to Sustainable and strategic development planning above).

Caerphilly County Borough Council is the Minerals Planning Authority with responsibility for planning control over minerals exploration and working within the county borough. The Council considers that, on mineral issues, national policy and guidance is sufficiently clear and therefore will be relied upon in the determination of planning applications in relation to mineral extraction and related development, in conjunction with any relevant countywide policies and site-specific policies contained within the Adopted LDP. In respect of the potential impact of Minerals exploration on the water environment Policy *CW5 Protection of the Water Environment* specifically states that:

“Development proposals will only permitted where:

- 1 They do not have an unacceptable adverse impact upon the water environment, and
- 2 Where they would not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water).”

**Benefits**

- 1 Policy framework contributes to managing flood risk and protecting the water environment.

**Time Scale for Implementation**

2006 – 2021

**Short term 0 – 20 years**

### 6.13.6 Waste Plans Prevention Detailed Objectives 1, 2, 3, 4, 15

There are no municipal landfill sites operating within Caerphilly County Borough Council, however there are a number of inert waste sites which are recorded on the public register held by Environmental Health.

There are 4 closed landfill sites which are monitored for gas and leachate. These are Trinant, Coed Top Hill, Danygraig and Aberbargoed, all of which have separate leachate drainage systems which discharge into foul sewers.

The former Council Municipal waste site at Trehir closed in 2006 and the drainage systems of surface water, groundwater and leachate are monitored on a weekly basis, data collected and passed to the Environment Agency in an Annual Report. Again, the leachate is collected in a separate drainage system and discharged into the trunk sewer.

The Authority also operates recycling centres and these are located at: Aberbargoed, Penallta, Penmaen, Rhymney, Trehir and Full Moon. A waste transfer station is also located within the curtilage of the Full Moon site. All 6 sites are contained and contaminated or polluted flows are directed to the foul sewer with the exception of Penmaen and Rhymney where foul water is directed into a septic tank.

It is proposed that the present regime of discharge of leachate to foul sewers and the monitoring of sites will continue

In respect of **waste**, the LDP implements a sustainable, integrated approach to waste management, which minimises the production of waste and its impacts on the environment and maximises the use of unavoidable waste as a resource. To this end the LDP identifies all allocated and protected B2 employment sites as potentially suitable locations for new in-building facilities and adopts the Area of Search Maps in the Regional Waste Plan as appropriate advice for developers to first seek sites for in-building and open air facilities. In respect of the potential likely impact of Waste Proposals on the water environment, Policy *CW5 Protection of the Water Environment* specifically states that:

“Development proposals will only be permitted where:

- 1 They do not have an unacceptable adverse impact upon the water environment, and
- 2 Where they would not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water).”

Where waste schemes are proposed in vulnerable areas, the need for a flood consequence assessment will be highlighted as a requirement of any future planning application in line with paragraph 1.40 of the Adopted LDP and in order to comply with the requirements of National Planning Guidance.



### **Recycling Green Waste**

#### **Benefits**

- 1 Ensure that potential pollution sites are monitored and the leachate is discharged to a suitable foul sewer
- 2 To ensure that surface water from landfill sites and waste sites does not contaminate water courses.

#### **Time Scale for Implementation**

**On-going**

**Short Term to Long Term 0 – 100 years**

### **6.13.7 Sustainable Drainage (SuDS)**

#### **Prevention**

**Detailed Objectives 1, 2, 3, 4, 13, 14, 15 17**

#### **Engineering Issues**

Within the Flood and Water Management Act 2010, Caerphilly County Borough Council has been designated as a Lead Local Flood Authority for its administrative area.

LLFA in Wales will take on the role of the SuDS Adopting and Approving Body in relation to sustainable drainage systems. In this role CCBC will be responsible for both approving the original design of the SuDS and adopting and maintaining the finished system.

CCBC have a commitment to promote the use of SuDS wherever new sites are developed or where brown field sites are re-developed.

The philosophy of SuDS is to replicate, as closely as possible, the natural drainage from a site before development.



The objectives of sustainable drainage are; quality, quantity and amenity and biodiversity.



### **Attenuation Pond**

It is anticipated that SuDS will achieve the following:

- 1 Reduce runoff rates, thus reducing the risk of downstream flooding
- 2 Reducing the additional runoff volumes and runoff frequencies that tend to be increased as a result of urbanisation, and which can exacerbate flood risk and damage receiving water quality
- 3 Encourage natural groundwater recharge to minimise the impact on aquifers and river base flows in the receiving catchment
- 4 Reducing pollutant concentration in stormwater, thus protecting the quality of the receiving water body
- 5 Acting as a buffer for the accidental spills by preventing direct discharge of high concentrations of contaminants to the receiving water body
- 6 Reducing the volume of surface water runoff discharging to combined sewer systems, thus reducing discharges of polluted water to watercourses via Combined Overflows (CSO) spills
- 7 Contributing to the enhanced amenity and aesthetic value of developed areas
- 8 Providing habitats for wildlife in urban areas and opportunities for biodiversity enhancement

The following techniques will be considered as part of SuDS – filter strips, swales, infiltration basins, wet ponds, extended detention basins, constructed wetlands, filter drains and perforated drainpipes, infiltration devices, pervious surfaces and green roofs.

The information above have been taken from The SuDS Manual prepared by CIRIA

### **Planning Issues**

As outlined in ‘Sustainable and Strategic Development Planning’ above, TAN 12 – Design promotes the use of SuDs in the design of new development. However, despite this guidance, the issue of adoption complicates it. Normally, the council will adopt the drainage system provided as part of a new development. However the council do not, currently, adopt SuDS. Consequently developers are reluctant to incorporate SuDS into their designs as they will maintain liability for the system.

It is acknowledged that the position may change in the near future under potential changes being instigated by the Welsh Government. But until such time as a body exists that will adopt such drainage systems, it is unlikely that developers will want to utilise SuDS in their development proposals.

### **Benefits**

- 1 Policy framework contributes to managing flood risk, protecting water quality and reducing environmental damage.
- 2 Improve the quality of surface water

### **Time Scale for Implementation**

2006 – 2021

**Short term 0 - 20 years**

## **6.13.8 Contaminated Land Prevention Detailed Objective 15**

CCBC maintains a register of all the contaminated land it is aware of. It is accurate and complete.

CCBC also holds information regarding sites, which are described as potential contaminated land. This information is not publicly available (due to issues relating to the blighting of land etc as well as the fact that the information may not be accurate)

It is proposed that further survey work and site investigations will be carried out in order to improve the accuracy and completeness of the information available regarding contaminated land.

CCBC has a Contaminated Land Inspection Strategy that details the way in which Caerphilly CBC will progress potential sites.

Where contaminated land, which is in the ownership of CCBC, is known to be present within areas subject to flood risk the land will be made more resistant to flooding. This may include the construction of drainage ditches or earth bunds to direct water away from areas that are likely to cause contaminated material to adversely affect the quality of surface water.

One of the requirements of the planning system is to guide each development in order to lessen the risk from both natural and man-made hazards including risks from land contamination. Whilst the system should not necessarily prevent the development of such land (although this could be the most appropriate response in some cases), it should ensure that any development undertaken is suitable for the land concerned and that the physical constraints of the land are fully taken into account. Any proposals therefore, for the redevelopment of contaminated land, will need to have due regard for national planning policy and guidance including Chapter 13 of Planning Policy Wales together with the provisions of the policies contained within the LDP and Policy CW5 *Protection of the Water Environment*.

The responsibility for determining the extent of contamination rests with the developer who must also ensure that the land is suitable for the proposed development. However, the Council must take into account any implications on public health and ensure that new development is not undertaken without an understanding of the risks involved; or, that development does not take place without appropriate remediation, having regard to both the natural and built environment.

The LDP recognises that primarily because of CCBC industrial legacy, certain areas of land in the County Borough remain potentially contaminated. Furthermore, that the remediation of such land may be required before it can be brought back into beneficial use. As a means of alerting interested parties to the potential of contamination, the Council is required to maintain a register of contaminated land and this has been taken into account in preparing the LDP. The register is also used to inform developers whether potential risks are known to exist and to what extent further investigations may be necessary.

The above strategy is intended to protect public safety whilst helping to realise one of the primary aims of the LDP i.e. to promote regeneration through the use of suitable and appropriate brownfield land rather than greenfield sites. Within this context, it is recognised that on some sites, in order to successfully fund decontamination works, a phased approach to remediation may be necessary.

The LFRMS will have an approach which is consistent with National Planning Policy and the LDP.

CCBC have developed a Contaminated Land Inspection Strategy – Directorate of the Environment - March 2010.

### **Benefits**

- 1 To improve the quality and completeness of information relating to contaminated land

- 2 To prevent contaminated material adversely affecting the quality of surface water.

**Time Scale for Implementation**

2006 – 2021

**Short term 0 - 20 years**

**6.13.9 Scheduled Ancient Monuments and Listed Buildings**

**Preparedness**

**Detailed Objective 9**

CCBC has developed a plan and database showing the location of all Ancient Monuments and Historic Listed Buildings within the borough.

When the revised surface modelling is carried out and the Hazard and Risk Maps prepared details of all such buildings will be established which are located within flood risk areas.

Surveys will be carried out to establish what measures, where practicable, will be required in order to provide additional resistance from the entry of flood water to Scheduled Ancient Monuments and Listed Buildings in a manner which is sympathetic to their architectural and historic interest.



**Historic Building**

**Benefits**

- 1 To ensure that information is available to consider design measures, which will provide building with increased resistance to flood water.

**Time Scale for Implementation**

**Short term 0 - 20 years**



### **6.13.10 Conservation Areas, Registered Historic Parks and Gardens and Historic Landscapes**

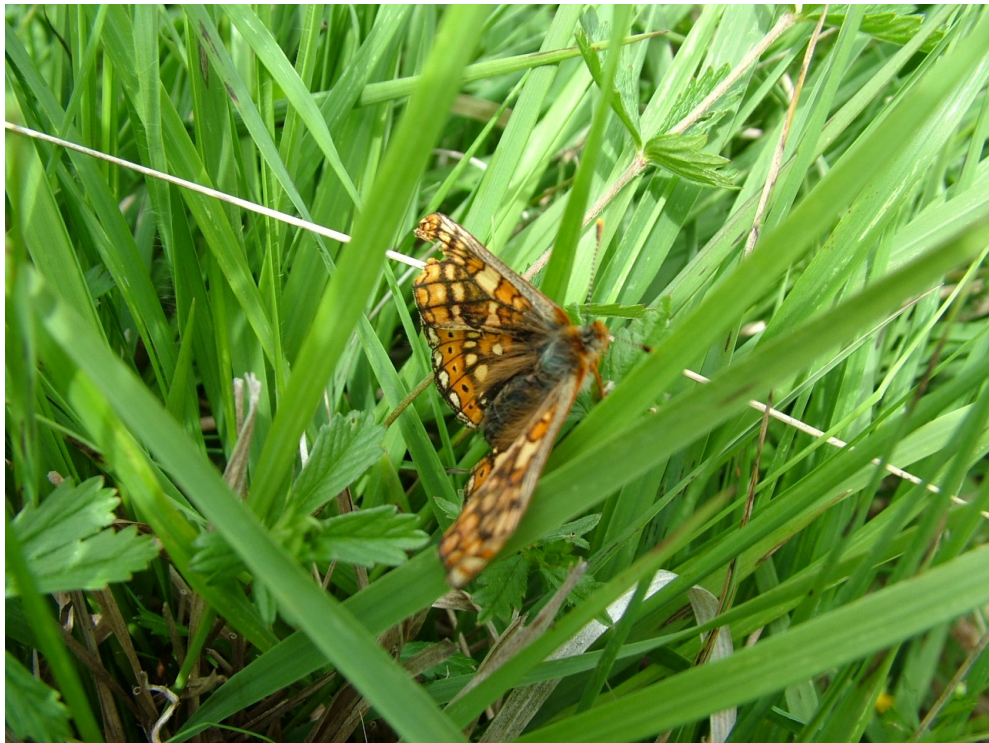
#### **Preparedness**

#### **Detailed Objectives 9, 12**

CCBC has developed a plan and database showing the location of all Conservation Areas, Registered Historic Parks and Gardens and Historic Landscapes within the borough.

When the revised surface modelling is carried out and the Hazard and Risk Maps prepared details of all such buildings will be established which are located within flood risk areas.

Surveys will be carried out to establish what measures, where practicable, will be required in order to provide additional resistance from the entry of flood water to Conservation Areas, Registered Historic Parks and Gardens and Historic Landscapes in a manner which is sympathetic to their architectural and historic interest.



#### **Conservation Area**

#### **Benefits**

- 1 To ensure that information is available to consider design measures, which will provide building with increased resistance to flood water.

#### **Time Scale for Implementation**

**Short term 0 - 20 years**

## **6.14 Flood Forecasting, Warning and Response**

### **6.14.1 Flood Planning and Response**

#### **Preparedness**

#### **Detailed Objectives 1, 2, 3, 4, 9, 10, 12, 13**

The Civil Contingencies Act (2004) delivers a single framework for civil protection in the United Kingdom. The Act is separated into two substantive parts:

Part One focuses on local arrangements for civil protection, establishing a statutory framework and responsibilities for local responders.

Part Two focuses on emergency powers, establishing a modern framework for the use of legislative measures that might be necessary to deal with the effects of most serious emergencies.

Under Part One of the act, local responders are divided into two categories, depending on the extent of their involvement in civil protection work, and places a set of duties on each.

Caerphilly County Borough Council is defined as a Category One responder and is therefore required to:

- 1 Assess the risk of emergencies occurring and use this to inform contingency planning;
- 2 Put in place emergency plans;
- 3 Put in place business continuity arrangements;
- 4 Put in place arrangements to make information available to the public about civil protection matters and maintain arrangements to warn, inform and advise the public in the event of an emergency;
- 5 Share information with other local responders to enhance co-ordination;
- 6 Co-operate with other local responders to enhance co-ordination and efficiency;
- 7 Provide advice and assistance to businesses and voluntary organisations about business continuity management.

#### **Identifying the Risk:**

The first step in the emergency planning process is to identify and assess the risk of an emergency occurring. This allows for effective emergency planning and also increases confidence in the response and produces fewer surprises. It also enables a more effective use of resources and produces clear ownership and accountability for the risk and its management.

In undertaking its risk assessment process, Caerphilly County Borough Council recognises the impact emergencies have on the social and economic wellbeing of its communities and the disruptions suffered. The

Council is fully committed to its community leadership role in assisting members of the public to react to and cope with these disruptions.

Based on the ongoing threat, historical evidence and influenced by Regional and National guidance, Caerphilly County Borough Council recognises flooding as a significant risk to its communities. Therefore a number of plans and procedures have been put in place to assist the response to flooding incidents experienced within the geographical area of Caerphilly County Borough.

#### **Planning for the Risk:**

As a Category One responder, one of the main duties placed upon the Council is to maintain plans and procedures. This is to ensure that, if an emergency occurs or is likely to occur the Council can deliver its functions so far as necessary for the purpose of preventing the emergency, reducing, controlling or mitigating its effects, or taking other action in connection with it.

The Council has developed a set of integrated generic; specific and multi agency plans to ensure that staff, managers and officers meet their emergency responsibilities.

#### **Benefits**

- 1 To clarify the level of risk and to identify the role of CCBC in managing the risk

#### **Time Scale for Implementation**

Ongoing

**Short term 0 20 years**

### **6.14.2 Flood Awareness**

#### **Preparedness**

**Detailed Objectives 1, 2, 3, 4, 9, 10, 12, 13**

As part of its community leadership role, the Council recognises its role in raising awareness within communities that are at risk of flooding.

To this end the Council works closely with the Environment Agency as part of their public Flood Awareness Wales campaign that aims to ensure that those communities at risk of flooding know how to prepare and how to respond during a flooding incident.

To date the Council has taken part in a number of community meetings and drop in sessions to help promote the development of community flood plans.

In addition, through its website, the Council provides advice, guidance and simple actions to help individuals prepare for and deal with the consequences of flooding. The website also provides links to Environment Agency, factsheets and guidance documents.

The Council is also working with the Environment Agency to promote the completion of business flood plans with business in flood risk areas and also provides business continuity advice through its website.

**Benefits**

- 1 Raise awareness of flood risk within the communities of CCBC

**Time Scale for Implementation**

Ongoing

**Short term 0 20 years**

**6.14.3 Flood Warning**

**Preparedness**

**Detailed Objectives 1, 2, 3, 4, 9, 10, 12, 13**

**Weather Warnings:**

The Met Office National Severe Weather Warning Service provides warnings of severe or hazardous weather, which could range from widespread disruption of communications to conditions resulting in transport difficulties or threatening lives.

It is a free at point of use warning service, mainly for Category 1 and 2 responders. The warnings alert recipients to a forecasted severe/extreme weather event which allows planning to occur to mitigate or reduce the impact of the weather.

Warnings are also provided to the general public via the broadcast media and the Met Office Website.

Warnings are received by the Council via e-mail directly to the Senior Emergency Planning Officer. The e-mails are automatically disseminated to nominated personnel within each Directorate. The statements are used to inform specific actions undertaken within Directorates, as part of their flooding preparations and response.

**Flood Warnings:**

The Environment Agency provides a flood warning service throughout England and Wales in areas at risk of flooding from rivers or the sea.

Using the latest available technology, Environment Agency staff monitor rainfall and river levels 24 hours a day and use this information to forecast the possibility of flooding. If flooding is forecast, the Agency issue warnings using a set of three different warning types.



**FLOOD ALERT**



**FLOOD WARNING**



**SEVERE FLOOD WARNING**

The Environment Agency issue warnings by;



- 1 Phone, text, email or fax via the Floodline Warnings Direct service.
- 2 The Environment Agency Website.
- 3 The Agency's Floodline where there is recorded information on the latest warnings and predictions, or the facility to speak to an operator for more general information 24 hours a day.
- 4 Through the media.

The Caerphilly County Borough Area Local Flood Warning Plan identifies areas that are at risk from main river flooding within the County Borough Area and describes the arrangements that are in place and the systems used to issue flood warnings.

The Council are also recipients of the Environment Agency Flood Warnings for those areas identified in the Caerphilly County Borough Area Local Flood Warning Plan. The warnings are used to inform specific actions undertaken within appropriate Departments as part of their flooding preparations and response.

### **Surface Water Flood Forecasting and Warning:**

As a Lead Local Flood Authority the Council is aware of the risks associated with surface water flooding and the impact that it can have on its communities. Surface water flooding can happen so quickly and with communities caught unawares the effects can be severe.

In 2011 the Department for Environment, Food and Rural Affairs (Defra) set up a cross-government steering group to coordinate the development of surface water flood forecasting and warning services. The group is made up of Defra, Welsh Government, Environment Agency (England and Wales), Flood Forecasting Centre, Met Office, Lead Local Flood Authorities and Local Government Associations in England and Wales.

The Steering Group is currently holding a number of workshops for strategy developers and flood responders from local authorities, water companies, infrastructure owners and other relevant national and local organisations with an interest in surface water flooding. The workshops will gather views on what future surface water services could look like and discuss possible ways of delivering them. The workshops will also help inform the Environment Agency's work to produce its new Flood Incident Management Strategy.

The Council is fully engaged in this process.

### **Benefits**

- 1 To give local communities as much warning of potential flooding as possible to allow residents to take appropriate action.

### **Time Scale for Implementation**

Ongoing

**Short term 0 – 20 years**

#### **6.14.4 Flood Forecasting**

##### **Preparedness**

##### **Detailed Objectives 1, 2, 3, 4, 9, 10, 12, 13**

Flood forecasting within the Council is dependant on the information supplied by the Flood Forecasting Centre, which is a partnership between the Met Office and Environment Agency.

Established in 2009 and is operational 24 hours a day, 7 days a week, the centre forecasts for all natural forms of flooding that could affect the County Borough Area – river, surface water and groundwater.

To assist Category One and Two's responders in planning and responding to flooding, the Flood Forecasting Centre produces a Flood Guidance Statement, which presents an overview of the flood risk across five days and identifies possible severe weather, which could cause flooding and significant disruption to normal life.

As with Weather Warnings, Flood Guidance Statements are received by the Council via e-mail directly to the Senior Emergency Planning Officer and are automatically disseminated to nominated personnel within each Directorate. The statements are also used to inform specific actions undertaken within Directorates as part of their flooding preparations and response.

However, the Flood Guidance Statement is issued daily by the Flood Forecasting Centre which shows a rolling five day forecast of flood risk at county level for England and Wales. These are categorised into fluvial and coastal and/or surface water flooding risk. Awareness of this type of problem is dependent upon Local Authorities monitoring potential trouble spots together with information received from the general public.

##### **Benefits**

- 1 To give local communities and individuals the maximum amount of warning possible

##### **Time Scale for Implementation**

Currently in place and ongoing

**Short term 0-20 years**

#### **6.14.5 Emergency Response Plans**

##### **Preparedness**

##### **Detailed Objectives 1, 2, 3, 4, 9, 10, 12, 13**

In addition to the plans and procedures published by the Council, the Environment Agency also produce a plan which describes the arrangements that are in place and the systems used to issue warnings to locations at risk of flooding from main river watercourses, within the Caerphilly County Borough Area. This plan, maintained by the Environment Agency, is distributed to all agencies with a role to play in the response to flooding.

**Benefits**

- 1 To manage the response of CCBC and its Risk Partners to various emergencies including flooding
- 2 To give support to the communities during and after emergencies

**Time Scale for Implementation**

Ongoing

**Short term 0 – 20 years**

**6.14.6 Community Flood Plans**

**Preparedness**

**Detailed Objectives 1, 2, 3, 4, 9, 10, 12, 13**

CCBC has only one Community Flood Plan in place covering Ynysddu community. This area was chosen by the Environment Agency as it is considered to be one of the communities at greatest risk of river flooding within Wales.

A Flood forum was set up by the EA bringing together representatives of the community of Ynysddu, local Councillors, Environment Agency employees and staff members from CCBC Emergency Planning and Engineering Groups.

Although the forum was established to produce a Community Plan relating to a main river, in this case the river Sirhowy, it is considered as an appropriate grouping to consult as part of the preparation of the FRM Strategy as the same community is also subject to flooding from surface water, ordinary watercourses and their interface with the River Ebbw. A meeting has taken place with the Ynysddu Flood Forum to assist in the preparation of this Strategy and a number of Questionnaires were filled in by members of the public attending the meeting.

In addition, CCBC Emergency Planning department has established Flood Forums at Cwmfelinfach and Risca in order to produce Community Flood Plans for these areas. A forum has also been set up for the Dyffryn Business Park.

These additional Flood Forums will be set in place within the next two years and therefore consultation will not be possible as part of the preparation of this Strategy, however, the time scale will allow consultation with these group as part of the preparation of the Flood Risk Management Plans.

**Benefits**

- 1 The local communities will be made more aware of the risks of flooding to their properties
- 2 The plans will allow individual house holders to prepare their own Flood Risk Plans
- 3 The social and economic effects of any likely flooding will be reduced

### **Time Scale for Implementation**

It is anticipated that the additional Community Flood Plans proposed for CCBC will be completed in collaboration with the Environment Agency and CCBC Emergency Planning Department within the next 5 years

**Short term 0-20 years**

## **6.14.7 Multi-Agency Flood Plans**

### **Preparedness**

#### **Detailed Objectives 1, 2, 3, 4, 9, 10, 12, 13**

Caerphilly County Borough Council recognises that an efficient response to, and planning for flooding, requires a multi agency approach and to this end the Council works closely with all its professional partners.

With regards to civil protection, the main vehicle for this co-operation within the Gwent Police force area is the Local Resilience Forum (LRF).

The forum consists of all Category One and Two responders and include the Police, Fire and Rescue Service, Health Agencies including Ambulance, the Environment Agency, Utility Agencies and Voluntary Organisations.

To inform its planning process the forum produces the Gwent LRF Community Risk Register. The Community Risk Register identifies the level of risk considered for flooding within the Gwent LRF area based on national guidance and local input.

In addressing these identified risks, the forum has established the Gwent LRF Severe Weather Group to ensure a multi agency approach to severe weather related major incidents within the Gwent LRF Area, including flooding.

This group has produced, on behalf of the LRF, the Gwent LRF Flood Arrangements, which is designed to identify flood risk from all sources within the Gwent LRF area and provide a focus for multi-agency response to flooding incidents.

The plan is designed primarily to be used at a Strategic Control Group for a major flooding incident that requires a multi agency response. The plan underpins the Gwent Major Emergency Response Arrangements.

In addition to these documents the LRF has also established a number of other plans which would assist in a multi agency response to a major flooding incident. These include the Gwent LRF Evacuation and Shelter Plan and Gwent LRF Recovery Plan.

### **Benefits**

- 1 To manage the response of CCBC and its Risk Partners to various emergencies including flooding
- 2 To give support to the communities during and after emergencies

### **Time Scale for Implementation**

Ongoing

**Short term 0 – 20 years**

### **6.14.8 Major Incident Plans Preparedness Detailed Objectives 1, 2, 3, 4, 9, 10, 12, 13**

The Council's primary generic plan is the Caerphilly County Borough Council Major Incident Plan and describes agreed arrangements which are intended to assist the co-ordination of the Council's response to any actual or threatened major incident, while maintaining normal services as far as possible.

The Plan is designed to provide a flexible framework of procedures to enable a quick, effective and appropriate response to mitigate the effects of any major emergency on the public and the environment.

The Plan outlines:

- 1 The Council's Emergency Management Structure;
- 2 The trigger for activating the Plan, including alert and standby procedures;
- 3 Activation procedures;
- 4 Identification and generic roles of the Incident Response Team;
- 5 Location of the Incident Response Team room from which a major incident will be managed;
- 6 Generic emergency management roles of all parts of the organisation in relation to responding to a major incident;
- 7 Complementary generic arrangements of other responders;
- 8 Stand-down procedures.

#### **Directorate Plans:**

To assist Directorates to meet their agreed responsibilities as outlined in the Major Incident, the Council has developed Directorate Major Incident Plans. Each plan:

- 1 Sets out the Directorate's responsibilities for service provision in any major incident;
- 2 Establishes the mechanism for 24 hours activation of key personnel;
- 3 Provides contact details for the Directorate's staff and other resources;
- 4 Provides action checklists for the key personnel/emergency functions.

### **Operational Procedures:**

There are a number of operational procedures which identify specific actions undertaken as part of the Council's preparations and response to predicted or actual flood events. These include the Highways Operations Group Out of Hours Duty Officer Manual which clarifies responsibilities, procedures and the nature of response to an emergency and the Emergency Planning Response Procedures which provide guidance on the initial actions to be taken when alerted to an actual or threatened emergency.

### **24hr On Call Response:**

The Council operates a 24 hour duty officer system that provides an urgent response to major incidents.

### **Benefits**

- 1 To manage the response of CCBC and its Risk Partners to various emergencies including flooding
- 2 To give support to the communities during and after emergencies

### **Time Scale for Implementation**

Ongoing

**Short term 0 – 20 years**

## **6.15 Land, Cultural and Environmental Management**

### **6.15.1 Land Management**

#### **Prevention**

**Detailed Objectives 1, 2, 3, 4, 5, 6, 7, 8, 12, 13, 14, 15, 18**

#### **Planning Issues**

As previously outlined (refer to Sustainable and Strategic Development Planning) the single biggest influence that the LDP has in respect of flood risk is in effective land management. Allocating land for development in appropriate locations and providing a policy framework that assists in directing development away from flood risk areas are key elements of land management and flood risk. The LDP also identifies open areas for protection, such as Special landscape Areas (6) and Visually Important Local Landscapes (5) and areas of nature conservation importance such as Sites of Importance for Nature Conservation (190), all of which contribute to reducing the risk of flooding.

The council are also a significant landowner in the county borough, providing many important open areas for informal and formal leisure and recreation. The council has established 5 country parks and is currently progressing a community park in the Bedwas-Trethomas-Graig-y-Rhacca area. In addition to this the council work actively with landowners and farmers on environmental projects, such as Glastir, an agri-environmental scheme.

However it should be noted that the council have extremely limited powers to intervene or control what happens on the vast majority of land within the county borough, particularly in respect of agriculture, which has extensive permitted development rights.

### **Engineering Issues**

In order to reduce total runoff and/or control peak flows from catchments above areas identified as being subject to flood risk CCBC will consider introducing various methods of catchment management.

Where forestry planting has been introduced CCBC will enter into discussions with land owner to discuss felling and tree planting programmes to minimise increases in runoff after felling or reductions to peak flows in the medium term. It is anticipated that the Forestry Commission as one of the Risk Partners with CCBC will be engaged in consultation to control these processes.

Control over the construction of drainage systems within the forestry will also be discussed.

CCBC as the LLFA will also consult with Farm Unions and local farmers to discuss methods of farming, such as the direction of ploughing, which affects the nature of the runoff from farmland. The planting of shelter belts will also be considered.

The use of fertiliser and other chemicals used in the farming industry will also be discussed in an attempt to limit contamination of downstream watercourses.

### **Benefits**

- 1 Integrated land management opportunities benefiting a range of themes simultaneously, theoretically broadening the scope and increasing the likelihood of funding for projects that will improve land water management.
- 2 Reduction of surface water runoff and peak flows
- 3 Reduction of contamination to surface water runoff

### **Time Scale for Implementation**

Ongoing

**Short Term and medium term 0 – 50 years**

## **6.15.2 Resilience**

### **Preparedness**

**Detailed Objectives 5, 6, 7, 8, 14**

Within CCBC a culture of resilience to flood will be adopted in relation to property and land 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.

Resilience relating to properties is covered in 6.17.4 below.

Where land contains Sites of Special Scientific Interest (SSSIs) or Sites of Importance for Nature Conservation (SINCs) measures will be adopted which will minimise the risk of flooding if flooding is considered to be of detriment to the habitat. It must however be accepted, that total removal of risk will not be possible. As such the sites will be appropriately managed to increase the ability of the environments to cope with any changing conditions that may arise.

Where land containing SSSIs or SINCs is identified as being subject to flood risk, surveys and reports will be carried out to identify the potential damaging effects of flooding and what measures could be implemented to reduce the flood risk.

Such measures may include the construction of swales, drainage ditches or small earth bunds to divert surface water from the sensitive areas to areas of less environmental significance.

#### **Benefits**

- 1 To preserve existing habitats particularly SSSIs and SINCs
- 2 To return flooded habitats to their original condition as soon as possible

#### **Time Scale for Implementation**

##### **Short term 0 – 20 years**

### **6.15.3 Resistance**

#### **Protection**

##### **Detailed Objectives 5, 6, 7, 8, 14**

Within CCBC a culture of resistance to flood risk will be adopted in relation to property and land subject to flood risk. This will entail the implementation of measure which will reduce the risk of flood water entering properties and land which would be adversely affected by flooding. Resistance relating to properties is covered in 6.17.5 below.

Where land contains Sites of Special Scientific Interest (SSSIs) or Sites of Importance for Nature Conservation (SINCs) measures will be adopted which will minimise the risk of flood water entering the site although it must be accepted that total removal of risk will not be possible and that such sites will have a lower priority than the reduction of flood risk to people and residential property.

Where land containing SSSIs or SINCs is identified as being subject to flood risk surveys and reports will be carried out to identify the potential damaging effects of flooding and what measures could be implemented to reduce the flood risk.

Such measures may include the construction of swales, drainage ditches or small earth bunds to divert surface water from the sensitive areas to areas of less environmental significance.



### **Benefits**

- 1 To preserve existing habitats particularly SSSIs and SINCs

### **Time Scale for Implementation**

**Short term 0 – 20 years**

## **6.15.4 Restoration**

### **Prevention**

**Detailed Objectives 5, 6, 7, 8, 14, 15**

### **Planning Issues**

Land restoration is generally undertaken on land that has previously been subject to land uses that have had a significant adverse impact upon the land. Restoration sites are generally one of two types (or a mixture of both), former mineral/coal extraction sites or sites of chemical contamination from industrial processes.

Land reclamation/restoration is a reactive action, rather than a proactive one, and, as such, the methods and details of any scheme are dependant upon the circumstances of the site. Consequently flood risk is taken into account only as far as the site constraints allow.

The majority of large-scale restoration or reclamation schemes are undertaken using public grants or funding. In many cases public funding for such schemes is prioritised, with schemes that realise economic benefits (particularly in the form of development) being more likely to receive funding. Consequently the vast majority of large-scale restorations / reclamations are accompanied by built development. It is important to note that this development takes place on brownfield sites and as such satisfies one of the criteria, set out in TAN 15, that permits certain developments in flood risk areas.

### **Engineering Issues**

Traditionally CCBC has been subject to extensive mining for coal and iron ore. Various forms of deep mining have been used resulting in numerous large deposits of waste material on the surface in the form of tips. All coal and iron ore extraction by this method has now ceased within the Borough.

In more recent years coal extraction by opencast mining has been adopted and although significant excavations are carried out as part of the extraction process the sites are usually restored before works are completed.

In addition there has been a tradition of quarrying for building stone and aggregates. This type of operation generally leaves a vertical excavation forming a scar on the landscape.

Over the last 50 years the Welsh Government and its predecessors have funded numerous schemes within the Borough to restore sites that have been subject to mineral extraction and where significant derelict land has been left untreated. When such engineering works are planned it is the policy of CCBC to restore sites to a land form which blends well with the surrounding landscape and produces a natural land appearance. This form of restoration usually includes planting trees and seeding for stabilisation,

which reduce surface water runoff. These sites will be managed, particularly the woodlands, in order to maximise the stabilisation of the restored land and to minimise surface water flow.

Drainage on these sites usually takes the form of drainage ditches, swales, French drains, surface water sewers and lined channels. These techniques usually restore the surface water runoff to a level similar to green field values particularly after the vegetation has been established and the site matured.

Any site which is subjected to major earthworks, is likely to cause significant silt pollution to the local surface water and ordinary watercourses. In order to control the discharge from the site and to ensure that the quality of the water meets the Environment Agency standards for Discharge Consent the developer will have to install a series of settlement ponds. The ponds will need to be cleared of silt on a regular basis and the discharge will be monitored.

It is the policy of CCBC to restore all derelict land, where appropriate, to beneficial use.

**Benefits**

- 1 To establish new natural habitats
- 2 To restore land to beneficial use

**Time Scale for Implementation**  
**Short and Medium term 0- 50 years**

**6.15.5 Environmental Enhancement**  
**Prevention**  
**Detailed Objectives 5, 6, 7, 8, 14, 15, 17**

The council submits bids for funding, from various sources, to implement environmental improvements in urban and rural areas. These schemes cover a wide-range of projects from hard surface environments to natural environments and even habitat creation. However, such schemes are inevitably part of a larger development or improvement and are, therefore, often constrained in their scope.

Where possible such schemes should take account of, and improve, the situation in respect of flood risk.

**Benefits**

- 1 Decreased surface water runoff on new developments and publicly funded environmental enhancements

**Time Scale for Implementation**  
**Short, Medium and Long term 0 – 100 years**

## **6.15.6 Water Bodies Protection Detailed Objectives 8, 14, 15**

### **Reservoir Inundation Planning**

Reservoirs retain an important resource above natural ground level, but in doing so they present a potential flood risk to the downstream area.

The Government judges that a major reservoir inundation event could have a potentially catastrophic impact and therefore, following Sir Michael Pitt's report into the 2007 summer floods, Government accepted the recommendation for improving reservoir safety.

In particular through a Ministerial Direction, the Government aims to secure a reservoir flood plan for every large raised reservoir from which an uncontrolled release of water would pose a risk to life. Initially it is intended that flood plans should be in place for those reservoirs over 25,000m<sup>3</sup> and, subject to enactment of specific regulations contained within the Flood and Water Management Act 2010, for reservoirs over 10,000m<sup>3</sup>.

The Government has now produced reservoir inundation maps for all large raised reservoirs and has made them available to reservoir undertakers and to local emergency responders to inform their emergency planning process. These outline maps are also available to the general public by request to the Environment Agency and are also posted on their website.

### **On-site Planning:**

In 2003, the Water Act amended the Reservoir Act 1975 giving Welsh Government ministers the power to direct reservoir undertakers to prepare a reservoir flood plan. On-site plans should detail how reservoir undertakers would respond to a potential or real reservoir failure. They should also contain a detailed description of the on-site triggers and actions required in response to those triggers in an emergency.

The Government reservoir inundation maps indicate that there are nine large raised reservoirs wholly contained within the Caerphilly County Borough Area with an additional five, which are located in an adjacent local authority, whose inundation area would have some affect on the County Borough Area.

Of these ten, the Council is the designated undertaker for four and has therefore completed, or in the process of completing, appropriate on-site plans. The reservoirs concerned are:

- 1 Penpedairheol Flood Storage Reservoir;
- 2 Pen-y-Fan Pond;
- 3 Jepsions Pond;
- 4 Bute Town Reservoir.

The other reservoirs are in private ownership and are:

- 1 Caerphilly Castle Moats;
- 2 Rhymney Bridge 1 and 2;
- 3 Rhaslas Pond.
- 4 Nant y Draenog;
- 5 Cefn Mably Lodge Lake;

### **Off-site Planning:**

The Civil Contingencies Act 2004 places duties on category one and two organisations to put in place emergency plans and to communicate and work together on all aspects of emergency planning. Reservoir off-site plans are written in accordance with the requirements of the Act.

Ministerial guidance suggests that two levels of off-site plans are put in place. A generic plan covering a geographical area, to ensure that local responders are able to make a swift and effective response to any reservoir emergency, involving reservoirs for which specific off-site plans have not been constructed. To this end the Gwent Local Resilience Forum has produced the 'Generic Off-Site Plan Template for Reservoir Emergencies'.

In addition to the Generic Plan, a site specific reservoir emergency plan should be put in place for those reservoirs designated as higher priority. Within the Gwent area the reservoirs at Carno have been designated as such a reservoir and therefore Blaenau Gwent County Borough Council has produced the 'Specific Off-Site Plan For Lower Carno And Upper Carno Reservoirs'. As part of the inundation area of these reservoirs affect areas of Caerphilly County Borough, the Council, through the Emergency Planning Team, have been integral to the planning and publication of this plan.

For the other reservoirs indicated that are wholly within the County Borough Area, the Council will look to develop a Generic Reservoir Major Incident Plan which will include where appropriate site specific arrangements.

### **Water Bodies over 2,000m<sup>2</sup> in area**

CCBC propose to prepare a database of all water bodies within the Borough that have a surface area greater than 2,000m<sup>2</sup> and could therefore have a significantly affect on surface water flooding. A survey will be carried out to identify these structures within the next two years

### **Benefits**

- 1 To be prepared for any emergency resulting from a failure in any water retaining structure
- 2 Provides protection to local residents

### **Time Scale for Implementation**

Survey of water bodies with area greater than 2,000 m<sup>2</sup> will be carried out with two years.

Plans - Timescales for the completion of this work 0 – 5 years.

**Short term 0 – 20 years**

## **6.15.7 Habitat Creation**

### **Protection**

**Detailed Objectives 8, 14, 15**

### **Planning Issues**

Whilst planning has significant scope for habitat creation, in virtually every case it is dependant upon some other form of development, i.e. it is rare for a scheme of habitat creation to be implemented for its own sake. Most habitat creation schemes are reactions to impacts that their primary

development has on the existing environment, providing mitigation against effects or compensatory provision for loss of important habitat. In such cases the habitats created reflect those lost or impacted upon and it is not possible to predetermine the use habitat features that can assist in addressing flood risk.

Obviously where scope exists, such measures should be incorporated into habitat creation schemes, but schemes should not be compromised through inclusion of such measures, where they would be inappropriate.

### **Engineering Issues**

In order to reduce total runoff and/or control peak flows from catchments above areas identified as being subject to flood risk, CCBC will consider creating new habitats having characteristics which will reduce the total runoff or reduce the peak level of surface water discharge from the site.

Where there is currently a catchment with high runoff characteristics such as open grassland the following habitats may be created to control surface water flows:

- 1 Woodland
- 2 Wetland
- 3 Attenuation ponds
- 4 Hedgerows



**Construction of Reed Beds**

Where forestry planting will be considered CCBC will enter into discussions with the Forestry Commission and Countryside Council for Wales as Risk Partners as well as the local land owner and the Farmers Union.

Where wetlands and storage ponds are considered consultation will also take place with the Environment Agency

**Benefits**

- 1 Improvements to water management including reduced surface water runoff and increased water retentive capacity
- 2 Improve bio-diversity

**Time Scale for Implementation**

**Short, Medium and Long term 0 – 100 years**

**6.15.8 Control of Invasive Species**

**Protection**

**Detailed Objectives 5, 6, 7, 8, 12, 15**

On completion of the new flood modelling maps being prepared by the Environment Agency, plans will be prepared showing the location of invasive species of plants and animals within the areas subject to flood risk. In particular the survey will concentrate on Himalayan Balsam, Japanese Knotweed, Floating Pennywort, Giant Hogweed and Signal Crayfish. When the Flood Risk Management Plans are prepared efforts will be made to divert flood water from areas where there are extensive infestations of invasive species. Where this cannot be avoided the invasive species will be subject to a comprehensive treatment programme. In the case of Japanese Knotweed and Giant Hogweed this will generally take the form of herbicide application whilst Himalayan Balsam can be controlled through cutting or pulling to prevent flowering and seeding.

It is an offence to plant or cause their spread under the Wildlife and Countryside Act 1981 and all waste containing these plant species comes under the control of Part II of the Environmental Protection Act 1990.

Where physical works are to be undertaken in areas infested with invasive plant species, controls should be programmed and implemented at the earliest opportunity. This will prevent further spread, lessen the time taken to control the infestation and reduce the cost of treatment.

All works will be carried out in line with The Knotweed Code of Practice - managing Japanese Knotweed on development sites. (Current best practice)





### **Invasive Species - Japanese Knotweed**

#### **Benefits**

- 1 To have details of the location of invasive species to avoid the accidental transfer to other land through watercourses.
- 2 To plan and implement the reduction in areas populated with invasive species.
- 3 Reduce risk to human health
- 4 Reduce risk of flooding
- 5 Reduce damage to infrastructure
- 6 Cost saving of preventing invasive plant species becoming established.

#### **Time Scale for Implementation**

A fine detail survey will be carried out within 5 years of the publication of The Strategy.

Control of invasive species is on-going

**Short Term to Long Term 0 – 100 years**

### **6.15.9 Soil Management Plans**

#### **Protection**

**Detailed Objectives 5, 6, 7, 8, 12, 15, 17**

When works are carried out on undeveloped land in order to implement measures identified within The Soil Management Plans, a survey will be carried out to assess the quality of the soil within the site. A Soil Management Plan will then be prepared to ensure that soil and associated habitat of interest is retained as part of the development. Where appropriate the soil hydrology will be enhanced to improve habitat and flood risk management.

### **Benefits**

- 1 To preserve habitats
- 2 To encourage the development of more interesting habitats

### **Time Scale for Implementation**

On-going

**Short Term – Long Term – 0 – 100 years**

## **6.16 Asset Construction, Management and Maintenance**

### **6.16.1 System Asset Management Plans**

#### **Protection**

#### **Detailed Objectives 11, 13**

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

In order to satisfy this requirement CCBC has set up a database using Excel and layers within ArcMap Geographic Information System (ArcMap GIS), which have the following information recorded:

- 1 Records within the Excel database and GIS layer showing all known culverted watercourses and all associated manholes, intakes and outlets, owned by CCBC and other land owners.

More recently CCBC has purchased three modules of a bespoke system for Asset Management. It is this system, which will be used in the future for the management of drainage structures including the following:

- 1 Database of all known pipes, culverts, channels, drainage ditches, manholes, intakes and outfalls.
- 2 GIS layers of all known pipes, culverts, channels, drainage ditches, manholes, intakes and outfalls.
- 3 Records of all inspections carried out to grids or culverts.
- 4 Records of cleaning of grids and gullies

The system of database and GIS layers will be used by CCBC to manage drainage assets. Further information is required and the following surveys and calculations will be needed to be carried out:

- 1 Calculation of capacity of each culvert
- 2 Identification of intake structures below current EA standards, which will need to be upgraded
- 3 Identification of all owners and their contact details
- 4 Current condition of each significant culvert

Where areas are identified which are subject to a high level of flood risk one of the measures which will be considered in order to reduce flood risk will be the construction of new surface water culverts or channels.



**Benefits**

- 1 Provide details of all existing drainage structures which are likely to affect flood risk
- 2 Give easy and efficient access to available information
- 3 Provide condition surveys and maintenance records for all drainage structures
- 4 Maintain records of cleaning and inspection of grids and gullies

**Time Scale for Implementation**

**Short term – 0 – 20 years**

**6.16.2 Defence/Structure Management and New Construction Protection**

**Detailed Objectives 1, 2, 3, 4, 9, 11, 12, 13**

CCBC has a number of formal flood defences, which have been plotted within the GIS system. These defences are largely earth formed embankments, which have been constructed by the Environment Agency.

A survey will be implemented in order to establish a list of the defences within the borough, including details of their construction and condition.

In addition CCBC has a number of informal flood defences, which may include items such as boundary walls to properties, embankments constructed for highway schemes, individual properties, or even kerb lines. Although these features were not constructed as flood defences, in some cases they defend properties against flooding and in others they affect the route of surface water during floods and therefore can significantly affect flood risk.

It is proposed that some informal structures controlled by individuals or government organisations be identified as part of the Hazard and Risk Management Plans to be prepared by June 2012. This information will then be included in the CCBC database of drainage assets.

**Benefits**

- 1 To exclude flood water from areas identified as subject to flood risk

**Time Scale for Implementation**

**Sort and Medium term 0 – 50 years**

**6.16.3 Channel Maintenance and New Construction Protection**

**Detailed Objectives 1, 2, 3, 4, 9, 11, 12, 14, 17**

Drainage channels, which have been identified as being significant to flood risk, have been included in the CCBC database of drainage structures and the GIS layers.

Where these structures are in the ownership of CCBC they are maintained by the CCBC Drainage Department. Channels may include ordinary watercourses, lined channels, drainage ditches and swales.

The condition of these culverts is unknown and maintenance is carried out on an “as required” basis and may include the following:

- 1 Cutting of grass and shrubs where this may impede flows and reduce channel capacity
- 2 Repairs to concrete inverts or bank protection where damage has occurred, which could undermine the integrity of the channel.

It is proposed as part of this strategy that surveys will be carried out of all known 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.

Following the next round of surface water modelling and the preparation of Hazard and Risk Maps, the Flood Risk Management Plans will be written. These plans will identify individual measures to be implemented in each flood risk area, which may include the construction of additional channels to carry excess surface water from areas of high flood risk.



**Lined Channel**

### **Benefits**

- 1 To bring all channels on significant watercourses to be fit for purpose
- 2 To ensure that all channels are well maintained

### **Time Scale for Implementation**

#### **Short term 0 – 20 years**

## **6.16.4 Culverts, Gullies, Highway and Culvert Infrastructure Maintenance and New Construction**

### **Protection**

#### **Detailed Objectives 1, 2, 3, 4, 9, 11, 12, 13**

Culverts and pipes, which have been identified as being significant to flood risk, have been included in the CCBC database of drainage structures and on the GIS layers.

Where these structures are in the ownership of CCBC or have been classified as being of strategic importance they are maintained by the CCBC Drainage Department.

Where access inside the culverts is relatively easy and the culvert is regarded as being of strategic importance they are inspected on an annual basis.

Most of the culverts, which are in CCBC ownership, do not fall into this category and therefore their condition is unknown and maintenance is carried out on an “as required” basis and may include the following:

- 1 Repairs to culvert inverts and walls where the construction is in masonry.
- 2 Replacement of sections of culvert, which have collapsed using modern pipes.
- 3 Replacement or repair of existing structures such as manholes, intakes and outlets.
- 4 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, The new structures will be designed and built in accordance with the Environment Agency Code of Practise for intakes.

It is proposed as part of this strategy that surveys will be carried out of all culverts, 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 culvert 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 culverts. Consideration will also be given to the feasibility to restore culverts back to open watercourses.

Following the next round of surface water modelling and the preparation of Hazard and Risk Maps, the Flood Risk Management Plans will be written. These plans will identify individual measures to be implemented in each flood risk area, which may include the construction of additional culverts designed to modern standards to carry excess surface water from areas of high flood risk.

CCBC has the following Operational Procedures in order to maintain the surface water assets.

- 1 Land Drainage – Maintenance and Renewal.
- 2 Sandbag Operational Procedure.
- 3 Severe Weather Culvert Inspections.
- 4 Ditches and Dredging.
- 5 Equipment used to investigate Drainage Problems.
- 6 Out of hours (Duty Officer Manual) – April 2012 (Section relating to flooding incidents).
- 7 Winter Service Plan 2111-2012.
- 8 Survey Sheet.
- 9 Gully Cleansing.
- 10 Gully Schedule Referral System.
- 11 Highway Maintenance and Renewal.



**Blocked grid following heavy rain**

**Benefits**

- 1 To bring all culverts on significant watercourses to a fit for purpose standard.
- 2 To ensure that all culverts are well maintained.

**Time Scale for Implementation**

**Short term 0 – 20 years**

## **6.17 Studies, Assessments and Plans**

### **6.17.1 Investigation**

#### **Preparedness**

#### **Detailed Objective 16**

In the preparation of this strategy and identification of measures, which may be implemented as part of the Risk Management Plans a number of issues have been identified in terms of the lack of information currently available within CCBC. It is proposed that numerous surveys and investigations will be carried out in order to supplement the information already available.

A list of the surveys required is given below:

- 1 Where land containing SSSIs or SINCs is identified as being subject to flood risk, surveys and reports will be carried out to identify the potential damaging effects of flooding and what measures could be implemented to reduce the flood risk.
- 2 Survey of water bodies with area greater than 2,000 m<sup>2</sup>.
- 3 Additional information required for the database and GIS layers.
  - 1 Calculation of capacity of each culvert and determine details of the catchment served.
  - 2 Identification of intake structures below current EA standards, which will need to be upgraded.
  - 3 Identification of all owners and their contact details.
  - 4 Current condition of each significant culvert.
- 4 Identify all features, which act as flood defence structures.
- 5 Survey 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.
- 6 Survey all culverts, 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 culvert and its condition.
- 7 Further survey work and site investigations will be carried out in order to improve the accuracy and completeness of the information available regarding contaminated land.
- 8 Surveys will be carried out to establish what measures will be required in order to provide additional resistance to flood water to Scheduled Ancient Monuments and Historic Listed Buildings.
- 9 A survey will be carried out to identify where leachate is being discharged from refuse tips both current and historic and from



cemeteries. The nature of the leachate will be established and its affect on the quality of surface water.

- 10 A survey will be carried out of all ground water discharges from all mine workings to establish the location and quality of the water.
- 11 A survey will be implemented in order to establish a list of the defences within the borough, including details of their construction and condition.
- 12 On completion of the new flood modelling maps being prepared by the Environment Agency, plans will be prepared showing the location of invasive species within the areas subject to flood risk.



### **Investigation of Drainage System**

#### **Benefits**

- 1 To have information available to identify where measures may be required
- 2 To have information available to design new measures

#### **Time Scale for Implementation**

**Short term 0 – 20 years**

**6.17.2 Risk Assessment  
Preparedness  
Detailed Objective 16**

A measure of the flood risk within CCBC was established at part of the PFRA Report. As previously outlined a total of 59 Blue Squares have been identified and using the methodology defined above, 47 of these squares are contained within the Flood Risk Area.

The Key Flood Risk Indicators for the CCBC Flood Risk Area have been calculated as follows:-

1	Human health consequences – Number of people (2.23 multiplier)	16,141
2	Other human health consequences – Number of critical services flooded	69
3	Economic consequences – number of non-residential properties flooded	1,955

As part of the requirements of the Flood Risk Regulations the Flood Risk in CCBC will be reassessed and the following time scale has been draw up.

- 1 Updated Flood Map for Surface Water to be prepared by the Environment Agency by December 2013
- 2 Flood Hazard and Risk maps to be published by December 2012
- 3 Flood Risk Management Plans to be published by December 2015

The process listed above will result in a more detailed and accurate picture of the flood risk in CCBC.

**Benefits**

- 1 To provide a more accurate measure of the flood risk within CCBC
- 2 To set a benchmark of flood risk for the Borough, which, will be used to establish the reduction of flood risk as a result of implementing additional measures

**Time Scale for Implementation  
Sort and medium term 0 – 50 years**

**6.17.3 Strategy Plan  
Preparedness  
Detailed Objective 16**

This Local Flood Risk Management Strategy for CCBC 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 equitably and will govern the process to establish what measures will be implemented in order to achieve the goal of reducing flood risk within CCBC 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.

**Benefits**

- 1 Ensure that Flood Risk Management Plans are all prepared in a consistent way

**Time Scale for Implementation**

Short term 0 – 20 years

**6.17.4 Local Property- Flood Mitigation - Resilience Preparedness Detailed Objective 12**

CCBC has a stock of 10,500 houses. A total of 9,300 properties must be upgraded to NICEIC standards over the 7 years from 2013 – 2030. Only the kitchens have to be refurbished on the ground floor. The grants available do not allow for building in flood resilience and other ground floor rooms other than kitchens.

In addition, CCBC's own offices, schools, health centres, sheltered accommodation and other council related buildings will be considered.

The buildings vary in age but none of them have been built to withstand flooding. It is proposed that once the detailed flood modelling has been completed all Council owned buildings at risk will be identified. When these 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 of refurbishment of all ground floor rooms and the extra cost of building in resilience.

Where new buildings are planned within areas at risk of flooding CCBC will adopt a policy of using building standards which are resilient to water inundation.

Methods of achieving building resilience in flood risk areas may include the following:-

**Use of flood resilient materials**

Ceramic tiled floors, flood proof skirting, steel kitchens units. Replace chipboard kitchens and bathroom units with plastic, steel or solid wood. Fit water resistant doors and window frames. Replace usual plaster with a more water-resistant version such as lime plaster or cement render. Always use waterproof sealant on external walls and water resistant paint on internal walls. Use denser concrete screeds on concrete floors. Replace insulation with cell insulation which will survive flooding. Install concrete floors instead of timber suspended. Wall joints to be protected by installing a chemical damp proof course below joist level.



### **Use of flood resilient building techniques**

Walls re-plastered up to 1 metre above floor level with water resilient plaster, all main appliances on plinths, kitchens units with base units raised off the ground and raise electrical points and other services above flood level. Use tiled floors with rugs that can be removed easily. Buy airbricks with removable covers – put them on during flood, but remove afterwards to help drying process. Install expensive electric equipment such as boilers upstairs.

#### **Benefits**

- 1 Less damaged will be caused to properties subject to flooding
- 2 Buildings will be renovated and brought back into use more quickly.
- 3 The overall cost of the building life cycle will be reduced.

#### **Time Scale for Implementation**

Building in resilience to existing properties will take place as properties are programmed for refurbishment, only when it has been established that they are within an area subject to flood risk. The time scale therefore for all council owned properties to be refurbished is likely to be up to 50 years

**Medium term 20-50 years**

### **6.17.5 Local Property- Flood Mitigation - Resistance Protection**

**Detailed Objectives 1, 2, 3, 4, 12**

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.

Measures may include portable flood walls, flood guards to doors or the replacement of existing doors with doors with seals which will withstand the depth of water predicted by the modelling. These measures would need to be installed with non-return valves or double-check valves in the foul sewers to prevent flood water entering the properties through the sewer systems.

#### **Benefits**

- 1 To ensure that properties damaged by flooding will be brought back to a habitable state as quickly as possible

#### **Time Scale for Implementation**

**Sort and medium term 0 – 50 years**

### **6.17.6 Pre-feasibility Studies, Feasibility Studies Preparedness**

**Detailed Objective 16**

When the Flood Risk Management Plans are being prepared various measures will be considered for implementation. At this stage pre-feasibility plans will be carried out which will identify the measures most likely to achieve the desired reduction in flood risk at appropriate cost.

Following this process a much more limited number of measures will be selected for further more detailed feasibility studies.

**Benefits**

- 1 Ensure that the most appropriate measures are put forward for implementation

**Time Scale for Implementation**

This work will be carried out within the next four years to ensure that the Flood Risk Management Plans are all completed

**6.17.7 Project Plans**

**Preparedness**

**Detailed Objective 16**

On completion of the feasibility study referred to in 6.17.6 above each measure will be subjected to appraisal based on the following criteria:

- 1 Does it contribute the CCBC high level strategy of reducing flood risk?
- 2 What measurable effect does the measure have on reducing flood risk?
- 3 Is the scheme within a high priority flood risk area?
- 4 Does the cost benefit analysis show the scheme to be value for money?
- 5 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.

**Benefits**

- 1 To identify flood risk in a more precise way
- 2 Allows the preparation of measures to reduce flood risk

**Time Scale for Implementation**

**Sort and medium term 0 – 50 years**

**6.18 High Level Awareness and Engagement**

**6.18.1 Partnership Working**

**Preparedness**

**Detailed Objectives 13, 18**

Close working with the following partnerships will be implemented:

- 1 Other Risk Partners
- 2 Adjacent Local Authorities
- 3 The Communities at risk
- 4 Caerphilly Biodiversity Partnership

- 5 Caerphilly Environment Partnership
- 6 Health, Social Care and Wellbeing Partnership
- 7 Community Safety Partnership

### **Benefits**

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.

### **Time Scale for Implementation**

Immediate & ongoing

**Short term 0 – 20 years**

## **6.19 Monitoring**

### **6.19.1 Erosion Monitoring**

#### **Preparedness**

**Detailed Objectives 14, 15**

It is not anticipated that CCBC will be affected significantly by erosion. There may be some limited erosion in main rivers but that issue is not the subject of this report.

Minor erosion may take place in ordinary watercourses but the channels formed by streams within the County Borough Area have been established over many years and therefore future erosion is not considered to be a significant problem. However, where a problem is identified “greener” more sustainable measures for the management of erosion on susceptible watercourses will be considered.

Erosion within steep stream beds does occur on a small scale which results in debris build up on screens at the entrance to culverts. This material would be noticed during the routine examination of the screens and arrangements made to remove the debris from the site.

In order to minimise the impact of debris restricting flows into culverts all new or improved grids will be constructed with additional grids upstream to collect the debris before it arrives at the culvert entrance.

### **Benefits**

- 1 To enable corrective action to be taken if the affect of flooding is causing restrictions in channels and water courses.

### **Time Scale for Implementation**

**Short term 0 – 20 years**

### **6.19.2 Habitats Monitoring**

#### **Preparedness**

**Detailed Objectives 5, 6, 7, 8, 13, 14, 15**

The monitoring of designated sites of ecological and habitat importance including, Special Areas of Conservation (SACs), Sites of Special Scientific

Interest (SSSIs), Regionally Important Geodiversity Sites (RIGS), Sites of Importance for Nature Conservation (SINCs) and Local Nature Reserves (LNRs) forms part of LDP monitoring, which strongly correlates with Caerphilly Biodiversity Action Plan (BAP) Habitat monitoring. 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. The importance of watercourses for the maintenance of connectivity between habitats will be considered.

**Benefits**

- 1 Monitoring of change (reduction, increase, improvement of natural habitats).

**Time Scale for Implementation**

Ongoing

**Short term 0 – 20 years**

**6.19.3 Topographical Survey**

**Preparedness**

**Detailed Objective 16**

Topographical surveys will be carried out where required to allow construction schemes to be designed as part of the Flood Risk Management Plans

**Benefits**

- 1 To allow measures to be designed in detail for specific sites.

**Time Scale for Implementation**

Surveys will be carried out within 2 years to allow measures to be designed for the FRMP

**Short term 0 – 20 years**

**6.19.4 Aerial Photography**

**Preparedness**

**Detailed Objective 16**

Monitoring sites/habitats via aerial photography is possible. We receive aerial photographs of the whole borough once every 2 years, that are available for viewing on GIS.

**Benefits**

- 1 Ability to monitor certain changes without site visit.

**Time Scale for Implementation**

Ongoing

**Short term 0 – 20 years**



**Aerial Photograph**

**OBJECTIVES AND RELATED MEASURES**

	<b>Objective</b>	<b>Measures</b>
	<b>Overarching Objective 1</b>  <b>Reducing the impacts on individuals, communities businesses and the environment;</b>	
1	Reduce the number of people exposed to the risk of flooding.	6.13.1; 6.13.2; 6.13.4; 6.13.5; 6.14.1 – 6.14.8; 6.15.1; 6.16.2 – 6.16.4; 6.17.5
2	Reduce the number of residential and commercial properties affected by the risk of flooding	6.13.1; 6.13.2; 6.13.4; 6.13.5; 6.14.1 – 6.14.8; 6.15.1; 6.16.2 – 6.16.4; 6.17.5
3	Reduce the number of people exposed to risk of flooding of significant depth and velocity.	6.13.1; 6.13.2; 6.13.4; 6.13.5; 6.14.1 – 6.14.8; 6.15.1; 6.16.2 – 6.16.4; 6.17.5
4	Reduce disruption to critical infrastructure or prepare plans to allow the operations to be maintained.	6.13.1; 6.13.2; 6.13.4; 6.13.5; 6.14.1 – 6.14.8; 6.15.1; 6.16.2 – 6.16.4; 6.17.5
5	Protect and enhance Natura 2000 Sites	6.13.1; 6.15.1 - 6.15.5; 6.16.8; 6.15.9; 6.19.2
6	Protect and enhance Sites of Special Scientific Interest (SSSIs)	6.13.1; 6.15.1 - 6.15.5; 6.16.8; 6.15.9; 6.19.2
7	Protect and enhance Sites of Importance for Nature Conservation (SINCs)	6.13.1; 6.15.1 - 6.15.5; 6.16.8; 6.15.9; 6.19.2
8	Contribute to the delivery of Caerphilly Biodiversity Action Plan (BAP)	6.13.1; 6.15.1 - 6.15.5; 6.16.8; 6.15.9; 6.19.2
9	Minimise damage to known historic areas and sites: Scheduled Ancient Monuments, Listed Buildings, Conservation Areas, Registered Historic Parks and Gardens and Registered Historic Landscapes.	6.13.8; 6.13.9; 6.14.1 – 6.14.8; 6.16.2 – 6.16.4

**OBJECTIVES AND RELATED MEASURES (Continued)**

	<b>Objective</b>	<b>Measures</b>
	<b>Overarching Objective 2</b>  <b>Raising awareness of and engaging people in the response to flood</b>	
10	Provide systems to give early warning of potential flooding to individuals and communities.	6.14.1 – 6.14.8
11	Provide efficient systems for the management and maintenance of surface water assets and drainage systems	6.16.1 – 6.16.4
12	Reduce economic damage	6.13.2; 6.13.4, 6.13.9; 6.14.1 – 6.14.8; 6.15.1; 6.15.8; 6.15.9; 6.16.2 – 6.16.4; 6.17.4; 6.17.5
13	Endeavour to reduce cost of management	6.13.4; 6.13.6; 6.14.1 – 6.14.8; 6.15.1; 6.16.1; 6.16.2; 6.16.4; 6.18.1; 6.19.2
	<b>Overarching Objective 3</b>  <b>Providing an effective and sustained response to flood events</b>	
14	Creating natural channels and water bodies with minimal modifications	6.13.1; 6.13.6; 6.15.1 – 6.15.7; 6.16.3; 6.19.1; 6.19.2
15	Improving water quality	6.13.1; 6.13.3; 6.13.5 – 6.13.7; 6.15.1; 6.15.4 – 6.15.9; 6.19.1; 6.19.2
16	Provide Flood Risk management Plans for each area subject to flood risk	6.17.1 – 6.17.3; 6.16.6; 6.17.7; 6.19.3; 6.19.4
17	Ensuring that measures are designed and constructed in a sustainable way	6.13.1; 6.14.6; 6.15.5; 6.15.9; 6.16.3
18	Ensuring that CCBC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities	6.15.1; 6.18.1
	<b>Overarching Objective 4</b>  <b>Prioritising investment in the most at risk communities.</b>	
19	Ensuring that investment decisions are prioritised in the most at risk communities on a consistent, defensible basis and are subject to cost benefit analysis.	ALL

## **7 How and when the measures are expected to be implemented**

7.1 Under Section 6 a list of measures have been identified to implement the objectives detailed in section 5 of this strategy. Within each measure the time scale for implementation has been given which comply with those given in the Welsh Government Guidance as listed below:

- 1 Short term (0-20 years).
- 2 Medium term (20-50 years).
- 3 Longer term (50-100 years).

7.2 Within this first version of the Strategy 43 measures have been identified in order to ensure that the 19 detailed objectives will be achieved. It is anticipated that detailed projects and construction scheme will be identified as part of the Flood Risk Management Plans which must be completed by June 2015. These Plans will have additional information available for their preparation including more accurate modelling and the Flood Hazard and Flood Risk Plans.

Future versions of the Strategy will therefore include details of the measures which will be identified in the preparation of the Plans and will also include detailed cost benefit analysis where appropriate.

7.3 Measures will be selected for detailed preparation and design work on a prioritised basis, which will take account of the level of flood risk based on a combination of social, economic and environmental issues. This system will be based on a series of priorities to be adopted by CCBC. Once a scheme has been prepared an estimated cost will be provided and a cost benefit analysis carried out to determine its priority for obtaining financial support. Input will be provided by the Finance Department to establish the financial resources available and whether the proposal is realistic in terms of finance and time scale. The availability of physical resources in terms of design staff and construction facilities will also be considered.

7.4 Where measures have been identified in partnership with other Risk Management Authorities, CCBC will endeavour to agree how, by when and by whom these measures are expected to be implemented.



## **8 The costs and benefits of the measures and methods of funding.**

**In order for The Strategy to be successful it is essential that significant funding be made available, in addition to the normal funding arrangements from Welsh Government. Options for funding which have been considered are given below.**

- 8.1 A total of 43 measures have been identified within the Strategy in order to implement the 19 detailed objectives which have been agreed.

For each of the measures identified, the benefits (be they tangible or intangible), the associated costs and the means by which the measures will be funded will need to be determined. These details cannot be incorporated within the Local Strategy as yet, as no specific measures for implementation at particular locations have been identified at this stage. The individual specific measures will be identified during the preparation of the Flood Risk Management Plans which will be completed by June 2015.

Before the detailed measures can be specified it will be necessary to complete the process outlined below as required by the Regulations:

- 1 Prepare Flood Hazard Plans. (to be completed by 22 June 2013).
- 2 Prepare Flood Risk Plans. (to be completed by 22 June 2013).
- 3 Prepare Flood Risk Management Plans. (to be completed by 22 June 2015).

In addition the following procedures will need to be undertaken to identify the measures to be implemented at specific locations:

- 4 Modelling of individual areas identified as high risk.
- 5 Prioritisation of areas based on magnitude of flood risk.
- 6 Design of measures to be implemented.

- 8.2 A cost/benefit analysis is ultimately dependant on the strategic priorities and the means of funding and therefore the Strategy addresses these issues together wherever possible. For each measure identified it is important to establish which organisations/stake holders are funding the measures and which organisations/stake holders are benefiting from the proposed measures. This will form an important element the cost/benefit analysis process.

- 8.3 The Welsh Government will be undertaking a review of the appraisal guidance relating to the allocation of funding, and it is anticipated that this will be out for consultation in 2013. Until any revised guidance is published LLFAs should continue to use the current Project appraisal Guidance (PAG) series supported by any specific additional or updating material provided by the Welsh Government.

For the purposes of the Strategy, cost / benefit analysis should be undertaken in accordance with the Flood and Coastal Defence Project Appraisal Guidance (FCDPAG3).

It is acknowledged that measures, to date, have been based upon a cost/benefit ratio where the benefits are determined to be greater in the long term than the associated costs. Going forward, however, measures should retain the cost/benefit compliance, whilst ensuring that they are proportionate to the level of risk presented.

- 8.4 When considering the works required in delivering their Strategy, CCBC will be mindful of work ongoing to deliver the National Strategy, and also of works carried out by other organisations in the area, particularly other Risk Management Authorities. Early engagement with other Risk Management Authorities will assist with this by providing an opportunity to share information and gain a better understanding of the work program for each partner accordingly.



**Funding required to replace aging culverts**

## **8.5 Potential Sources of Funding**

### **Public Funding**

#### **8.5.1 Funding from Welsh Government**

With less direct central government funding available, it is clear that changes are needed to the traditional approaches to funding flood risk management. The current situation regarding government flood risk management funding is summarised below:

- 1 £22,727 of Welsh Government funding has already been committed and used to prepare the PRFA in 2011.
- 2 A further £90,000 of Welsh Government funding has been committed to each Unitary Authority in Wales to fund the preparation of the LFRMS and the provision of an Asset Register for items that have a significant effect on flood risk.
- 3 It is anticipated that the Welsh Government will provide further funding for the continued implementation of the requirements of the Act, although this has not been confirmed.

## **8.5.2 Local Authority Funding**

During the annual budget setting process and development of medium term financial plans (MTFP's) Local Authorities will consider their strategic service delivery objectives and through this process there is an opportunity to consider financial resource requirements for specific services, including those required by way of a regulatory framework. This gives the opportunity to consider additional financial resource for flood risk responsibilities either by revenue based funding or capital budget allocation. This would invariably be undertaken in the context of competing service demands for finite financial resources available to the Local Authority.

## **8.5.3 Funding through the Community Infrastructure Levy**

Section 106 (S.106) agreements, which are voluntary legal agreements that allow local planning authorities to seek provision of infrastructure, have been subject of significant "tightening-up". On 6 April 2014 they will be restricted even further to make such infrastructure provision almost impossible.

The Planning Act 2008 makes provision for local planning authorities to prepare and implement a Community Infrastructure Levy (CIL), which can be used to fund those infrastructure elements that will no longer be deliverable through S106 agreements.

The council is currently preparing its CIL Charging Schedule, which identifies what development will be subject to CIL and what the level of the levy is. Once adopted the CIL charge is mandatory to all development to which it is applicable.

The revenue generated by CIL is to be used to provide infrastructure required to enable development to take place in accordance with the adopted development plan. There are many types of infrastructure that CIL could potentially be used to deliver. However it is highly likely that the requirement for infrastructure will greatly exceed the ability of CIL to pay for it. Decisions on what infrastructure CIL will be used to deliver will be a matter for each local planning authority and will be based on stated prioritised list of eligible infrastructure

The decision to fund flood defence or flood risk schemes through CIL will be a matter for the council in its consideration through the CIL preparation

process. It should be noted that flood management is one of many infrastructure types that will be vying for CIL funding and it is far from certain whether finance for such infrastructure will be forthcoming from CIL.

#### **8.5.4 Funding through the European Union**

European Union funding is available through the Interreg scheme. The scheme will allow a major piece of work to go ahead and will enable land to be opened up to development. As surface water management plans are created across the study area, options proposals from these reports will be used to inform future proposals to the European Regional Development Fund.

### **Private funding**

#### **8.5.5 Section 106 funding – Developer Contributions**

S.106 agreements are voluntary legal agreements that allow local planning authorities to seek provision of infrastructure and other matters as part of the process of permitting new development. As outlined in 8.5.3 above the current and future use of S.106 agreements is being severely restricted. As at 6 April 2014 S.106 agreements will only be eligible for infrastructure that is necessary to enable a development to be granted permission. As such strategic flood infrastructure or infrastructure not directly related to the proposed development cannot be subject of S.106 agreements. S.106 agreements can, however, be used to provide SuDS or other flood risk measures, which are essential to the development.

Overall the contribution that S.106 agreements can make towards flood risk infrastructure is limited.

#### **8.5.6 Water Company Funding**

Water companies invest money in flood alleviation schemes as part of their duties to remove properties from the DG05 flooding register. Sometimes the most effective way to do this is to work in partnership with risk management authorities on flood alleviation schemes in other areas which can help reduce surface water pressure downstream.

Water companies are able to raise funds for flood alleviation schemes through the prices they charge their customers. However these prices are heavily regulated by OFWAT. When determining price limits OFWAT determines how much water companies can charge its customers to:

- 1 finance day to day spending
- 2 finance capital investment programmes
- 3 reward outperformance in the previous five-year period
- 4 continue to finance previous capital investment through the return the company earns on its regulatory capital value (RCV)
- 5 pay tax it is liable for

### **8.5.7 Local fundraising**

In addition to contributions from developers, another important funding mechanism will come from local fundraising from the local communities and businesses who stand to benefit from the proposed flood defence schemes. Fundraising may appear to be a daunting task but the best place to start is with who stands to benefit from the project.

### **8.5.8 Other sources of funding**

In areas prone to flooding, where potential mitigation schemes are identified, Caerphilly County Borough Council will liaise with the local Federation of Small Businesses (FSB) to assist in putting together funding to support projects. While the FSB will not have a significant budget, its support can be used to raise local business support.

DEFRA is currently producing a good practice guide to support LLFA called 'Solutions for joint funding of surface water schemes'. This project will explain the funding mechanisms and time cycles, approval processes of key partners and benefits of joint funding of local flood risk management.

## **9 The assessment of local flood risk for the purpose of the strategy**

9.1 The PFRA completed by CCBC, as required by the Regulations, has been used to inform the development of this Strategy. The identification of the areas potentially at risk of flooding, and the assessment of that risk, has been used to determine what further investigation or studies are required

9.2 CCBC, who has areas identified as being at significant flood risk (as defined by the Welsh Government), will be completing further specific analysis of these areas, providing Flood Hazard and Flood Risk Maps by 2013 and a full Flood Risk Management Plan for the relevant areas by June 2015.

Although these significant flood risk areas and the further analysis do not cover the whole of an LLFA area, the information has been considered and addressed within this Strategy.

9.3 As part of the PFRA exercise CCBC, using their own records and liaising with other Risk Management Authorities, have accumulated a considerable information resource relating to historic flooding events. With the new responsibilities provided under the Act for LFFAs to investigate all flooding incidences, it is expected that this resource will be enhanced and has, therefore, been considered by CCBC to inform their assessment of the local flood risk.

9.4 To decide on the significance of an individual flood Defra/WG/EAW have set key flood risk indicators that 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.

9.5 CCBC has no information currently available relating to future flooding other than that provided by the EAW. It is the intension of CCBC to carry out electronic modelling within the Flood Risk Area, including all other areas at risk of flooding within the county borough, as part of the preparation of Flood Hazard and Flood Risk Maps and the Flood Risk Management Plan for the borough.

At this stage CCBC does not have details of the capacity of the local drainage but this information will be calculated as part of the preparation work for the Flood Hazard and Flood Risk Maps and the Flood Risk Management Plans.

9.6 As previously stated a total of 59 Blue Squares have been identified and using the methodology defined above, 47 of these squares are contained within the Flood Risk Area.

This is shown in Fig 2 - CCBC Flood Risk Area and Blue Squares

The Key Flood Risk Indicators for the CCBC Flood Risk Area have been calculated as follows:-

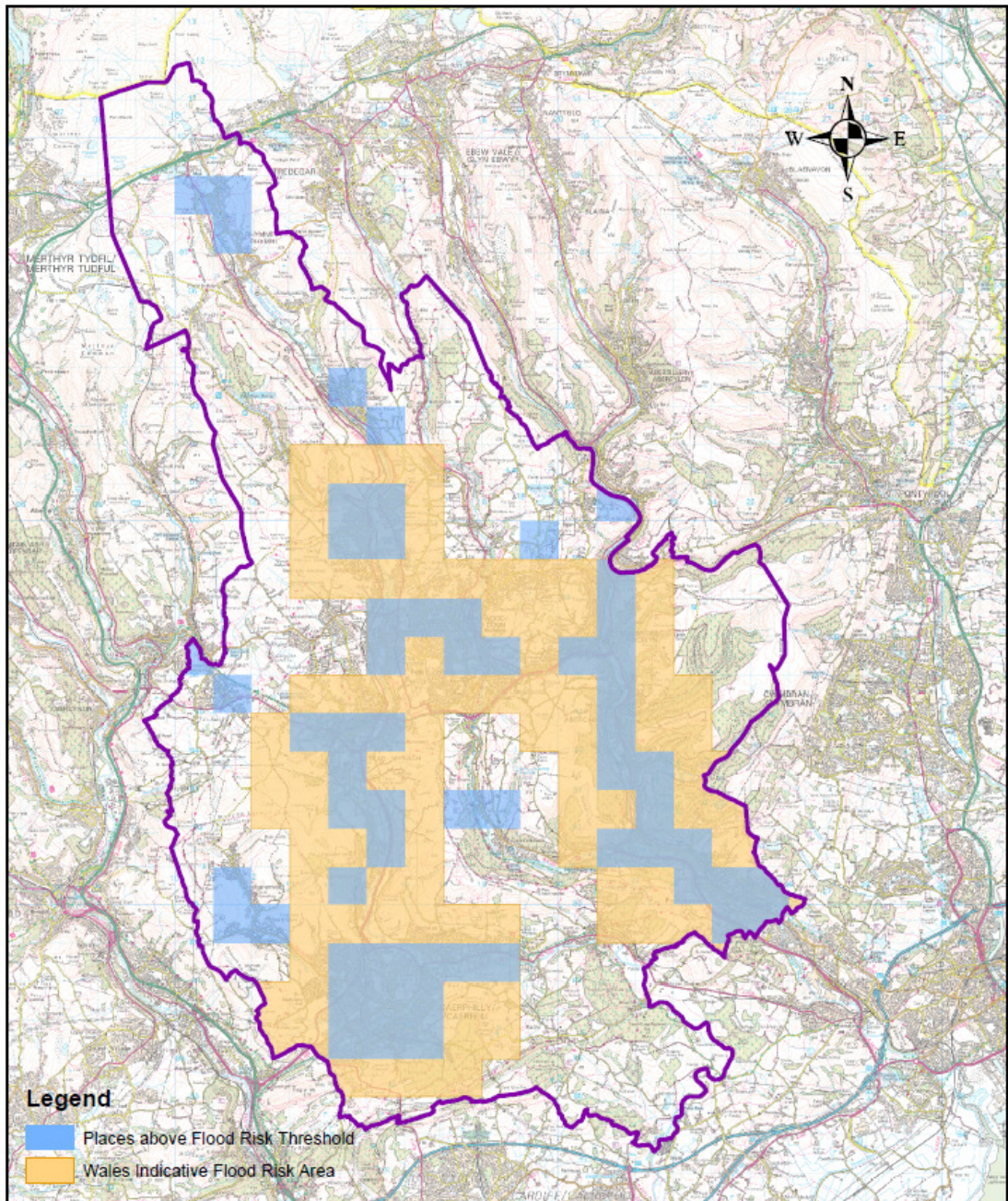
1	Human health consequences – Number of people (2.23 multiplier)	16,141
2	Other human health consequences – Number of critical services flooded	69
3	Economic consequences – number of non-residential properties flooded	1,955

- 9.7 A prioritised system will be used to establish the order in which areas will be studied in detail for the development of Flood Risk Management Plans. This order may change as more information is obtained from the surface water modelling and the preparation of Hazard and Risk Maps.





FIGURE 2 - EA INDICATIVE FLOOD RISK AREA & BLUE SQUARES FOR CCBC





## **10 How and when the strategy will be reviewed**

10.1 The National Strategy will be reviewed normally 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 which will include the following:

- 1 Updated Flood Map for Surface Water to be prepared by the Environment Agency by December 2013.
- 2 Flood Hazard and Risk maps to be published by December 2012.
- 3 Flood Risk Management Plans to be published by December 2015.

The process listed above will result in a more detailed and accurate picture of the flood risk in CCBC.

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

Future versions of the Strategy will therefore include details of the measures which will be identified in the preparation of the Plans and will also include detailed cost benefit analysis where appropriate.

CCBC consider that the first review of the Strategy should take place as soon as practicable after the completion of the Plans in 2015. Thereafter it is proposed that the Strategy will be reviewed on a six year cycle.

The review of the National Flood and Coastal Erosion Risk Management Strategy (NFCERMS) will take place in 2017. Changes to the NFCERMS will be taken into account in future reviews of the LFRMS.

## **11 How the strategy contributes to the achievement of wider environmental objectives**

CCBC has considered and recorded measures on how their Local Strategies will contribute to the achievement of wider environmental objectives.

### **11.1 Water Framework Directive**

In keeping with the requirements of the Water Framework Directive (WFD) and the National Strategy, considering sustainable development and working with natural processes to provide solutions to flood risks will help to mitigate the effects on biodiversity. Risk management measures can significantly benefit biodiversity in protecting designated sites and contributing to improving and maintaining these in a favourable condition. The National Strategy encourages the provision of biodiversity enhancements and minimising any adverse affects and so must also be considered with Local Strategies.

CCBC has taken into account these principles in establishing measures which will be introduced in order to implement The Strategy.

### **11.2 Strategic Environmental Assessment (SEA)**

The Welsh Government has determined that the National Strategy requires a Strategic Environmental Assessment (SEA) to be undertaken. Given the nature, content and legal requirement to produce Local Strategies, an SEA is also required for the LFRMS.

It is a legal requirement in the UK for certain plans and programmes stipulated by the SEA Directive (2001/42/EC), to undergo SEA. The SEA Directive is implemented in Wales by the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004.

CCBC Planning Department have carried out the SEA for this Strategy.

### **11.3 Habitats Regulations Assessment**

The Welsh Government also determined that the National Strategy required a Habitats Regulations Assessment (HRA) to be undertaken. Given the nature, content and legal requirement to produce Local Strategies, LLFAs will need to undertake HRA on their strategies.

CCBC has commissioned Dr Ruth Thomas of Sustainability Research, Writing and Consultancy to prepare the HRA for this Strategy

## 11.4 Partnership Working

Partnership working and collaboration is an integral part of managing flood risk and is reflected in the duty to co-operate within The Act.

### 11.4.1 Community

Stronger links with the local community groups is encouraged, enabling local expertise to assist in both the identification of the risks and their mitigation or resolution.

It has been established that working with communities in managing flood risk will help:

- 1 Understand the needs of individuals, communities and businesses;
- 2 Make informed plans, decisions and policies;
- 3 Communities to understand what flood risk means for them, including what they should do in a flood;
- 4 Communities to recover more quickly after a flood;
- 5 Meet goals (including timescales);
- 6 Increase local support;
- 7 Increase trust in government;
- 8 Improve the reputation of LLFA (and other partners)

To date CCBC has engaged with the community through a number of Flood Forum namely: Ynysddu, Cwmfelinfach, Risca and Dyffryn Business Park

CCBC has also sought the views of the public regarding the preparation of The Strategy as detailed below.

### 11.4.2 RESULTS OF INTIAL PUBLIC SURVEY

Initially an on-line survey was placed on the CCBC webpage and a small response was obtained from members of the public. Information about the survey was also circulated to all members of staff at CCBC and the 1300 strong View Point Panel was consulted. Staff members of CCBC also attended Flood Forums at Ynysddu and Cwmfelinfach. In total 139 responses were received and a summary of their analysis is given below.

From the analysis over 94% responded as individuals of which 76% had not been affected by flooding. Of those who experienced flooding 77% indicated that the road had flooded 47% gardens and/or fields, 17% out buildings but only 17% stated that their houses had flooded internally.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 1, 2, 3, 4 and 18**

A total of 48% of the respondents had become more involved by obtaining more information about flood risk, preparation of flood plans, attended local action groups and signing up for flood warnings but 17% have done nothing as they see the responsibility with other agencies.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 1, 2, 3, 4 and 10**

Analysis of what respondents indicated as being the most important sources of flooding show that 34% identified surface water, 20% rivers, 16% watercourses, 15% ground water and 15% sewers.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 11, 12, 13, 14 and 16**

When asked about flood risk approximately 46% did not consider themselves at risk, 29% stated that their local area had been subject to flooding, 14% had been affected by flooding in the past and 11% are aware of their risk but have not been affected previously.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 1, 2, 3, 4, 10, 11, 12, 14 and 16**

The survey showed that 67% want the flood risk to be reduced wherever possible, 28% think the risk should be reduced where flooding has previously occurred and the remaining 5% indicated that the flood risk level should be maintained at its current level.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 10, 11, 12, 14 and 16**

In response to the question regarding the priorities for management after protecting life and keeping people safe 37% gave homes as top priority followed by 27% for local amenities, then 17% businesses and 13% roads. Only 3% gave protection of the environment as their highest priority.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 1, 2, 3, 4, 10, 12, 14, and 16**

The questionnaire showed concerns about flood risk management to be highest with regard to emergency planning at 20%, maintenance of watercourses at 17%, followed by 15% availability of insurance, 13% new developments, 13% availability of funding, 10% climate change, 10% property values and 2%, rural land management.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 11, 12, 14 and 16**

When asked about what CCBC and its partners should do to manage flood risk 21% considered cleaning road gullies and watercourses to be the highest priority, 20% considered managing assets such as culverts, 19% working with planners on new developments, 16% constructing flood defence schemes in areas at highest risk, 13% working with local communities to help prepare them for flood risk and 11% construct flood defences wherever possible.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 10, 11, 12, 14, 16 and 18**

When asked about funding for flood alleviation schemes 44% consider that CCBC should be working with organisations with drainage responsibilities,

33% consider that as many organisations as possibly should be involved with funding and only 23% believe local residents and businesses should also be involved with funding

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 16, 18 and 19**

The questionnaire gave a list of possible funding sources and from this list 20% identified developers, 19% international funding, 19% Local Authorities, 17% environmental initiatives, 9% Businesses, 8% Landlords and Housing Associations, only 4% community groups and 3% residents

**This question has enabled CCBC to obtain the views of the public in relation to detailed objectives 16, 18 and 19**

Only 33% of the respondents indicated that they were aware of the role of CCBC as a Lead Local Flood Authority.

**This question has enabled CCBC to obtain the views of the public in relation to detailed objective 18**

**As far as is practicable the views of the public have been taken into account in the preparation of The Strategy.**

#### **11.4.2 Risk Partners**

Section 13 of the Flood and Water Management Act 2010 provides that Risk Management Authorities must co-operate with other relevant authorities in the exercise of their flood and coastal erosion risk management functions. Enabling the sharing of information between authorities in order to discharge this function.

It also allows for Risk Management Authorities to arrange for a flood risk management function to be exercised on its behalf by another Risk Management Authority:

CCBC has commenced the process of collaborative working with other Flood Risk Management Authorities by:-

- 1 The process of consultation on the SEA and the draft Strategy.
- 2 Meeting with other Lead Local Flood Authorities through The South East Wales Flood Risk Management Group and informal support group for the same area which including all adjacent authorities.
- 3 Interaction with Welsh Water / Dŵr Cymru to obtain details of their services within the Borough.
- 4 Meeting with all relevant internal partners within CCBC.
- 5 Meeting with Forestry Commission.
- 6 Interaction with The Countryside Council for Wales as a Statutory Consultee.
- 7 Interaction with CADW as a Statutory Consultee.

It is the intension of CCBC to continue and extend this process of collaborative working in order to complete and implement The Strategy.

# **CAERPHILLY COUNTY BOROUGH COUNCIL**

## **LOCAL FLOOD RISK MANAGEMENT STRATEGY**

### **Appendices**

- 1 The Risk Management Authorities
- 2 National Strategy
- 3 Datasets available on the EA DataShare website
- 4 Relevant Policy, Regulations and Legislation
- 5 Glossary of Terms used within the Guidance
- 6 List of documents to be consulted
- 7 Consultations
- 8 Detailed Objectives and Measures Table

## Appendix 1 - The Risk Management Authorities

On the 1<sup>st</sup> April 2013 a new single body will bring together the functions of the Countryside Council for Wales, the Environment Agency Wales and the Forestry Commission Wales. On the 25<sup>th</sup> October 2012, Welsh Government announced that the single body is to be named National Resource Wales. However, as this Strategy predates the implementation of the new single body, the organisations involved will continue to be referred to individually.

### 3.1 Environment Agency Wales (Part of National Resources Wales from 1<sup>st</sup> April 2013)

#### Head Office

Tŷ Cambria House  
29 Newport Road  
Cardiff  
CF24 0TP

#### South East Area Office

Rivers House  
St Mellons Business Park  
Cardiff  
CF3 0EY

#### Contact

Name: Gary Purnell  
Telephone Number: 08708 506506  
Email: [Gary.Purnell@environment-agency.gov.uk](mailto:Gary.Purnell@environment-agency.gov.uk)

#### Floodline

Phone Number: 0845 988 1188 (24 hour service)  
Type Talk: 0845 602 6340

### 3.2 Lead Local Flood Authority

#### Caerphilly County Borough Council

Pontllanfraith Civic Centre

#### Contact

Name Terry Shaw  
Phone Number: 01495 2235319  
Email: [shawt@caerphilly.gov.uk](mailto:shawt@caerphilly.gov.uk)

#### Caerphilly County Borough Council

Highways Operations Group  
Highways House  
Penmaen Road  
Pontllanfraith  
NP12 2DY

#### Contact

Name: Marcus Lloyd  
Telephone Number: 01495 235748  
Email: [lloydmi@caerphilly.gov.uk](mailto:lloydmi@caerphilly.gov.uk)

### 3.3 Water Company

#### **Dŵr Cymru – Welsh Water**

Pentwyn Road  
Nelson  
Treharris  
CF46 6LY

#### **Contact**

Head Office Phone Number: 01443 452300  
Customer Services: 0800 052 0140  
Website: [www.dwrcymru.co.uk](http://www.dwrcymru.co.uk)

#### **Contact**

Name: Nick Holt  
Telephone Number:  
Email: [nick.holt@dwrcymru.com](mailto:nick.holt@dwrcymru.com)

#### **Contact**

Name: Martin Chatham  
Telephone Number:  
Email: [martin.chatham@dwrcymru.com](mailto:martin.chatham@dwrcymru.com)

### 3.4 Additional Risk Partners

#### 3.4.1 Internal Partners (Caerphilly County Borough Council)

##### **Planning Department**

Caerphilly County Borough Council  
Pontllanfraith House, Pontllanfraith, Blackwood, NP12 2YW

##### **Contact**

Name: Tim Stephens  
Telephone Number: 01495 235259  
Email: [stepht@caerphilly@caerphilly.gov.uk](mailto:stepht@caerphilly@caerphilly.gov.uk)

##### **Emergency Planning**

Caerphilly County Borough Council  
Pontllanfraith House, Pontllanfraith, Blackwood, NP12 2YW

##### **Contact**

Name: Sheryl Andrews  
Telephone Number: 01495 235048  
Email: [andres@caerphilly.gov.uk](mailto:andres@caerphilly.gov.uk)

##### **Environmental Health**

Caerphilly County Borough Council  
Pontllanfraith House, Pontllanfraith, Blackwood, NP12 2YW

##### **Contact**

Head of Public Protection  
Name: Robert Hartshorn  
Telephone Number 01495 235315  
Email: [hartsr@caerphilly.gov.uk](mailto:hartsr@caerphilly.gov.uk)



**Finance**

Caerphilly County Borough Council  
Penllta House, Tredomen Park, Tredomen,  
Ystrad Mynach, Hengoed, CF82 7PG

**Contact**

Head of Corporate Finance  
Name: Nicole Scammell  
Telephone Number: 01443 863022  
Email: [scammn@caerphilly.gov.uk](mailto:scammn@caerphilly.gov.uk)

**3.4.2 External Partners**

**Flood Risk Management Wales (RCEM)**

**Environment Agency Wales (Part of National Recourse Wales from 1<sup>st</sup> April 2013)**

Ty Cambria 29 Newport Road Cardiff CF24 0TP

**Contact**

Name: Stephen Cook  
Telephone Number: 07818454599  
Email: [Stephen.cook@environment-agency.wales.gov.uk](mailto:Stephen.cook@environment-agency.wales.gov.uk)

**Emergency Services**

**South Wales Fire and Rescue Group**

**Resilience and Planning Risk Management Department**

Forest View Business Park Llantrisant Pontyclun CF72 8LX

**Contact**

Name: Alison Kibblewhite  
Telephone Number: 01443 232118  
Email: [a-kibblewhite@southwales-fire.gov.uk](mailto:a-kibblewhite@southwales-fire.gov.uk)

**Welsh Ambulance Services NHS Trust**

South East Region Headquarters  
Vantage Point House, Vantage Point Business Park,  
Ty Coch Way, Cwmbran, NP44 7HF

**Contact**

Name: via South East Headquarters  
Telephone Number: 01633 294866

**Gwent Police**

Police Headquarters Turnpike Road Croesyceiliog  
Cwmbran NP44 2XJ

**Contact**

Name: Sergeant Alyn Jones  
Telephone Number: 01633 642221  
Email: [alyn.jones@gwent.pnn.police.uk](mailto:alyn.jones@gwent.pnn.police.uk)

**National Flood Forum**

Old Snuff Mill Warehouse, Park Lane, Bewdley  
Worcestershire, DY12 2EL

**Contact**

Chief Executive  
Name: Paul Cobbing

Telephone Number: 0777 3355181  
Email: [Paul.cobbing@floodforum.org.uk](mailto:Paul.cobbing@floodforum.org.uk)

**National Farmers Union**

**Head Office**

Agricultural House, Stoneleigh Park, Stoneleigh  
Warwickshire, CV8 2TZ  
Telephone Number: 02476 58500

**Welsh Office of NFU**

**Contact**

Name: Dafydd Jarrett  
Telephone Number: 01982 554222  
Email: [dafydd.jarrett@nfu.org.uk](mailto:dafydd.jarrett@nfu.org.uk)

**National House Builders**

NHBC House, Davy Avenue, Knowlhill  
Milton Keynes, MK5 8FP

**Contact**

Name: Steve Evans  
Telephone Number: 02476 328868  
Email: [sevans@NHBC.co.uk](mailto:sevans@NHBC.co.uk)

**Network Rail**

Western House, 1 Holbrook Way, Swindon, SA1 1BD

**Contact**

Name: Alex Hinshelwood  
Telephone Number: 07825376891  
Email: [alex.hinshelwood@networkrail.co.uk](mailto:alex.hinshelwood@networkrail.co.uk)

**Community and Town Councils**

Aber Valley Community Council  
Mrs S Huges  
Abertridwr Library, Aberfawr Road,  
Abertridwr CF83 4EJ  
02920 832061  
[abervalleycc@caerphilly.gov.uk](mailto:abervalleycc@caerphilly.gov.uk)

Argoed Community Council  
Mr G James  
13 Cherry Tree Road, Pontllanfraith,  
Blackwood NP12 2 PY  
07855 556483

Bargoed Town Council  
Mrs L Tams  
The Settlement, 35 Cardiff Road,  
Bargoed CF81 8NZ  
01443 830184

Bedwas, Trethomas and Machen Community Council  
Mrs S Chick  
Council Offices, Newport Road, Bedwas

Caerphilly CF83 8YB  
029 2088 5734

Blackwood Town Council  
Mr J Hold  
Heddfan, 12 Aspen Way,  
Blackwood NP12 1WW  
01495 224636

Caerphilly Town Council  
Mr K Williams  
Twyn Community Centre The Twyn  
Caerphilly CF83 1JL  
029 2088 8777

Darren Valley Community Council  
Mr G Williams  
29 Bishops Grove  
Merthyr Tydfil CF47 9LJ  
01686 382553

Draethen, Waterloo and Rudry Community Council  
Sally Chick  
Ty Cyw, Starbuck Street  
Rhydri, Caerphilly VF83 3DP  
029 2086 0067  
[tycyw@hotmail.co.uk](mailto:tycyw@hotmail.co.uk)

Gelligaer Community Council  
Mrs C Mortimer  
Council Offices, Ilwyn Onn  
Penpedairheol, Hengoed CF82 8BB  
01443 821322

Llanbradach and Pwllypant Community Council  
Mr W M Thompson  
12 Mountain View  
Machen CF83 8QA  
01633 440492

Maesycwmmmer Community Council  
Mrs G Thomas  
33 Bryn Lane  
Pontllanfraith, Blackwood NP12 2PG  
01495 2210070

Nelson Community Council  
Mr A Koskins  
Ty'r Ffynon, 40 High Street  
Nelson, Treharris CF46 6EU  
01443 450047

New Tredegar Community Council  
Mrs D Gronow  
7 Clyde Close

Pontllanfraith NP12 2FY  
01495 226809

Penyrheol, Trecenydd and Energlyn Community Council  
Mrs H Treherne  
Golwg-y-cwm, Lower Brynhyfryd Terrace  
Senghenydd CF83 4GR  
029 2083 0666

Rhymney Community Council  
Mr G Williams  
29 Bishops Grove, Penydarren  
Merthyr Tydfil CF47 9LJ  
01685 382553  
[Geraint235@btinternet.com](mailto:Geraint235@btinternet.com)

Van Community Council  
Mr J Dilworth  
3 School Street  
Pont-y-Clun CF72 9AA  
01443 228535  
[john@jdilworth49.plus.com](mailto:john@jdilworth49.plus.com)

**Gwent Local Resilience Forum**

GLRF Office, Police Headquarters, Turnpike Road  
Croesyceiliog, Cwmbran, NP44 2XJ

**Contact**

Name: Karl Nielsen (GLRF Co-ordinator)  
Telephone Number: 01633 642453  
Email: [GLRF.Coordinator@gwent.pnn.police.uk](mailto:GLRF.Coordinator@gwent.pnn.police.uk)

**Countryside Council for Wales (Part of National Resources  
Wales from 1<sup>st</sup> April 2013)**

Maes-y-Ffynnon, Penrhosgarnedd, Bangor  
Gwynedd, LL57 2DW

**Contact**

Name: Helen Fletcher  
Telephone Number: 02920 444606; 01792 326450; 07989 389521  
Email: [h.fletcher@ccw.gov.uk](mailto:h.fletcher@ccw.gov.uk)

**Association of Drainage Authorities (ADA)**

6 Electric Parade, Surbiton  
Surrey, KT6 5NT  
Telephone: 020 8399 7350  
Email: [admin@ada.org.uk](mailto:admin@ada.org.uk)

**Contact**

Name: Ian Moodie  
Telephone Number:  
Email: [ian.moodie@ada.org.uk](mailto:ian.moodie@ada.org.uk)

**Country Land and Business Association (CLA)**

Unit 8, Broadaxe Business Park, Presteigne  
Powys, LD8 2LAQ  
Telephone: 01547 317085

Email: [info.wales@cla.org.uk](mailto:info.wales@cla.org.uk)

**Contact**

Name: Ben Underwood

Telephone Number:

Email: [ben.underwood@cla.org.uk](mailto:ben.underwood@cla.org.uk)

**SWTRA – South Wales Trunk Road Agency**

12A Llandarcy House, The Courtyard, Llandarcy,  
Neath, SA10 6EJ

**Contact**

Name: Kevin Price

Telephone Number: 01792 325963

Email: [k.price@southwales-tra.gov.uk](mailto:k.price@southwales-tra.gov.uk)

**Contact**

Name: Ian Duguid

Telephone Number: 01792 325911

Email: [i.r.duguid@southwales-tra.gov.uk](mailto:i.r.duguid@southwales-tra.gov.uk)

**Forestry Commission Wales (Part of National Resources Wales  
from 1<sup>st</sup> April 2013)**

District Office Resolven Neath SA11 4DR

**Contact**

Name: Peter Cloke

Telephone Number: 03000 68205

Email: [Peter.cloke@forestry6.gov.uk](mailto:Peter.cloke@forestry6.gov.uk)

**CADW**

Unit 5-7 Cefn Coed Nantgarw Cardiff

**Contact**

Name: Suzanne Whiting

Telephone Number: 01443 336000

Email: [Suzanne.whiting@wales.gsi.gov.uk](mailto:Suzanne.whiting@wales.gsi.gov.uk)

**Adjacent Local Authorities**

**Merthyr Tydfil CB Council**

**Contact**

Name: Kevin Davies

Telephone Number: 01685 726227

Email: [kevin.davies@merthyr.gov.uk](mailto:kevin.davies@merthyr.gov.uk)

**Rhonda Cynon Taf C B Council**

**Contact**

Name: Andrew Stone

Telephone Number: 01443 490413

Email: [andrew.stone@rctcbc.gov.uk](mailto:andrew.stone@rctcbc.gov.uk)

**Powys C B Council**

**Contact**

Name: Simon Crowther

Telephone Number:

Email: [simon.crowther@powys.gov.uk](mailto:simon.crowther@powys.gov.uk)

**Torfaen C B Council**

**Contact**

Name: Mark Strickland

Telephone Number:

Email: [Mark.Strickland@torfaen.gov.uk](mailto:Mark.Strickland@torfaen.gov.uk)

**Blaenau Gwent C B Council**

**Contact**

Name: Christian Cadwallader

Telephone Number: 01495 354707

Email: [christian.cadwallader@blaenau-gwent.gov.uk](mailto:christian.cadwallader@blaenau-gwent.gov.uk)

**Cardiff City Council**

**Contact**

Name: Gary Jenkins

Email: [gjenkins@cardiff.gov.uk](mailto:gjenkins@cardiff.gov.uk)

**Newport City Council**

**Contact**

Name: Richard Lloyd

Email: [Richard.lloyd@newport.gov.uk](mailto:Richard.lloyd@newport.gov.uk)

**Welsh Assembly Government**

**Contact**

Name: Paul Critchley

Email: [Paul.Critchley@Wales.GSI.gov.uk](mailto:Paul.Critchley@Wales.GSI.gov.uk)

## Appendix 2 - National Strategy

The Welsh Government is responsible for developing, maintaining and applying a flood and coastal erosion risk management strategy for Wales; a National Strategy.

The National Strategy will give effect to the requirements of the Flood and Water Management Act 2010, providing a framework for more specific actions to be implemented by the Welsh Risk Management Authorities. It will create a framework for delivering effective flood and coastal erosion risk management in Wales both now and in the future.

Under Section 8 of the Act the National Strategy is required to include details of:

- 1 the Risk Management Authorities in Wales;
- 2 the flood and coastal erosion risk management functions that may be exercised by those Authorities in relation to Wales;
- 3 the objectives from managing flood and coastal erosion risk;
- 4 the measures proposed to achieve those objectives;
- 5 how and when the measures are to be implemented;
- 6 the costs and benefits of those measures, and how they are to be paid for;
- 7 the assessment of flood and coastal erosion risk for the purpose of the strategy;
- 8 how and when the strategy is to be reviewed;
- 9 the current and predicted impact of climate change on flood and coastal erosion risk management; and
- 10 how the strategy contributes towards the achievement of wider environmental objectives.

The Welsh Government is committed to ensuring that the Risk Management Authorities manage the risks of flooding and coastal erosion in Wales and reduce their impacts by adopting a broader range of responses that encompass not only traditional defences and protection against flooding and coastal erosion, but a wider group of interventions using the full range of risk management tools.

An effective flood and coastal risk management system must focus on protecting people and key assets and managing the impacts of the risk on the natural environment.

It is the Welsh Government's intention to develop a system that:

- 1 embeds sustainable development as the key principle in forming decisions and which is reflected in an approach that promotes the wellbeing of people in Wales and addresses the needs of the economy and the environment;
- 2 is focussed on the needs of individuals, communities and businesses and which recognises that different groups have different needs and varying capacity to deal with flood risk and that the service they receive must be tailored accordingly
- 3 promotes equality and does not exacerbate poverty;
- 4 is based upon a holistic understanding of the risks and consequences;
- 5 considers the full range of risk management responses;
- 6 facilitates long term resource planning; and
- 7 allows prioritisation of investment, resources and actions.

To support the development of this system the Welsh Government is committed to delivering the four overarching objectives for flood and coastal erosion risk management in Wales as follows:

- 1 **reducing the impacts** on individuals, communities, businesses and the environment from flooding and coastal erosion;
- 2 **raising awareness of and engaging people in the response to** flood and coastal erosion risk;
- 3 **providing an effective and sustained response** to flood and coastal erosion events; and
- 4 **prioritising investment** in communities most at risk.

The National Strategy will set out the expectations on the Risk Management Authorities in order to achieve these objectives.

A public consultation exercise on the Draft National Strategy was completed in 2010 and the consultation responses received along with the *formal Assembly Government Response to the Public Consultation* is available on the Welsh Government website.

Following comments received during the consultation and in light of subsequent discussions with the Environment Agency, Countryside Council for Wales and Cadw it was determined that a Strategic Environmental Assessment (SEA) and a Habitats Regulations Assessment should be completed. The completed assessments are available from the Welsh Government website.

The findings of these assessments has fed into the development of the National Strategy, ensuring that the environment is afforded a high level of protection by ensuring the integration of environmental considerations into the preparation and adoption of the National Strategy and contributing to the promotion of sustainable development and environmental protection.



### Appendix 3 – Datasets available on the EA DataShare Website.

As at September 2011, the following datasets were available to Local Authorities via the Environment Agency DataShare website

(<http://www.geostore.com/environment-agency/>):

- 1 Areas Susceptible to Surface Water Flooding
- 2 Areas Susceptible to Groundwater Flooding
- 3 Detailed River Network
- 4 Flood Zones 2
- 5 Flood Zones 3
- 6 Flood Defences
- 7 Flood Storage Areas
- 8 Areas Benefiting from Flood Defences
- 9 Flood Map for Surface Water 1:200 Rainfall
- 10 Flood Map for Surface Water 1:30 Rainfall
- 11 Flood Map for Surface Water DTM
- 12 Historic Flood Map
- 13 Historic Landfill
- 14 National Receptor Dataset – Property Points
- 15 National Receptor Dataset – Social, cultural and environmental (part 1)
- 16 National Receptor Dataset – Social, cultural and environmental (part 2)
- 17 Sealed Main Rivers
- 18 WFD Classification Data
- 19 WFD Risk Assessment Data
- 20 WFD Environmental objectives
- 21 WFD Measures/Actions
- 22 WFD River Waterbodies (River\_Waterbodies\_fRBMP)
- 23 WFD River Waterbody Catchments (River\_Waterbody\_Catchments\_fRBMP)
- 24 WFD River Basin Districts (RBD\_fRBMP)
- 25 WFD Lake Waterbodies (Lakes\_fRBMP)
- 26 WFD Coastal Waterbodies (Coastal\_fRBMP)
- 27 WFD Transitional (Estuarine) Waterbodies (Transitional\_fRBMP)
- 28 WFD Groundwaterbodies (Groundwaters\_fRBMP)
- 29 WFD Monitoring Network (Monitoring Network\_fRBMP)
- 30 WFD Artificial Waterbodies: Canals (AWB\_Canals\_fRBMP)
- 31 WFD Artificial Waterbodies: Surface Water Transfer Channels (AWB\_SWT\_fRBMP)
- 32 SSSI Ditches (AWB\_SSSI\_Ditches\_fRBMP)

## **Appendix 4 – Relevant Policy, Regulations and Legislation**

### **Including the Flood and Water Management Act 2010 and the Flood Regulations 2009**

#### **Water Framework Directive**

1. The Water Framework Directive (WFD) is the most substantial piece of EC water legislation to date and is designed to improve and integrate the way water bodies are managed throughout Europe. It came into force on 22 December 2000 and was transposed into UK law in 2003 via the Water Environment (Water Framework Directives) (England and Wales) Regulations 2003. Member States must aim to reach good chemical and ecological status in inland and coastal waters by 2015. It is designed to:
  - 1 Prevent deterioration in the classification status of aquatic ecosystems, protect them and improve the ecological condition of waters;
  - 2 Aim to achieve at least good status for all waters. Where this is not possible, good status should be achieved by 2021 or 2027;
  - 3 Promote sustainable use of water as a natural resource;
  - 4 Conserve habitats and species that depend directly on water;
  - 5 Progressively reduce or phase out releases individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
  - 6 Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and
  - 7 Contribute to mitigating the effects of floods and droughts.
2. The Water Framework Directive establishes new and better ways of protecting and improving rivers, lakes, groundwater, transitional (where freshwater and seawater mix) and coastal waters. In order to achieve this, in 2009 the Environment Agency produced 3 River Basin Management Plans in Wales setting out measures to protect and improve the water environment. These are currently being implemented and will be revisited in 2015, 2021 and 2027, to ensure that the water bodies status does not deteriorate from standards set in 2009 as part of the initial River Basin Management Plans.
3. It is important that measures to manage local flood risk do not cause deterioration of water bodies and should consider opportunities to improve water bodies in conjunction with local flood risk management.

#### **TAN 15 – Development and Flood Risk (2004)**

4. Technical Advice Note 15 (TAN15) sets out the Welsh Government's policy on development and flood risk. It identifies that flood risk should be taken into account at all stages of the planning process. It sets out a precautionary approach that seeks to avoid inappropriate development in areas at risk of flooding and to direct new development away from the areas of highest risk shown on Development Advice Maps. Where new development is, exceptionally, necessary in such areas, the policy objective is to mitigate flood risk to an acceptable level for the lifetime of the development without increasing flood risk elsewhere, taking into account the impacts of climate change.

### **Climate Change Act 2008**

5. The Climate Change Act 2008 requires a UK-wide climate change risk assessment every five years, accompanied by a national adaptation programme for England-only and non-devolved matters that is also reviewed every five years. The Act has given the UK and Welsh Governments powers to require public bodies and statutory organisations such as water companies to report on how they are adapting to climate change.

### **Conservation of Habitats and Species Regulations 2010**

6. The Conservation of Habitats and Species Regulations 2010 transpose the Habitats Directive into UK law. The Regulations aim to help maintain and enhance biodiversity in the UK and throughout the EU, by conserving natural habitats and protecting priority species and their habitats. The requirement to identify and designate sites of Community importance for habitat type and species, known as Special Areas of Conservation is a key aspect of the regulations. In addition, the Regulations provide strict protection measures for particularly rare and threatened species and require that assessments are undertaken before permission or consents are granted within European sites.

### **Environmental Assessment of Plans and Programmes (Wales) Regulations 2004**

7. The Environmental Assessment of Plans and Programmes (Wales) Regulations transpose into law European Directive 2001/42 /EC “on the assessment of the effects of certain plans and programmes on the environment”, commonly known as the Strategic Environmental (SEA) Directive. The aim of the Directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development. The SEA process identifies the likely significant environmental effects that are likely to result from a plan of programme and should show how the results of the environmental assessment have been taken into account in the implementation of the plan of programme. Guidance is available on the Welsh Government website.

### **The Land Drainage Act 1991**

8. The Land Drainage Act 1991 outlines the duties and powers to manage land drainage for a number of bodies including the Environmental Agency, Internal Drainage Boards, Local Authorities, Navigation Authorities and riparian owners.

### **Civil Contingencies Act (2004)**

9. The Civil Contingencies Act 2004, and accompanying non-legislative measures, delivers a single framework for civil protection in the United Kingdom capable of meeting a full range of challenges such as flooding. The Act is separated into two substantive parts: local arrangements for civil protection (Part 1) and emergency powers (Part 2)

## Appendix 5 – Glossary of Terms used within this Guidance

### 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).

### B

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

### 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.

**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 an/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.

**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 6 – List of Documents Consulted**

### **1 CCBC Information**

- 1 Caerphilly Local Development Plan up to 2021 (Adopted November 2010) (Caerphilly LDP)
- 2 Caerphilly Local Development Plan up to 2021 – Strategic Environmental Assessment/Sustainability Appraisal Documents:  
Document 1 – Scoping Report  
Document 2 – Review of Relevant Plans, Programmes and Policies  
Document 3 – The Assessment of Preferred and Alternative LDP Strategies  
Document 4 – The Assessment of the Detailed LDP  
Document 5 – Habitats Regulations Assessment (Incorporating Appropriate Assessment) (October 2008)
- 3 Caerphilly County Borough Council Contaminated Land Inspection Strategy – Directorate of the Environment – March 2010

### **2 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 Eastern Valleys Catchment Flood Management Plan Summary Report - January 2010 Managing Flood Risk – Environment Agency Wales
- 4 Preparing your property for flooding – A guide for householders and small businesses – Environment Agency
- 5 Personal Flood Plan – Environment Agency
- 6 Flooding from groundwater – Practical advice to help reduce the impact of flooding from groundwater – Local Government Association – Environment Agency
- 7 Flood and Coastal Risk Management Appraisal Guidance (FCERM-AG)
- 8 Severn River Basin management Plan

### **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
- 12 Water Framework Directive

#### **4 Legislation**

- 1 Land Drainage Act 1991
- 2 Flood Risk Regulations 2009
- 3 Flood and Water Management Act 2010

#### **5 Other**

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

## **Appendix 7 - Consultation**

### **Flood Risk Management Authorities**

#### **Environment Agency Wales**

- 1 10 May 2012 - To discuss collaborative working with communities at risk of Flooding
- 2 Consultation over Scoping Report for SEA and HRA
- 3 26 Sep 2012 – Discussion about Flood Risk management Plans

#### **Environment Agency Wales**

- 1 22 May 2012 – Ynysddu Flood Forum – 5 responses
- 2 12 July 2012 – Pontymister Flood Forum – 7 responses
- 3 11 Oct 2012 – Ynysddu Flood Forum

### **Water Company - Dŵr Cymru – Welsh Water**

#### **CADW**

- 1 Consultation over Scoping Report for SEA and HRA

#### **Countryside Council for Wales (CCW)**

- 1 Consultation over Scoping Report for SEA and HRA

### **Internal Risk Partners**

#### **Project Team**

- 1 8 May 2012 – Planners, Emergency Planning, Environmental Health to discuss the FRMS
- 2 31 July 2012 – To discuss progress on all aspects of the scheme

#### **Planning Department**

- 1 15 May 2012 – To discuss involvement of planning team
- 2 29 May 2012 – To discuss SEA and HRA and time scale
- 3 26 June 2012 – To discuss progress with LFRMS Report including objectives. Update on progress with scoping.
- 4 10 July 2012 – To discuss progress and measures to be completed by Planning Team
- 5 24 July 2012 – to discuss progress on the scoping report for SEA and work on required on the Strategy Report
- 6 24 Sep 2012 – to discuss SEA
- 7 25 Sep 2012 – to discuss SEA
- 8 27 Sep 2012 – to discuss SEA
- 9 28 Sep 2012 – to discuss SEA

#### **Emergency Planning**

- 1 14 May 2012 – To discuss emergency plans already completed, programme for the development of additional plans and information available on critical services
- 2 12 July 2012 – To discuss detail of measures already provided

### **Estates**

- 1 18 June 2012 – To discuss buildings owned by CCBC and building resilience

### **Housing Department**

- 1 31 May 2012 – to discuss building resilience and implementation

### **External Risk Partners**

#### **Forestry Commission**

- 1 19 July 2012 – to discuss FC policies on tree planting and felling, drainage and use of chemicals to control weeds and fertilizer

#### **Public Consultation**

- 1 22 May 2012 - Meeting with Local Flood Forum – Ynysddu
- 2 On-line survey
- 3 Through CCBC – Contact Group of 1300 members of the public

### **Our on-line survey was put onto our webpage on 20 July 2012**

#### **Paper copies of survey**

- 1 22 May 2012 – Ynysddu Flood Forum – 5 responses
- 2 12 July 2012 – Pontymister Flood Forum – 7 responses

#### **Collaborative Working**

Sharing of staff between CCBC and CCBC  
Regular contact with our adjacent authorities

#### **Support Group – Collaboration with other LLFAs**

An informal support group has been set up of which CCBC is a member

- 1 28 June 2012 – To discuss programme for LFRMS, SEA and HRA
- 2 25 June 2012 – to discuss programme, development of the LFRMS and setting of objectives
- 3 20 Sep 2012 to discuss programme for the completion of The Strategy

		Overarching Objective 1									Overarching Objective 2			Overarching Objective 3			Overarching Objective 4			
CAERPHILLY COUNTY BOROUGH COUNCIL		Reducing the impacts on individuals, communities businesses and the environment;									Raising awareness of and engaging people in the response to flood			Providing an effective and sustained response to flood events			Prioritising investment in the most at risk communities.			
FLOOD RISK MANAGEMENT STRATEGY DETAILED OBJECTIVES AND MEASURES		Reduce the number of people exposed to the risk of flooding.	Reduce the number of residential and commercial properties affected by the risk of flooding.	Reduce 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.	Protect and Enhance Natura 2000 Sites	Protect and Enhance Sites of Special Scientific Interest (SSSIs)	Protect and Enhance Sites of Importance for Nature Conservation (SINCS)	Contribute to the delivery of CCBC Biodiversity Action Plan	Minimise damage to known historic areas and sites: Scheduled Ancient Monuments, Listed Buildings, Conservation Areas, Registered Historic Parks and Gardens and Registered Historic Landscapes	Provide systems to give early warning of potential flooding to individuals and communities.	Provide efficient systems for the management and maintenance of surface water assets and drainage systems.	Reduce economic damage	Endeavour to reduce cost of management	Creating natural channels and water bodies with minimal modification	Improve water quality	Provide Flood Risk Management Plans for each area subject to flood risk	Ensure that measures are sustainable	Ensure CCBC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities	Ensure that investment decisions are prioritised in the most at risk communities on a consistent, defensible basis and are subject to cost benefit analysis.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
<b>6.13</b>	<b>Development Planning and Adaption</b>																			
6.13.1	Sustainable and Strategic Development Planning	√	√	√	√	√	√	√	√						√	√		√		√
6.13.2	Strategic Flood Risk Assessment (SFRA) / Strategic Flood Consequences Assessment (SFCA)	√	√	√	√								√							√
6.13.3	Water Cycle Strategies															√				√
6.13.4	Relocation	√	√	√	√								√	√						√
6.13.5	Mineral Plans	√	√	√	√											√				√
6.13.6	Waste Plans	√	√	√	√											√				√
6.13.7	Sustainable Drainage (SuDS)	√	√	√	√									√	√	√		√		√
6.13.8	Contaminated Land															√				√
6.13.9	Scheduled Ancient Monuments and Listed Buildings									√										√
6.13.10	Conservation Areas, Registered Historic Parks and Gardens and Historic Landscapes									√			√							√
<b>6.14</b>	<b>Flood Forecasting, Warning and Response</b>																			
6.14.1	Planning and Response Awareness	√	√	√	√					√	√		√	√						√
6.14.2	Flood Awareness	√	√	√	√					√	√		√	√						√
6.14.3	Flood Warning	√	√	√	√					√	√		√	√						√
6.14.4	Flood Forecasting	√	√	√	√					√	√		√	√						√
6.14.5	Emergency Response Plans	√	√	√	√					√	√		√	√						√
6.14.6	Community Flood Plans	√	√	√	√					√	√		√	√						√
6.14.7	Multi-Agency Flood Plans	√	√	√	√					√	√		√	√						√
6.14.8	Major Incident Plans	√	√	√	√					√	√		√	√						√

CAERPHILLY COUNTY BOROUGH COUNCIL		Overarching Objective 1									Overarching Objective 2			Overarching Objective 3			Overarching Objective 4			
		Reducing the impacts on individuals, communities businesses and the environment;									Raising awareness of and engaging people in the response to flood			Providing an effective and sustained response to flood events			Prioritising investment in the most at risk communities.			
FLOOD RISK MANAGEMENT STRATEGY DETAILED OBJECTIVES AND MEASURES		Reduce the number of people exposed to the risk of flooding.	Reduce the number of residential and commercial properties affected by the risk of flooding.	Reduce 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.	Protect and Enhance Natura 2000 Sites	Protect and Enhance Sites of Special Scientific Interest (SSSIs)	Protect and Enhance Sites of Importance for Nature Conservation (SINCS)	Contribute to the delivery of CCBC Biodiversity Action Plan	Minimise damage to known historic areas and sites: Scheduled Ancient Monuments, Listed Buildings, Conservation Areas, Registered Historic Parks and Gardens and Registered Historic Landscapes	Provide systems to give early warning of potential flooding to individuals and communities.	Provide efficient systems for the management and maintenance of surface water assets and drainage systems.	Reduce economic damage	Endeavour to reduce cost of management	Creating natural channels and water bodies with minimal modification	Improve water quality	Provide Flood Risk management Plans for each area subject to flood risk	Ensure that measures are sustainable	Ensure CCBC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities	Ensure that investment decisions are prioritised in the most at risk communities on a consistent, defensible basis and are subject to cost benefit analysis.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
<b>6.15</b>	<b>Land, Cultural and Environmental Management</b>																			
6.15.1	Land Management	√	√	√	√	√	√	√	√				√	√	√	√			√	√
6.15.2	Resilience					√	√	√	√						√					√
6.15.3	Resistance					√	√	√	√						√					√
6.15.4	Restoration					√	√	√	√						√	√				√
6.15.5	Environmental Enhancement					√	√	√	√						√	√		√		√
6.15.6	Water Bodies								√						√	√				√
6.15.7	Habitat Creation								√						√	√				√
6.15.8	Control of Invasive Species					√	√	√	√				√			√				√
6.15.9	Soil Management Plans					√	√	√	√				√			√		√		√
<b>6.16</b>	<b>Asset Construction, Management and Maintenance</b>																			
6.16.1	System Asset Management Plans											√		√						√
6.16.2	Defence/Structure Management and New Construction	√	√	√	√					√		√	√	√						√
6.16.3	Channel Maintenance and New Construction	√	√	√	√					√		√	√	√	√			√		√
6.16.4	Culverts, Gullies, Highway and Culvert Infrastructure Maintenance and New Construction	√	√	√	√					√		√	√	√						√

		Overarching Objective 1									Overarching Objective 2			Overarching Objective 3			Overarching Objective 4			
CAERPHILLY COUNTY BOROUGH COUNCIL		Reducing the impacts on individuals, communities businesses and the environment;									Raising awareness of and engaging people in the response to flood			Providing an effective and sustained response to flood events			Prioritising investment in the most at risk communities.			
FLOOD RISK MANAGEMENT STRATEGY DETAILED OBJECTIVES AND MEASURES		Reduce the number of people exposed to the risk of flooding.	Reduce the number of residential and commercial properties affected by the risk of flooding.	Reduce 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.	Protect and Enhance Natura 2000 Sites	Protect and Enhance Sites of Special Scientific Interest (SSSIs)	Protect and Enhance Sites of Importance for Nature Conservation (SINCS)	Contribute to the delivery of CCBC Biodiversity Action Plan	Minimise damage to known historic areas and sites: Scheduled Ancient Monuments, Listed Buildings, Conservation Areas, Registered Historic Parks and Gardens and Registered Historic Landscapes	Provide systems to give early warning of potential flooding to individuals and communities.	Provide efficient systems for the management and maintenance of surface water assets and drainage systems.	Reduce economic damage	Endeavour to reduce cost of management	Creating natural channels and water bodies with minimal modification	Improve water quality	Provide Flood Risk management Plans for each area subject to flood risk	Ensure that measures are sustainable	Ensure CCBC works in partnership with all other Risk Partners and works collaboratively with adjacent Authorities	Ensure that investment decisions are prioritised in the most at risk communities on a consistent, defensible basis and are subject to cost benefit analysis.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
<b>6.17</b>	<b>Studies, Assessments and Plans (SWMPs, Project Plans, SMPs links)</b>																			
6.17.1	Investigation																✓			✓
6.17.2	Risk Assessment																✓			✓
6.17.3	Strategy Plan																✓			✓
6.17.4	Local Property - Flood Mitigation - Resilience											✓								✓
6.17.5	Local property - flood Mitigation - Resistance	✓	✓	✓	✓							✓								✓
6.17.6	Pre-feasibility Studies, Feasibility Studies																✓			✓
6.17.7	Project Plans																✓			✓
<b>6.18</b>	<b>High level awareness and engagement</b>																			
6.18.1	Partnership Working													✓					✓	✓
<b>6.19</b>	<b>Monitoring</b>																			
6.19.1	Erosion Monitoring														✓	✓				✓
6.19.2	Habitats Monitoring					✓	✓	✓	✓					✓	✓	✓				✓
6.19.3	Topographical Survey																✓			✓
6.19.4	Aerial Photography																✓			✓