



Vale of Glamorgan Council

Local Flood Risk Management Strategy

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Foreword

Councillor Robert F Curtis
Cabinet Member for Environment and Visible Services



This is the first Vale of Glamorgan Strategy for Local Flood Risk Management and it is a key step in ensuring that the risk of flooding in the Vale of Glamorgan is dealt with as whole, joining up the work done by the Council, Government Bodies and Water Companies with that of communities and individual householders. During recent years, areas of the United Kingdom having been subjected to devastating flood events. Communities within the Vale of Glamorgan, such as Boverton, Llantwit Major, Llanmaes and the Coldbrook Catchment in Barry have also experienced the severe impacts and consequences of flooding. It is widely accepted that floods such as these are likely to become more frequent as the effects of climate change develop. The consequences of an increase in flooding will be a greater risk to life, the economy and the environment of the Vale.

The Strategy considers how various activities can assist in managing flood risk, including better planning policy to ensure new development does not increase flood risk for its neighbours, the efficient management of surrounding landscape to reduce flooding at source and to ensure that emergency responses are targeted where flood risk is greatest. However the activities identified in this Strategy can only contribute to the management of flood risk. It would not be realistic, even if we were not experiencing a period of austerity, to protect all property and infrastructure from flood risk. Instead efforts need to be made by all involved, organisations and householders alike, to reduce flood risk in practical ways not only by reducing the probability of flooding but also its impact, making sure that properties can cope in the event of a serious flood.

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

This Strategy focuses on 'local flood risk', defined as flooding caused by surface runoff, groundwater and ordinary watercourses (streams, ditches etc). This type of flooding was the cause of most of the damage of the local floods of 1998, 2000 and 2007 and need to be taken as seriously as flooding from main rivers or the coast. However it is not the source of flooding but the effects that matter to those affected and we are keen to make sure that all forms are managed together and tackled according to level of risk rather than by what caused it or who shouts loudest. The Strategy therefore sets out how we will work collaboratively with other key stakeholders to input into the management of all sources of flood risk and ensure that investment decisions are made according to levels of risk.

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

The Local Flood Risk Management Strategy is our statement of intent for dealing with flood risk within the Vale of Glamorgan and ensuring that our communities, infrastructure and the wider environment are more resilient to the impacts of flooding and climate change. I hope it will help you become better informed of everyone's responsibilities, how to find out your flood risk and what we can do to help you become safer.

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Executive Summary

The Flood and Water Management Act 2010 places a responsibility upon Local Authorities, as Lead Local Flood Authorities, to develop, maintain, apply and monitor a strategy for local flood risk management (a 'Local Strategy'). This Local Strategy forms the framework within which communities have a greater say in local risk management decisions.

This Local Strategy encourages effective flood risk management by enabling people, communities, business and the public sector to work together to:

- Ensure a clear understanding of the risks of flooding and erosion, nationally and locally, so that investment in risk management can be prioritised more effectively;
- Set out clear and consistent plans for risk management so that communities and businesses can make informed decisions about the management of the residual risk;
- Encourage innovative management of flood and coastal erosion risks, taking account of the needs of communities and the environment;
- Form links between the local flood risk management strategy and local spatial planning;
- Ensure that emergency plans and responses to flood incidents are effective and that communities are able to respond properly to flood warnings; and
- Help communities to recover more quickly and effectively after incidents

The content of the Local Strategy has been developed in line with the vision and priority outcomes of the Vale of Glamorgan Community Strategy. The Local Strategy is also aligned with the National Strategy for Flood and Coastal Erosion Risk Management in Wales. It provides the key local information to facilitate common understanding of local flood risk, who is involved, what their responsibilities are, objectives and practical measures to deliver the objectives over time. The purpose of the Strategy is to assess local flood risks, encourage partnership working, influence local planning policy, direct available resources to those most at risk and enable the Vale of Glamorgan Council (referred to throughout the Local Strategy as 'The Vale') to fairly and transparently manage flood risk within the community.

The Local Strategy is currently in draft format and will be put forward for public consultation to allow people, communities, business and other public sector organisations to review and comment on the content. This is an essential part of the Local Strategy development process as it ensures the content reflects the actual risks, needs and wants of the community that it serves. The finalised Local Strategy will be published by the Council following consultation feedback.

"Our Vision for the Vale of Glamorgan is a place; that is safe, clean and attractive, where individuals and communities have sustainable opportunities to improve their health, learning, skills, prosperity and wellbeing; and where there is a strong sense of community in which local groups and individuals have the capacity and incentive to make an effective contribution to the future sustainability of the area" Vale of Glamorgan Community Strategy (2011 – 2021)

"Vale residents and organisations respect the local environment and work together to meet the challenge of climate change." Vale of Glamorgan Community Strategy (2011 – 2021) – Priority Outcome No. 3

1. Introduction

Section Overview

The purpose of this section is to answer the following questions:

- What is a Local Flood Risk Management Strategy?
- Where can I find specific information within this document?
- What are the legislative drivers for this Strategy?
- What other documents are related to the Strategy?

1.1 WHAT IS A LOCAL FLOOD RISK MANAGEMENT STRATEGY?

The Flood and Water Management Act 2010 (FWMA) places a responsibility upon Local Authorities, as Lead Local Flood Authorities (LLFAs), to develop, maintain, apply and monitor a strategy for local flood risk management (a 'Local Strategy').

The Local Strategy forms the framework within which communities have a greater say in local risk management decisions. In combination with the National Strategy¹, the Local Strategies encourage more effective risk management by enabling people, communities, business and the public sector to work together to:

- Ensure a clear understanding of the risks of flooding and erosion, nationally and locally, so that investment in risk management can be prioritised more effectively;
- Set out clear and consistent plans for risk management so that communities and businesses can make informed decisions about the management of the residual risk;
- Encourage innovative management of flood and coastal erosion risks, taking account of the needs of communities and the environment;
- Form links between the local flood risk management strategy and local spatial planning;
- Ensure that emergency plans and responses to flood incidents are effective and that communities are able to respond properly to flood warnings; and
- Help communities to recover more quickly and effectively after incidents.

It will do this by acting as the evidence base for the decisions and actions required for managing flood risk. The minimum requirements for a Local Strategy are summarised below:

- Identify Risk Management Authorities in the Local Authority's area;
- Describe the flood and coastal erosion risk management functions that may be exercised by those Authorities in relation to the area;
- Set objectives for managing local flood risk;
- Describe the measures proposed to achieve those objectives;
- Define how and when the measures are expected to be implemented;
- Estimate the costs and benefits of those measures, and how they are to be paid for;
- Complete an assessment of local flood risk for the purpose of the strategy;
- State how and when the strategy is to be reviewed; and
- Show how the strategy contributes to the achievement of wider environmental objectives.

¹ The 'National Strategy' is set by the Welsh Government and has four overarching objectives – reducing the consequences of flooding, raising awareness of flooding, providing an effective response to flood events and prioritising investments in the most at risk communities.

1.2 STRUCTURE OF THE LOCAL STRATEGY

The table below summarises structure of the Local Strategy and the key questions that are answered by each section.

Table 1-1: Structure of the Local Strategy

Section No.	Title	Key Questions
1	Introduction	What is a Local Flood Risk Management Strategy? Where can I find specific information within this document? What are the legislative drivers for this Strategy? What other document are related to the Strategy?
2	Local Flood Risk	What is 'local flood risk'? What flooding has happened in the past? What flooding could happen in the future? How do all the sources of flooding interact? Where are the highest risk areas? Who is most at risk? How are non-local sources of flood risk managed?
3	Roles and Responsibilities	Who is responsible for managing flood risk? What are the responsibilities of each of these organisations? Who do I contact about flooding?
4	Objectives and Measures	What are the National Objectives for management of flood risk? What are the Local Objectives for management of flood risk? What measures will be used to deliver the Local Objectives? Who will be responsible for implementing the measures? How will the measures be funded?
5	Funding and Implementation	Who will fund the measures? How will the measures be implemented?
6	Environmental Assessment	How will this Strategy impact the environment? How will the environmental impacts be managed? What will the environmental benefits be?
7	Review and Update	How often will the Strategy be reviewed? Who is responsible for update of the Strategy? How can I contribute to the Strategy? What happens after the consultation process?
8	References	Details of reference documents used to create the Local Strategy
Appendices	Various	Supporting documents for the Local Strategy – including a glossary of terms and consultation response forms.

1.3 LEGISLATIVE CONTEXT

1.3.1 FLOOD AND WATER MANAGEMENT ACT (2010)

The Flood and Water Management Act (2010) places new responsibility on Local Authorities to manage and lead on local flooding issues. The Act requires Local Authorities to deliver new duties and responsibilities with regard to managing flood risk, including:

- Taking an active role leading flood risk management as Lead Local Flood Authorities (LLFAs)

- Cooperating with other relevant authorities to manage local flood risk
- Duty to investigate flood incidents and report upon them
- Maintain an 'Asset Register' of assets that have a significant influence on local flood risk
- Designate 'features' that have a significant influence on local flood risk
- Regulation of works on 'ordinary watercourses'
- Development and implementation of Local Flood Risk Management Strategies (LFRMS)
- Responsibility for first approval, then adoption, management and maintenance of Sustainable Urban Drainage System (SUDS) where they service more than one property (not currently enacted – expected to be enacted in 2013)

This Local Strategy is one of the new requirements of the Flood and Water Management Act. The FWMA reinforces the need to manage flooding holistically and in a sustainable manner. This has grown from the key principles within Making Space for Water (Defra, 2005) and was further reinforced by the summer 2007 floods and the Pitt Review (Cabinet Office, 2008). It implements several key recommendations of Sir Michael Pitt's Review of the Summer 2007 floods.

It should be noted that from 1 of April 2013 Natural Resources Wales (NRW), a new body formed by the Welsh government, took over the functions previously carried out by the Environment Agency (EA) in Wales, alongside the Forestry Commission Wales and the Countryside Council for Wales. Both EA and NRW references are used in the Local Strategy depending on the date of the reference information used (i.e. EA for documents / information produced prior to 1 April 2013 and NRW for any references or input after 1 April 2013).

1.3.2 FLOOD RISK REGULATIONS (2009)

The Flood Risk Regulations (FRR) (2009) are the transposition of the European Union Floods Directive into English and Welsh law. The Regulations require three main types of assessment / plan to be produced:

- Preliminary Flood Risk Assessments (PFRA)** to be completed by all LLFAs and the EA by the 22 December 2011. Flood Risk Areas, at potentially significant risk of flooding, were also identified. Maps and management plans will be developed on the basis of these flood risk areas.
- Flood Hazard Maps and Flood Risk Maps.** NRW and LLFA are required to produce Hazard and Risk Maps for all sources of flooding by 22 December 2013.
- Flood Risk Management Plans.** NRW and LLFA are required to produce Flood Risk Management Plans for 'Flood Risk Areas' by 22 December 2015.

It should be noted that only (a) above is compulsory for all LLFAs. Where an LLFA is not located within a nationally defined 'Flood Risk Area', then (b) and (c) above are not required. The Vale has produced a PFRA and is not within a Flood Risk Area. Therefore, the Council is only required to complete (a) and then review the document every six years.

The Vale was initially included within the Cardiff Indicative Flood Risk Area in the Wenvoe and Culverhouse areas. The boundary for the Cardiff Indicative Flood Risk area was revised during the PFRA process to run along the Local Authority boundary line and no longer encroaches on the Vale of Glamorgan.

1.3.3 PLANNING POLICY WALES / TAN 15

Planning Policy Wales (2011) is the overarching land use planning policy for Wales. It provides the policy framework for the effective preparation of local planning authorities' development plans. The main policy document is supplemented by 21 topic based Technical Advice Notes (TANs). The key document influencing flood risk is TAN 15 (Development and Flood Risk).

TAN 15 provides technical guidance which supplements the policy set out in Planning Policy Wales in relation to development and flooding. It advises on development and flood risk as this relates to

sustainability principles, and provides a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed. The Unitary Development Plan (Refer Section 1.4.4) and Local Development Plan (Refer Section 1.4.5) implement this guidance at the local policy level. The Local Strategy is also closely linked with local development control in regard to management of flood risk.

1.3.4 OTHER RELEVANT LEGISLATION

Flood Risk Management is affected by a range of guidance and legislation. Some of these include:

- Climate Change Act (2008)
- Conservation of Habitats and Species Regulations (2010)
- Civil Contingencies Act (2004)
- Strategic Environmental Assessment (SEA) Directive (2001/42/EC)
- Land Drainage Act (1991)
- Water Framework Directive (2007)
- Wildlife and Countryside Act (1981)
- Countryside and Rights of Way Act (2000)
- Public Health Act (1936)

1.4 RELATED DOCUMENTS

1.4.1 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

It is 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.

The purpose of SEA is to provide for a high level of protection of the environment, by ensuring the integration of environmental considerations into the preparation of the Local Strategy and to contribute to the promotion of sustainable development and environmental protection.

The SEA for the Vale Local Strategy has been completed as a stand-alone study and is produced as Volume 2 of this document for reference purposes. The outcomes of the SEA are reflected in Section 6 of this document where there is a summary of how the Local Strategy contributes to achievements of wider environmental objectives.

1.4.2 HABITATS REGULATION ASSESSMENT (HRA)

In Wales, the Conservation of Habitats and Species Regulations (2010) implements the EU 'Habitats Directive' and some elements of the 'Birds Directive'. This legislation provides the legal framework for the protection of habitats and species of European importance in Wales and England.

The Habitats Regulations require that a Local Authority to consider the requirements of the Habitats Directive in exercising any of its functions. This includes any plans, projects or strategies that potentially affect European sites. The HRA for the Vale Local Strategy has been completed as a stand-alone study and is included in Volume 3 of this document for reference purposes. The outcomes of the HRA are reflected in Section 6 of this document where there is a summary of how the Local Strategy contributes to achievements of wider environmental objectives.

1.4.3 WATER FRAMEWORK DIRECTIVE ASSESSMENT (WFD)

The purpose of a WFD Assessment is to assess the potential impacts of flood and coastal risk management activities on the ecological status of surface water and main river bodies (excluding lakes). The assessment process consists of three levels:

- Preliminary
- Level 1
- Level 2

The Preliminary Assessment is undertaken at the project definition stage and helps determine whether further assessment is needed. A Level 1 assessment is intended to provide information about

the nature of the hydromorphological conditions of a water body and allow the likely hydromorphological responses to new flood risk management infrastructure or activities to be investigated. This, in turn, informs a more accurate assessment of whether Biological Quality Elements (BQEs) are likely to be affected.

The scope for further Level 2 investigations should be determined at the end of the Level 1 assessment. A Level 2 assessment is intended to provide additional, targeted information and should build upon the existing information gathered as part of the Level 1 assessment. At this stage of Local Strategy development, only a Preliminary WFD Assessment is intended to be undertaken in order to identify potential impacts on relevant water bodies. The outcomes of the WFD assessment will be reflected in Section 6 of this document following receipt of current WFD status ratings for watercourses in the Vale of Glamorgan area (these had not been supplied by the EA at the time of writing).

1.4.4 UNITARY DEVELOPMENT PLAN (1996 – 2011)

The Unitary Development Plan (1996 – 2011) remains the adopted development plan for the area. The Local Development Plan, currently under production, will only supersede this once formally adopted. The UDP contains several policies relating to management of flood risk through development. These policies include:

- ENV 6 (East Vale Coast)
- ENV 7 (Water Resources)
- HOUS 1 (Residential Allocations)
- EMP 1 (Land for Employment Uses)
- TOUR 4 (Caravan, Chalet and Tent Sites)
- TOUR 5 (Non-Residential Tourist Attractions)
- MIN 9 (Environmental Controls)
- WAST 2 (Criteria for assessing Waste Management facilities)

Until the Local Development Plan (2011 – 2026) is formally adopted by the Council, the UDP policies will apply and will need to be applied in parallel with those contained within this Local Strategy.

1.4.5 LOCAL DEVELOPMENT PLAN (2011 – 2026)

Following an earlier consultation on the February 2012 Deposit LDP the Council has resolved to produce a new Deposit LDP for public consultation later in 2013. This plan, following an 'Examination in Public' and once formally adopted, will eventually supersede the adopted UDP. The LDP timetable is currently under review and an indicative adoption date will be known once agreed.

Although the Deposit LDP is currently under production, it is noted that the LDP strategy is closely aligned with the Vale of Glamorgan Community Strategy (2011 – 2026) in terms of meeting the ongoing development needs of the community. The LDP and community strategy emphasise the desire for local groups and individuals to make an effective contribution to the future sustainability of the Council area. This desire is also reflected in this Local Strategy and there are specific objectives set and measures provided that will allow communities to ensure their future sustainability with regard to the effects of climate change on flood risk. Once finalised, relevant LDP policies will need to be applied in parallel with those included within this Local Strategy – they are intended to be complementary.

2. Local Flood Risk

Section Overview

The purpose of this section is to answer the following questions:

- What is 'local flood risk'?
- What flooding has happened in the past?
- What flooding could happen in the future?
- How do all the sources of flooding interact?
- Where are the highest risk areas? Who is most at risk?
- How are non-local sources of flood risk managed?

2.1 SOURCES OF FLOODING – LOCAL FLOOD RISK

There are several potential sources of flooding within the Vale of Glamorgan. They are summarised in the table below with the **local flood risk sources** that are addressed by the Local Strategy **highlighted**. Surface Water flooding, Ordinary Watercourse flooding and Highways flooding are commonly addressed together as they essentially represent the same flood mechanism. The non-local sources of flooding are the responsibility of the stated Risk Management Authorities (RMAs). Further information on the roles and responsibilities of RMAs for flood risk is provided in Section 3.

The various sources of flooding interact with each other and can create complex flooding mechanisms in certain areas. This can make it difficult (or impossible) to determine overall sole responsibility for flooding in a specific area and it is often concluded that flooding is caused by multiple sources. While the Local Strategy is focussed on reducing the consequences of the three 'local' sources of flooding described in the table below, it also facilitates partnership working to manage risk with other organisations where multiple sources of flooding have occurred historically or are predicted to occur in the future.

Table 2-1: Sources of Flooding

Flood Source and Mechanism	Responsibility				
	Vale of Glamorgan Council	Natural Resources Wales	Dwr Cymru / Welsh Water	Vale of Glamorgan Highways	South Wales Trunk Road Agency
Surface Water - Runoff as a result of high intensity rainfall when water is ponding or flowing over the ground surface before it enters the underground drainage network or a watercourse	●				
Ordinary Watercourse - Flooding which occurs as a result of the capacity of the ordinary watercourse being exceeded resulting in out of bank flow (water coming back out of rivers and streams).	●				
Groundwater - Occurs when the water level within the groundwater aquifer rises to the surface	●				
Main Rivers - Occurs when a designated 'Main River' cannot cope with the volume water draining into it from the surrounding land and it spills onto the surrounding area.		●			
Coastal - Occurs when a high astronomical tide and / or storm (tidal surge) exceeds the level of coastal land or coastal flood defences. Inland flooding can also be caused by 'tide locking' of		●			

Flood Source and Mechanism	Responsibility				
	Vale of Glamorgan Council	Natural Resources Wales	Dwr Cymru / Welsh Water	Vale of Glamorgan Highways	South Wales Trunk Road Agency
rivers or estuaries.					
<u>Reservoirs</u> – Occurs when a reservoir / canal embankment or control fails and releases a large volume of retained water into the downstream area.		●			
<u>Sewer</u> - Flooding which occurs when the capacity of the underground drainage system is exceeded, resulting in flooding inside and outside of buildings.			●		
<u>Burst pipes or water mains</u> – Occurs when water supply or drainage infrastructure fails			●		
<u>Highways Flooding</u> – A combination of sewer and surface water flooding located on a highway				●	
<u>Highways Flooding (M4 / A4232)</u> - A combination of sewer and surface water flooding located on a main highway					●

2.2 HISTORIC FLOODING

Main River flooding accounts for the majority of all recorded flood events in the Vale of Glamorgan. Surface water flooding is difficult to quantify as many incidents are masked by the impact of Main River flooding or go unreported. However, based on anecdotal evidence and improved recording of recent incidents surface water flooding is believed to occur fairly frequently within the Vale of Glamorgan. Localised groundwater flooding is reported to have occurred in Ewenny Village, St Brides Major, East Monkton, Rhoose and Barry.²

The Vale of Glamorgan Preliminary Flood Risk Assessment (PFRA) refers to two major historic flooding incidents (October 1998 and July 2007). These events have been classified as having “locally significant harmful consequences” which is defined using the indicators set out in the Defra/WAG document ‘Selecting and reviewing Flood Risk Areas for local sources of Flooding’. Widespread flooding is also known to have occurred in October and November 2000.

A prolonged period of heavy rain in October 1998 resulted in flooding across South Wales, including communities in the Vale of Glamorgan. Properties in Colwinston, Llandow, Llantwit Major, St Athan, Aberthin, Cowbridge, Llancafán, Llysworney, Llanblethian, Llanmaes, Boverton, Dinas Powys, Sully Road, Lavernock Road, Eastbrook and Peterston Super Ely were affected by the flooding. The primary cause of flooding was attributed to floodwaters overtopping the banks of main rivers and ordinary watercourses, restrictions to flow in channels and surcharging of drains. In addition, surface water flooding is known to have been a cause of damage in some areas³.

From 29 October to 3 November 2000, a series of depressions tracked across Wales bringing spells of gale force winds and heavy rain. The highest rainfall intensities were recorded in the Vale of Glamorgan on 29 October and caused widespread flooding. Main locations impacted by Main River flooding included Dinas Powys, Sully Moors Road, Cowbridge, Llanblethian, Llancafán and Peterston Super Ely.

A substantial Main River Flood Alleviation Scheme (FAS) was installed to the north of Cowbridge following the 1998 and 2000 flood events. The level of protection provided by the FAS is reported in

² Environment Agency (January 2012) Ogmere to Tawe CFMP Summary Report

³ <http://www.ukweatherworld.co.uk/forum/index.php?topic/74587-wales-october-1998-floods/>

the Ogmore to Tawe Catchment Flood Management Plan (March 2009) as the 1% Annual Exceedance Probability (a 1 in 100 chance of occurring in every year). The FAS was designed to protect historically flooded properties in Cowbridge and Llanblethian.

On 20th July 2007, Barry, together with a number of other locations in the Vale of Glamorgan, was subjected to intense rainfall. Significant flooding of properties and roads was reported as watercourses and land drainage systems were unable to cope with the intensity of the event. One of the most significant areas of flooding was along the route of the Coldbrook watercourse which runs from the Colcot area through the town's districts of Gibbonsdown, Cadoxton and Palmerston to the open stream adjacent to the A4231 Barry Docks Link Road. In all, approximately 100 residential properties and four schools were flooded along the route of the watercourse or within its catchment area. Local roads were closed and some properties were so badly affected by the floods that the residents were unable to return to their properties for 6 months.⁴

More recently, widespread flooding was recorded across the Vale in December 2012 and January 2013, including surface water, main river, ordinary watercourse, groundwater and sewer flooding⁵. Main river flooding was reported in Boverton, Sully Brook and Llantwit Major. Other serious flooding incidents, directly impacting on properties, included Broughton, St. Athan, St. Mary Church, Llanmaes, Llancadle and Rhoose. Many other incidents were recorded impacting on gardens, highway and public open spaces. The flooding in the Sully Brook area of the Eastern Vale had a significant impact on commercial operations in this area – *“major business companies, and employers, in that area have been continually flooded over the past few years, experiencing extensive damage and interruptions to their business activities, and where in the last instance, on the 23rd December 2012, the village of Sully was virtually cut off, as far as road travel is concerned, by the flooding of these roads and the flooding to Lavernock Road and Sully Road”*⁶. Flooding noted in this area is likely to be predominately fluvial flooding from the Sully Brook, encompassing both main river and ordinary watercourses.

Localised floods have and will continue to occur in many areas of the Vale under severe weather conditions and climate change is likely to make them more frequent and more severe. The aim of this Local Strategy is to reduce the risks where possible and have emergency plans in place to deal with exceptional severe events.

2.3 POTENTIAL FUTURE RISK OF FLOODING

2.3.1 LOCAL FLOOD RISK – SURFACE WATER AND ORDINARY WATERCOURSES

Preliminary Flood Risk Assessment - 2011

A Preliminary Flood Risk Assessment (PFRA) was prepared in 2011 by The Vale to meet its duties to manage local flood risk under the Flood Risk Regulations 2009. As part of the PFRA, analysis was carried out to identify key areas in the Vale of Glamorgan where the potential risk of surface water flooding is expected to be greatest. This work was carried out using ‘locally agreed surface water information’ (refer below) and the ‘indicators for significant harmful consequences’ (refer table below).

The locally agreed surface water information dataset combines local information on surface water flooding with the EA's Flood Map for Surface Water (for a rainfall event with a 1 in 200 chance of occurring in any year and which shows surface water flooding greater than 0.3m deep). The analysis was completed on a council wide basis and identified **Dinas Powys, Llantwit Major and Cowbridge** as at significant future risk from surface water flooding.

⁴ www.coldbrookflood.co.uk

⁵ Vale of Glamorgan Council, Flood Incident Records (Accessed in December 2013)

⁶ Councillor R.A. Penrose (LFRMS Consultation Response dated 14 May 2013)

Table 2-2: Indicators for Significant Harmful Consequences

Social / Human Health	Number of People	Based on number of residential properties x2.34
	Critical Services	Includes schools, hospitals, nursing homes, utilities infrastructure
Economic Activity	Non Residential / Commercial Properties	Includes shops and businesses
	Agricultural Land	Areas of land (hectares) based on agricultural grade
	Roads and Rail	Based on length in km
Environment	Area of internationally or nationally designated site	Including Special areas of Conservation; Special Protection Areas; Ramsar sites or Sites of Special Scientific Interests
	Number of nationally / internationally important heritage features	Includes World Heritage Sites; Scheduled Monuments; Listed buildings and Registered parks and Gardens

Source: Value of Glamorgan Preliminary Flood Risk Assessment (2011)

Local Strategy Surface Water Flood Risk Assessment - 2012

A more detailed analysis of the potential impacts of future surface water flooding was completed for the Local Strategy and is shown in Table 2-3. The analysis uses the same baseline information and impact criteria as that used for the PFRA, but provides further detail based on specific local parish / community boundaries. Section 2.5 provides detailed information on the selection of the impact parameters, colour coding and investigation priorities shown in Table 2-3.

The results of the analysis are presented in the table on the following page. The purpose of this analysis is to provide a consistent basis for making prioritisation decisions on future flood mitigation investigations and possible works. Figure 2—1 and Figure 2—2 show the baseline information used in the analysis. Figure 2—5 and Figure 2—6 show the Investigation Priority along with locations of each of the parishes within NRW Operational Catchments.

Table 2-3: Future Potential Surface Water Flood Impacts and Investigation Priority

NRW Operational Catchment	Parish Council Name	Human Health			Economic Activity				Environment			Significant Historic Local Flooding Experienced?	Historic Flooding Notes	Overall Investigation Priority
		Res. Properties (No.)	Critical Services (No.)	Critical Service Type	Non-Residential Properties (No.)	Agricultural Land (km ²) - Grade 1, 2 and 3	Road (km)	Rail (km)	Designated Sites (No.)	Heritage Features (No.)	Details			
Barry Coastal/ Coldbrook/ Cadoxton/ Thaw/ Coastal Rhoose	Barry Community	308	6	Sewage treatment, Gas regulating, and 4 x Electricity sub-stations	15	0.24	2.51	0.23	2	10	Coedydd Y Barri/ Barry Woodlands SSSI; Cliff Wood Golden Stairs SSSI; Medieval House Site SAM; Site of Medieval Mill & Mill Leat Cliffwood SAM; Porthkerry railway Viaduct.	YES - But works underway to resolve issues	Coldbrook - 100 Residential Properties Flooded / Local Roads Closed / 4 Schools Flooded (20 July 2007) – Source: The Vale Preliminary Flood Risk Assessment (PFRA)	High
Cadoxton	Dinas Powys Community	88	1	Electricity sub-station	6	0.38	0.83	0.56	2	7	SSSI Coedydd Y Barri/ Barry Woodlands SSSI; Cog Mors SSSI; Cogan Deserted Medieval Village (SAM) majority in Penarth	YES - But works underway to resolve issues		High
Ely/Cadoxton	Llandough Community	5			1	0.00	0.45		1	1	Cwm Cydfin, Leckwith SSSI	NO		Low
Cadoxton/Ely	Michaelston Community	1				0.18	0.04		1	9	Cwm Cydfin, Leckwith SSSI; The Old Dairy at Cwrt-yr-Ala (LB)	NO		Low
Cadoxton/ Penarth Coastal/Ely	Penarth Community	99	2	2 x Electricity sub-stations	3	0.09	1.30	0.47	1	2	Llynnoedd Cosmeston/ Cosmeston Lakes SSSI; Cogan Deserted Medieval Village (SAM)	YES	Tidal and overland flow (27 Properties for overland flow flooding) – Date Unknown - Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	High
Cadoxton/ Sully Coastal	Sully Community	47			2	0.06	0.48		3	2	Penarth Coast SSSI; Cog Moors SSSI (majority of SSSI in Dinas Powys); Llynnoedd Cosmeston/ Cosmeston Lakes SSSI (majority of SSSI in Penarth); Middleton Moated Site (SAM); Former Lodge and Screen walls flanking the driveway entrance to Sully Hospital (LB)	YES	22 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	Medium
Cwm Col Huw/Thaw	Llan-Maes Community	18	1	Pumping infrastructure	1	0.06	0.18			2	Plaisted House and Cottage (LBs)	YES - But works underway to resolve issues	16 Residential Properties Flooded / Local Roads Closed (28 Oct 1998) Source: The Vale PFRA	Medium

NRW Operational	Parish Council	Human Health			Economic Activity				Environment			Significant Historic Local	Historic Flooding Notes	Overall Investigation Priority
		Res.	Critical	Critical Service	Non-	Agricultural	Road	Rail	Designated	Heritage	Details			
Cwm Col Huw	Llantwit Major Community	82	4	Pump house, Telecommunications, Electricity sub-station and Clinic	11	0.34	1.24	0.89		9	Footbridge over Stream, Church of St Illtud (LB); Garden Wall and Gate of Flanders Farmhouse (LB); The Causeway (LB); Castle Ditches Camp (SAM); Llantwit Major Monastic Settlement (SAM); Caermead Roman Site (SAM); Summerhouse Camp (SAM); The Chantry House (SAM)	YES	17 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	High
Ely	Pendoylan Community	1	2	The Vale Hospital and Pumping infrastructure	1	0.25	0.17	0.04	1	9	Ely Valley SSSI; Cae'rwigau Isaf, Cae'rwigau (LB)	NO		Medium
Ely	Peterston-super-Ely Community	2	1	Sewage treatment		0.19	0.09	0.10	1	1	Ely Valley SSSI	NO		Medium
Ely	St. Georges-super-Ely Community	2			2	0.21	0.18	0.03	1	2	Ely Valley SSSI	NO		Medium
Ewenny	Colwinston Community	3				0.19	0.10			1		YES	4 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	Low
Ewenny	Ewenny Community	4			1	0.14	0.24	0.05	2	5	Ewenny and Pant Quarries SSSI; Old Castledown SSSI (majority of SSSI in St. Brides Major)	YES	28 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	Low
Ewenny	Llangan Community	8			1	0.06	0.29			1	Pantruthin-fach Farmhouse (LB)	YES	12 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	Low

NRW Operational	Parish Council	Human Health			Economic Activity				Environment			Significant Historic Local	Historic Flooding Notes	Overall Investigation Priority
		Res.	Critical	Critical Service	Non-	Agricultural	Road	Rail	Designated	Heritage	Details			
Ewenny/ Coastal West Vale	St. Bride's Major Community	39	1	Pumping infrastructure	3	0.47	0.34	0.07	6	21	Old Castle Down SSSI; Clemenstone Meadows SSSI, Wick; Ewenny and Pant Quarries SSSI; Southerndown Coast SSSI; Coed Y Bwl SSSI; Cnap Twt SSSI; Dunraven Castle Hillfort (SAM); Ogmores Castle (SAM); Ogmores Stepping Stones (SAM); Stepsau Duon (SAM) Fynnon y Pant; (LB); Clapper Bridge (LB); Pont Groes Gwta (LB); Grand Lodge (LB); Boundary Wall N of Seamount Lodge (LB); Fynnon y Pant (LB)	YES	8 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	High
Coastal West Vale/Ewenny	Wick Community	6				0.08	0.01		2	2	Clemenstone Meadows SSSI, Wick; Outbuilding at Church Farm (LB); Tithe Barn, Dovecot & Remains of Other Buildings (SAM) majority of SAM is in St Donats Community	NO		Low
Coastal West Vale	St. Donats Community	15			3	0.15	0.19		1	12	Monknash Coast SSSI; Cwm Nash Defended Enclosure (SAM); Tithe Barn, Dovecot & Remains of Other Buildings (SAM); Area of Shrunken Medieval Village (SAM); Nash Point Camp (SAM); Outbuilding at Village Farm incorporating remains of Marcross Castle (LB); Nicholl-Carne Memorial Cross in Churchyard of Church of St Donat (LB); Churchyard Wall of Church of St Donat, including Railings and Gates (LB); Sundial at St Donat's Castle (LB).	NO		Medium

NRW Operational	Parish Council	Human Health			Economic Activity				Environment			Significant Historic Local	Historic Flooding Notes	Overall Investigation Priority
		Res.	Critical	Critical Service	Non-	Agricultural	Road	Rail	Designated	Heritage	Details			
Thaw	Cowbridge with Llanblethian Community	83	2	Water filtration and Clinic	23	0.25	2.36		1	9	Cors Aberthin SSSI; War Memorial in front of Town Hall (LB); Gate House and bridge at Ty Mawr (LB); Range of buildings at Court Farm (LB).	YES	High Street flooded three times in last 25yrs (1998, 2013 and one other). Source: Local Resident 19 Residential / 1 Non-Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	High
Thaw	Llancarfan Community	23	3	Sewage treatment, Pumping infrastructure and Water-wheel	3	1.00	0.17		2	26	Nant Whitton Woodlands SSSI; Coedydd Y Barri/ Barry Woodlands SSSI; Llantrithyd Place (SAM); Horseland moated homestead (SAM); LlanCADLE Deserted Medieval Village (SAM); Llancarfan Monastery (SAM); Walterston ringwork (SAM);	NO		High
Thaw	Llanfair Community	2			1	0.39	0.00			8	Fishwier Farmhouse, St Mary Church (LB); Old Beaupre Castle (SAM)	NO		Low
Thaw/Ely	Penllyn Community	10			2	0.47	0.24			4	Cross base in churchyard of St. Brynach (LB); Village Farmhouse (LB)	YES	20 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	Medium
Thaw/Coastal Rhose	Rhose Community	83	1	Electricity sub-station	2	0.41	0.15	0.23	2	7	Walls surrounding Fonmon Pond including the Bridge and Weir and Wells at Fonmon (LB); East Aberthaw Coast SSSI; Coedydd Y Barri/ Barry Woodlands SSSI	YES	24 Residential / 2 Non-Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	High

NRW Operational	Parish Council	Human Health			Economic Activity				Environment			Significant Historic Local	Historic Flooding Notes	Overall Investigation Priority
		Res.	Critical	Critical Service	Non-	Agricultural	Road	Rail	Designated	Heritage	Details			
Thaw	St. Athan Community	22			1	0.49	0.35	0.00		7	Fleminston Deserted Village (SAM); West Orchard Manor House (SAM); East Orchard Manor House (SAM); Limpert Bay Anti-invasion Defences (SAM)	YES	23 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	Medium
Thaw	St. Nicholas and Bonvilston Community	6	1	Electricity sub-station		0.08	0.22		1	7	Nant Whitton Woodlans SSSI	NO		Medium
Thaw/Cadoxton	Wenvoe Community	34	1	Sewage treatment	4	0.71	0.65		1	18	Coedydd Y Barri/ Barry Woodlands SSSI; Well House (LB); Nant Bran Farmhouse & Bull Shed (LBs); Vine Walk and Kiosks (LB); Fountain to South of Dyffryn House (LB); Lower South Terrace at Dyffryn Gardens (LB)	YES	8 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	High
Thaw/Ely	Welsh St. Donats Community	1			1	0.11	0.04		1	4	Pysgodlyn Mawr SSSI			Low
Ewenny/Thaw	Llandow Community	21	3	Electricity sub-station, and 2 x Pumping infrastructure	9	0.45	0.19	1.61		2	Parish church of the Holy Trinity, Ty Draw (LB)	YES	2 Residential (Date Unknown). Source: Cabinet Report on Flood Risk Management in the Vale (June 2009)	High

NOTES:

- Blank cells indicate no impact calculated (i.e. zero properties)
- Site of Special Scientific Interest (SSSI) / Listed Building (LB) / Scheduled Ancient Monument (SAM)

Figure 2—1: Surface Water Flood Impact Map – West

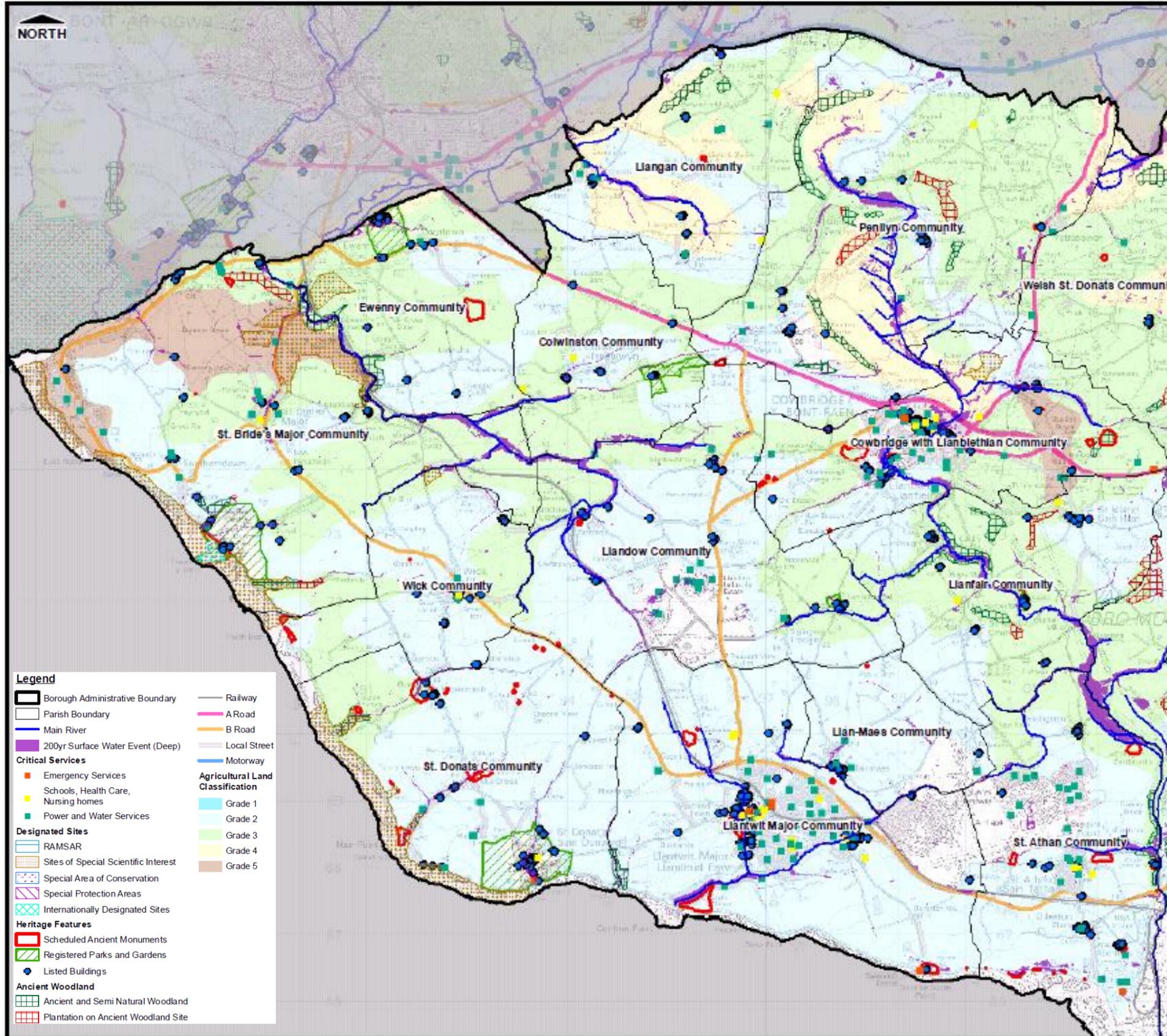


Figure 2—1-1: Surface Water Flood Impact Map – West – Cowbridge

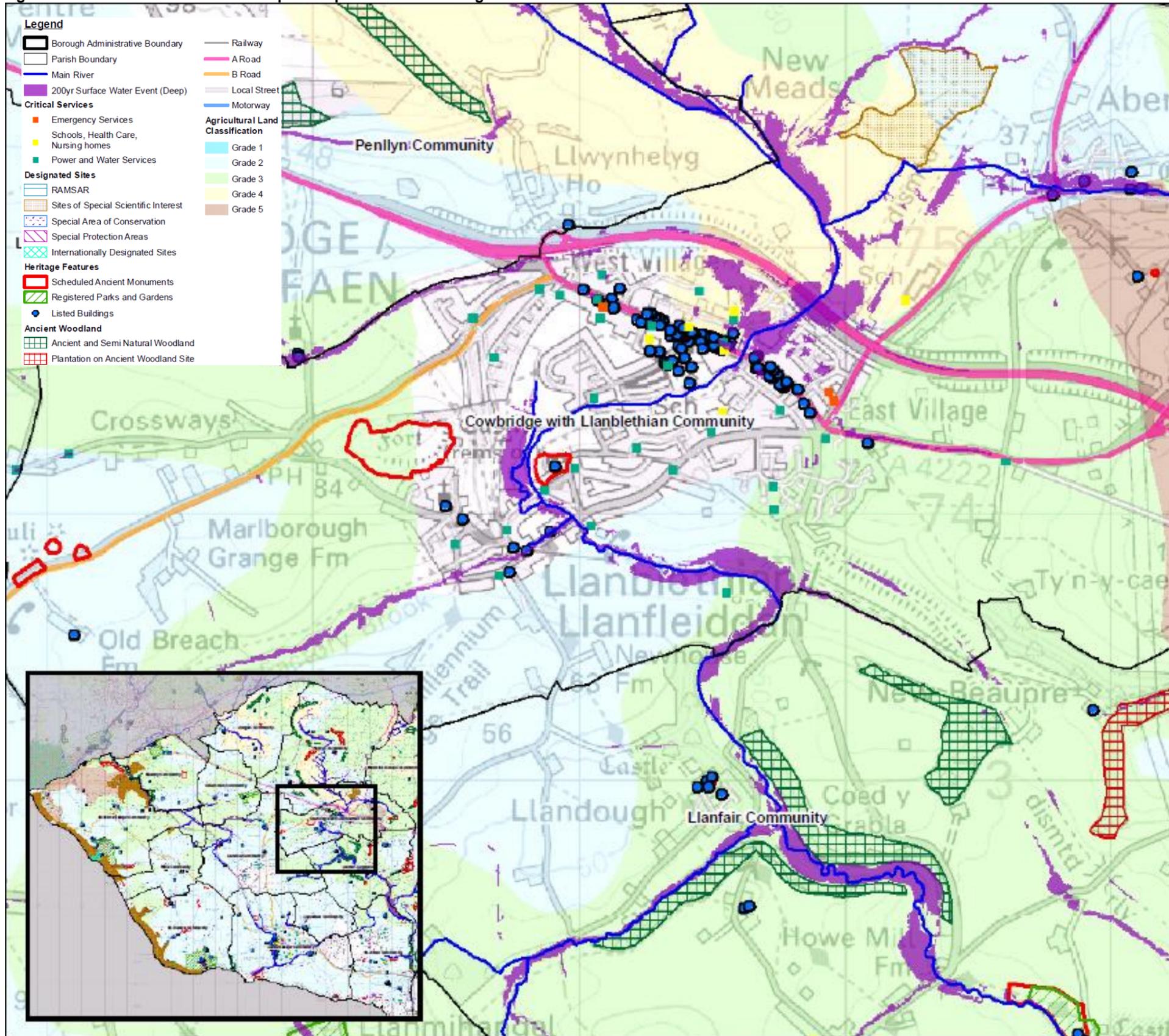


Figure 2—1-2: Surface Water Flood Impact Map – West – Llantwit Major

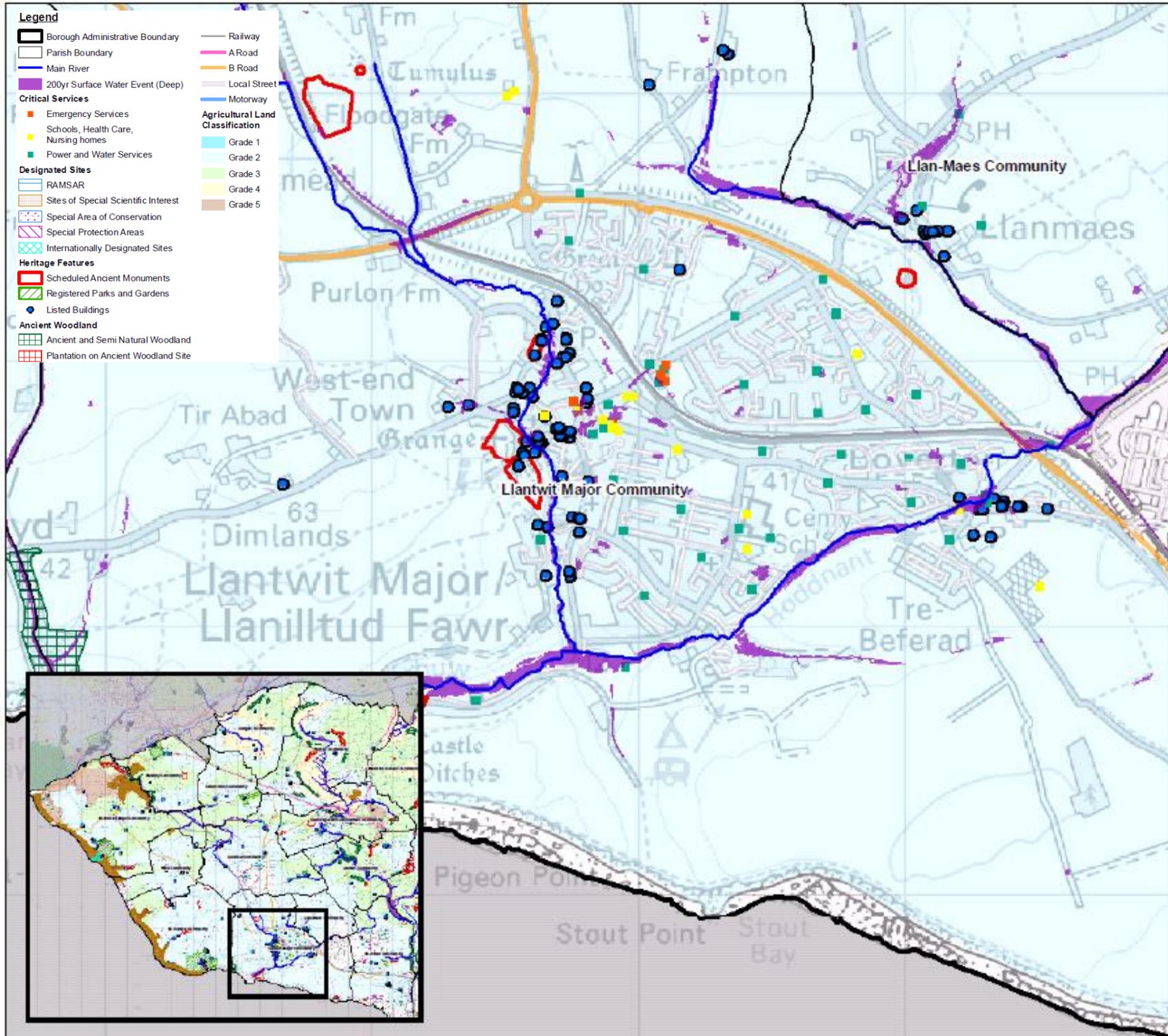


Figure 2—2: Surface Water Flood Impact Map – East

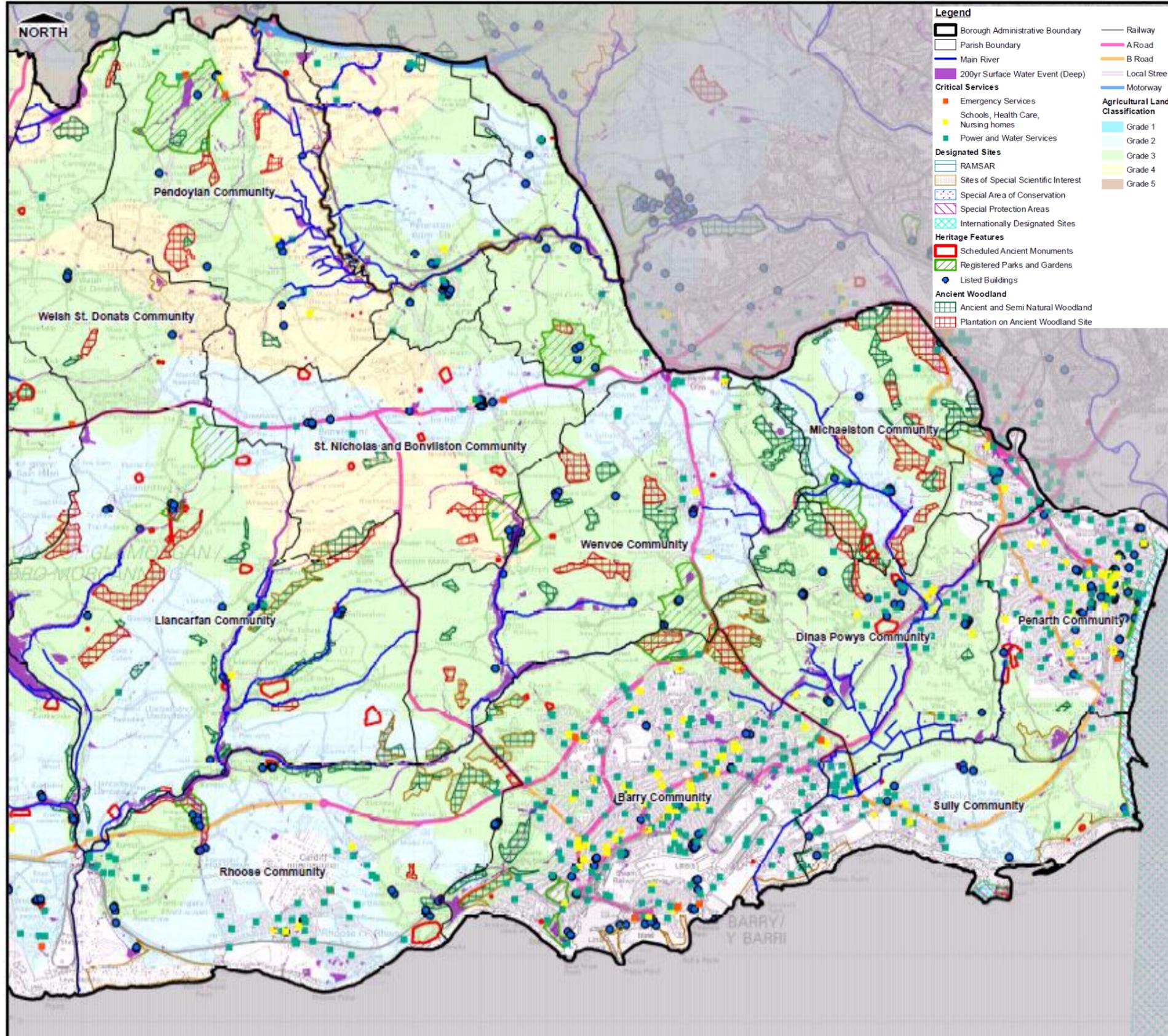


Figure 2—2-1: Surface Water Flood Impact Map – East – Penarth

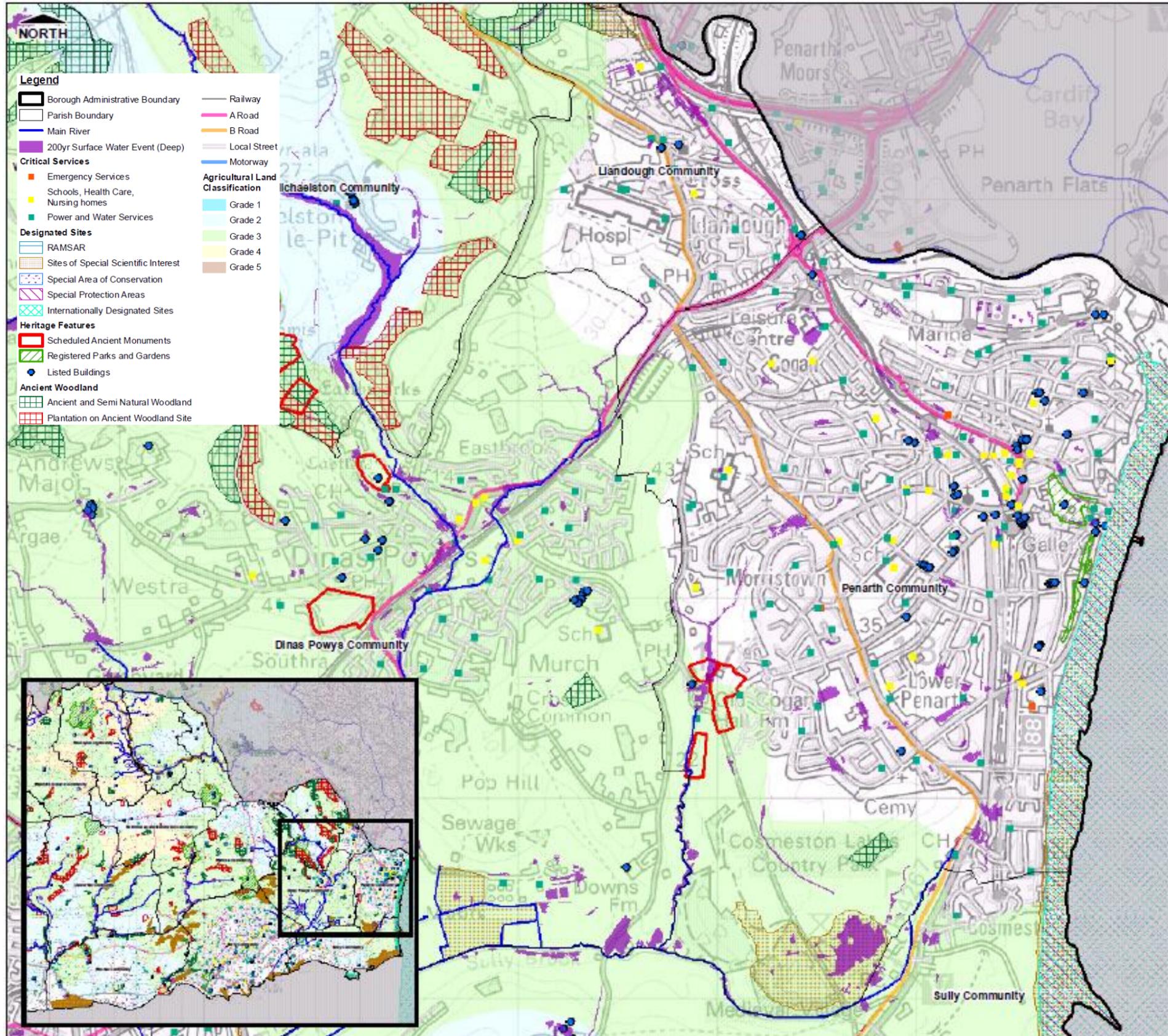
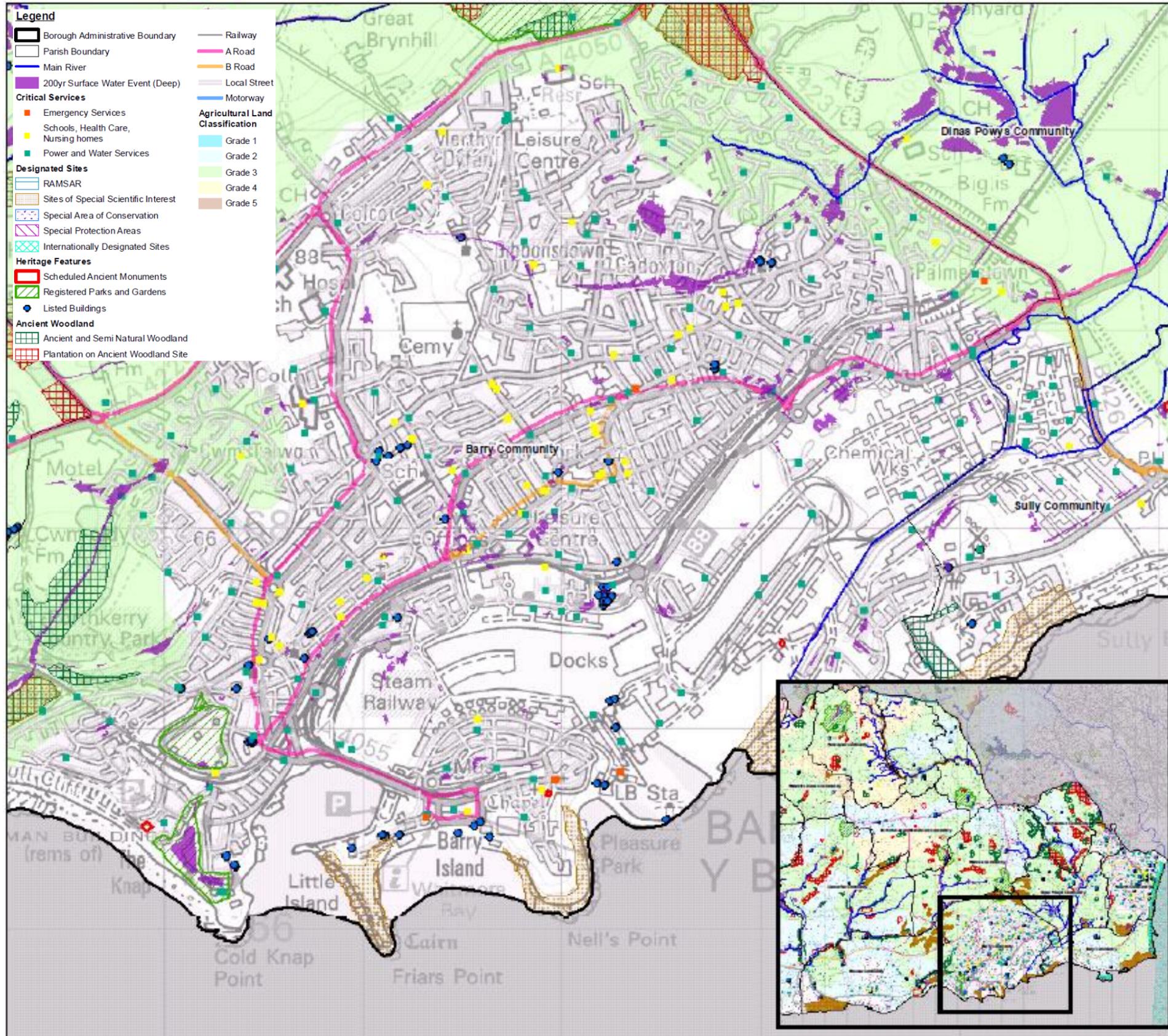


Figure 2—2-2: Surface Water Flood Impact Map – East – Barry



2.3.2 LOCAL FLOOD RISK – GROUNDWATER

Groundwater flood risk in the Vale is currently poorly understood. Very little historic evidence of this type of flooding is available and the predicted future impacts are primarily based on generic national geological mapping. The future susceptibility to groundwater flooding and potential impacts on local receptors is shown in Figure 2—3 and Figure 2—4 on the following pages.

2.4 FLOODING INTERACTIONS

Whilst the primary focus of this strategy is local flooding (surface, ground and ordinary watercourses), flooding can arise from a combination of different sources. Where the source can be clearly identified, the responsible organisation will be the main point of contact. However, it is often not easy to determine the source or where multiple sources are involved. In these cases the Lead Local Flood Authority will take the lead and work with partners to investigate and deal with the issue in a manner appropriate to the level of risk.

The flood incident reporting (refer Section 4) process will have provision within it for the collection of information to enable the responsible organisation for flooding to be identified. Where the flooding satisfies the criteria for carrying out a full investigation and it has not been possible to establish the source, this would need to be done as part of the full investigation.

The full investigation will take account of all elements of information such as stakeholders' historic records, hydraulic model outputs and information obtained from members of the public at the time of the flooding incident. Local communities, landowners and the public will be crucial to helping us increase our knowledge and understanding of localised flooding.

Figure 2—3: Areas Susceptible to Groundwater Flooding - West

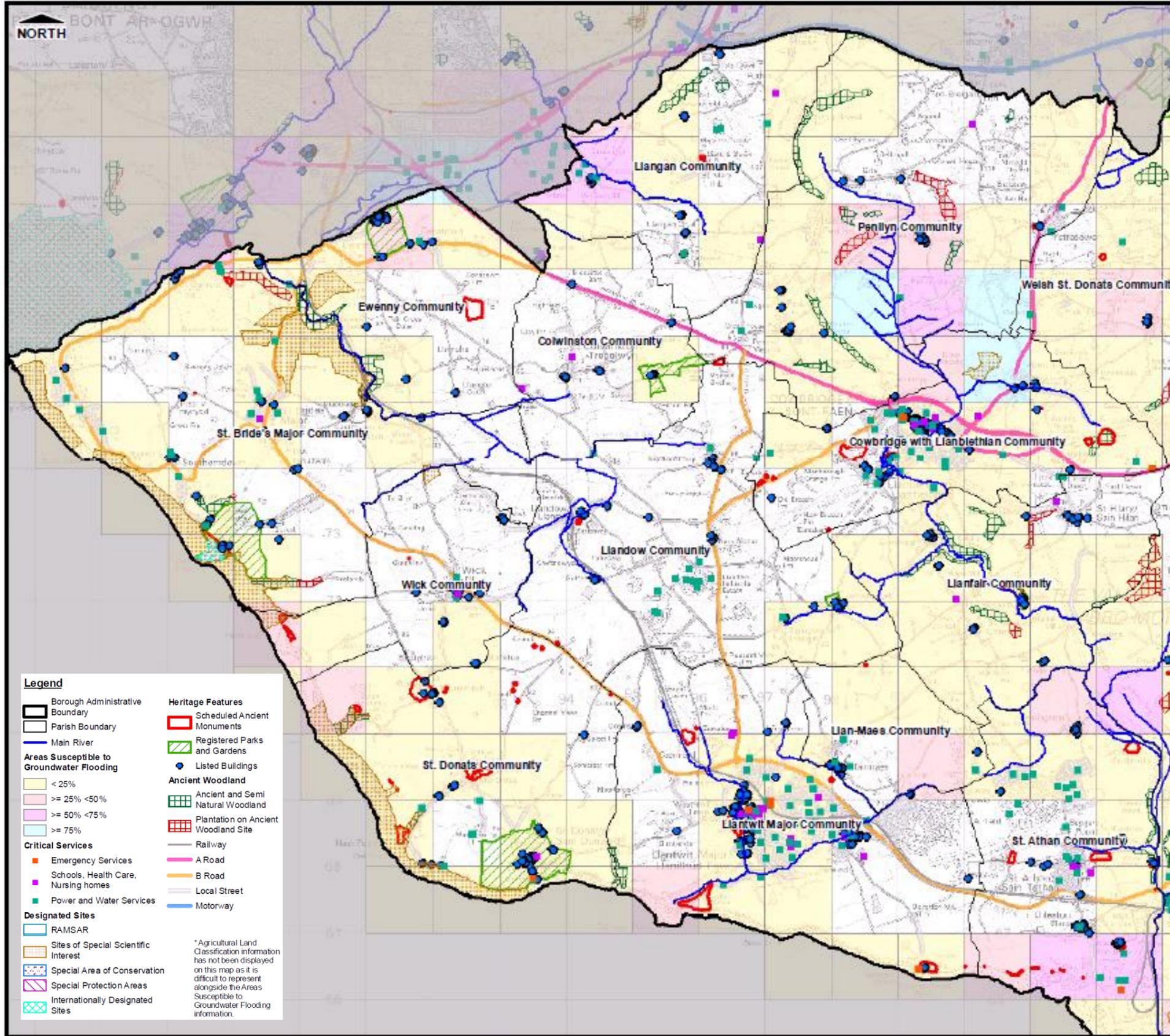


Figure 2—3-1: Areas Susceptible to Groundwater Flooding – West – Cowbridge

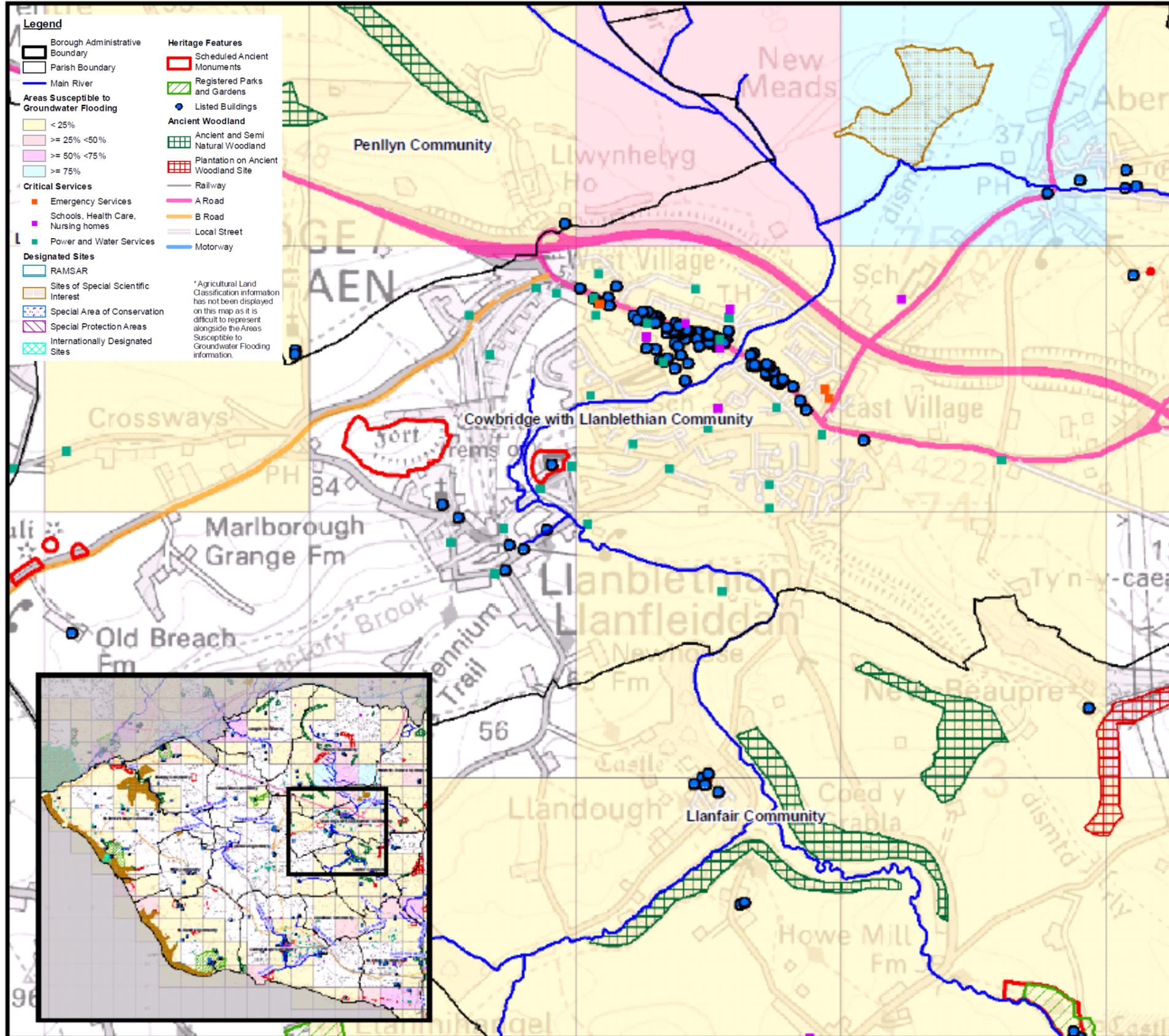


Figure 2—3-2: Areas Susceptible to Groundwater Flooding – West – Llantwit Major

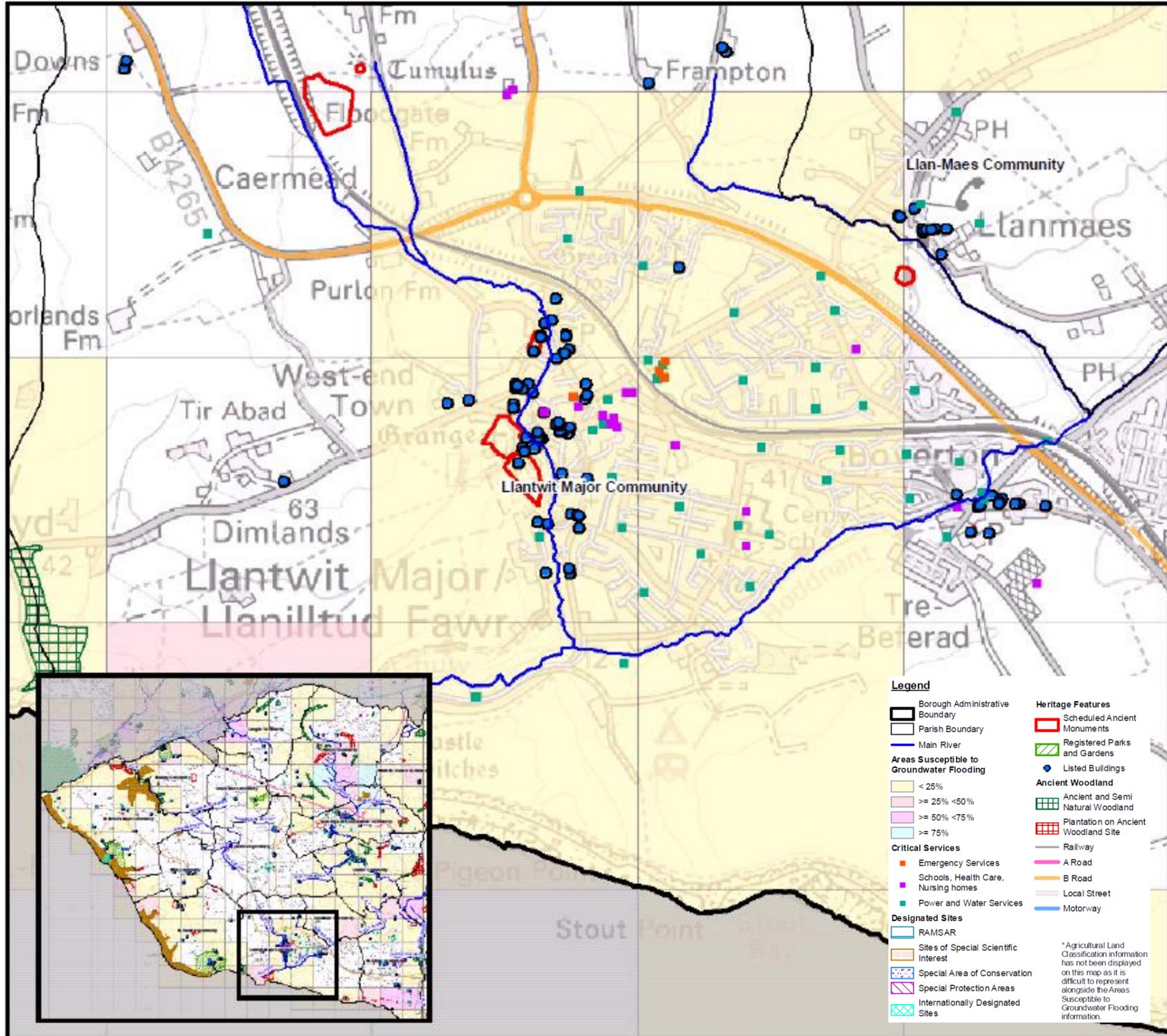


Figure 2—4: Areas Susceptible to Groundwater Flooding - East

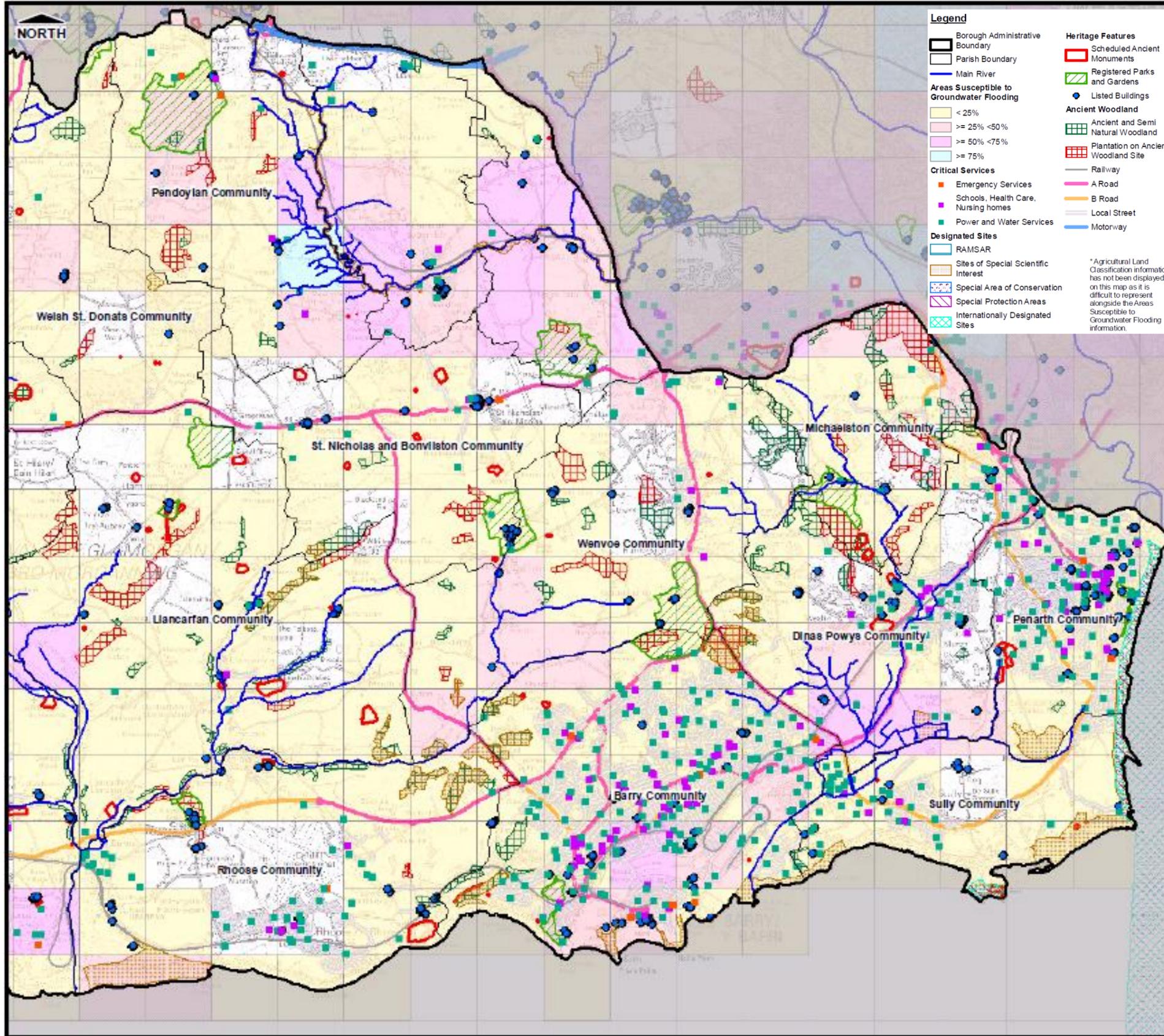


Figure 2—4-1: Areas Susceptible to Groundwater Flooding – East – Penarth

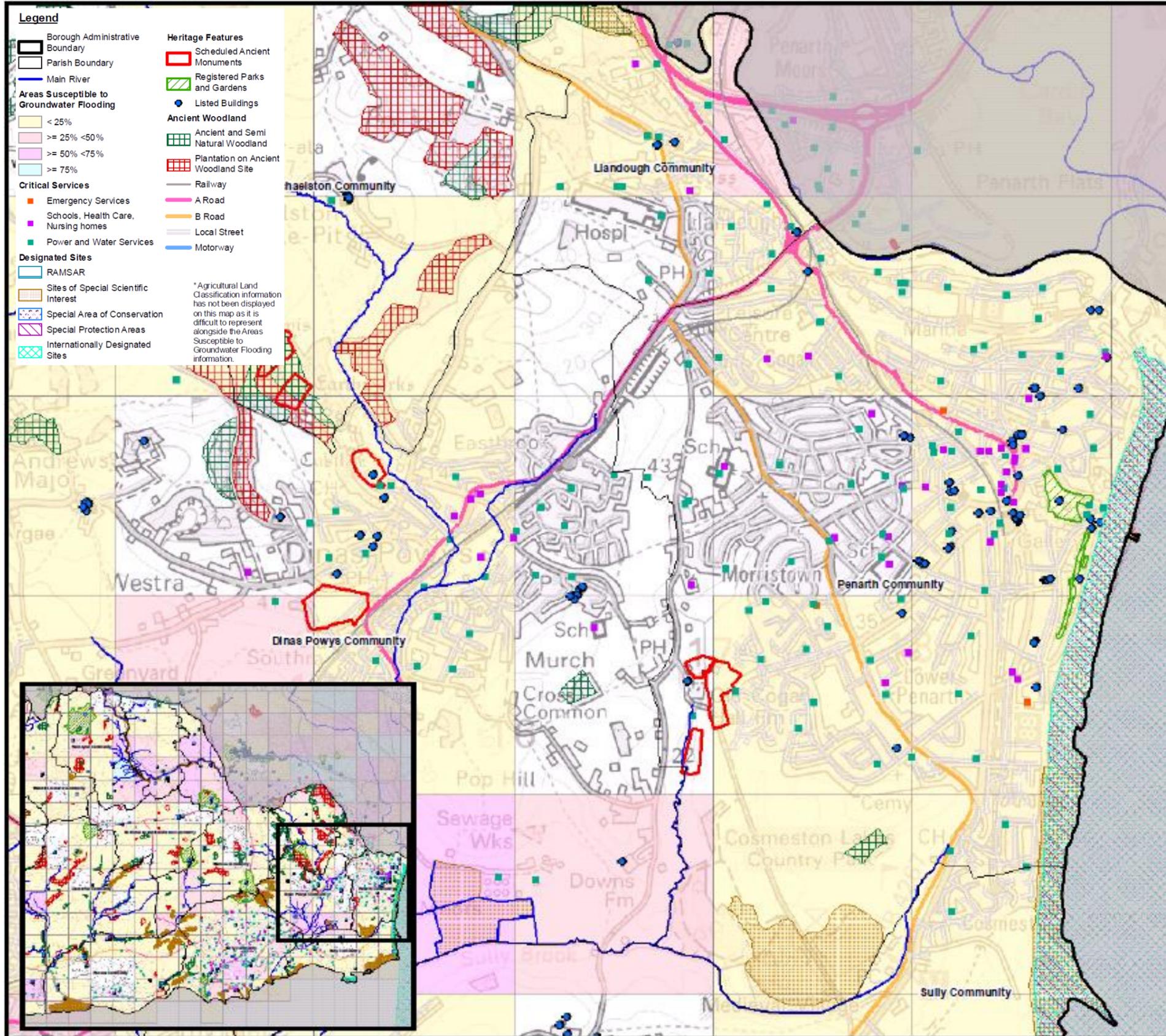


Figure 2—4-2: Areas Susceptible to Groundwater Flooding – East – Barry

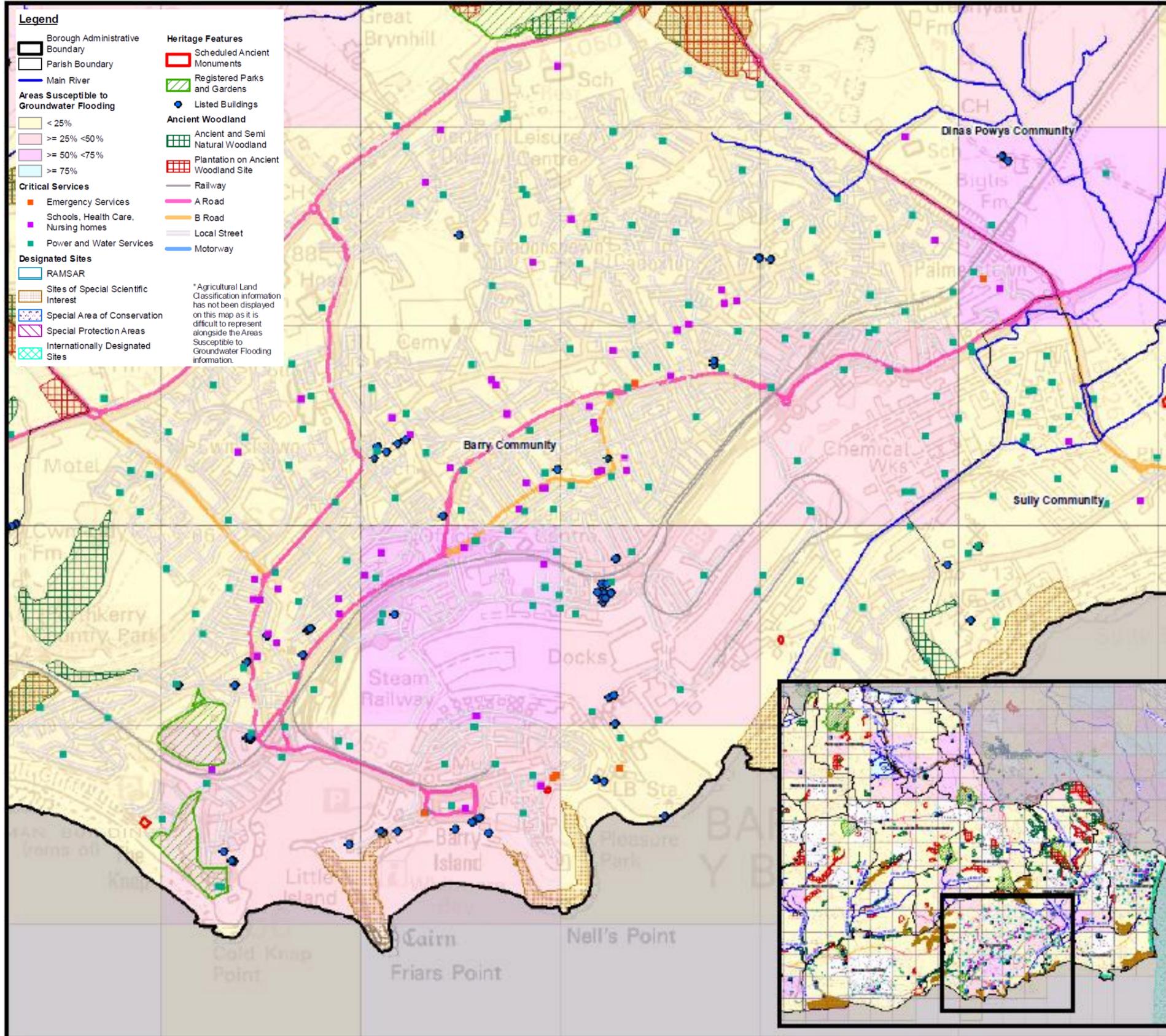
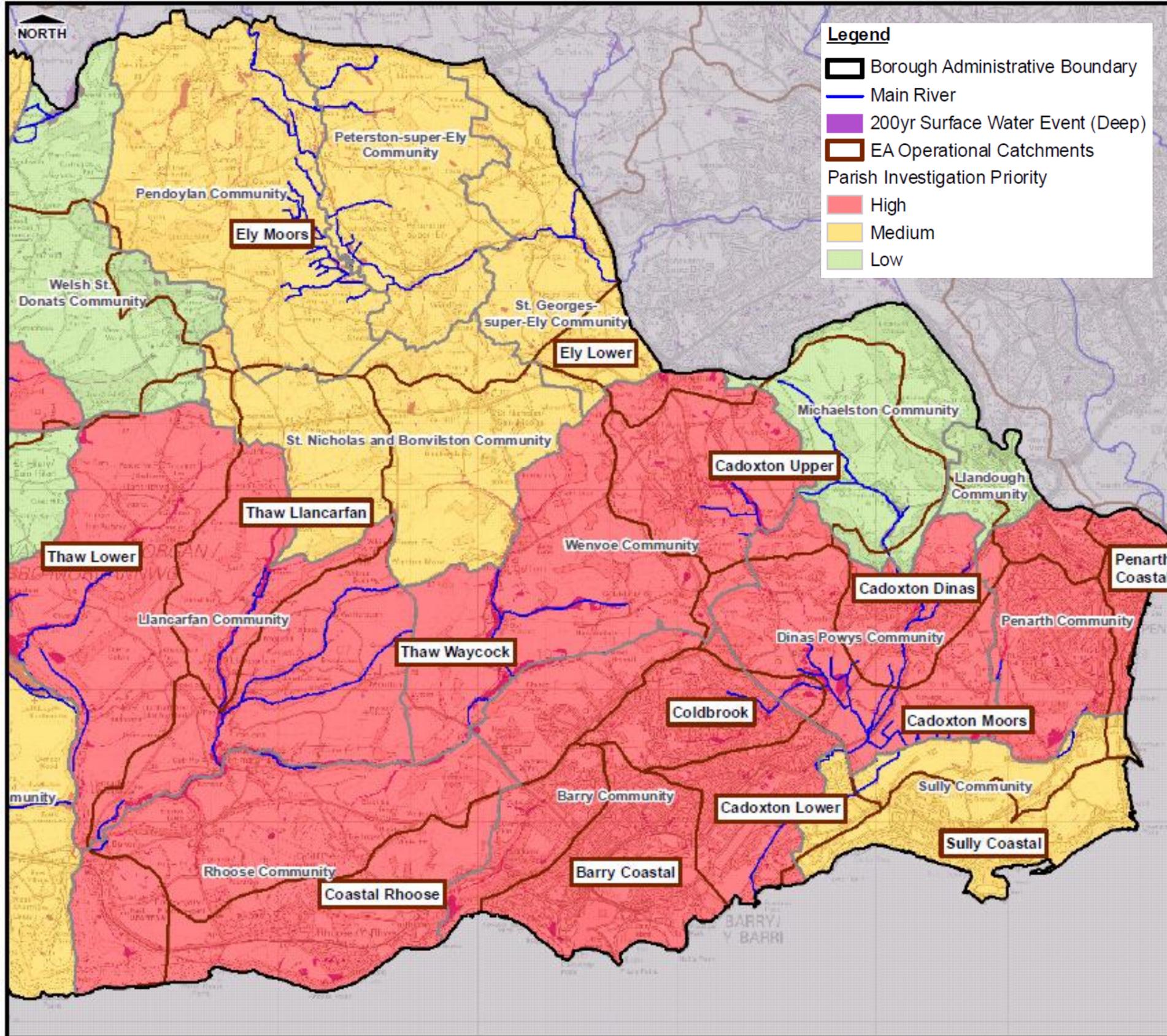


Figure 2—6: Surface Water Flood Impact and Investigation Priority - East



2.5 PRIORITISATION OF RISK AREAS

It is not feasible to look in detail at every potential flooding location straight away. The resources to manage flood risk are finite and it is therefore necessary to identify locations where the focus of effort will derive the maximum benefit in terms of overall flood risk reduction in the Vale of Glamorgan. A preliminary area prioritisation has been completed as part of this Draft Local Strategy and we will seek the views of the public and other stakeholder investigations before finalising the prioritisation criteria.

Building on work done for the Preliminary Flood Risk Assessment with regard to 'locally significant harmful consequences' (refer Table 2-2), the tables below contain preliminary thresholds for classifying the impact / consequence of flooding and the associated level of priority for further investigation work in line with the measures defined in Section 4 (Objectives and Measures).

National guidance issued by Defra (2010) sets thresholds for defining areas where the flood is significant. No guidance has been issued for defining 'locally significant harmful consequences' and it is up to each LLFA to set its own definition. It has been suggested by NRW that the local thresholds should be an order of magnitude below the significance criteria for determining Flood Risk Areas in Wales. The national threshold was set at 200 persons, 20 businesses or 1 critical service per one km grid square flooded to a depth of 300mm during a 1 in 200 year rainfall event.

Table 2-4: Locally Significant Harmful Consequences

Impact	Parameter	Threshold	Justification
Human Health	Number of People	20 persons / 9 properties (assuming 2.34 people per property)	One order of magnitude less than national threshold
	Critical Services	1 service	Disruption to critical services can have a significant impact
Economic Activity	Non Residential Properties	2 non-residential properties	One order of magnitude less than national threshold
	Agricultural Land	0.4km ² of Grade 1, 2 or 3 Land	Significant impact on excellent (Grade 1) to good / moderate (Grade 3) quality agricultural land
	Roads and Rail	750m of road (A Road, B Road, Local Street and motorway) or rail (any type) impacted	Disruption to key transport links has a significant impact on economic activity
Environment	Internationally or nationally designated site	1 or more sites potentially impacted	Potential impacts need to be identified and reviewed on a case-by-case basis (some habitats may benefit from seasonal flooding)
	Number of nationally / internationally important heritage features	1 or more features potentially impacted	Potential impacts need to be identified and reviewed on a case-by-case basis (some features may not be detrimentally impacted by flooding)

The table below presents a potential matrix for determining overall priority for further investigation work based on the parameters in the table above. The relative importance of each parameter is preliminary and subject to review following the consultation process. Overall priority for investigation within a community is based on the overall total score for all the parameters. Overall priority ranges are:

- **High = 24 to 40**
- **Medium = 13 to 23**
- **Low = 0 to 12**

Table 2-5: Parameter Priority Scoring and Classification (Preliminary)

Parameter	Priority Classification and Score		
	More than zero but less than Threshold	Equals or Exceeds Threshold	Significant Historic Flooding Experienced
Number of People	Low (1)	Medium (3)	High (5)
Critical Services	High (5)*	High (5)	High (5)
Non Residential Properties	Low (1)	Medium (3)	High (5)
Agricultural Land	Low (1)	Medium (3)	Medium (3)
Roads and Rail	Low (1)	Medium (3)	Medium (3)
Internationally or nationally designated site	High (5)*	High (5)	High (5)
Number of nationally / internationally important heritage features	High (5)*	High (5)	High (5)

* Note: The threshold levels defined for these parameters are '1' – therefore any impact on these parameters will result in a 'high' priority classification.

2.6 MANAGEMENT OF OTHER SOURCES OF FLOODING

2.6.1 MAIN RIVERS - CATCHMENT FLOOD MANAGEMENT PLANS

As noted earlier in this section, flooding caused by Main Rivers is the responsibility of NRW. The EA produced Catchment Flood Management Plans (CFMPs) to give an overview of the Main River flood risk across each river catchment. They recommend ways of managing those risks now and over the next 50-100 years. CFMPs consider all types of inland flooding, from rivers, ground water, surface water and tidal flooding, but not flooding directly from the sea, (coastal flooding), which is covered in Shoreline Management Plans (refer Section 2.6.2). They also take into account the likely impacts of climate change, the effects of how we use and manage the land, and how areas could be developed to meet our present day needs without compromising the ability of future generations to meet their own needs⁷.

The Ogmore to Tawe CFMP covers the majority of the Vale of Glamorgan and includes the catchments of the Ewenny, Col-huw, Thaw and Cadoxton. The catchment of the River Ely is included in the Taff and Ely CFMP. The CFMP area is sub-divided into 'sub-areas' which have similar physical characteristics, sources of flooding and level of risk. For each sub-area the most appropriate approach to managing flood risk has been identified and one of six generic flood risk management policies has been allocated. The key flooding mechanisms reported for the CFMP sub-areas within the Vale of Glamorgan are summarised below. Figure 2—9 and Figure 2—10 show the Main River flood extents for the Vale.

Coastal Lowlands (includes the Col-huw, Lower Cadoxton, Lower Thaw and Ewenny/ Alun catchments). Tidally influenced river flooding is the dominant source at low return periods, with surface water flooding an issue in some areas, particularly in the East Vale. Groundwater flooding is also believed to be an issue in some areas.

Central Vale (includes Lower Thaw/ Waycock catchments) the main sources of flooding from lowland rivers and moorland runoff. Flood risk from the main river is considered to be low with the majority of

⁷ Definition of CFMPs from Environment Agency website www.environment-agency.gov.uk

flooding contained to grazing pasture. There is a faster catchment response after prolonged rainfall due to saturated ground conditions which may cause some localised issues.

Upper Thaw A Flood Alleviation Scheme (FAS) has reduced the level of flood risk within the main urban settlements of Cowbridge and Llanblethian. Elsewhere, informal defences provide protection where individual properties are at risk. The main source of flood risk is failure or overtopping of these defences.

Urban Cadoxton Flooding from lowland rivers is the main source of risk. This can be combined with surface water, sewer flooding and culvert blockage.

Peterston Super Ely (includes the catchment of the River Ely within the Vale of Glamorgan). The principal source of flood risk is river flooding from the Ely.

2.6.2 COASTAL FLOODING - SHORELINE MANAGEMENT PLANS

Management of coastal flooding in the Vale of Glamorgan is led by NRW and delivered by two 'Coastal Group' partnerships – the Severn Estuary Coastal Group and the South Wales Coastal Group. Each of these groups has produced 'Shoreline Management Plans' (SMPs) to facilitate management of coastal erosion and flood risk. The coverage within the Vale of Glamorgan of these SMPs is shown in Figure 2—7 and Figure 2—8.

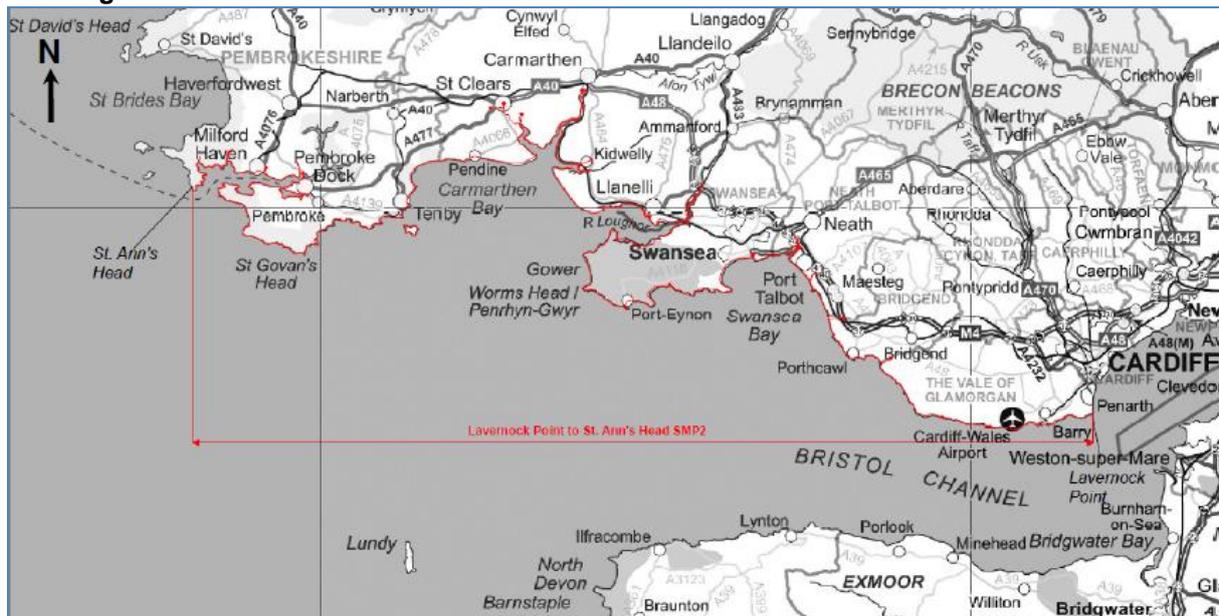
SMPs address a wide range of factors which can influence the management of the coastline. The location of coastal communities, existing defences, power stations and public utilities, transport links, ports and harbours, industrial facilities, tourist and amenity areas, conservation and heritage sites and the wider natural environment will affect how coastal erosion and flood risks are managed. The consideration of these factors as well as cost and affordability will inform the development of sustainable and deliverable flood and coastal erosion risk management policies. SMPs set out the long term vision for the coast and provide a route map for decision makers to move from the present situation towards the future. Figure 2—9 and Figure 2—10 show the coastal flood extents for the Vale.

Figure 2—7: Severn Estuary Coastal Group - Estuary area from upstream of Lavernock Point west of Cardiff and Brean Down in Somerset



Source: Severn Estuary Coastal Group Website (<http://www.severnestuary.net/secg> - Accessed October 2012)

Figure 2—8: South Wales – St. Ann’s Head in Pembrokeshire to Lavernock Point in Vale of Glamorgan



Source: Lavernock Point to St. Ann's Head SMP2 (January 2012)

Figure 2—9: Main River and Coastal Flood Risk – West

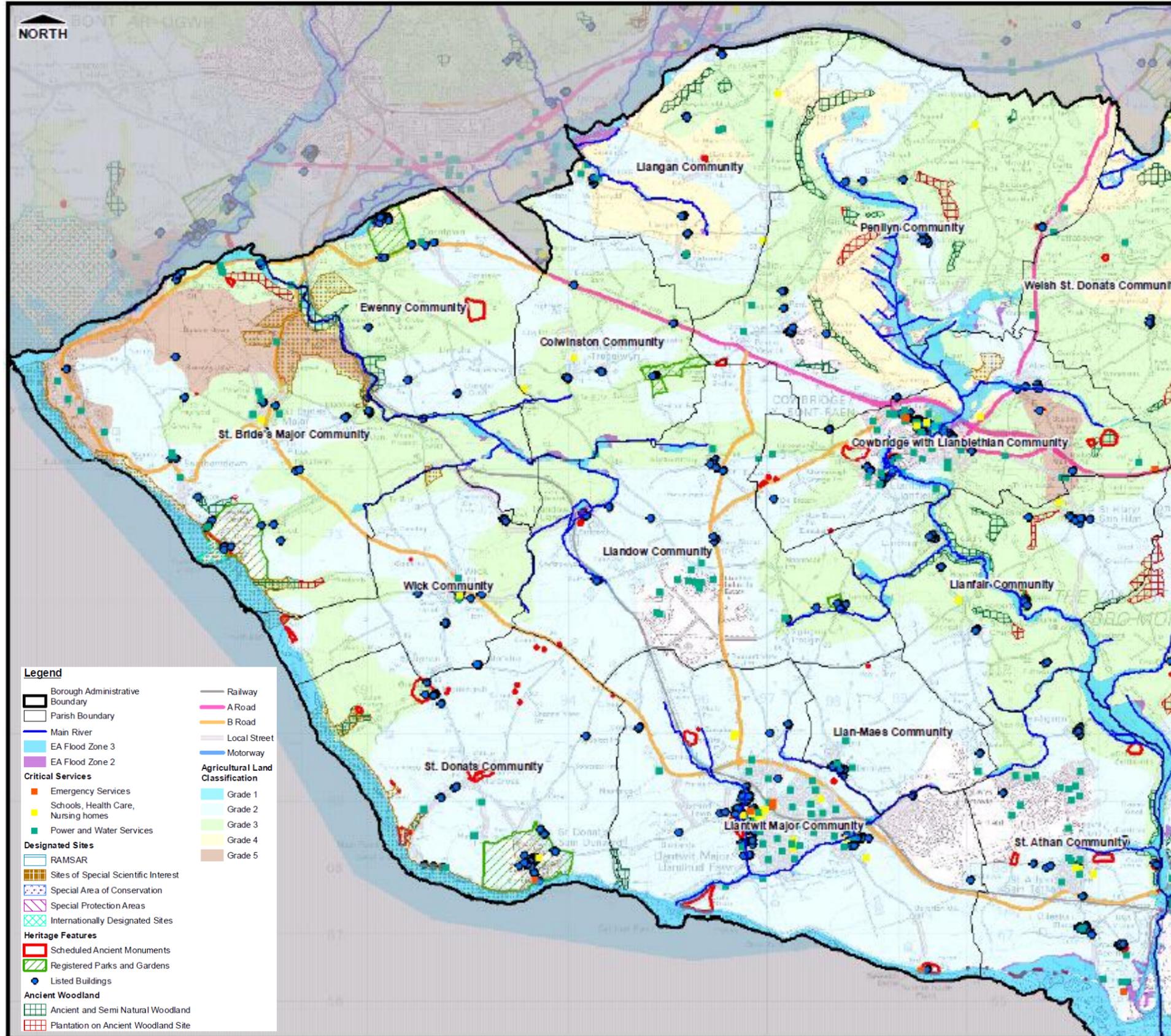


Figure 2—9-1: Main River and Coastal Flood Risk – West – Cowbridge

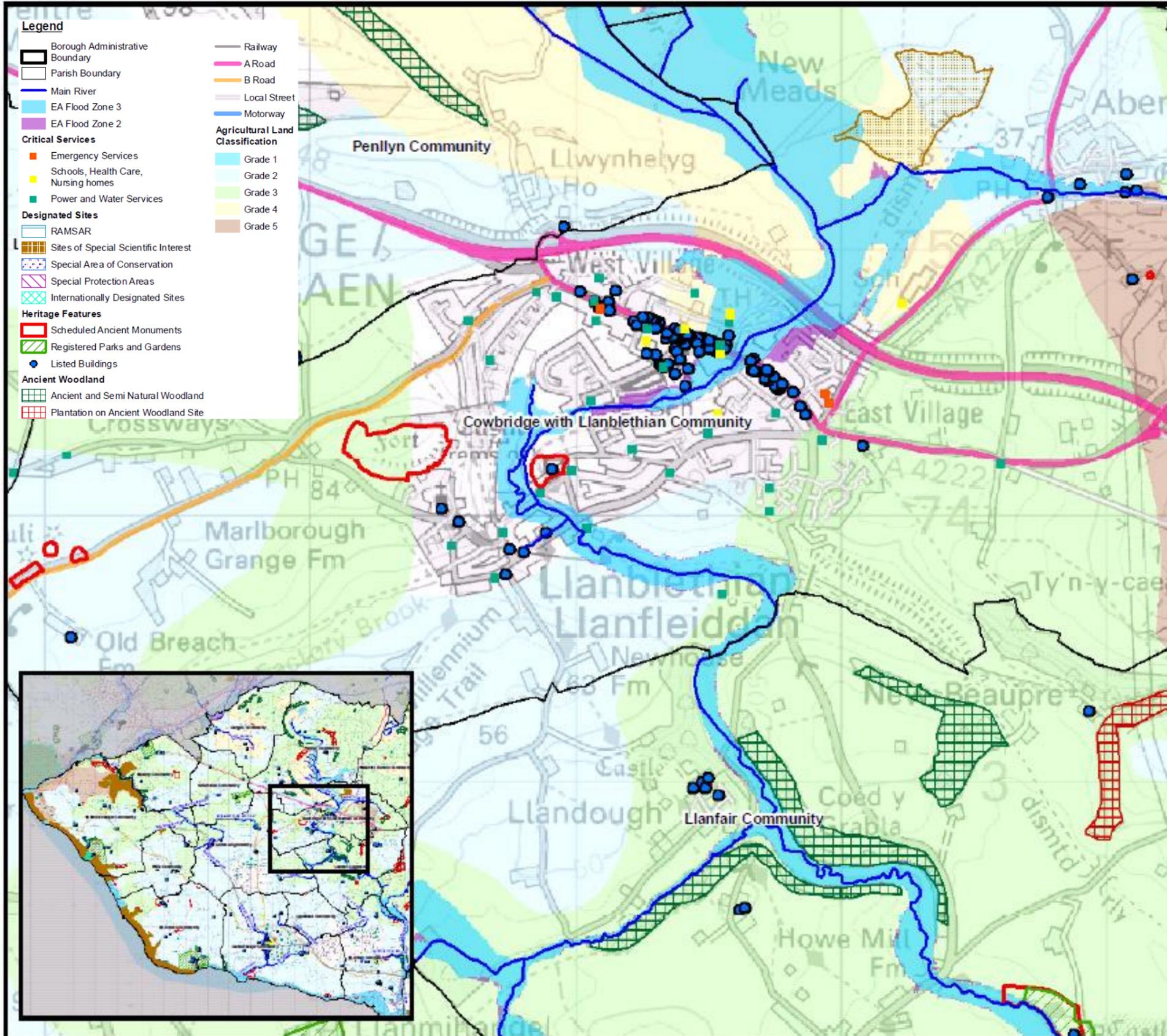
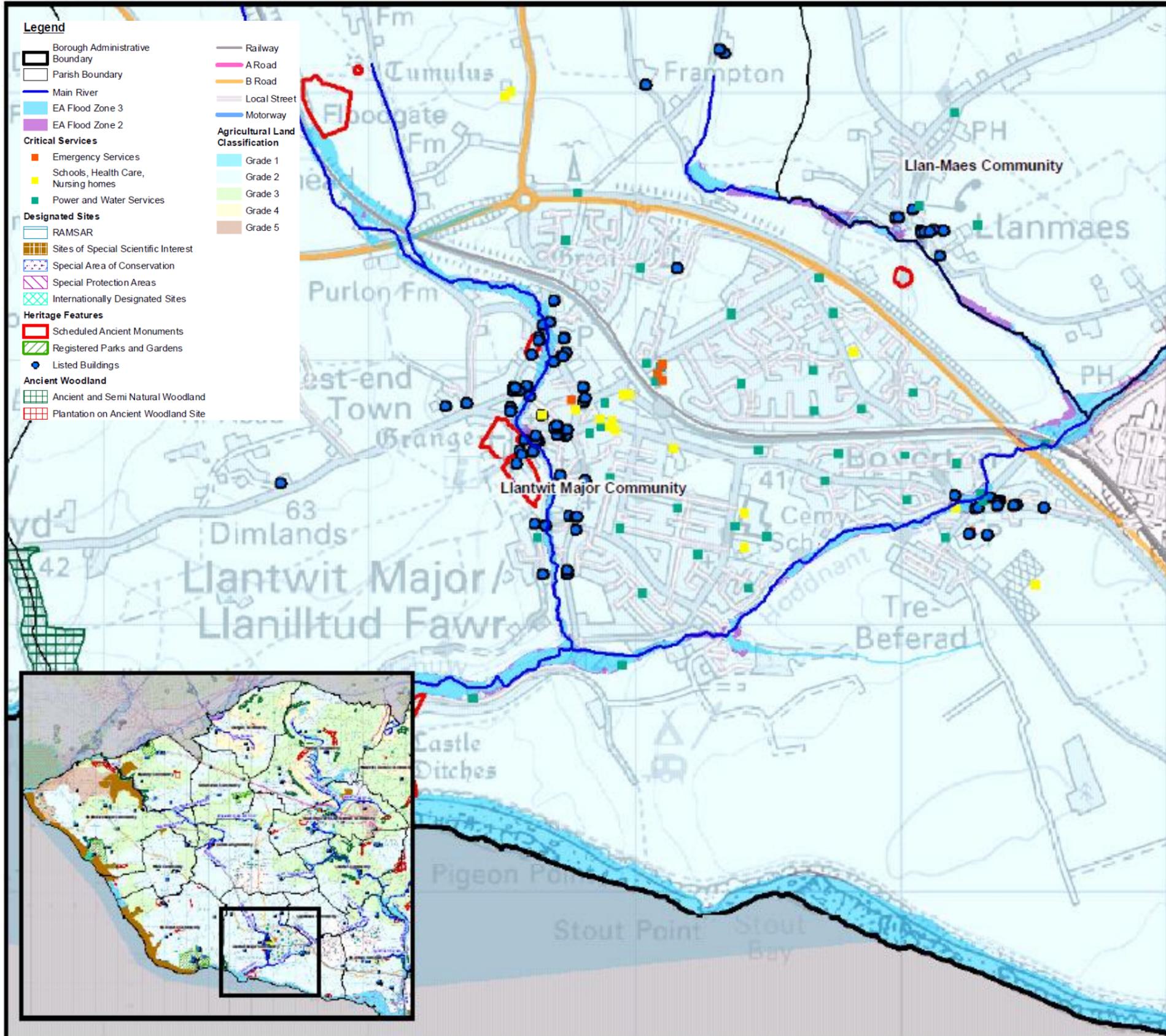


Figure 2—9-2: Main River and Coastal Flood Risk – West – Llantwit Major



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Figure 2—10: Main River and Coastal Flood Risk – East

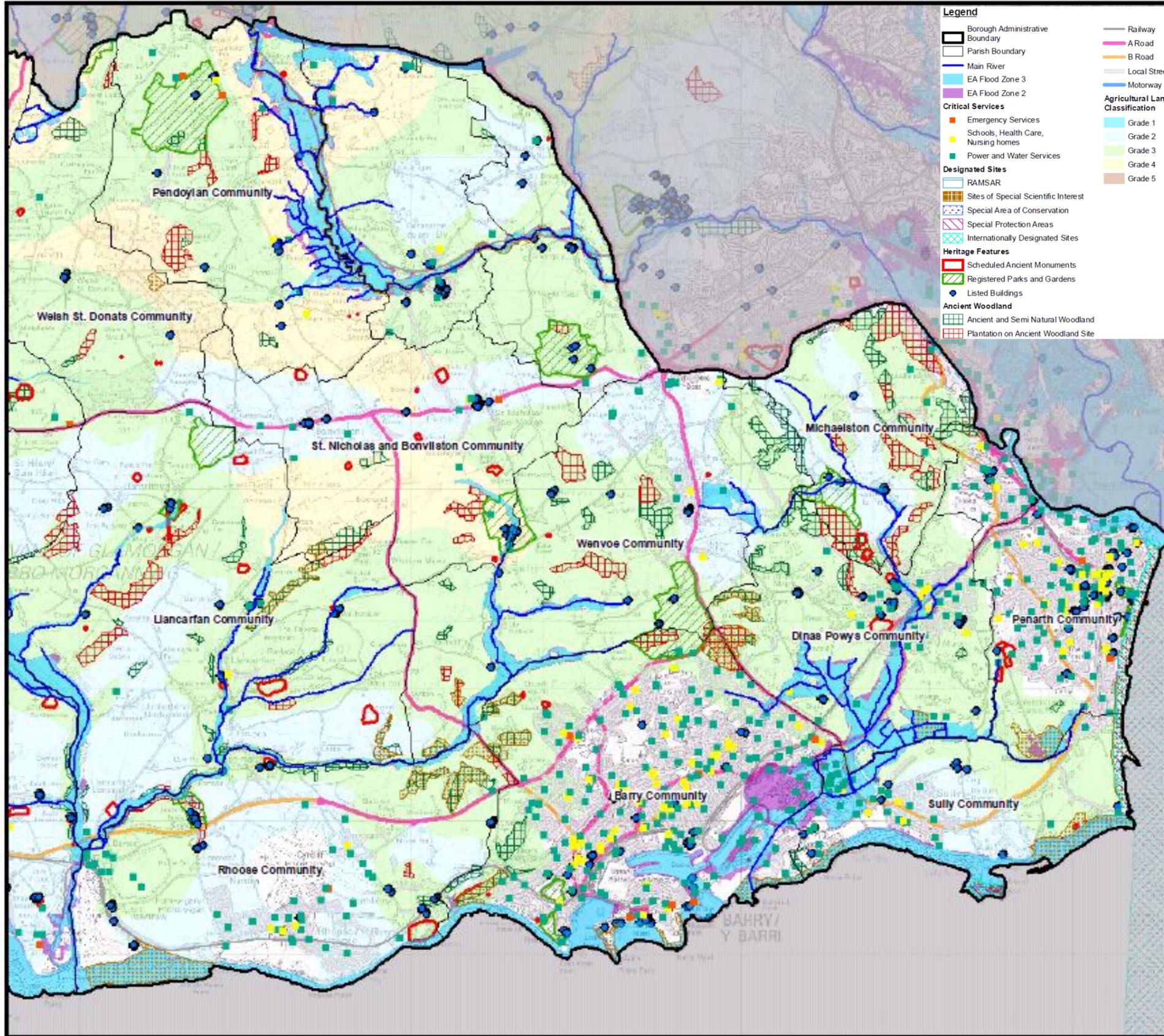
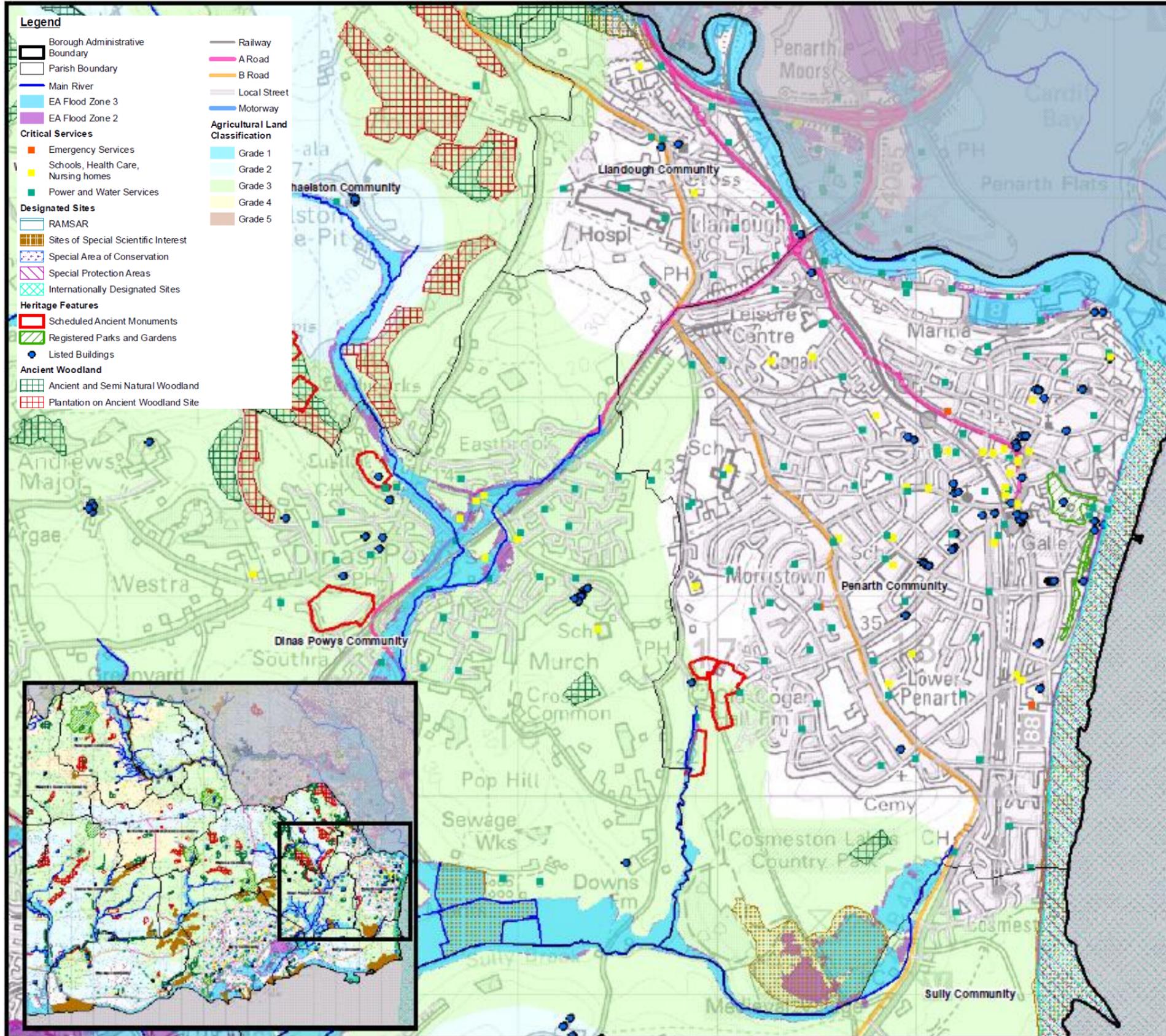


Figure 2—10-1: Main River and Coastal Flood Risk – East – Penarth



2.6.3 SEWER FLOODING – WELSH WATER / DWR CYMRU

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.

A key distinction between the responsibility for surface water and sewer flooding between Welsh Water and The Vale is that Welsh Water are only responsible for sewer capacity up to a certain level of service. If flooding occurs during an event that exceeds this defined level of service, then it is the responsibility of the Vale of Glamorgan. For example, a combined sewer system in a village may have been designed to convey flows resulting from a 1 in 30 year rainfall event, if a 1 in 50 year event occurs, then the sewer system will not be able to cope with the excess flows and flooding may result. Building a sewer system that is large enough to cope with flows generated by a 1 in 50 year event is not cost effective, so the excess flows will result in surface water flooding in this situation.

Welsh Water is responsible for internal and external property flooding caused by sewer systems operating under their normal design conditions. Causes for flooding may include blockage or other operational problems with the sewer network. When flooding occurs during these conditions, Welsh Water is required to maintain a register of locations that incur damage from the flooding and prioritise funding for works to alleviate the problem. Funding priorities are defined using a five year cycle called Asset Management Plans (AMP). The AMP is the programme of work agreed with the Regulator (Ofwat) for a specified 5-year period. Welsh Water are currently in the AMP5 period (2010 – 2015).

2.6.4 ARTIFICIAL SOURCES – RESERVOIRS AND CANALS

There are no significant canals within the Vale of Glamorgan boundary. Significant reservoirs within the Vale include:

- Cowbridge Flood Alleviation Scheme (Cowbridge – NGR 301010, 175223) – Owned by NRW
- Hensol Hospital Lake (South West of Junction 34 on the M4 – NGR 304696, 179113) – Owned by J H Leeke & Sons Ltd

The risk of reservoir breach or failure of these structures is managed by NRW. NRW has completed a study to estimate the largest area that might be flooded if a reservoir were to fail and release the water it holds. The study does not address the probability of failure – only the potential consequences. The probable extents of flooding caused by a reservoir failure are available from the NRW website along with relevant guidance on what to do in the unlikely event of a failure.

Warren Mill Pond (Cowbridge – NGR 305098, 175865 – Ownership unknown) has also been identified as a large reservoir, but does not exceed the volume criteria set by NRW for potential breach mapping. Monitoring and maintenance of the structure will be the responsibility of the owner.

3. Roles and Responsibilities

Section Overview

The purpose of this section is to answer the following questions:

- Who is responsible for managing flood risk?
- What are the responsibilities of each of these organisations?
- Who do I contact about flooding?

3.1 ORGANISATIONS RESPONSIBLE FOR MANAGING FLOOD FISK

The Vale of Glamorgan, as the Lead Local Flood Authority, is the lead organisation responsible for managing local flood risk. However, there are a number of other organisations (refer Table 3-1) that have an important role in flood risk management and a range of relevant duties and powers. Effective flood risk management will require co-ordination and co-operation of these organisations.

The Flood & Water Management Act identifies a number of Risk Management Authorities (RMAs) who have specific duties, powers and responsibilities regarding flood risk management. When exercising their flood or coastal risk management functions these RMAs (except Welsh Water) are required to act in a manner consistent with both the Local and National FRMS. Welsh Water must have regard to the relevant Local Strategy. As well as the RMAs there are a number of organisations and stakeholders that make an important contribution to flood risk management or could be affected by flood risk management activities.

Table 3-2 and Table 3-3 identify the roles and responsibilities for the relevant RMAs and stakeholder groups in The Vale. The matrix below shows the key organisations responsible for managing the various types of flooding in The Vale. If in doubt the Vale of Glamorgan, as LLFA, should be contacted in the first instance.

Table 3-1: Responsibility for Flood Risk Management

Flood Source	Vale of Glamorgan Council	NRW	Dwr Cymru Welsh Water	Vale of Glamorgan Highways	South Wales Trunk Road Agency
Surface Water	•				
Groundwater	•				
Ordinary watercourse	•				
Main rivers		•			
Coastal flooding		•			
Reservoirs		•			
Sewer flooding			•		
Burst pipes or water mains			•		
Highways Flooding				•	
Highways Flooding (M4 / A4232)					•

3.2 ROLES AND RESPONSIBILITIES FOR MANAGING FLOOD FISK

The tables below details the roles and responsibilities of the various organisations and other stakeholders involved with management of flood risk within the Vale of Glamorgan.

Table 3-2: Vale of Glamorgan Risk Management Authorities

Organisation	Role	Responsibilities
Natural Resources Wales	Operational responsibility for flooding from main rivers, the sea & coastal erosion	Responsibility for managing flooding from main rivers
		Responsibility for managing flooding from reservoirs
		Responsibility for managing coastal flooding
	Oversight responsibilities in relation to all flood and coastal erosion risk management in Wales	Strategic overview for all forms of flooding, including development of the National Strategy for Flood & Coastal Erosion Risk Management
		Monitoring and reporting on flood and coastal erosion risk management, including the application of the National Strategy and implementation of local strategies.
		Review of the assessments, plans and maps produced by Vale of Glamorgan as Lead Local Flood Authority to meet the Flood Risk Regulations
		Supporting collaboration, knowledge-building and sharing of good practice.
		Managing the Flood Risk Management Wales Committee (RFCC) and supporting their decisions in allocating funding for flood defence and flood resilience schemes.
		Providing grants to local risk management authorities to support the implementation of their powers
		Issuing levies to lead local flood authorities to support the implementation of coastal erosion and flood defence schemes
		Communication of flood risk flood warnings to the public, the media and to partner organisations
		Supporting communities to be flood resilient through sharing best practice and provision of information
		Advising on the planning process
Statutory consultee to the sustainable drainage approving body on sustainable drainage		
Vale of Glamorgan Council	Lead Local Flood Authority	Responsibility for managing local flood risk - flooding from ordinary watercourses, surface runoff and groundwater
		Duty to comply with the national strategy & prepare LFRMS

3 - Roles and Responsibilities

Organisation	Role	Responsibilities	
		Investigations of flooding where appropriate and publishing reports	
		Regulation & consenting works on ordinary watercourses	
		Designating structures and features that have a local flood risk function and maintaining a public register of assets that have a significant effect on local flood risk	
		Powers to carry out practical works to manage flood risk from surface water and groundwater.	
	Highways Authority	Management of the majority of roads in the Vale and their associated drainage (excluding M4 & A4232)	
		Regular inspection & maintenance to ensure highway drainage systems are clear and blockages cleared where reasonably practicable	
		Potential adoption of SuDS serving highways	
		Powers to undertake works to prevent the highway from flooding and to divert or carry out works to a watercourse as necessary	
		Assistance to transport people to a place of safety and restore traffic flow during an event	
	SuDS Approving Body (when in place)	Establishment of a SuDS Approval Body	
		Approval, adoption & maintenance of SuDS systems serving more than one property	
	Planning Authority	Preparation of the local development plan, supported by an appropriate assessment of flood risk (in accordance with TAN 15) and determining planning applications	
		Working with the SAB to ensure new development applications are supported by appropriate drainage proposals	
	Emergency Planning	Emergency Planning – category one responder under the civil contingencies act and the role is set out in the Multi Agency Flood Plan	
		Develop Emergency Plans and Business Continuity Plans; Provide advice and assistance to businesses and voluntary organisations regarding business continuity management	
		Develop arrangements for Civil Preparedness information available for public use, and maintain a system for warning, informing and advising the public in the event of an emergency	
		Share information and co-operate with other responders	
	Coastal Local Authority	Operational powers relating to coast protection i.e. protecting against coastal erosion (responsibility lies with NRW)	
	Dwr Cymru	Drainage of foul water,	Primary responsibility for floods from water & sewerage systems (sewer flooding, burst pipes or water mains,

3 - Roles and Responsibilities

Organisation	Role	Responsibilities
Welsh Water	treatment of waste, surface water sewers and combined sewers. Provision of water.	floods caused by system failures)
		Duty to have regards to relevant local strategy and act consistently with the national strategy
		Duty to cooperate with other authorities, including sharing data
		Maintain a register of properties at risk of flooding due to a hydraulic overload in the sewerage network (DG5 register) and undertake improvements to alleviate sewer flooding problems on the DG5 register
		Adoption of private sewers.
		Statutory consultee to the SAB when the system is proposed to communicate with the public sewer.
South Wales Trunk Road Agency (Neath & Port Talbot Borough Council)	Highways Authority	Managing, maintaining and improving the strategic road network in South Wales. In terms of flood risk management the agency has a similar role & similar responsibilities to The Vale as Highways Authority but with specific responsibility for the M4 & A4232

Table 3-3: Other Stakeholders

Organisation	Responsibilities
Property owners & residents	It is the responsibility of householders and businesses to look after their own property and protect it from flooding. There will be many occasions when flooding occurs despite all parties meeting their responsibilities therefore it is important that householders whose homes are at risk of flooding take steps to ensure that their house is protected.
Riparian Owners	Householders or businesses whose property is adjacent to a river, stream or ditch are likely to be riparian owners with responsibilities. Riparian owners have a right to protect their property from flooding and erosion but in most cases will need to discuss the method of doing this with Natural Resources Wales (main rivers) or the Vale of Glamorgan (ordinary watercourses). They are responsible for maintaining the bed and banks of the watercourse and ensuring there is no obstruction, diversion or pollution to the flow of the watercourse.
Utility and Infrastructure Providers	Utility and infrastructure providers such as Network Rail, energy companies (e.g. Western Power Distribution & Wales & West Utilities) and telecommunication companies have a role to play in flood risk management as their assets can be important consideration in planning for flooding. They should share information on relevant assets (e.g. culverts) with flood risk management authorities and consider flood risk management issues when planning for the future development and maintenance of their infrastructure to provide that their assets and systems are resilient to flood and coastal risks and that the required level of service can be maintained in the event of a flood.
Parish Councils and Communities	Parish / Town councils and community groups can make important contributions to help manage flooding by helping residents to be aware of and manage the risk to their household. Parish Councils and community groups should record and report flooding incidents when they occur and make this information available to The Vale. Parish / Town Councils can raise funds through council tax precept or through other local commitments to supplement funding for local flood defence and flood resilience projects and / or work with communities to reduce costs by enlisting help to complete the works or supporting studies.
South Wales Local Resilience Forum	Comprised of Local Authorities, emergency services and other responders to assist co-ordination and co-operation to respond to incidents at a local level. Responsibility to ensure that planning for major flooding events is fully aligned with the work of relevant operating authorities.
Emergency Services	Responding to flooding incidents (alongside other emergencies). Responsibility to assist with planning for flooding incidents, through membership of the South Wales LRF and the Vale Flood Forum
Flood Risk Management Wales Committee	The FRM committee is in place to promote efficient, targeted and risk-based investment in flood and coastal erosion risk management that optimises value for money and benefits for local communities. The committee is responsible for approving plans and allocating much of the funding available to Natural Resources Wales and the Vale of Glamorgan for flood risk management works. The committee also helps to guide flood & coastal activities by providing a link between Natural Resources Wales, Vale of Glamorgan, other risk management authorities and relevant bodies. They ensure there are coherent plans for identifying, communicating and managing flood and coastal erosion risks across catchments and shorelines and provide support as required for LLFAs in development of local strategies.
Vale of Glamorgan Flood Forum	The Vale Flood Forum was set up to help formulate a multi-agency approach to a significant flooding incident by identifying best practices and procedures for dealing with major flooding incidents and providing input to jointly agree, review and improve flood forecasting, emergency planning and operations response to flooding. The forum assists responding agencies to formulate an integrated response to a major flooding incident by helping to develop and maintain a multi-agency plan for dealing with a major

3 - Roles and Responsibilities

Organisation	Responsibilities
	flooding incident within The Vale, and assisting in the preparation and presentation of exercises to test the plan. The forum provides a representative to the South Wales Local Resilience Forum Flood Group
Swansea & Carmarthen Bay Coastal Engineering Group	This group is a vehicle for joint funding of strategic studies, monitoring and high level target compliance and provides strategic coastal management duties.
Severn Estuary Coastal Group	The group works to promote sustainable shoreline management, and to facilitate the duties and responsibilities of local authorities and other organisations managing coastal protection & flood defence issues around the Severn Estuary

4. Objectives and Measures

Section Overview

The purpose of this section is to answer the following questions:

- What are the National Objectives for management of flood risk?
- What are the Local Objectives for management of flood risk?
- What measures will be used to deliver the Local Objectives?
- Who will be responsible for implementing the measures?
- How will the measures be funded?

4.1 NATIONAL OBJECTIVES

One of the statutory requirements of a LFRMS is that it is consistent with the National Strategy for Flood and Coastal Risk Management. The National Strategy has four overarching objectives and eleven sub-objectives – these are summarised in the table below.

Table 4-1: National Strategy Objectives

No.	Objectives	Sub-Objectives
1	Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion	1. Provide Strategic Leadership and Direction at a National Level
		2. Provide Strategic Leadership and Direction at a local Level
		3. Develop policies for effective land use management and enhanced development control procedures where appropriate
		4. Establish regular maintenance schedules for flood and coastal erosion risk management assets
2	Raising awareness of and engaging people in the response to flood and coastal erosion risk	5. Ensure that by 2026 everyone who lives in a flood risk area understands the flood risk they are subject to, the consequences of this risk and how to live with that risk
		6. Enhance property and community level resilience
3	Providing an effective and sustained response to flood and coastal erosion events	7. Ensure the preparation and testing of Emergency Plans
		8. Respond to events in a timely and appropriate manner
		9. Facilitate recovery from flooding within the shortest possible timescales
4	Prioritising investment in the most at risk communities	10. Develop a National Programme of investment for flood and coastal erosion risk management
		11. Increase the use of alternative sources of funding for flood and coastal erosion risk management

Source: National Strategy for Flood and Coastal Erosion Risk Management in Wales (November 2011)

To ensure The Vale LFRMS is consistent with these National Objectives, the local objectives have been defined in alignment with the same overarching objectives. This will enable the Vale to effectively work with the Welsh Government, NRW and neighbouring Lead Local Flood Authorities as

they will all be aiming to achieve a similar set of objectives. The following sections detail the Flood Risk Management objectives for the Vale. Along with the measures that will be used to achieve them.

4.2 LOCAL OBJECTIVES

The local flood risk management objectives detailed in the following sections are based on the National Objectives and have considered the following standard strategic options:

1. **Do nothing:** Acknowledging that flood risk will increase with climate change, thereby increasing the overall impacts over time.
2. **Maintain at current position:** Maintain current management position, acknowledging that through climate change, the level of protection will decrease over time.
3. **Maintain in line with climate change:** Maintain current management position with improvement over time in line with anticipated climate change impacts.
4. **Improve management practices to reduce flood risk consequences:** *Improve flood risk management practices to reduce social, environmental and economic consequences of flooding.*

The main objective of the National Strategy is to **reduce the consequences** of flooding for individuals, communities and the environment. Therefore, the local objectives are targeted to improve management practices and reduce flood risk consequences.

4.3 HOW THE OBJECTIVES WILL BE ACHIEVED

The strategy identifies the measures that The Vale will adopt to achieve the local objectives. Measures are activities that will be undertaken to manage risk and achieve the stated objectives. Wherever possible measures which achieve multiple benefits, such as water quality, biodiversity and amenity benefits will be promoted. Both structural and non-structural measures have been considered. Structural measures include physical options to manage flood risk such as improved land management to reduce surface runoff, de-culverting of rivers and drainage improvements. Non-structural measures include activities such as spatial planning, emergency planning and improved flood awareness. A range of measures have been considered under the following themes:

Development planning and adaptation: This covers measures mainly intended to prevent flooding to communities and properties and includes activities such as preparation of plans and strategies (e.g. SFCA) and implementation of suitable LDP policies.

Flood forecasting, warning and response: This covers measures mainly intended to help people prepare for flooding and includes the preparation and testing of flood response plans, increasing flood awareness and improving flood forecasting and warning services.

Land, cultural and environmental management: This covers measures mainly intended to prevent flooding to communities and properties. It includes activities such as improved land management to control and manage runoff, river restoration and environmental enhancement. Activities under this theme have significant potential to achieve wider environmental benefits as well as flood risk management.

Asset management & maintenance: This covers measures mainly intended to protect people and assets from flooding and in some cases prevent flooding occurring. Activities include channel maintenance, defence / structure management and the development of System Asset Management Plans (SAMPs).

Studies, assessments & plans: This covers measures mainly intended to help prepare for flooding by gaining a greater understanding of flood risk. It also includes studies and measures to reduce flood risk, for example feasibility studies and property level flood protection.

High level awareness and engagement: This covers partnership working aimed at helping organisations prepare for flooding.

Monitoring: This covers measures intended to help prepare for flooding by increasing the available information through activities such as wave & tide monitoring, topographic survey and beach profile monitoring.

The LFRMS should where possible be aligned with other existing plans such as the UDP / LDP, SMP and CFMP. Where relevant links to proposed policies and actions identified in these plans are noted in the following sections. The following sections detail the local objectives and measures that will be used to achieve them.

4.4 WHEN THE MEASURES WILL BE IMPLEMENTED

The table in the following sections set out proposed timescales for delivery of the measures, suggested lead responsibility for their delivery and potential sources of funding. The timing of the measures is recommended for the short (0 – 20 years), medium (20 – 50 years) and longer term (50 – 100 years).

4.5 REDUCING THE CONSEQUENCES

National Objective: Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion

The table below details the local objectives that the Vale will use to support delivery of the above national objective along with comments identifying how they align with other statutory duties / responsibilities / objectives / current activities where applicable.

Table 4-2: Reducing the Consequences – Local Objectives

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
1	Provide leadership and direction at a local level	Lead and maintain a 'Local Partnership for Flood Risk Management' to discuss local flood risk issues and share information.	X	X	X	The Vale / Flood Forum	Revenue (FWMA Responsibility)	The Vale of Glamorgan Flood Forum currently meets on an approximately quarterly basis. Consider whether remit of flood forum should be expanded to form the partnership group LLFA duty under the FWMA
		Establish collaborative working relationships with neighbouring LLFA officers to manage cross-boundary flood risks	X	X	X	The Vale / Flood Forum	Revenue (FWMA Responsibility)	Refer Section 2 (Local Flood Risk) to identify key areas of interaction LLFA duty under the FWMA
		To provide clear guidance on responsibility on management of all sources of flood risk and support stakeholders to carry out their responsibilities	X	X	X	The Vale	Revenue (FWMA Responsibility)	Refer Section 3 for summary of roles and responsibilities for local flood risk management. Suggest this is reviewed annually. LLFA duty under the FWMA
		Create and implement a Local Flood Risk Management Strategy	x	X	X	The Vale	Revenue (FWMA Responsibility)	This document. Suggest interim reviews on a yearly cycle and full review on a six yearly cycle to accord with national Strategy reviews.

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
								LLFA duty under the FWMA
2	Develop local planning control policies to ensure sustainable flood and coastal erosion risk management measures are delivered by development	Monitor the impact of LDP policies through Annual Monitoring Reports (AMRs) and review policies where required based on the best available local flood risk information	X			The Vale	Revenue (FWMA Responsibility)	Refer to LDP Monitoring Criteria – Core Indicators, required by national policy, will measure the amount of development permitted in flood zones. Additionally, Local Indicators, which measure the annual number of developments permitted in flood risk areas, may also be included in the LDP.
		Provide clear guidance on local flood risk management requirements for developers by working with NRW and other relevant partners to develop a comprehensive understanding of all sources of flood risks.	X			The Vale	Revenue	Link with overall council officer capacity building in relation to management of flood risk
		Establish a SUDS Approval Body (SAB) to review development proposals, adopt SUDS from developers and ensure sustainable flood management practices are implemented	X			The Vale	Revenue (FWMA Responsibility)	LLFA duty under the FWMA
		Develop and implement a planning process for identifying and 'designating' significant structures or features that have a 'significant influence on local flood risk'	X			The Vale	Revenue (FWMA Responsibility)	LLFA duty under the FWMA

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
		Establish clear links between local flood risk and significant environmental sites ^[1] to understand the impacts and opportunities presented by their interaction	X			The Vale / NRW	Revenue	The HRA, SEA and WFD assessments will highlight these links
		Finalise and implement a clear policy on culverting of watercourses that is aligned with the national NRW policy and promotes positive environmental impacts.	X			The Vale / NRW	Revenue	Refer Draft Culverting Policy Consistent with CFMP
		Ensure that local flood risk management policy created by the Council is consistent with other existing Council policy and does not conflict with the policy of other local Risk Management Authorities	X	X	X	The Vale	Revenue	Coordinate through ongoing Flood Forum meetings and collaborative work
3	Establish and maintain an 'Asset Register' as defined by the FWMA	Create and maintain an Asset Register using a suitable software platform	X	X	X	The Vale	Revenue (FWMA Responsibility)	LLFA duty under the FWMA
		Establish a local definition of 'significant influence on local flood risk'	X			The Vale	Revenue	
		Populate the Asset Register with structures and features that have a 'significant influence on flood risk'	X			The Vale	Revenue (FWMA Responsibility)	LLFA duty under the FWMA
		Regularly review and update the Asset Register		X	X	The Vale	Revenue (FWMA Responsibility)	LLFA duty under the FWMA

[1] Significant environmental sites include Special Areas of Conservation, Sites of Special Scientific Interest, Special Protection Areas, RAMSAR Sites, European Protected Species and Biodiversity Action Plan (BAP) Species

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
		Establish and implement maintenance schedules for high risk assets on the register that are the responsibility of the Council. These measures will safeguard natural conservation and protect the receiving environment	X			The Vale	Revenue (FWMA Responsibility)	LLFA duty under the FWMA
		Encourage maintenance of third party assets to safeguard nationally and internationally designated sites from inappropriate development	X	X	X	The Vale / Flood Forum	Revenue / Community / Private	
		Encourage maintenance of privately owned assets and minimise unnecessary constrictions in watercourses	X	X	X	The Vale / Communities	Revenue / Community / Private	
4	Seek to reduce flood risks & consequences to identified high risk areas	Undertake detailed studies to identify the causes and consequences of flooding in these areas, both now and in the future	X	X	X	The Vale / NRW / Welsh Water / Affected Communities	Revenue / Local Levy / FDGiA	Refer Prioritisation of Areas in Section 2 (Local Flood Risk)
		Undertake a feasibility studies to investigate options for reducing flood risk in high risk areas confirmed by detailed studies	X	X	X	The Vale / NRW / Welsh Water / Affected Communities	Revenue / Local Levy / FDGiA	Consistent with CFMP actions
		Promote deculverting, particularly as land comes up for redevelopment, through implementation of the culverting policy and relevant UDP / LDP policies - These policies will ensure that biodiversity interests are protected in accordance with national regulations and guidance.	X	X	X	The Vale / NRW / Welsh Water	Revenue / Local Levy / FDGiA	Consistent with CFMP actions

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
		Seek to reduce runoff from existing developed areas through robust LDP policies and implementation of the SAB. These policies will ensure that biodiversity interests are protected in accordance with national regulations and guidance.	X	X	X			
		Secure funding and community “buy-in” to implement property level flood protection to existing properties at risk. These policies will ensure that biodiversity interests are protected in accordance with national regulations and guidance.	X	X		The Vale / NRW / Affected Communities	Revenue / Local Levy / FDGiA	
		Develop and implement a risk based maintenance plan for local and main highway drainage assets	X	X	X	The Vale / South Wales Trunk Road Agency	Revenue	Local Flood Risk Information (refer Section 2.3.1) can be used to identify high risk areas in combination with knowledge of local maintenance operators.

4.6 RAISING AWARENESS

National Objective: Raising awareness of and engaging people in the response to flood and coastal erosion risk

The table below details the local objectives that the Vale will use to support delivery of the above national objective along with comments identifying how they align with other statutory duties / responsibilities / objectives / current activities where applicable.

Table 4-3: Raising Awareness – Local Objectives

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
1	Identify communities and businesses that are at risk from flooding and coastal erosion	Use national flood risk maps to identify high risk areas	X			The Vale / NRW	Revenue (FWMA responsibilities)	Refer Preliminary Flood Risk Assessment Refer Section 2 (Local Flood Risk)
		Undertake detailed studies in areas of uncertain flood risk to confirm level of risk and who may be affected	X			The Vale	Revenue / Local Levy / FDGiA	Surface Water Management Plan (SWMP) Technical Guidance (2010) provides a clear methodology for detailed assessment of local flood risks
2	Work with at risk communities and businesses to collectively understand local flood risks and how they can be managed	Develop effective methods for communicating and sharing flood risk information with at risk communities	X			The Vale	Revenue (FWMA responsibilities)	Aligns with the Local Development Plan Vision – “The Vale of Glamorgan is a place...where there is a strong sense of community in which local groups and individuals have the capacity and incentive to make an effective contribution to the future sustainability of the area”
		Undertake regular community liaison in identified risk areas to discuss risks and how they can be managed	X	X	X	The Vale	Revenue	
		Work with at risk businesses to develop risk management and business continuity plans that protect and safeguard the natural environment and are proportional to the local risks	X	X	X	The Vale	Revenue	

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
		Work with other RMAs to establish areas that may see increased risk through the implementation of CFMP & SMP policies and develop a strategy to communicate this to affected communities and raise awareness.	X	X		The Vale / Flood Forum	Revenue	
3	Promote property and community level flood resilience	Proactively seek national funding to support local community and property level resilience measures which are environmentally friendly and sustainable	X	X	X	The Vale / NRW	Revenue / Local Levy / FDGiA	Refer Section 5 (Funding and Implementation) for details of funding sources
		Build a robust knowledge base within the council to assist the community in implementation of flood resilience measures	X			The Vale	Revenue	Link with overall council officer capacity building in relation to management of flood risk

4.7 PROVIDING AN EFFECTIVE AND SUSTAINED RESPONSE

National Objective: Providing an effective and sustained response to flood and coastal erosion events

The table below details the local objectives that the Vale will use to support delivery of the above national objective along with comments identifying how they align with other statutory duties / responsibilities / objectives / current activities where applicable.

Table 4-4: Providing an Effective and Sustained Response – Local Objectives

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
1	Ensure the preparation and testing of Emergency Plans	Prepare community specific emergency plans in relation to local flood risk which accord with national guidance and environment regulations	X			The Vale / Flood Forum	Revenue	Refer Section 2 (Local Flood Risk)
		Regularly review and update emergency plans using the best available local flood risk information. These will accord with national guidance and environment regulations.	X	X	X	The Vale / Flood Forum	Revenue	Links with current activities of Emergency Planning Unit
		Organise and participate in regular community level emergency exercises in areas identified as at high risk of flooding – including communication procedures, location / deployment of resources and coordination with other services.	X	X	X	The Vale / Flood Forum	Revenue	Exercises should be based on predicted flood extents (not arbitrary scenarios)
		Contribute to and participate in any national or regional emergency exercise programmes related to flood risk	X	X	X	The Vale / Flood Forum	Revenue	

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
2	Respond to flood events in a timely and appropriate manner	Utilise the resources available to the Council to provide support for the Emergency Services	X	X	X	The Vale	Revenue	Links with current activities of Emergency Planning Unit
		Coordinate the Voluntary Agencies to mitigate the effects of the incident as it occurs	X	X	X	The Vale	Revenue	
		Investigate and publically report on significant flood incidents within two months of their occurrence (including identification of responsible parties for mitigation)	X	X	X	The Vale	Revenue (FWMA Responsibility)	LLFA duty under the FWMA Identified as a 'next step' in PFRA: Create system based on PFRA annexes
3	Facilitate recovery from flooding within the shortest possible timescales	Take the lead role in facilitating the rehabilitation of the community and the restoration of the environment	X	X	X	The Vale	Revenue	Links with current activities of Emergency Planning Unit.
		Provide support to local businesses through implementation of environmentally sustainable business continuity planning	X	X	X	The Vale	Revenue	
		Use local flood risk knowledge to identify vulnerable individuals / communities and assess potential level of flood impact based on risk maps in advance of incident.	X	X	X	The Vale / Flood Forum	Revenue	

4.8 PRIORITISING INVESTMENT

National Objective: Prioritising investment in the most at risk communities

The table below details the local objectives that the Vale will use to support delivery of the above national objective along with comments identifying how they align with other statutory duties / responsibilities / objectives / current activities where applicable.

Table 4-5: Prioritising Investment – Local Objectives

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
1	Utilise a risk based approach to managing flood risk to ensure structural and non-structural measures are considered to arrive at a cost-effective solutions that are proportional to local flood risk	Develop a comprehensive understanding of local flood risk management tools that are practical for use in the Vale of Glamorgan (based on local ground conditions and existing infrastructure)	X			The Vale	Revenue	Link with development of SAB (Refer Section 4.5) Link with overall council officer capacity building in relation to management of flood risk
		Establish a clear and transparent risk based hierarchy for decision making on flood risk mitigation prioritisation and investment	X			The Vale	Revenue	Link with definitions of 'significant influence on local flood risk' (refer Section 4.5) and 'significant flood incident' (Section 4.5)
		Maintain an up to date knowledge of significant environmental sites and how they interact with flood risk areas to ensure that multi-benefit flood risk mitigation solutions are identified and improve the status of their classification.	X	X	X	The Vale / NRW	Revenue	The HRA, SEA and WFD assessments will highlight these links

No.	Local Objectives	Measures	Timescale for Implementation			Key Partners	Potential Funding	Comment
			Short	Medium	Long			
2	Identify and prioritise local risk mitigation works for feeding into the National Investment Programme	Identify and prioritise areas of flood and coastal erosion risk	X			The Vale	Revenue / Local Levy / FDGiA	Refer Section 2 (Local Flood Risk)
		Prepare feasibility studies for mitigation of risk in high priority areas and submit to National Programme for consideration	X			The Vale	Revenue / Local Levy / FDGiA	Refer Section 4.6(Raising Awareness)
3	Promote the use of alternative funding sources through delivery of multi-benefit risk mitigation projects which are sustainable and protect biodiversity interests using multiple funding sources	Clearly identify all beneficiaries of proposed risk mitigation schemes	X			The Vale	Revenue	Local Development Plan (2011 – 2026) allows Community Infrastructure Levy to be used for ‘Flood Defence’
		Proactively maintain a high level of understanding of available funding sources and how to access them	X	X	X	The Vale	Revenue	Link with Vale of Glamorgan Flood Forum (refer Section 4.4)
		Proactively maintain a high level of flood risk management resource and skills within the council to ensure local risk management schemes can be investigated, designed and implemented using available funding sources (These will not cause any harm to features of the natural environment – including protected or priority species, habitats as well as wildlife corridors)	X	X	X	The Vale	Revenue	Refer Section 5 (Funding and Implementation) for details of funding sources
								Link with overall council officer capacity building in relation to management of flood risk

5. Funding and Implementation

Section Overview

The purpose of this section is to answer the following questions:

- Who will fund the measures?
- How will the measures be implemented?

5.1 FUNDING

It is important to identify what funding mechanisms are available to the Vale and its partners to pay for the measures that are proposed. This section provides a summary of sources of funding available to the Vale to implement the measures.

It is likely that funding will need to be sought from a variety of sources in order to deliver projects as central government funding will be limited each year and may only provide a contribution towards the costs of planned schemes. Additional local funding may be required to facilitate projects going ahead. Current sources of funding include:

Flood defence grant in aid (FDGiA): The Welsh Government provides grants for flood and coastal erosion risk management schemes. Until recently these monies could only be used for main river and coastal erosion schemes, but is now available to projects relating to all sources of flooding. The government will be undertaking a review of the scheme appraisal guidance relating to the allocation of funding. This may lead to some changes in the way funds are allocated however at the time of writing this report there was no available information on the likely outcomes of the review.

Local levy funding: Local levy is an additional source of funding raised by the RFCC and can be used to support the implementation of locally important projects. The funds can be used to help fund projects relating to any source of flooding, as well as coastal erosion.

Revenue funding for LLFA responsibilities: The government is making additional funds available to councils in the short-term to fulfil their new roles and responsibilities under the FWMA. Once allocated, the grants are able to be managed by The Vale according to its needs and priorities.

Council Tax & Business rate supplements: Local authorities may choose to invest in flood risk management from income generated through council tax levies and precepts. This approach has been successfully used in the past to promote flood risk management schemes although may require approval through referendum. The Vale is responsible for setting council tax and managing spend; flood risk components may be distributed to other authorities (e.g. parish councils) to contribute to a local scheme. Business rate supplements could be levied in a similar manner.

Developer based contributions: Section 106 Agreements provide a means of securing developer contributions towards schemes that are necessary for a development to be acceptable in planning terms and directly relates to the development. The Vale is responsible for negotiating, collecting and managing funding secured through this route. Section 106 contributions must be directly linked to the specific development and therefore there is limited opportunity for reallocation of funds.

Community Infrastructure Levy (CIL): This is a new tariff style charge which local authorities may impose on new houses and other buildings for capital expenditure purposes, including flood defence. The Vale has resolved in principle to commence preparation of a CIL. Once in place it is expected to replace S106 agreements in many respects.

Local fundraising / private contributions: In addition to the above contributions from the local communities and businesses that benefit from schemes may be an important source of funding for local schemes.

5.2 IMPLEMENTATION - COST / BENEFIT APPRAISAL

A cost / benefit appraisal is usually completed for proposed flood risk management schemes (physical works and non-tangible community initiatives) to help ensure the measures are proportionate to the level of risk presented and in some cases to help prioritise schemes and secure funding. It is recognised that specification of costs and benefits of measures is a requirement of a Local Strategy. However, it must also be acknowledged that in order to complete this process that detailed information on the specific costs and benefits of a measure is required. At this stage of Local Strategy development, this type of information is not available to undertake a meaningful analysis.

Many of the proposed objectives relate to improving understanding of flood risk in the Vale to better prepare for floods, manage the consequences of flooding and to prioritise future investment. The identified measures to implement these objectives generally relate to the way The Vale and its partners approach their responsibilities for flood risk management in their everyday work. Until further investigations are completed and there is greater certainty on funding it is considered inappropriate to identify specific physical works investments or community initiatives and therefore the need for cost / benefit appraisal of proposals is not applicable at this time.

Future iterations of the LFRMS may include proposed measures which involve the implementation of structural or non-structural measures to reduce the consequences of flooding. A cost / benefit appraisal of these measures will then be completed as appropriate, in accordance with the guidance in place at the time. The appraisal will consider the whole life benefits of the measures (both tangible and intangible), the associated implementation costs and ongoing maintenance costs.

6. Environmental Assessment

Section Overview

The purpose of this section is to answer the following questions:

- How will this Strategy impact the environment?
- How will the environmental impacts be managed?
- What will the environmental benefits be?

6.1 BACKGROUND

In order to determine the potential environmental effects of the LFRMS, the plan will undergo three separate but related processes – a Strategic Environmental Assessment (SEA), Habitats Regulation Assessment and a Water Framework Assessment. These three assessments are completed to ensure a positive overall impact on the environment and to meet the statutory requirements associated with each. The following sections summarise how each of the assessments influence the objectives and measures of the Local Strategy. Each assessment is available in full in the Appendices of this Local Strategy document.

6.1.1 STRATEGIC ENVIRONMENTAL ASSESSMENT

It is a legal requirement in the UK for certain plans and programmes stipulated by the Strategic Environmental Assessment (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 (SI 2004 No. 1656, W170), hereafter referred to as the SEA Regulations.

The purpose of a 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.

The aim of the SEA is therefore to identify potentially significant environmental effects created as a result of the implementation of the plan or programme on issues such as '*biodiversity, population, human health, fauna, flora, soil, water, air, climatic, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors*' (Annex 1(f)).

The SEA is currently at the 'Scoping' stage and is being developed alongside the LFRMS. The identification of other relevant policies and the collection of baseline information has been completed and the resultant potential environmental issues have been proposed.

The key environmental issues to be addressed within the SEA are: water resource and quality; flood risk, flooding and coastal defence; population and health; biodiversity, geodiversity, cultural heritage and landscape; resource and consumption and; climate change. The table below shows SEA Objectives that have been developed based on the key environmental issues and the LFRMS objectives and measures. The LFRMS objectives and measures will be tested against the SEA objectives following initial consultation with the Flood Forum to ensure all issues have been addressed.

Table 6-1: SEA Objectives

SEA Objective	Key Sustainability Issues
1. To minimise the risk of flooding	> 650 residential properties, 189 commercial properties, 5 schools, 1 emergency service and 4 electricity substations at future risk of flooding from surface water.
2. To maintain and enhance water resources and quality	Water resource issues. Quality of water bodies, particularly their ecological status
3. To protect and enhance human health and wellbeing	Increasing population. 5 Lower Layer Super Output Areas (LSOAs) ⁸ in Barry fall within the top 20% of most deprived areas in Wales.
4. To ensure the impact of flood on existing and future critical infrastructure is minimised	International travel. Cardiff Airport, Barry Docks, M4 National and regional transport links – M4, A48, Swansea to London Railway
5. To ensure that new development is located with respect to the Justification Test (UDP / LDP and TAN 15)	Flood Risk Zones Various sources of flood risk including river flooding, surface water flooding, sewer flooding, tidal flooding and groundwater flooding.
6. To protect and enhance biodiversity and geodiversity across the Vale of Glamorgan	Protection of internationally, nationally and locally sites designated for habitats, species and geological conservation.
7. To maintain and/or enhance the character of the townscape and cultural heritage features and assets throughout the Vale of Glamorgan	Large number of historic sites and buildings within the Vale. Protection of Scheduled Ancient Monuments (SAM), listed buildings, conservation areas and historic parks and gardens.
8. To protect best quality soil and preserve and/or enhance the landscape character of the Vale of Glamorgan	High grade soils Protection of Heritage Coast Distinct characteristics for each landscape area Ability of local landscape to accept change
9. To adapt development to the impacts of climate change	Future climate change predictions Ecological footprint Energy consumption

6.1.2 HABITATS REGULATION ASSESSMENT

EC Directive (92/43/EEC) on the Conservation of natural habitats and of wild flora and fauna ('Habitats Directive') is implemented, along with certain elements of the Birds Directive (79/409/EEC)

⁸ LSOAs were defined using 2001 Census data from groups of Output Areas (typically four to six) and were constrained by the Standard Table wards used for 2001 Census outputs. They had a minimum size of 1,000 residents and 400 households, but average 1,500 residents. Measures of proximity (to give a reasonably compact shape) and social homogeneity (to encourage areas of similar social background) were also included.

in the UK by *The Conservation of Habitats and Species Regulations 2010 (SI 490, 2010)*. This legislation provides the legal framework for the protection of habitats and species of European importance in Wales.

The protected sites comprise Special Areas of Conservation (SAC) and Special Protection Areas (SPA), and the Habitats Regulations are also applied to candidate SACs (cSAC), potential SPA (pSPA) and Ramsar sites (sites designated under the 1971 Ramsar Convention⁹ for internationally important wetlands). These sites are referred to collectively in this report as 'European sites'.

Regulation 9(5) of the Habitats Regulations requires that a competent authority must consider the requirements of the Habitats Directive in exercising any of its functions. Article 6(3) of the Habitats Directive sets out the decision-making tests for plans and projects likely to affect European Sites. Any plan or project not directly connected with or necessary to the management of the European Site(s) but likely to have a significant effect thereon, either individually or in combination with other plans or projects, is subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

The assessment is underpinned by the precautionary principle, especially in the assessment of potential impacts and their resolution. If it is not possible to rule out the risk of harm on the evidence available then it is assumed that a risk may exist and it needs to be dealt with in the assessment process.

The Local Strategy sets out objectives and measures to be implemented at a lower level to guide individual flood risk and coastal erosion works, which could potentially have significant effects upon European sites. The Local Strategy is therefore a plan as defined by the Habitats Regulations and requires associated assessment.

The following European Sites have been identified and are considered by the assessment. These sites occur within the Vale of Glamorgan and/or within a 5km radius:

- Severn Estuary SPA, SAC, Ramsar
- Dunraven Bay SAC
- The Kenfig SAC
- Cardiff Beech Woodlands SAC
- Blackmill Woodlands SAC

The HRA is currently undergoing screening and scoping in consultation with NRW. It is understood that the view of NRW is that a strict buffer for hydrological effects or issues affecting mobile species (such as migrating fish) is not favoured by them. We are currently consulting with NRW over the European Sites to be considered. The HRA will be completed following initial consultation with stakeholders to ensure all relevant sites have been identified.

6.1.3 WATER FRAMEWORK DIRECTIVE ASSESSMENT

The Water Framework Directive (WFD) (2000/60/EC) is a substantial piece of EC water legislation which was made law in England and Wales in 2003 (Water Environment (Water Framework Directive) (England and Wales) Regulations 2003). The main purpose of the WFD is to establish a framework for the protection and sustainable use of the water environment. The Directive sets Environmental Objectives for all surface waters (rivers, transitional, lakes and coastal waters) at the water body scale, the effective unit of management and monitoring defined under the WFD. The Objectives, set out in Article 4 of the Directive, include the prevention of deterioration of Ecological Status within the water body.

The objective of the WFD Assessment is to assess the impacts of flood and coastal risk management (FCRM) activities on the ecological status of all surface water body types (excluding lakes). At the time of writing the Local Strategy, the current WFD status of river bodies within the Vale had not been provided to the project team by NRW. Therefore, this assessment has not been initiated as yet. It is

⁹ Note that 'Ramsar' is not an abbreviation for a longer term, it was the location of the described convention held in Ramsar (Iran) in 1971.

expected the required data will be available following initial consultation with stakeholders. The WFD assessment will:

- Document the likely scale (temporal and spatial) of the hydromorphological change, and identify any direct loss of Biological Quality Elements (BQEs).
- Document the likely nature (rate, direction and mechanism) of the hydromorphological change, to allow the indirect loss of BQEs to be evaluated.
- Identify the ability of the BQEs to recover from the changes that have been identified (eco-adaptability) and the timescale over which such recovery is likely.
- Identify whether any hydromorphological changes are likely to result in deterioration in ecological status or ecological potential (taking into account spatial and temporal scales of change).
- Provide an indication of the level of confidence associated with the likely outcome (i.e. the degree of uncertainty in the assessment based on available information).
- Provide justification of why further assessment is required to increase certainty about the likely change and impact.

6.2 ENVIRONMENTAL ASSESSMENT OUTCOMES

The following initial outcomes are indicated at this stage:

Reducing the Consequences – Local Objectives:

- Developing local planning policies and the provision of a SUDS approval body has the potential to both positively and negatively affect environmental parameters such as climate change, water quality, biodiversity and landscape.
- Any development, changes to flood frequency and any alterations to flood risk within areas of potentially contaminated land associated with the LFRMS options could lead to changes in water bodies' ability to maintain good ecological status.
- The LFRMS measures seek to manage flood risk to critical infrastructure and material assets within the Vale. The implementation of measures has the potential to disrupt critical transport infrastructure (such as road or rail networks), facilities and utilities (such as clean water).

Raising Awareness – Local Objectives

- Working with communities to raise awareness and promote property flood resilience will in general have a positive impact on human health and wellbeing, particularly for those within areas with a higher risk of flood.
- Conversely, increased awareness could lead to flood risks perceived to be higher than actual resulting in higher stress affecting quality of life for some individuals.

Providing an Effective and Sustained Response – Local Objectives

- Dependent upon response measures implemented, there is potential to negatively impact upon water quality, biodiversity and material/cultural assets, but positively impact upon human health.

Prioritising Investment – Local Objectives

- The identification and prioritisation of areas of flood risk and the subsequent feasibility studies has the potential to interact with water quality, landscape, material/cultural assets, soils, biodiversity and human health and wellbeing.
- It is currently assumed that there will be no impacts on air quality or waste management from the LFRMS and these are therefore scoped out (subject to agreement with the Consultation Bodies) at this stage.

7. Review, Update and Monitoring

Section Overview

The purpose of this section is to answer the following questions:

- How often will the Strategy be reviewed?
- Who is responsible for update of the Strategy?
- How can I contribute to the Strategy?
- What happens after the consultation process?

7.1 STRATEGY REVIEW AND UPDATE

7.1.1 FREQUENCY

The Local Strategy should be reviewed and updated every six years as a minimum. It is logical to align the review cycle with the requirements of the Flood Risk Regulations (2009) and the review of the National Strategy for Flood and Coastal Erosion Risk Management in Wales. The Regulations require another Preliminary Flood Risk Assessment (PFRA) to be completed in 2017 and similarly, the review of the National Strategy is also programmed for 2017. The both review processes will highlight any new flood risk information and this can then be used to update the Local Strategy in late 2017.

In addition, there may be circumstances which should trigger a review and/or an update of the Strategy in the interim. Examples of other triggers for review include:

- Occurrence of a significant flood event
- Additional data or modelling becoming available, which may alter the understanding of flood risk
- Outcome of investment decisions by partners influences available funding
- Development or other topographic changes which may affect flood risk

It is in the interest of The Vale and the community they represent that the Strategy remains current and up-to-date. To help facilitate this, The Vale will liaise with other flood risk management authorities and monitor progress.

7.1.2 RESPONSIBILITY

Review and update of the Strategy is the responsibility of The Vale as a Lead Local Flood Authority. Other local risk management authorities are required to support the review and update process by supply of relevant data to inform the Strategy.

7.2 MONITORING

As the Lead Local Flood Authority, The Vale is responsible for monitoring the implementation of this Local Strategy. This includes monitoring its own activities and those completed by other Risk Management Authorities as defined in Section 3. The following sections describe monitoring activities that will be undertaken by The Vale. These will be developed into formal monitoring activities and detailed in a separate Technical Note to support the Local Strategy. The Technical Note will include further detail such as process diagrams, indicative timescales and parties whom to consult with regularly.

7.2.1 OTHER RISK MANAGEMENT AUTHORITY ACTIVITIES

The following Risk Management Authorities will be liaised with regularly via The Vale Flood Forum:

- NRW
- Welsh Water
- South Wales Trunk Road Agency
- Vale of Glamorgan Highways (as Highways Authority)

7.2.2 FLOOD INCIDENT INVESTIGATION

The Vale will investigate all reports of flooding to ascertain the source, magnitude and impact of any flooding, as well as identifying the responsible authority / body to respond to the incident. This may or may not then trigger a 'formal' investigation and reporting under the FWMA and the threshold criteria defined in Section 2 of this document. The Vale will continue to collaborate through the Flood Forum, and regular liaison with other FRM bodies / emergency services to collate records of flooding incidents from external agencies.

8. References

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Natural Resources Wales (2009b) Taff and Ely Catchment Flood Management Plan, Version 2

Natural Resources Wales (2009c) River Basin Management Plan - Western Wales River Basin District

National Archives (2009) Flood Risk Regulations (2009)

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Severn Estuary Coastal Group (2009) Shoreline Management Plan 2: Severn Estuary, <http://www.severnestuary.net/secg/publications.html> [Accessed 22 October 2012]

Welsh Government (2011a) National Strategy for Flood and Coastal Erosion Risk Management in Wales

Welsh Government (2011b) Local Flood Risk Management Strategies – Local Strategy Guidance

Appendix A – Glossary

Term	Definition
AEP	Annual Exceedance Probability
Aquifer	A source of groundwater comprising water bearing rock, sand or gravel capable of yielding significant quantities of water.
AMP	Asset Management Plan, see below
Asset Management Plan	A plan for managing water and sewerage company (WaSC) infrastructure and other assets in order to deliver an agreed standard of service.
ASStSWF	Areas Susceptible to Surface Water Flooding. A national data set held by the EA and based on high level modelling which shows areas potentially at risk of surface water flooding.
Catchment Flood Management Plan (CFMP)	A high-level planning strategy through which the EA works with their key decision makers within a river catchment to identify and agree policies to secure the long-term sustainable management of flood risk.
CFMP	Catchment Flood Management Plan, see entry above
CIRIA	Construction Industry Research and Information Association
Civil Contingencies Act	This UK Parliamentary Act delivers a single framework for civil protection in the UK. As part of the Act, Local Resilience Forums have a duty to put into place emergency plans for a range of circumstances including flooding.
CLG	Government Department for Communities and Local Government
Climate Change	Long term variations in global temperature and weather patterns caused by natural and human actions.
Culvert	A channel or pipe that carries water below the level of the ground.
Defra	Government Department for Environment, Food and Rural Affairs
DEM	Digital Elevation Model: a topographic model consisting of terrain elevations for ground positions at regularly spaced horizontal intervals. DEM is often used as a global term to describe DSMs (Digital Surface Model) and DTMs (Digital Terrain Models).
DG5 Register	A water-company held register of properties which have experienced sewer flooding due to hydraulic overload, or properties which are 'at risk' of sewer flooding more frequently than once in 20 years.
DSM	Digital Surface Model: a topographic model of the bare earth/underlying terrain of the earth's surface including objects such as vegetation and buildings.
DTM	Digital Terrain Model: a topographic model of the bare earth/underlying terrain of the earth's surface excluding objects such as vegetation and buildings. DTMs are usually derived from DSMs.

Term	Definition
EA	Environment Agency: Government Agency reporting to Defra charged with protecting the Environment and managing flood risk in England (The functions previously carried out by the Environment Agency in Wales were taken over by 'Natural Resources Wales' / NRW in April 2013)
Indicative Flood Risk Areas	Areas determined by the Environment Agency as potentially having a significant flood risk, based on guidance published by Defra and WAG and the use of certain national datasets. These indicative areas are intended to provide a starting point for the determination of Flood Risk Areas by LLFAs.
National FCERM Strategy	National Flood and Coastal Erosion Risk Management Strategy. Prepared by the EA in partnership with WAG. The strategy is required under the Flood and Water Management Act 2010 and will describe what needs to be done by all involved in flood and coastal risk management to reduce the risk of flooding and coastal erosion, and to manage its consequences.
FMfSW	Flood Map for Surface Water. A national data set held by the EA showing areas where surface water would be expected to flow or pond, as a result of two different chances of rainfall event, the 1 in 30yr and 1 in 200yr events.
Flood defence	Infrastructure used to protect an area against floods such as floodwalls and embankments; they are designed to a specific standard of protection (design standard).
Flood Risk Area	See entry under Indicative Flood Risk Areas.
Flood Risk Regulations	Transposition of the EU Floods Directive into English and Welsh law. The EU Floods Directive is a piece of European Community (EC) legislation to specifically address flood risk by prescribing a common framework for its measurement and management.
Flood and Water Management Act (FWMA 2010)	An Act of Parliament which forms part of the UK Government's response to Sir Michael Pitt's Report on the Summer 2007 floods, the aim of which is to clarify the legislative framework for managing surface water flood risk in England and Wales. The Act was passed in 2010 and is currently being enacted in stages.
Fluvial Flooding	Flooding resulting from water levels exceeding the bank level of a watercourse (river or stream). In this report the term Fluvial Flooding generally refers to flooding from Main Rivers (see later definition).
FRR	Flood Risk Regulations, see above.
IDB	Internal Drainage Board. An independent body with powers and duties for land drainage and flood control within a specific geographical area, usually an area reliant on active pumping of water for its drainage.

Term	Definition
IUD	Integrated Urban Drainage, a concept which aims to integrate different methods and techniques, including sustainable drainage, to effectively manage surface water within the urban environment.
LDP	Local Development Plan containing the local planning policies which guide development over the next 15 years which, once adopted, will guide development.
Local Strategy	A local strategy required by the FWMA 2010 that must specify: (a) the risk management authorities in the authority's area, (b) the flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area, (c) the objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with the Flood Risk Regulations 2009), (d) the measures proposed to achieve those objectives, (e) how and when the measures are expected to be implemented, (f) the costs and benefits of those measures, and how they are to be paid for, (g) the assessment of local flood risk for the purpose of the strategy, (h) how and when the strategy is to be reviewed, and (i) how the strategy contributes to the achievement of wider environmental objectives.
Lead Local Flood Authority	Local Authority responsible for taking the lead on local flood risk management. The duties of LLFAs are set out in the Floods and Water Management Act 2010.
LiDAR	Light Detection and Ranging, a technique to measure ground and building levels remotely from the air, LiDAR data is used to develop DTMs and DEMs (see definitions above).
LLFA	Lead Local Flood Authority, see above.
Local Resilience Forum	A multi-agency forum, bringing together all the organisations that have a duty to cooperate under the Civil Contingencies Act, and those involved in responding to emergencies. They prepare emergency plans in a co-ordinated manner and respond in an emergency. Roles and Responsibilities are defined under the Civil Contingencies Act.
LPA	Local Planning Authority. The local authority or Council that is empowered by law to exercise planning functions for a particular area. This is typically the local borough or district Council.
LRF	Local Resilience Forum, see above.

Term	Definition
LSOA	Lower Layer Super Output Area - Built using 2001 Census data from groups of Output Areas (typically four to six) and were constrained by the Standard Table wards used for 2001 Census outputs. They had a minimum size of 1,000 residents and 400 households, but average 1,500 residents. Measures of proximity (to give a reasonably compact shape) and social homogeneity (to encourage areas of similar social background) were also included.
Main River	Main rivers are a statutory type of watercourse in England and Wales and are usually larger streams and rivers, but may also include some smaller watercourses. A main river is defined as a watercourse marked as such on a main river map, and can include any structure or appliance for controlling or regulating the flow of water in, into or out of a main river. The Environment Agency's powers to carry out flood defence works apply to main rivers only.
NRD	National Receptor Dataset – a collection of risk receptors produced by the EA. A receptor could include essential infrastructure such as power infrastructure and vulnerable property such as schools and health clinics.
NRW	Natural Resources Wales - Environment Agency, the Forestry Commission and Countryside Council for Wales were amalgamated into NRW as of 1 April 2013
Ordinary Watercourse	All watercourses that are not designated Main River, and which are the responsibility of Local Authorities or, where they exist, IDBs are termed Ordinary Watercourses.
Partner	A person or organisation with responsibility for the decision or actions that need to be taken.
PFRA	Preliminary Flood Risk Assessment, see below.
Pitt Review	Comprehensive independent review of the 2007 summer floods by Sir Michael Pitt, which provided recommendations to improve flood risk management in England and Wales.
Pluvial Flooding	Flooding from water flowing over the surface of the ground; often occurs when the soil is saturated and natural drainage channels or artificial drainage systems have insufficient capacity to cope with additional flow.
Preliminary Flood Risk Assessment	Assessment required by the EU Floods Directive which summarises flood risk in a geographical area. Led by Local Authorities.
Resilience Measures	Measures designed to reduce the impact of water that enters property and businesses; could include measures such as raising electrical appliances.
Resistance Measures	Measures designed to keep flood water out of properties and businesses; could include flood guards for example.
Risk	In flood risk management, risk is defined as a product of the probability or likelihood of a flood occurring, combined with the consequence of the flood.

Term	Definition
Risk Management Authority	Defined by the Flood and Water Management Act as “the EA, a lead local flood authority, a district council for an area for which there is no unitary authority, an internal drainage board, a water company, and a highway authority”.
RMA	Risk Management Authority, see above.
SAM	Scheduled Ancient Monument
Sewer flooding	Flooding caused by a blockage or overflowing in a sewer or urban drainage system.
SSSI	Site of Special Scientific Interest
Stakeholder	A person or organisation affected by the problem or solution, or interested in the problem or solution. They can be individuals or organisations, includes the public and communities.
SUDS	Sustainable Drainage Systems, see below.
Sustainable Drainage Systems	Methods of management practices and control structures that are designed to drain surface water in a more sustainable manner than some conventional techniques. Includes swales, wetland sand ponds.
Surface water	Rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving), and has not entered a watercourse, drainage system or public sewer. Refer to Pluvial flooding.
SWMP	Surface Water Management Plan.
The Vale	The Vale of Glamorgan Council
UDP	Unitary Development Plan – Refer Section 1.4.4
UKCIP	The UK Climate Impacts Programme. Established in 1997 to assist in the co-ordination of research into the impacts of climate change. UKCIP publishes climate change information on behalf of the UK Government and is largely funded by Defra.
WaSC	Water and Sewerage Company.

Appendix B – Consultation Response Summary

Name / Role	Organisation	Consultation Question Ref.	Response / Comment	Review Response	Action Required?	By Who?	By When?	Completed?
Paul Critchley	Welsh Govt (Flood and Coastal Risk Management / Energy, Water and Flood Division)		Please find attached the summary checklist completed whilst undertaking our review with some comments included for your consideration. As you will see we have considered element 6 [Does the Strategy specify the costs and benefits of those measures, and how they are to be paid for?] as being 'not really', but I am very much of the view that, as this is the first iteration of the LFRMS, LLFAs may not have all the relevant information (especially in relation to the costs and benefits of measures) and given that this is acknowledged within the LFRMS along with how those gaps will be addressed / included going forward in future iterations of the LFRMS then I am content. Ultimately, LFRMS should provide their readers with the information relating to the local flood risks and how each will be managed in their area, including setting out what is not known at the time of publication and how that will be addressed going forward.	LFRMS should state specifically that costs will be revisited in future when additional certainty is gained with regard to funding and actions	Modify LFRMS as noted - Refer Section 5.2	CSL	14/06/2013	Yes
			Refer 'Review of Local Flood Risk Management Strategies (Checklist) - Vale of Glamorgan.doc' - Key comments detailed below:	N/A				
			(1) 2.3.2 on page 16 reference numbers from the "Figure and Figure" quote missing, should they read "Figure 3 and Figure 4".	References will be corrected	Modify LFRMS as noted	CSL	14/06/2013	Yes
			(2) Table 6 on page 18 - in relation to the parameters "Critical Services", "Internationally or nationally designated site" and "Number of nationally / internationally important heritage features" given that the threshold is 1 for each should the priority classification score for "more than zero, but less than Threshold" be "High (5)" as well to avoid any confusion?	Description will be amended as suggested	Modify LFRMS as noted	CSL	14/06/2013	Yes
			(3) 3.1 on page 26 refers to tables 5, 6 and 7 should this be tables 7, 8 and 9?	References will be corrected	Modify LFRMS as noted	CSL	14/06/2013	Yes
			(4) Page 27 - Recognised that a single body will be established, but suggest that they should change that when the final draft is produced.	Description will be amended as suggested	Modify LFRMS as noted	CSL	14/06/2013	Yes
			(5) Section 4 & 5 refer - Against each measure in a table they identify the potential funding route and have a section identifying funding options that could be available they also recognise that central Gov funding is limited. They also ref the new funding Scheme that may bring about changes to funding. However in section 5.2 it is stated that until further investigations are completed and there is a greater certainty on funding it is considered inappropriate to complete cost benefit analysis at this stage.	Refer response above to general comment on this issue	None			
			(6) Considered in section 2 - They do not have a FRA - they did have a small area that overlapped with Cardiff but was realigned to the LA boundary. They have used the PFRA work to help develop the local flood risk areas and consider a prioritisation system to trigger investigation and work.	This context is already provided in Section 1.3.2 with reference to the Flood Risk Regulations	None			
John Raine (Senior Planner - Planning and Transportation Services) / Emma Reed (Operational Manager - Development Services)	Vale of Glamorgan Council		Paragraph 1.4.4 – page 5 Revise text to remove 'soon' so that it reads: "the Unitary Development Plan (1996 – 2011) remains the adopted development plan for the area. The Local Development Plan, currently under production, will only supersede this once formally adopted"... Typo in second sentence – should read 'UDP'	Make changes as described	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Paragraph 1.4.5 – page 5 Revise text to read: Following an earlier consultation on the February 2012 Deposit LDP the Council has resolved to produce a new Deposit LDP for public consultation later in 2013. This plan, following an 'Examination in Public' and once formally adopted, will eventually supersede the adopted UDP. The LDP timetable is currently under review and an indicative adoption date will be known once agreed. Although the Deposit LDP is currently under production, it is noted that the LDP strategy is closely aligned with the Vale of Glamorgan Community Strategy (2011 – 2026) in terms of meeting the ongoing development needs of the community. The LDP and community strategy emphasise the desire for local groups and individuals to make an effective contribution to the future sustainability of the Council area. This desire is also reflected in this Local Strategy and there are specific objectives set and measures provided that will allow communities to ensure their future sustainability with regard to the effects of climate change on flood risk. Once finalised, relevant LDP policies will need to be applied in parallel with those included within this Local Strategy – they are intended to be complementary.	Make changes as described	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Local Objective 2 – Page 37 Change 'comment' column to read: Refer to LDP Monitoring Criteria – Core Indicators, required by national policy, will measure the amount of development permitted in flood zones. Additionally, Local Indicators, which measure the annual number of developments permitted in flood risk areas, may also be included in the LDP	Make changes as described	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Local Objective 4 – Page 39 Change text to read: "and relevant UDP / LDP policies". Add missing timescale for implementation – ongoing / long term?	Make changes as described	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Appendix A – Glossary Add reference to the Adopted UDP in the Glossary Under LDP add text to read: "which, once adopted, will guide development"	Make changes as described	Modify LFRMS as noted	CSL	14/06/2013	Yes
Huw Morgans (Senior Engineering Assistant - Visible Services)	Vale of Glamorgan Council		Executive summary contains 2 errors text reads Value of Glamorgan should be Vale of Glamorgan	Make changes as described	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Page 5 1.4.4 UPD should be UDP	Make changes as described	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Page 9 text reads Figure 1 and Figure presumably Figure 2	Make changes as described	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Table 4 what does it relate to?	Check context of table and ensure it is referenced in text	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Page 16 2.3.2 Local flood risks groundwater Figure and Figure presumably Figures 3 and 4 perhaps better splitting text at his point?	Check context of references and correct	Modify LFRMS as noted	CSL	14/06/2013	Yes

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			Page 21 2.6.1 Para 2 Figure and Figure	Check context of references and correct	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Coastal lowlands, should this refer to Lower Thaw as well? and in Cadoxton section it getting tidal locked?	Review locations described and update as necessary	Modify LFRMS as noted	CSL	28/06/2013	Yes
			2.6.2 Reference to Figures No's not Figures below or split text above the relevant Figures.	Check context of references and correct	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Figures 5 and 6 have wrong annotations should be Severn Estuary Coastal Group and is link correct also on figure 6 Swansea Carmarthen Bay Coastal Engineering Group as source?	Check annotations (may be directly from reference source). Check links are live.	Modify LFRMS as noted	CSL	14/06/2013	Yes
			P26 Table 7 appears to be condensed version of Table 2	This is correct - content is repeated for readers ease of reference.	None			
			Tables 5 and 6 description is wrong should be Tables 8 and 9	Check context of references and correct	Modify LFRMS as noted	CSL	14/06/2013	Yes
			Table 9 includes SCBCEG but not SECG	Make changes as described	Modify LFRMS as noted	CSL	28/06/2013	Yes
			P.50 Table 15 item 6 nationally and internationally sites designated perhaps should read designated sites,	This table is adapted from the SEA and uses same terminology.	None - Change of terminology may confuse readers of Local Strategy and SFA			
			Abbreviations in table not explained or in glossary at the end. SAM LSOA's	Add abbreviations to glossary and check footnotes in table (already includes SAM - but not LSOA)	Modify LFRMS as noted	CSL	28/06/2013	Yes
Councillor R.A. Penrose	Vale of Glamorgan Council		May I ask the Cabinet Member for Environment and Visible Services why the Sully Moors Road and Hayes Road areas of Sully have not been given any priority in the authority's Flood Prevention programme, when major business companies, and employers, in that area have been continually flooded over the past few years, experiencing extensive damage and interruptions to their business activities, and where in the last instance, on the 23rd. December 2012, the village of Sully was virtually cut off, as far as road travel is concerned, by the flooding of these roads and the flooding to Lavernock Road and Sully Road? RESPONSE (abridged): The Council's Local Flood Risk Management Strategy is currently in draft form and subject to consultation and I can confirm that the flooding events at Sully Moors Road and Hayes Road will be included within the document and properly assessed in line with other flooding matters.	Additional information will be included in Strategy with regard to this issue - further data was also provided by NRW (refer comments below). The info from NRW suggests flood issues in this area are predominantly from the Main River	CSL to review new data and add content to Local Strategy as appropriate	CSL	28/06/2013	Yes
Unknown	Website Submission - Dated 17 May 2013 (14:01)		e-Form reviewed and no comments or questions were made	None required				
Andrew Foyle (Welsh St Donats Community Council Member)	Website Submission - Dated 8 May 2013 (17:35) - Welsh St Donats Community Council	General Comments	We have experienced serious flooding in Watery Lane this winter. Remedial work has taken place and the problems resolved. However the success in the future will rely on excess water using the existing road drainage. It is essential that this is properly cleaned and maintained. Any strategy should include provision for this to take place on a regular, perhaps annually as a minimum, basis.	Issues identified will be reviewed and incorporated into Local Strategy as appropriate (flood mechanism confirmed as surface water flooding on road)	Added new measure to Table 4-2 (Reducing the Consequences) - Objective 4 (Seek to reduce flood risks & consequences to identified high risk areas) = Develop and implement a risk based maintenance plan for local and main road drainage	CSL	28/06/2013	Yes
Not stated on response (assumed to be Andrew Foyle as response is very similar to 17:35 submission on same day)	Website Submission - Dated 8 May 2013 (17:06)	Question 1 (Do you have any historic records of local flooding in your area?)	No	N/A				
		Question 2 (Do you agree with the list of Significant Harmful Consequences?)	No - No further clarification provided	N/A				
		General Comments	There is no major flooding in the Welsh St Donats area, but we have had significant problems with the western end of Watery Lane. Work has been done recently to solve the problems occurring last winter. The improvements are working but they are reliant on the existing drains to carry the excess water away. These drains must be maintained regularly to ensure that this happens..	Refer above response	None			
S Vaughn (Local resident?)	Website Submission - Dated 13 May 2013 (14:15)	Question 3: What other indicators should be included? Which should be removed?:	Number of People: 8 Critical Services: Non Residential Properties: 4 Agricultural Land: 4 Roads and Rail: 8 Area of Internationally or Nationally Designated Site: 8 Number of Nationally / Internationally Important Heritage Sites: 8	Meaning of response is unclear - question asked for suggestions of different flood impact indicators or if the proposed ones should be removed.	No further action proposed			
		Question 6: Are there any other RMA's or stakeholder groups missing from the list provided?:	Voluntary organisations that can assist residents that have been flooded, RNLI, CAVRA, Red Cross, WRVS etc.	Voluntary organisations are not classified as RMA's under the FWMA. However, propose that content is added in relevant emergency planning sections to provide completeness	Modify LFRMS as noted	CSL	14/06/2013	

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		General Comments	Cowbridge High Street has flooded 3 times in 25 years Twice in Oct (prob 1998 and one other) and 25 Jan 2013. There are historical flooding photos on the wall in the Vale public house , High St. Cowbridge . I have some photos of one of the October flooding incidents but not good quality as these incidents have happened very quickly and unexpectedly usually in the late evening and when it has been dark. Some residents have photos of the Jan 2013 flooding. Did the Cowbridge Flood Alleviation scheme fail in Jan 2013 ?	<p>CSL = Add details to historic records in strategy. Check source of flood and confirm as non-Main River (the presence of an FAS would suggest Main River)</p> <p>VoGC = On 25 Jan 2013 the flooding on Westgate was not main river, it was surface water / snow melt flowing down onto the road via Darren Farm to the west of Cowbridge. We believe all of the incidents referenced except 25 Jan 2013 were main river flooding – although there has been flooding to Westgate from surface water previously. The Jan 2013 incident has been investigated, recorded and an engineering solution is currently being developed by VoGC (responsible authority). Table 4 picks up Cowbridge as a broader area for investigation. The next round LFRMS will draw on the improved records of flooding, including Dec 2012, Jan 2013 etc. but the detail is not</p>	<p>VoGC to contact resident to obtain photos.</p> <p>Flood incident data Incidents in Cowbridge added to LFRMS content.</p> <p>Recommend query relating to Cowbridge FAS is forwarded to NRW for a response</p>	<p>VoGC = Obtain photos and forward Cowbridge FAS query to NRW</p> <p>CSL = No action</p>	<p>VoGC = June / July 2013</p> <p>CSL = 28/06/2013</p>	Yes
Gary Purnell (Technical Specialist - Flood Risk Analysis)	Natural Resources Wales		Refer: '130521 FINAL Response to Vale of Glam.doc' for detailed comments. Key comments are highlighted below.	Refer below				
			<p>Ecosystem Approach</p> <p>A key element of our "Living Wales" agenda is the recognition of an ecosystem approach and the delivery of Ecosystem services. We believe that your LFRMS is likely to be a key document in setting out how local flood risk management can be used to deliver ecosystem services. The document sets out high level actions relating to sustainable drainage, surface water management, and watercourse flood risk maintenance while taking into consideration social opportunities for local people integrated with ecological processes and biodiversity protection. We are also pleased and encouraged that your Local Strategy will form links between the local spatial planning. We would encourage you to develop opportunities for green infrastructure and the connectivity of networks through the development of flood risk management actions.</p>	Noted - no changes are proposed.	None			
			<p>Section 1:</p> <p>In Section 1.4.3, comments are made that the WFD status ratings for watercourses in the Vale of Glamorgan have not been provided (October 2012). We responded to the scoping documents on 6 December 2012 and advised your that a Local Authority Evidence Package is available http://www.infobasecymru.net (click Publications and then Environment). There is a pack available specifically for Vale of Glamorgan Council and other neighbouring authorities. This will also include any update with regard to WFD data (and supplementary information enclosed).</p>	Link was not passed to CSL in December 2012, however, data has now been downloaded.	<p>VoGC to obtain relevant underlying GIS data from EA for use by CSL.</p> <p>CSL to undertake WFD assessment - but analysis will be delayed if WFD GIS data is not provided</p>	CSL / VoGC	TBC	
		Question 1: Do you have any historic records of local flooding in your area?	Please see attached extracts (3No.) from Environment Agency in respect of the 1998 and 2000 floods. Recent flooding during December 2012 has also highlighted areas of significant risk within the Vale of Glamorgan	Records are of predominantly Main River flooding with some highways drainage issues.	CSL to review and incorporate into Local Strategy as appropriate (flooding may not be 'local' and therefore not addressed in detail)	CSL	28/06/2013	Yes
		Question 1: Do you have any historic records of local flooding in your area?	In reference to Table 3, Indicators for Significant Harmful Consequences, the Natural Resources Wales recommends the inclusion of Llancaiach Historic Landscape as part of the register of Historic Landscapes in Wales as a potential indicator for significant harmful consequences.	Agree with suggestion.	<p>VoG to obtain Shapefile of Llancaiach Historic Landscape area.</p> <p>CSL to include in impact analysis</p>	VoGC / CSL	28/06/2013	Deferred - Dataset could not be obtained in time available. VoG to include in next revision.
		Question 1: Do you have any historic records of local flooding in your area?	<p>Additional areas at risk from flooding, not included in your Local Strategy</p> <p>In the areas of Sully Moors Road and Hayes Road many companies and business aerie affected by floods from Sully Moors. There were access issues to Momentive, Cabot etc., and also flooding issues for the Ty Hafan Hospice off Hayes Road. The Village of Sully was almost isolated and cut off for access, because flooding affected not only Sully Moors Road but Lavernock Road near Cosmeston.</p> <p>Another area in the Vale of Glamorgan not included in your Local Strategy is Llancaiach.</p> <p>Many surface water problems resulted in highways being flooded e.g. Concrete Road B4265 near St.Athan, Cowbridge area, across A48 from Darran Valley, Bonvilston A48. Issues relevant to Rhoose should also be considered.</p>	Comments noted and will be included in Local Strategy along with data provided in Question 1	Modify LFRMS as noted	CSL	28/06/2013	Yes

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		Question 2: Do you agree with the list of Significant Harmful Consequences Indicators?	Within Table 3 Human Health: Critical Services, reference is made to the "power and water services," which we recommend? is replaced with "utilities infrastructure". The indicator appears to be comprehensive and reasonable.	Agree with suggestion.	Modify LFRMS as noted	CSL	14/06/2013	Yes
		Question 3: What other indicators should be included? Which should be removed?	In Table 3 reference is made o Human Health and we suggest that this is changed to read "Social/Human Health". This Table would then correspond to the three key Flood Risk Management objectives. Also within the end column under this indicator, that is, number of people, we recommend inclusion of "Number of Commercial properties at risk from flooding". Please also refer to our response in answer to Question 2.	Agree with suggestion for Social / Human Health. Commercial properties are already counted under 'non-residential properties' - Text will be amended to make this clear.	Modify LFRMS as noted	CSL	14/06/2013	Yes
		Question 4: Refer back to Table 3. Please rank these indicators in order of importance to you.	The indicators are appropriately categorised in order of importance. They also follow the logic of the three key Flood Risk Management Objectives, they are, Social, Economic and Environmental.	Noted - no changes are proposed.	None			
		Question 5: Are there any other significant artificial bodies of water (canals, reservoirs or lakes) that should be considered by this Strategy?	We are not aware of any other bodies of water which should be included.	Noted - no changes are proposed.	None			
		Question 6: Are there any other RMAs or stakeholder groups missing from the list provided?	We recommend that reference to our legacy bodies Environment Agency and Countryside Council for Wales (CCW) is replaced with Natural Resources Wales throughout this document. The lists of RMAs/other groups contained within this section appear to be comprehensive.	Noted - naming will be corrected throughout document	Modify LFRMS as noted	CSL	14/06/2013	Yes
		Question 7: Do you agree with the current division of organisations between Table 8 (RMAs) and Table 9 (other stakeholders)?	We recommend that reference to South Wales Trunk Road Agency is included in Table 8 instead of Table 9 because this Agency has similar roles and responsibilities (for the trunk roads only) as the Highways Department of the Vale of Glamorgan Council.	Agree with suggestion.	Modify LFRMS as noted	CSL	14/06/2013	Yes
		Question 8: Do you agree with the roles and responsibilities as described?	The roles and responsibilities are sufficiently covered.	Noted - no changes are proposed.	None			
		Question 9: Do you agree that the overall objective of the Strategy should be 'reducing the consequences' of flooding?	Yes. Your Local Strategy objectives, associated measures, timescales, funding and key partners are outlined in Sections 4.5 – 4.8. We support the inclusion of BAP Habitats. We also recommend that the footnote [1] on page 38 also makes reference to European Protected Species, and Biodiversity Action Plan (BAP) Species. Throughout your Local Strategy Objectives and Measures there are opportunities to explore the ways in which the environment can be enhanced by measures that decrease flood risk such as making use of innovative land management measures, which also have conservation gains. We support the measures at reducing the consequences and in achieving the local objective of developing local planning control policies to ensure sustainable flood and coastal erosion risk management measures are delivered by development. An ecosystems approach and opportunities for environmental enhancements should be considered through all objectives and stages of development, including policy development; discussions; raising awareness and understanding; development and design of management proposals; and funding criteria.	Footnote will be added as suggested . Other content noted - no changes proposed.	Modify LFRMS as noted	CSL	14/06/2013	Yes
		Questions 10 to 17 (inclusive):	We note how you have adopted the 4 overarching National Flood Risk Management Objectives and have used the 11 sub-objectives of the National Strategy, which correspond to your Local Objectives. We found information contained in Tables 11 to 14 useful, which clearly illustrates the interrelationship between specific measures, timescales, key partners and sources of funding (pages 36 to 46	Noted - no changes are proposed.	None			
		Question 18: What other funding sources could be considered to deliver local flood risk management objectives and measures?	The potential funding mechanisms covered in Tables 11 to 14 and Section 5.1 appears to consider a range of funding sources.	Noted - no changes are proposed.	None			
		Question 19: Have all significant environmental sites and objectives been addressed by this assessment?	We have no comments to provide at this stage.	Noted - no changes are proposed.	None			
		General Comments	We acknowledge that the guidance produced by the Welsh Government to assist Lead Local Flood Authorities (LLFAs) in the preparation of their Local Flood Risk Management Strategies has been adopted.	Noted - no changes are proposed.	None			
			In respect of implementation, we note in Section 4.4 that a time frame of short (0-20 years), medium (20-50 years) and longer term (50-100 years) is considered. Our view is that the delivery of your Local Strategy measures and objectives relies heavily on other production and implementation of other activities, for example, actions of the Flood Risk Management Plans, the updating of guidance and the partnership work of others. Whilst we welcome a joined up approach, your Local Strategy should consider any other aspects/gaps and this should be incorporated within the Strategy and SEA.	Noted - periodic reviews will accommodate these issues. VoGC is not currently a Flood Risk Area and does not require a Flood Risk Management Plan	None			
			Section 7 confirms that your Local Strategy will reviewed regularly with a formal update every six years as a minimum. We understand from you report that you intend to update your Local Strategy following the completion of the Preliminary Flood Risk Assessment (PFRA) in 2017. We recommend that the review of your Local Strategy coincides with the formal review of the National FCERM Strategy in 2017 as opposed to 2018, which is stated in the concluding line of Paragraph 1 of Section 7.1.1. We welcome that other triggers for review will be adopted.	Agree these reviews should be coordinated	Change text to accommodate timing as suggested	CSL	14/06/2013	Yes
			We would suggest that a clear monitoring strategy is produced and implemented, given that in measuring objectives there appears to be a reliance on other monitoring regimes and information from other organisations. It would be useful to know at this early stage, who will be consulted and what information is expected to be provided by those persons. Will this information be useful to you in assessing measures or will you need to set up a more detailed monitoring system?	The intention for a monitoring strategy can be added to the Local Strategy - but suggest that VoGC makes this decision	Update Section 7 to include comments on approach to monitoring	VoGC	06/08/2013	Yes
			References are made to our legacy bodies the Environment Agency and Countryside Council for Wales. These references should be replaced and referred to as "Natural Resources Wales," which came into force from 1st April 2013.	Refer response to Question 6	None			
			There appears to be a typo in comments made in Section 6.1.2, Habitats Regulations Assessment, and 'Cardiff Beech Woodlands SAC' should read 'Cardiff Beech Woods SAC.'	Make changes as described	Modify HRA as noted	CSL	14/06/213	Yes

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		SEA (Baseline Information)	Comments made in reference to Baseline Information, Section 4.2, Water do not convey the significance of water quality. We suggest that further consideration is given to WFD requirements and assessment of water quality. Also please refer to our comments made in reference to Section 1 of your Local Strategy. The results of which will support SEA objective, 2, To maintain and enhance water resources and quality given in Table 6.5.	Make changes as described	Modify SEA as noted	CSL	Await WFD data	Yes
		SEA (Section 5 Environmental Issues)	Comments made in Section 5 Environmental Issues and Problems do not convey the significance of water quality. We suggest that further consideration is given to WFD requirements and assessment of water quality. Also please refer to our comments made in reference to Section 1 of your Local Strategy. The results of which will support SEA objective, 2, To maintain and enhance water resources and quality given in Table 6.5.	Make changes as described	Modify SEA as noted	CSL	Await WFD data	Yes
		HRA	We have no comments to provide at this stage.	Noted - no changes are proposed.	None			
		Future Working Arrangements	We trust our advice is of use and please do not hesitate to contact us to discuss our advice and comments further. Please note our advice may alter should there be material changes to information and data. We will be pleased to have feedback from you and be informed as to how our advice has been reflected in the final SEA and Local Strategy documents. We note that the finalised Local Strategy will be published by the Council following consultation feedback. We look forward to the opportunity of commenting on relevant specific plans and projects when more detailed information becomes available. We would also request to be informed about progress on the implementation of measures specified and on any subsequent detailed actions. Please could you forward a copy of your final Strategy to us?	Noted	VoGC to provide copy of Local Strategy to NRW when published	VoGC	TBC	TBC



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