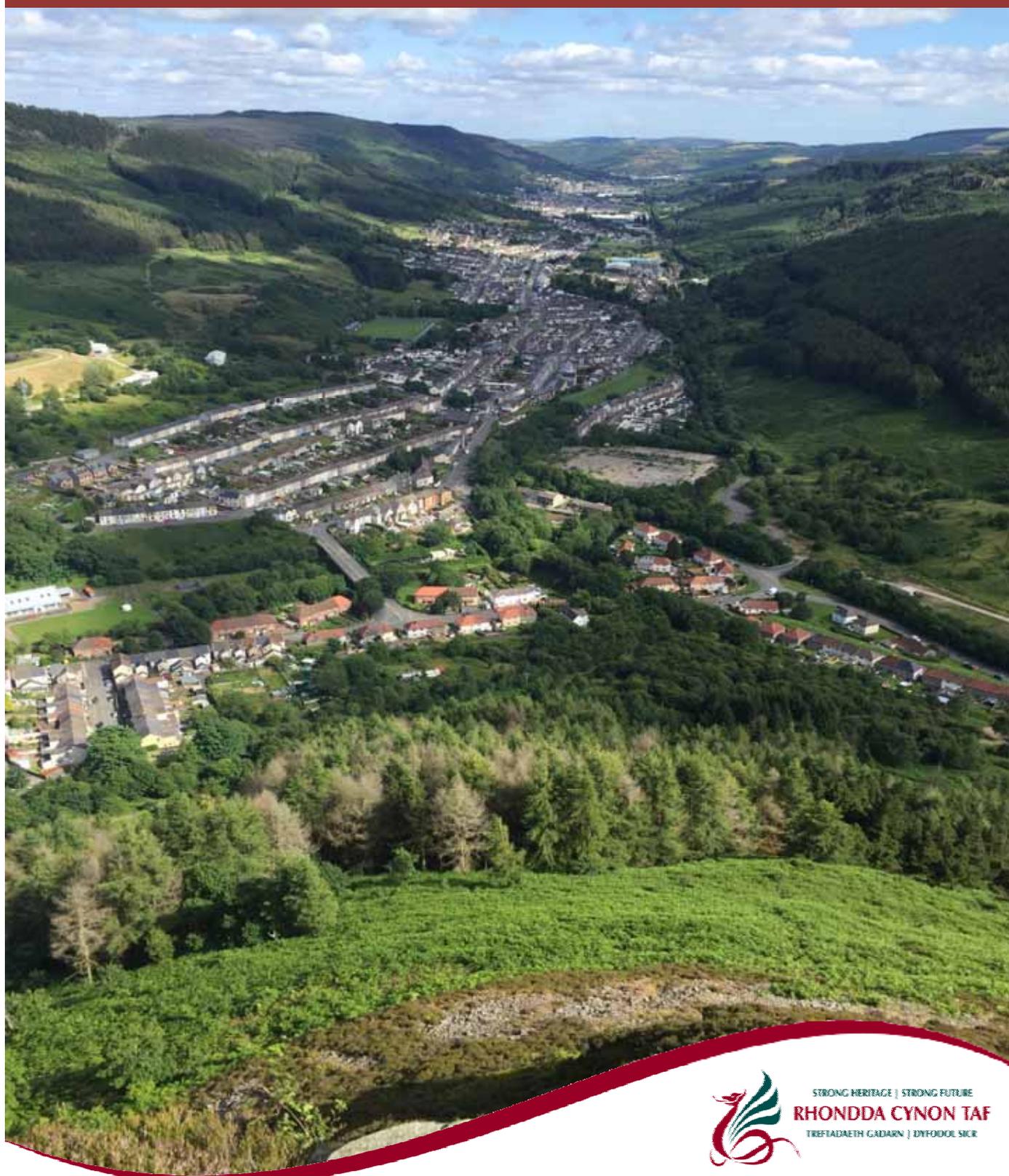


# RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL

## Flood Risk Management Plan

### VOLUME 1



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**RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL  
FLOOD RISK MANAGEMENT PLAN**

**VOLUME 1**

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## FOREWORD

*During recent years, communities in Rhondda Cynon Taf have experienced the severe impacts and consequences of flooding. We have also witnessed other areas of the United Kingdom being subjected to devastating flood events. It is widely held that floods such as these are likely to become more frequent as the effects of climate change develop. The consequences of this unchecked expected increase in flooding will likely see greater risks to life, the economy and the environment of Rhondda Cynon Taf. In response to the above, Rhondda Cynon Taf County Borough Council has developed a holistic response to managing flood risk in the form of its first Flood Risk Management Plan. The Flood Risk Management Plan has been prepared with due deference to the objectives outlined in Rhondda Cynon Taf County Borough Council's Local Flood Risk Management Strategy, published in 2012.*



*The Flood Risk Management Plan is a key milestone in ensuring that the risk of flooding within Rhondda Cynon Taf is managed as a whole, integrating the work done by the Council, Government Bodies, Water Companies, communities and individuals. The Flood Risk Management Plan sets out the various measures that will be used to both gain a greater understanding of; and manage flood risk within Rhondda Cynon Taf. It should be stressed that the measures outlined within the Flood Risk Management Plan only contribute to the management of flood risk, aiming to assist in the prioritisation of flood risk management interventions where most required. Given the current pressures on public finance, it would be unrealistic to protect all property and infrastructure from the risk of flooding.*

*The Flood Risk Management Plan focuses on local flood risk, defined as flooding caused by surface runoff, groundwater and ordinary watercourses (streams, ditches etc.). This type of flooding was responsible for the highly publicised flooding of 2009, and is as an important mechanism of flooding within Rhondda Cynon Taf as is flooding from main rivers. However, it is appreciated that it is not the source of flooding that is of importance to those affected, but the effects. The Flood Risk Management Plan therefore sets out how Rhondda Cynon Taf County Borough Council 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.*

*Measures within the Flood Risk Management Plan outline how Rhondda Cynon Taf County Borough Council will attempt to gain a better understanding of the risks of flooding. By using modern modelling software it is possible to determine properties that are at risk from flooding, or are likely to be at risk of flooding in the future. It is appreciated that householders may have concerns about using models to determine areas of flood risk, but they are a significant and important tool in ensuring that limited resources are used in an effective manner to target flood risk measures to areas at the highest risk.*

*The Flood Risk Management Plan presents Rhondda Cynon Taf County Borough Council's preferred methodology for dealing with and better understanding flood risk and ensuring that communities, infrastructure and the wider environment are more resilient to the impacts of flooding and climate change.*

*A. Morgan*

**Councillor Andrew Morgan**

Leader of the Council, Rhondda Cynon Taf County Borough Council

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## **1.0 PURPOSE OF THE FLOOD RISK MANAGEMENT PLANS**

### **1.1 What is a Flood Risk Management Plan?**

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

This Flood Risk Management Plan (FRMP) has been developed with this in mind and sets out how Rhondda Cynon Taf County Borough Council (RCTCBC) will manage flooding over the next six years, so that the communities and environment at highest risk benefit the most. In doing so, this Flood Risk Management Plan takes forward the objectives and measures set out in our Local Flood Risk Management Strategy (LFRMS), published in January 2013. The Local Flood Risk Management Strategy for Rhondda Cynon Taf County Borough Council can be found by following the link at [www.rctcbc.gov.uk/flooding](http://www.rctcbc.gov.uk/flooding).

This Flood Risk Management Plan also aims to achieve some of the objectives set out in the Welsh Government's National Flood and Coastal Erosion Risk Management Strategy (FCERM) which provides the national framework for flood and coastal erosion risk management in Wales through four overarching objectives:

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

### **1.2 What is Included in this Flood Risk Management Plan?**

The information included in Rhondda Cynon Taf County Borough Council's Flood Risk Management Plan includes the components set out in the Flood Risk Regulations 2009. Most of this information has been gathered and updated through this first cycle, and has been drawn from the findings of our Preliminary

Flood Risk Assessment and the measures we identified and set out in our Local Flood Risk Management Strategy.

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

To do so, this Flood Risk Management Plan highlights the areas which are most at risk from surface water flooding and ordinary watercourse flooding in Rhondda Cynon Taf County Borough Council and draws the conclusions from these risks, setting out the measures we will take over the next 6 years to mitigate these risks and make our communities more resilient.

Due to the nature of flooding and current funding situation, we have also looked at measures to reduce the likelihood of flooding using non-structural measures, including raising awareness of flooding and better understanding of local flooding issues. We have looked to address all aspects of flood risk management, focusing on prevention, protection and preparedness as required by EU legislation, as well as recovery and review.

## **1.3 Legislative context**

### **1.3.1 Flood Risk Regulations 2009**

The Flood Risk Regulations 2009 transpose the European Union Floods Directive (Directive 2007/60/EC on the assessment and management flood risk) into domestic law in England and Wales. The aim of the Directive is to provide a consistent approach to flood risk across Europe.

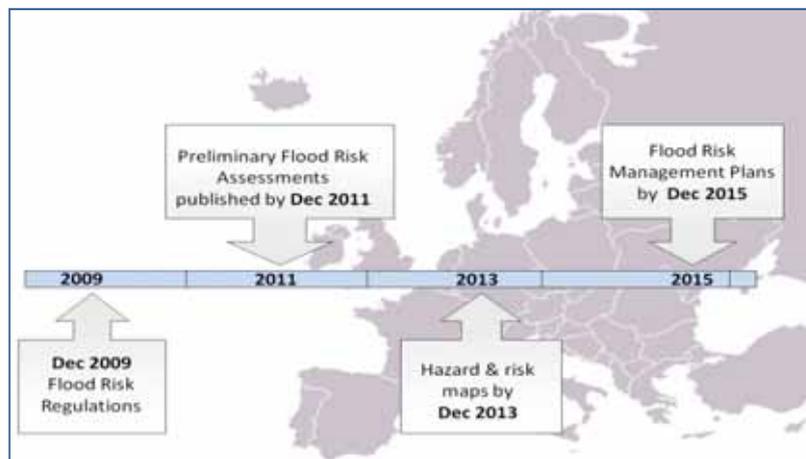
Under the Regulations, Rhondda Cynon Taf County Borough Council were identified as a Lead Local Flood Authority (LLFA). While Natural Resources Wales (NRW) is responsible for producing Flood Risk Management Plans at a river basin district level for communities at risk of flooding from main rivers and the sea, Lead Local Flood Authorities are required to produce local Flood Risk Management Plans to manage flooding from surface water and ordinary watercourse.

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

- Preliminary Flood Risk Assessment;
- Flood Hazard and Flood Risk Maps; and
- Flood Risk Management Plans.

These required publications are discussed in further Section 5.0 and the timeline for the publication of the requirements is presented in Figure 1.

**Figure 1:** Flood Risk Regulations 2009 Timeline



### **1.3.2 Flood and Water Management Act 2010**

The Flood and Water Management Act 2010 was introduced in April 2010 in England and Wales and set to implement many of the recommendations made by Sir Michael Pitt's Review of the widespread flooding of 2007 in the UK. The Act was also intended to clarify roles and responsibilities between Risk Management Authorities (RMA's).

Under the Act, the Welsh Government was required to produce a National strategy for Flood and Coastal Erosion Risk Management. Lead Local Flood Authorities were required to produce a Local Flood Risk Management Strategy in partnership with other risk management authorities. The strategy was published in January 2013 and is discussed further in Section 4.3.

## 1.4 Water Framework Directive

The Water Framework Directive (WFD) is a European Union directive which came into force on December 22<sup>nd</sup> 2000. The aim is for Member States to adopt a holistic approach to water management, considering surface and groundwater in both qualitative and quantitative terms, by 2015. The WFD establishes a legal framework to protect and restore clean water across Europe and ensure its long-term, sustainable use.

The directive's key objectives, as set out in Article 1, are to:

- prevent further deterioration and protect and enhance the status of aquatic ecosystems and associated wetlands;
- promote sustainable water use based on long term protection of available water resources;
- aim at enhanced protection and improvement of the aquatic environment;
- ensure the progressive reduction of pollution of groundwater and prevents its further pollution;
- contribute to mitigating the effects of floods and droughts.

The overriding objective, set out in Article 4 of the Directive, is that Member States are required to achieve “good surface water status” and “good groundwater status”, assessed by ecological and chemical qualities, and to prevent the deterioration in quality of those waters already classed as “good”. There are limited expectations to achieve these objectives. For example, bodies of water which have been irrevocably and heavily modified will be required to achieve a status of “good ecological potential”, which is equivalent to achieving good status given the constraints of the modifications.

The best model to achieve these objectives is management by river basin districts, rather than according to administrative or political boundaries. It is therefore required that Natural Resources Wales and the Environment Agency must produce and update a River Basin Management Plan for each district, setting out a programme of measures for the achievement of “Good Status”.

There is a requirement for a coordinated approach on a River Basin District level between the Environment Agency, Natural Resources Wales and lead Local Flood Authority as the Flood Risk Management Plans and the River Basin River District Management Plans are developed.

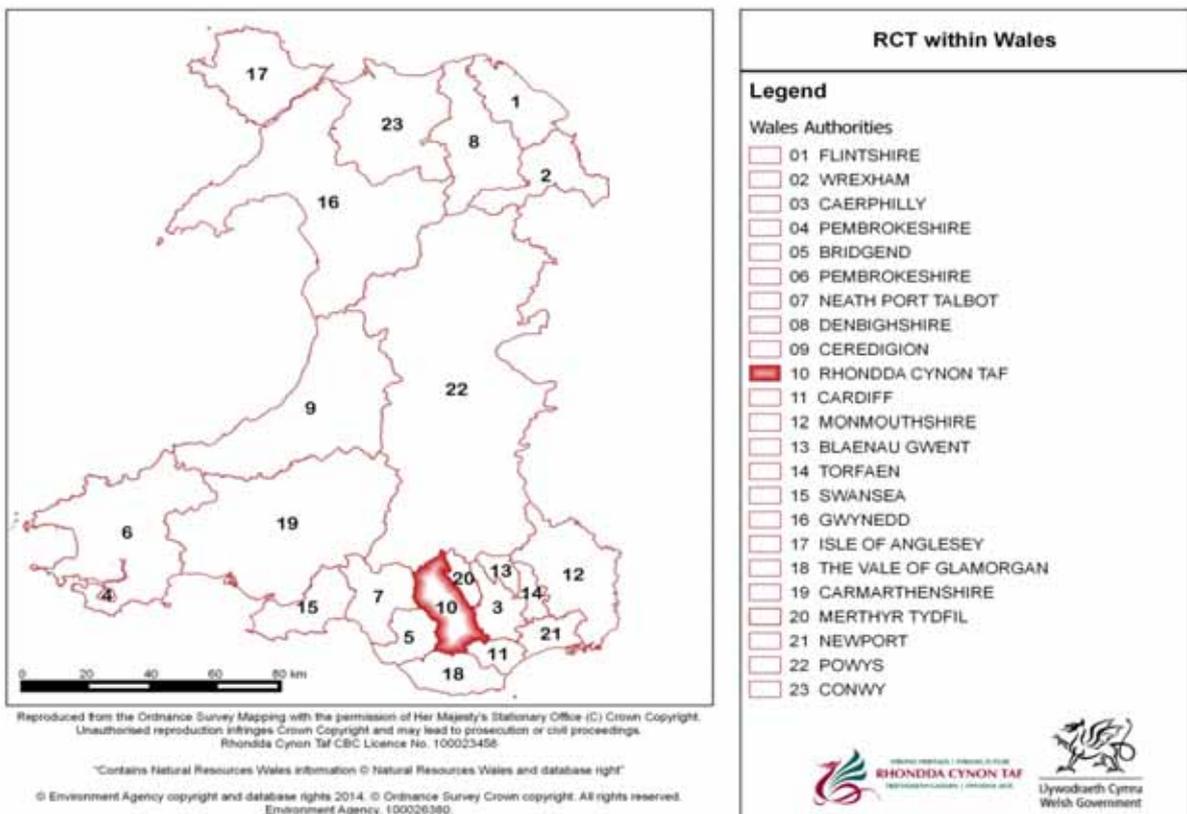
## 2.0 SUMMARY OF RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL

### 2.1 Administrative Area

This Flood Risk Management Plan encompasses the administrative area of Rhondda Cynon Taf County Borough Council.

Rhondda Cynon Taf County Borough Council is Unitary Authority situated within the valleys of South East Wales and is the second largest authority in Wales, formed in 1996 from former Borough of Rhondda, Cynon Valley and Taff Ely, excluding the areas of Pentyrch and Creigiau, which were incorporated into Cardiff City Council. Rhondda Cynon Taff County Borough Council covers an area of approximately 42,400 Hectares with a population of 234,300 (census 2011). Rhondda Cynon Taff County Borough Council is bordered to the north by Merthyr Tydfil and Powys County Borough Councils, Caerphilly County Borough Council to the east, Cardiff City Council and The Vale of Glamorgan County Borough Council to the south and Bridgend County Borough Council and Neath Port Talbot County Borough Council to the west. A location plan and administrative setting is presented in Figure 2.

**Figure 2:** Location of Rhondda Cynon Taf County Borough Council within Wales



## 2.2 Land Use

The area was originally settled after the last ice age, between 8 and 10,000 years ago. There are Bronze Age, Iron Age and Roman remains, mostly situated on the upland plateau. It is likely that the valleys were heavily wooded and very wet. In time, farming developed and there is evidence of early earth and timber 'platform houses' on the valley sides; later, local stone was used for the construction of farms and churches. Llantrisant is most likely the oldest town. The population of the area was very small but farming would have changed the landscape by clearing and managing woodland, creating fields, draining and cultivating land. Watermills provided small scale power generation for flour and cloth production. Local place names provide clues to this pre-industrial history.

The Industrial Revolution brought a significant change to the area. Iron ore deposits in the north and south of the coalfield basin, combined with nearby exposures of limestone and a ready supply of timber for charcoal, led to the development of the iron industry (Merthyr, Aberdare, Hirwaun and Llanharan/Llanharry) by the first half of the 19<sup>th</sup> century. Coal soon replaced charcoal as the fuel and as more coal seams were discovered, mining technology advanced, railways and ports were built and the coal industry became dominant across the area. In response, towns grew rapidly as migrants arrived to work in the new industries; local stone was quarried to build the densely packed rows of terraced houses that are characteristic of the South Wales Valleys. Pitheads were the focus of each mining village, taking up relatively little space as most people were employed underground. The waste from coal extraction, and from iron manufacture, was piled on hill tops and valley sides.

Industry had a huge impact on the water environment with the construction of weirs and water abstractions for industrial use and then returned, filthy, to the river. Streams were culverted and large quantities of water were pumped from mines to allow the seams to be worked. The valley towns developed during this period, providing services for local residents. Coal production peaked in the first half of the 20<sup>th</sup> century and the valleys population began to decline in the second half as the pits closed. Industrial estates were built to provide alternative sources of employment, initially at Treforest and Hirwaun and later on many reclaimed colliery sites. The southern half of the County Borough has seen a rapid expansion of residential development from the second half of the 20<sup>th</sup> century, which has stemmed the population decline.

Agriculture is still a significant land use as is forestry; in particular government owned conifer plantations, although they employ very few people.

The history of the area means that the main rivers are heavily modified with adjacent built up areas along much of their length. Many of the watercourses in the built up area and on reclaimed tips have been culverted or channelled. Areas of commercial forestry and farming have been drained to increase production.

### **2.3 Geology**

A review of available geological information indicates that Rhondda Cynon Taf is underlain by superficial deposits, consisting of Glacial Till and River Deposits, overlying Lower and Middle Carboniferous Coal Measures, consisting of mudstones, sandstones, siltstone, coal, ironstone and Ferricrete, which cover a significant area of the authority.

In the north and south of the county the underlying millstone grit and Carboniferous limestone is exposed: the northern band, in the foothills of the Brecon Beacons, being wider than the southern outcrop.

Superficial deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back around 2.6 million years. These deposits are mostly unconsolidated sediments such as gravel, sand, silt and clay. Within Rhondda Cynon Taf, superficial deposits associated with fluvial deposition, such as river gravels and alluvial clays and sands, are found at the floors of the main river valleys. Glacial Till is noted within valleys of minor watercourses and is more persistent in the north of the authority.

Areas of peat accumulation are found across the authority, with some extensive areas at higher altitudes in the north of the authority. These are considered to have good flood storage potential.

### **2.4 Hydrogeology**

The Carboniferous Coal measures form the largest aquifer within Rhondda Cynon Taf, classified by the Environment Agency as a Secondary A aquifer, which means that these rocks are capable of supporting water supplies at a local rather than strategic scale. Within Rhondda Cynon Taf it is likely that these rocks provide an important source for base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The Carboniferous limestones form a locally important aquifer.

Groundwater movement is likely to be controlled by intergranular flow within the sandstones of the coal measures and fracture flow within the mudstones and limestones.

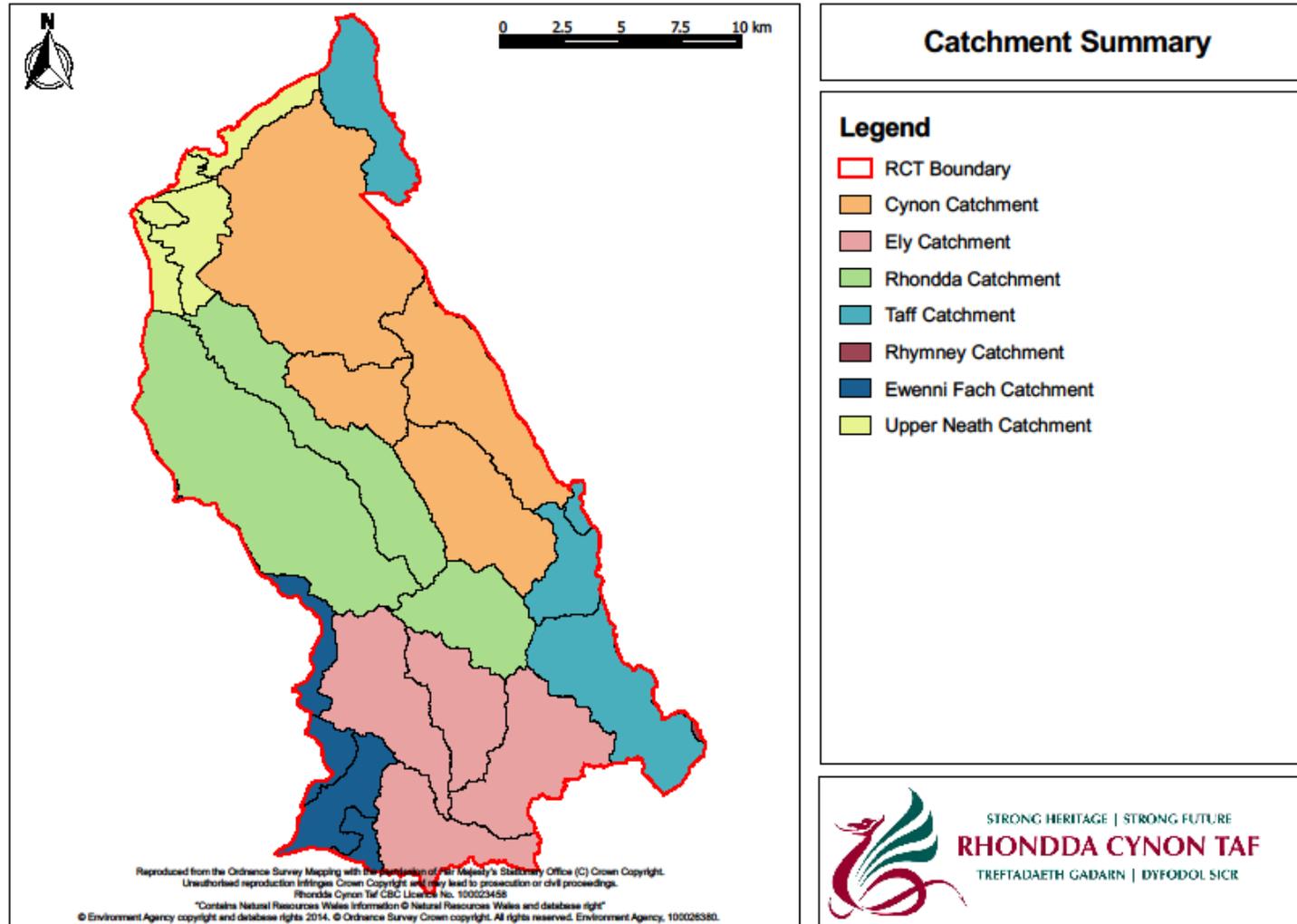
Due to the history of coal and ironstone mining in the south Wales coalfield there have been extensive underground workings, not all of which are mapped. During coal production in the twentieth century mines were routinely pumped to facilitate working and since the cessation of mining activity, this ground water pumping has been stopped. Ground water conditions are likely to have changed and there is anecdotal evidence of rising ground water levels. (For example, at Tir Founder fields in Aberdare); however, the impacts on ground water by the cessation of pumping are still poorly understood.

## **2.5 Catchment Characteristics**

The catchments of the South East Wales Valleys within Rhondda Cynon Taf are the Rhondda, Cynon, Taff and Ely. Each catchment is characterised by steep sides, which are susceptible to intense rainfall and associated flash flooding. The combination of topographic, geological and geographical factors causes the catchments within Rhondda Cynon Taf to have an almost immediate response to rainfall with events often subsiding in hours, rather than days.

The character of the landscape reflects the geological history. The high ground forms a plateau sloping gradually to the south, cut by steep sided and relatively straight valleys carved by glaciers in the last ice age. The most southerly glacial cwms in Britain are spectacular features of the upper Rhondda and Cynon Valleys. These catchments are described in more detail below. Figure 3 displays the catchments within the boundary of Rhondda Cynon Taf County Borough Council.

**Figure 3:** Catchments within Rhondda Cynon Taf County Borough Council



## 2.5.1 Rhondda Catchment

### 2.5.1.1 Hydrology

The Rhondda Valley is comprised of the Rhondda Fach in the east and the Rhondda Fawr in the west as two distinct valleys, separated by Mynydd Maendy.

The Rhondda Fawr is sourced on the south eastern slopes of the Craig y Llyn, where a series of watercourses, including the Nant Melyn, Nant Carnfoesen and Nant Garreg-lwyd, plunge over waterfalls and merge together to form the Rhondda Fawr. The key settlements in the Rhondda Fawr are Treorchy, Tonypany and Porth, with built up areas extending along the valley floor from Blaenrhondda in the north all the way to Porth. The headwaters are generally in a 'natural' condition whilst the main river channel is heavily modified.

The main tributary streams flowing into the Rhondda Fawr from the west are the Nant Selsig (Blaencwm), Nant Saerbren (Treherbert), Nant Cwm Parc (Treorchy) and the Nant Clydach (Tonypany). These tributaries are generally modified by urban development on the valley floor with unmodified headwaters. The only significant tributary from the east is the Nant Orchi (Treorchy) which is mostly rural.

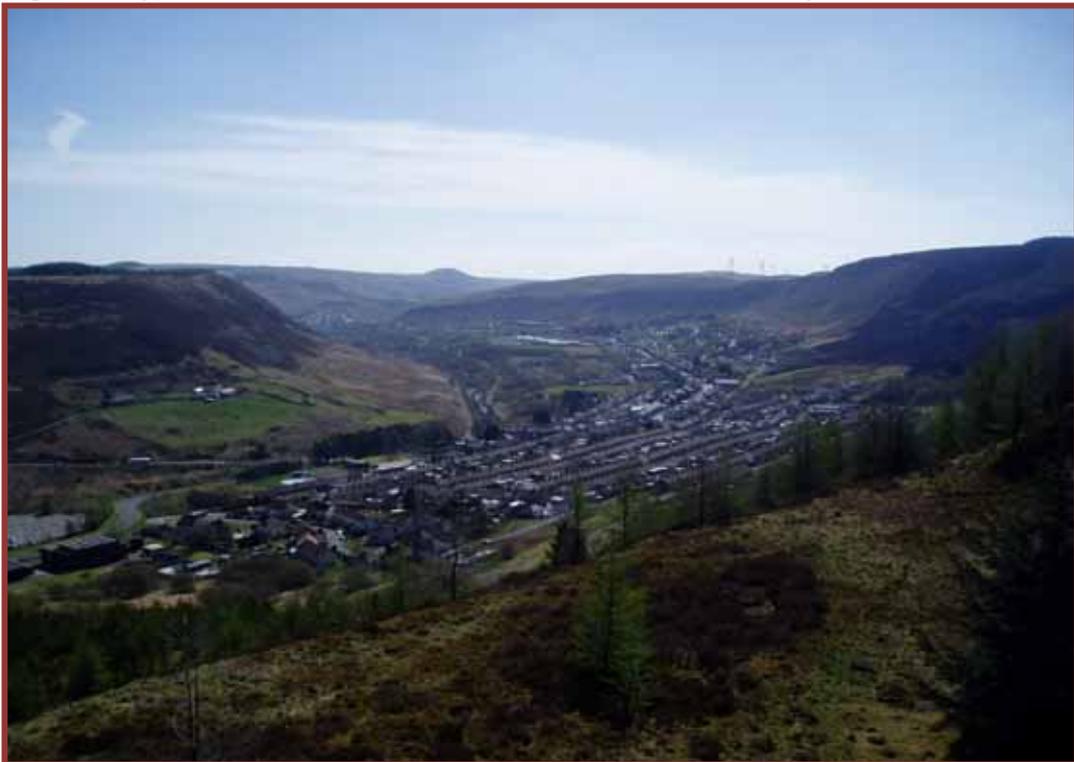
**Figure 4:** Typical view of the Rhondda Fawr with the town of Treorchy



The Rhondda Fach is sourced approximately 1 mile to east of the Rhondda Fawr with tributaries firstly being controlled within the Llest-wen Reservoir. Ferndale is the key settlement in Rhondda Fach and although there is urban development along the whole valley, from Maerdy to Porth, north of Wattstown it is generally above the main river level. For much of its length the Fach has a more natural river profile, the modified channel sections being mostly north of Maerdy (reservoirs) and between Wattstown and Porth.

There are no significant tributaries of the Rhondda Fawr or the Afon Rhondda.

**Figure 5:** Typical view of the Rhondda Fach with the town of Maerdy



The confluence of the Rhondda Fach and the Rhondda Fawr is situated in the town of Porth, where the Afon Rhondda continues to drain the catchment to the south, with its confluence with the Afon Taf in the town of Pontypridd. This section of river channel is modified throughout.

The Afon Rhondda is characteristic of a fluvio-glacial valley, with steep-sided valleys and extensive urbanisation of the narrow valley floors. The urban settlement is characterised by terraced streets along the valley floor and lower slopes, with the main road, rail (Fawr only), water and sewerage infrastructure located in the river corridor. Subsequent to the decline in the coal industry, extensive colliery spoil tips have been reclaimed, new industrial sites developed and public open space created. Much of this land is owned by the Council.

The Afon Rhondda Catchment is contained wholly with the boundary of Rhondda Cynon Taf.

### **2.5.1.2 Ecology**

The upland plateau includes extensive areas of deep peat, on the boundary with Neath Port Talbot. The land use is predominantly coniferous forest, originally planted in the 1970's, with the majority in the ownership of the Welsh government (40% of the land area). There are also areas of privately owned land on the plateau and valley sides, which are mostly used for sheep and pony grazing. There are a number of windfarm developments on the plateau where peatland management is a requirement of the planning consent.

Within the Rhondda catchment there are Sites of Special Scientific Interest at Mynydd Ty-Isaf Rhondda (which includes Cwm Saerbren and its glacial cwm and alpine vegetation), Blaenrhondda Road Cutting (geological exposure) and the oak woodlands of Craig Pont Rhondda, or as it is better known Glyn cornel (which is also part of the Glyn cornel Local Nature Reserve). Outside the built up area, much of the land is designated under planning policy provision in the Local Development Plan as Sites of Importance for Nature Conservation (SINC). The SINC designations include extensive areas of upland forestry and unplanted habitat, where, amongst other habitats, there is a concentration of upland blanket bog (much of which has been planted and partly drained by the Forestry Commission). Elsewhere the valley sides support extensive areas of ffridd, a particularly characteristic habitat (and species rich mosaic of habitats) which is comprised of complex mixtures of woodland, acid grassland, heath, marshy grassland, undisturbed coal spoil, cliff and scree, and scrub. The ffridd occupies the steep valley sides between the upland plateau above and the urban settlement boundary below, and is a superb example of habitat connectivity form important 'wildlife corridor' and wonderful aesthetic backdrops to the Rhondda towns and villages. The Rhondda Rivers are also a SINC, and are important for their riparian habitats and associated species, including salmon, dipper and otter. There are also a number of Regionally Important Geological Sites (RIGS) in Rhondda.

There is capacity to develop on a landscape, multi-benefit land and habitat restoration schemes as part of planning agreement requirements for a number of large wind farm schemes on the high coal field plateau. If successful these would deliver extensive peat bog and upland wetland restoration, carbon storage, flood risk management at source and grass fire control outputs.

## **2.5.2 Cynon Catchment**

### **2.5.2.1 Hydrology**

The Afon Cynon is sourced in the area northeast of Penderyn, where the Nant Cadlan issues from Carboniferous Limestones and sandstones on the southern fringes of the Brecon Beacons National Park. The Nant Cadlan and other minor tributaries merge into the Afon Cynon to the east of Pontbren Llwyd. In the upper Cynon Valley, the high ground of Craig yr Llyn forms the watershed with the Rhondda to the south. The Afon Cynon joins the Taff at Abercynon.

The catchment includes some areas of coniferous forestry on the plateau and the valley sides and significant areas of farmland, again used largely for sheep and pony grazing. There are a number of reclaimed coal spoil tips, often in Council ownership. The Council's operational landfill site is located on the plateau at Bryn Pica, northeast of Aberdare.

The principal town in Cynon Valley is Aberdare and the key settlements are Hirwaun and Mountain Ash. The Cynon Valley has a wider valley floor than that of the Rhondda and there is more undeveloped land, including areas of floodplain, between the settlements. There are also more industrial sites and public open spaces/ playing fields on the valley floor, together with the main road, rail and water infrastructure. Terraced Victorian housing and more modern developments occur throughout the valley.

The Valley is dominated by the Afon Cynon and a number of important valleyside tributary streams: these include the Nant Y Bwlch (Hirwaun), Afon Dare (Aberdare), Nant Melyn (Penywaun), Nant-y-gwydel (Llwydcoed), Nant yr Derlwyn (Trecynon) Nant Pennar (Mountain Ash), Nant Gwawr (Aberdare) and the Aman River (Aberaman). In addition the Cynon catchment also includes the separate tributary of the Afon Taf, the Nant Clydach, which is sourced in the highlands within St Gwynno Forest. From St Gwynno Forest, the Nant Clydach flows to the south into the Afon Taf near the village of Glyncoch. In the main areas of urbanised/post industrial valley bottom, streams and river channel have been modified, and sometimes grossly modified by a combination of culverting and canalisation as a result of housing development, industrial activity and tipping, coal mining, road building, and flood prevention: however, only the lower parts of the Dare and the Aman have significant built development. Elsewhere the Afon Cynon and many of its tributaries have natural stretches of riparian corridor, with largely natural bed and bank features. There is also a remnant section of the Aberdare Canal in Aberdare and remnants of the locks to the Glamorgan Canal in Abercynon.

The Afon Cynon is characteristic of a fluvio-glacial valley, with steep-sided valleys and urbanisation of the valley floors. The Cynon and Nant Clydach Catchment are contained wholly within the boundary of Rhondda Cynon Taf.

**Figure 6:** Typical view of the Cynon Valley



### **2.5.2.2 Ecology**

The Cynon Valley catchment supports nationally and internationally important areas of marshy grassland and lowland peat, particularly in the upper catchment. There are a suit of European protected Special Areas of Conservation (SAC) and a larger number of SSSIs. The SACs are Cwm Cadlan (a series of base-rich fen and marshy grassland pastures inside the BBNP), Blaen Cynon SAC (marshy and drier grassland, marsh fritillary butterfly habitat and lowland peat bog) and parts of the very extensive and varied habitats mosaics of Coedydd Nedd a Mellte (most of which is within the Neath catchment). The SSSI (some of which are also parts of the aforementioned SACs) also include a number of important grassland sites (with considerable components of marshy grassland and marsh fritillary habitat), at the head of the Cynon Valley these are Bryncarnau Grasslands Llwydcoed, Tir Mawr a Dderi Hir Llwydcoed SSSI, Cors Bryn-y-gaer SSSI, Woodland Park and Pontpren SSSI and Cwm Cadlan SSSI, while further down the Valley there is a further species-rich marshy and drier grassland habitat at Waun Goch:Penrhiw-cradoc SSSI and Caeau Nant Y Groes SSSI. The Cynon

Valley catchment includes the glacial cwm and reservoir which is part of Craig y Lyn SSSI, on the north facing flanks of the coalfield plateau above Rhigos.

The ecological importance of the Cynon Catchment is also evidenced by the number and extent of planning designated Sites of Importance for Nature Conservation (SINC). These include the main River and unmodified (or partially modified) principle tributaries. The river systems support a suit of key river species. The Cynon Valley has extensive areas of floodplain grassland, carr and wetland (which are of regional importance as rare examples of unimproved floodplain habitats with associated species and include Tirfounder Fields, Aberdare and the Wildlife Trust nature reserve at Pwll Waun Cynon, Mountain Ash) and these are included within various River Cynon SINCs and the Cynon River Park (a Local Development Plan allocation). The SINC include extensive areas of upland grassland and heath and forestry plantation, with relic bog habitats, and glacial cwms. The valleyside ffridd is also well established in the Cynon Catchment, with many species rich marshy and drier grasslands, areas of dry and wet heath, ancient and secondary woodlands, species-rich coal tips (old and new). These SINC help support the functioning capacity of the SAC and SSSI network and allows habitat connectivity for a huge range of species. The success of this connectivity can be seen in the health of the marsh fritillary butterfly meta-population, the survival of which is dependent upon a distribution of habitats as a landscape scale. There is heavy infestation of Japanese knotweed on riverside sites, particularly south of Mountain Ash.

As part of planning mitigation for housing, industrial, energy and mining open cast planning permissions there is capacity to develop landscape scale, multi-benefit land and habitat restoration schemes which could deliver habitat and wetland restoration, carbon storage, flood risk management at source and grass fire control outputs.

### **2.5.3 Taff Catchment**

#### **2.5.3.1 Hydrology**

The Afon Taf rises as two rivers, The Taf Fechan and the Taf Fawr, both sourced in the Brecon Beacons, before merging to form the Afon Taf north of Merthyr Tydfil. The Afon Taf flows through the southeast of Rhondda Cynon Taf County Borough Council, flowing into the authority approximately 1km to the northeast of Abercynon. The confluences with the Afon Rhondda, the Afon Cynon and the Nant Clydach are situated at Pontypridd, Abercynon and Glyncoch, respectively.

The Afon Taf leaves Rhondda Cynon Taf to the south of Gwaelod-Y-Garth where it continues to flow southward, outfalling into the Severn Estuary at Cardiff Bay. The valley floor is wider and the plateau lower than in Cynon and Rhondda. Most of the plateau and undeveloped valley sides are farmland with some private forestry and common land on the eastern boundary with Caerphilly.

The principal town of the Taff Valley in Rhondda Cynon Taf County Borough Council is Pontypridd, and urban development extends south to Taffs Well. There is a section of largely undeveloped floodplain between Abercynon and Pontypridd, comprising farmland and an area owned by the Dwr Cymru Welsh Water sewage treatment works. Whilst much of the urban development is characterised by terraced streets, there is more variety of Victorian housing and more recent housing developments. Treforest Industrial Estate, built in the 1930's and more recently extended, occupies the floodplain south of Pontypridd. The A470 trunk road, the rail-line, water and sewerage infrastructure follow the river corridor.

The significant tributaries are the Nant Cae Dwdwg (Cilfynydd), the Nant Gelliwion (Pontypridd), the Ely Brook (Pontypridd), Nant Corrwg (Rhydyfelin), Nant Ffynnon Wen (Upper Boat), Nant y Gedrys (Upper Boat) and Nant Cwmbedw following the Penrhos cutting (Nantgarw). There are some remnant sections of the Glamorgan Canal at Abercynon and Pontypridd and of the 'doctors' canal in Treforest.

**Figure 7:** Typical view of the Lower Taff catchment (Nantgarw)



### **2.5.3.2 Ecology**

There is a European protected SAC at Cardiff beechwoods, which just extends into Rhondda Cynon Taf County Borough Council and which is also designated as part of the Castell Coch Woodlands and Road section SSSI. The Taff Valley also supports woodland SSSI in the very north of the catchment at Penmoelatt SSSI, north of Merthyr where Rhondda Cynon Taf includes part of the rivers western catchment, and in the south at Pontypridd at Coed Gelliwion SSSI. There is also an extensive network of SINC on the valley side with large areas of mosaic ffridd, and semi-natural woodlands (including Craig Yr Hesg Local Nature Reserve in Pontypridd). The River Taff is a key SINC corridor, with important riparian habitats and species, and associated floodplain grasslands and wet woodlands. RIG sites include quarry rock exposures and quaternary floodplain deposits north of Pontypridd.

### **2.5.4 Ely Catchment**

#### **2.5.4.1 Hydrology**

The Ely valley is drained by the Afon Elai, which issues from Carboniferous Coal Measures on the slopes of Mynydd Pen-y-Graig and Mynydd Dinas in Rhondda Cynon Taf. The Afon Elai flows southwards through the principle town of Talbot Green before leaving Rhondda Cynon Taf adjacent to Junction 34 of the M4. The Afon Elai continues through Cardiff and discharges into Cardiff Bay.

The catchment includes the key settlement of Tonyrefail. Only the northern headwaters are confined to narrow steep sided glacial valleys, south of Tonyrefail the undulating terrain has characteristics of the border vale. The Afon Elai has two significant tributaries, the Afon Clun and Nant Muchudd, which are sourced on the western slopes of the Garth and the western slopes of Mynydd Y Glyn, respectively.

The Nant Muchudd rises in the highlands to the east of Tonyrefail, then flowing south to its confluence with the Afon Elai at Ynysmaerdy. The Afon Clun rises in a peat bog near Penycoedcae and flows to the west to its confluence with the Afon Elai in Pontyclun. The Clun has been identified under the Water Framework Directive as an area where pollution is compromising the water quality and a project to address these issues has been established by the Rivers Trust.

**Figure 8:** Typical view of the Afon Elai Catchment

#### 2.5.4.2 Ecology

A short section of the southerly extent of Afon Elai in Rhondda Cynon Taf County Borough Council is part of the Ely Valley SSSI (most of the SSSI lies in the Vale of Glamorgan). A particular feature of the SSSI and the Ely Catchment in RCT is Monk's hood (a native delphinium species). The catchment is particular national importance for its marshy and dry species rich grasslands with the extensive Rhos Tonyrefail SSSI and the Llantrisant Common and Pastures SSSI (part of which is Y Gweria Wildlife trust Nature Reserve). Modelling work has shown that the Ely catchment has one of the best and most connective landscapes of marshy grassland habitat in Wales for the rare marsh fritillary butterfly (which occurs in the Tonyrefail area and which used to be much more widespread throughout the catchment). Considerable conservation efforts from a partnership of organisations are looking to restore this butterfly's historic range. The catchment has a complex network of SINC's which is recognition of the high quality of habitats. The SINC designate a rich range of habitats from upland peat bog and heath, through extensive ffridd areas to more lowland marshy grassland, species-rich meadows, semi-natural (often river valley) woods and a network of streams and tributaries of the Ely (which is also a SINC) with a suit of key riparian species

As part of planning mitigation for housing, industrial, and energy planning permissions there is capacity to develop landscape scale, multi-benefit land and habitat restoration schemes which could deliver habitat and wetland restoration, carbon storage, flood risk management at source and grass fire control outputs.

Whilst there are some discrete areas of public forest (Llantrisant, Trecastle, Dimbath, Tynycoed) and some Common land (Llantrisant) most of the rural area is farmed, largely for sheep cattle and pony grazing with an extensive network of hedges and small woods. There has been major new housing, commercial and industrial development since the 1970s across the catchment. The catchment includes a number of active and disused limestone quarries on the southern edge.

## **2.5.5 Upper Neath Catchment**

### **2.5.5.1 Hydrology**

Part of the administrative area of the Cynon Valley lies in the upper Neath catchment, draining to Swansea Bay and forming part of the West Wales River Basin District. This area comprises a short section of the Nant Gwrelych, and the Nant Wyrfa Isaf, Nant Wyrfa Ichaf and Nant Cors y Pown which drain into the Nant Sychyrd, which forms the County Boundary (with Powys and Neath Port Talbot).

### **2.5.5.2 Ecology**

A small area drains to the Nant Mellte which forms part of the County Boundary with Powys. The limestone gorges of the Hepste, Sychyrd and Mellte and a wider limestone dominated landscape of woods, and grassland habitats are designated as part of the Coedydd Nedd a Mellte SAC and Dyffrynnoedd Nedd A Mellte A Moel Penderyn SSSI. There are a number of RIGS sites associated with limestone and coal measures.

## **2.5.6 Ewenny Fach Catchment**

### **2.5.6.1 Hydrology**

Part of the Ely administrative area in Rhondda Cynon Taf County Borough Council includes the headwaters of the Ewenny Fach which rises on Mynydd Meiros, flows through the key settlement of Llanharan and then west into Bridgend County Borough Council area outfalling to Swansea Bay at Ogmore by Sea. Although only covering a small area of Rhondda Cynon Taf, this is the second area that drains into the Swansea Bay River Basin District.

### **2.5.6.2 Ecology**

Again, species-rich marshy and dry grassland are an important feature of the Rhondda Cynon Taf catchment which includes part of the Brynna A Wern Tarw SSSI spanning the Bridgend boundary near Brynna. The Ewenny Fach (and tributaries) is SINC designated and important riparian corridors. SINC include upland bogs and grassland on the high ground north of Llanharan, and a rich network of wet and dry grasslands and woodlands in lowland areas, and some important brownfield habitats. Key species include strong colonies of Great Crested Newt (often on brownfield land), lesser horseshoe bats and dormice, with important networks of marsh fritillary butterfly habitat associated with the marshy grassland and fen SINC habitats.

As part of planning mitigation for housing, industrial, and energy planning permissions there is capacity to develop landscape scale, multi-benefit land and habitat restoration schemes which could deliver habitat and wetland restoration, carbon storage, flood risk management at source and grass fire control outputs.

## **2.6 Flood Risk in Rhondda Cynon Taf County Borough Council**

This plan has been undertaken based upon evidence and understanding of the present day risk from flooding in Rhondda Cynon Taf County Borough Council. Within the Borough, Main River, reservoir and local sources of flooding are present. This Flood Risk Management Plan focuses from flooding from local sources.

Local Flood Risk is defined within the Flood and Water Management Act 2010 as:

- Surface runoff;
- Groundwater; and
- Ordinary watercourses.

In addition to the above, this Flood Risk Management Plan considers the flood risk from sewer flooding and Highway drainage flooding. An assessment of the local sources of flood risk and other sources effecting Rhondda Cynon Taf County Borough Council is presented in Table 1.

Main Rivers have remained under the remit of Natural Resources Wales and they, in partnership with the Environment Agency, are responsible for the publication of the Severn River Basin District Flood Risk Management Plans.

**Table 1:** Summary of types of Flood Risk within Rhondda Cynon Taf County Borough Council

Type of Flooding		Causes of Flooding	Assessment of Flood Risk in RCTCBC
Surface Water Flooding (includes both ordinary watercourse and surface runoff)	Ordinary Watercourse	<p>Ordinary Watercourse flooding occurs when the capacity of a local drainage channel is exceeded. It also occurs due to blockages at culvert inlets and trash screens. Usually, flooding from culverts occurs following intense rainfall events happen, particularly following leave fall in the Autumn and the blockage of the trash screen with vegetation.</p> <p>Flooding can also occur in culverts when they collapse or are unmaintained.</p> <p>Ordinary watercourse flooding is the most common cause of flooding within RCTCBC.</p>	<p>Historically, ordinary watercourses within Rhondda Cynon Taf County Borough Council have been culverted, a practise that has led to significant flood risk resulting from blockage of inlets and lack of culvert capacity. Commonly, flooding has been experienced following blockages and poor maintenance of a watercourse. This is exacerbated where watercourses are culverted through development, as a culverted watercourse is more prone to blockages and flooding than an open watercourse.</p> <p>This Flood Risk Management Plan will look to implement measures to fully assess the capacity of culverts and where possible seek to replace culverts with open channels and where this is not practical, seek to introduce schemes to lessen the impact of flooding resulting from ordinary watercourse. The management of culverts is reactive and it is difficult to manage this risk proactively. This document will seek to highlight those watercourses at risk and implement a more proactive monitoring of culverts via CCTV equipment.</p>
	Surface Runoff	<p>Surface Runoff occurs when rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving) and has not yet entered a watercourse, drainage system or public sewer.</p> <p>This is particularly prominent following a prolonged wet period when the catchment is saturated, or after an intense storm following a prolonged dry period and rainfall is unable to infiltrate into the sub-strata.</p> <p>Land use and maintenance often serve to exacerbate surface runoff, such as felling of trees, increased impermeable development and agricultural poor practise.</p>	<p>This is common within Rhondda Cynon Taf County Borough Council as a result of the catchments geomorphology and the areas climate.</p> <p>This Flood Risk Management plan will look to reduce the effects of surface runoff by implementing controls on development and introducing sustainable drainage and reducing runoff flows and volumes within the authority.</p>

**Table 1 continued:** Summary of types of Flood Risk within Rhondda Cynon Taf County Borough Council

Type of Flooding	Causes of Flooding	Assessment of Flood Risk in RCTCBC
Groundwater Flooding	<p>Groundwater is subsurface water in the zone of saturation, including water below the water table and water occupying cavities, pores and openings in underlying rocks. Groundwater flooding is the result of groundwater rising up from the underlying aquifer or from water flowing from normal springs at ground level.</p> <p>This type of flooding tends to occur after prolonged periods of rainfall and the area's most at risk are often low-lying areas, where the groundwater table is more likely to be at a shallow depth. I</p>	<p>This is commonly experienced within RCTCBC where development has cut into hillsides without appropriate land drainage installed. Water then seeps/flows out of the hillside into properties and across land.</p> <p>Groundwater flooding is also noted to occur from mines adits following the cessation of pumping. Historically, coalmining operations would pump excess water</p> <p>There is limited local information available which provides evidence on the risk posed by groundwater flooding to RCTCBC and it is notoriously difficult to quantify groundwater.</p>
Combined Sewer Flooding	<p>Combined sewers within Rhondda Cynon Taf County Borough Council are under the ownership of Dwr Cymru Welsh Water. Combined sewers are underground conduits for the removal of drainage water and waste matter from source to treatment works.</p> <p>Flooding arises from combined sewers when excess rainwater entering the system exceeds the capacity of the sewer.</p>	<p>Dwr Cymru Welsh Water have provided information that 293 locations at risk of sewer flooding at varying locations across the authority.</p> <p>Rhondda Cynon Taf County Borough Council will look to work with Dwr Cymru Welsh Water to better understand the risks posed by combined sewer flooding and where the locations are.</p>
Highways Flooding	<p>Flooding to the highway occurs following an intense and short storm event. In these circumstances, the gully systems are unable to accommodate the volume of rainwater. Also, gullies may become blocked by debris.</p> <p>This type of flooding also provides a source of hydrocarbon contamination and is more of a problem when an intense rainfall follows a period of dry weather.</p>	<p>This is a potential problem throughout the authority. RCTCBC attempt to reduce the risk by undertaking gully clearance. This Flood Risk Management Plan will look to introduce soft measures, such as swales and reed beds to reduce flooding.</p>

### **3.0 HOW DO WE CURRENTLY MANAGE FLOOD RISK?**

Rhondda Cynon Taf County Borough Council currently manages flood risk via the following actions:

- Operational procedures;
- Powers bestowed upon all lead local flood authorities under the Land Drainage Act 1991 and Flood and Water Management Act 2010;
- Measures included within the Rhondda Cynon Taf County Borough Council Local Flood Risk Management Strategy; and
- The powers under the Highways Act 1980, where Rhondda Cynon Taf acts in its capacity as the Highways Authority.

#### **3.1 Operational Procedures**

Rhondda Cynon Taf County Borough Council has a number of operation procedures to manage flood within the authority.

1. Routine cleaning of gullies throughout the authority;
2. Emergency cleaning of blocked gullies following reporting of a problem by a member of the public;
3. Routine inspection and clearance of significant flood structures, such as culvert inlets;
4. Emergency inspection of culvert inlets and other significant structures following specific rainfall events;
5. Emergency cleansing of culvert inlets and other significant structures following a report to the authority from a member of the public.

#### **3.2 Regulatory Powers**

The Flood and Water Management Act 2010 bestowed additional duties on lead local flood authorities, which aid in the management of flood risk. The duties include the following:

1. A duty to investigate all flooding within its area, insofar as a lead local flood authority considers it necessary or appropriate (Section 19);
2. A duty to maintain a register of structures and features likely to affect flooding flood risk (Section 21);
3. A duty to contribute to sustainable development (Section 32); and
4. The consenting of structures on ordinary watercourse (Section 29) via a change to the Land Drainage Act 1991.

### 3.3 Local Flood Risk Management Strategy

The Local Flood Risk Management Strategy sets out to satisfy and fulfil the requirements of the Flood and Water Management Act 2010 and adopts a holistic approach to flood risk management.

The strategy sets out, at a high-level, the objectives for managing flood risk within Rhondda Cynon Taf County Borough Council.

The Local Flood Risk Management Strategy is consistent with “The National Strategy for Flood and Coastal Erosion Risk Management in Wales” (Welsh Government 2011), which identifies four overarching objectives:

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

#### 3.3.1 High Level Strategic Position

The Local Flood Risk Management Strategy identified four possible options at the highest flood risk management level for consideration:-

1. **Do Nothing** - acknowledging that flood risk will increase with climate change, increasing the risk of social, economic and environmental damage;
2. **Maintain Flood Risk Management at Current Levels** - acknowledging the social, economic and environmental risks;
3. **Maintain Current Level of Flooding by Improving Flood Risk Management** - keep at pace with climate change by improving flood risk management to maintain current level of protection; or
4. **Reduce the Consequences of Flood Risk** - take action to reduce social, environmental and economic damage due to flooding.

In order to comply with the requirements stated within The National Strategy for Flood and Coastal Erosion Risk Management in Wales, the high level strategy decision chosen by Rhondda Cynon Taf County Borough Council within the Local Flood Risk Management Strategy was to ‘**Reduce the Consequences of Flood Risk**’.

Rhondda Cynon Taf County Borough Council seeks to *Reduce the Consequences of Flood Risk*, by delivering **four core objectives**:

1. To utilise a risk based approach to managing flood risk, recognising that drainage and structural defences may not always be the most appropriate solution;
2. To develop a greater strategic understanding of flood risk from all sources within RCTCBC and at a wider 'catchment scale';
3. To raise community awareness of and actively engage communities in the response to flood risk;
4. Use of local planning policy to ensure that no new flood risk is created and where possible, opportunities to reduce flood risk are taken.

These core objectives are currently being delivered by a series of detailed objectives. These detailed objectives have due regard principally to the following higher tier strategies:

- *National Strategy for Flood and Coastal Erosion Risk Management in Wales* (Welsh Government, 2011);
- *Live. Grow. Aspire. Achieve. 2010-2020 Rhondda Cynon Taf Community Strategy* (Rhondda Cynon Taf County Borough Council, 2010).

Additionally, the detailed objectives attempt to embed sustainable development principles with the aim of enhancing the social, economic and environmental wellbeing of people and communities within Rhondda Cynon Taf County Borough Council.

Table 2 presents Rhondda Cynon Taf County Borough Council's core flood risk management objectives and their relationship to the detailed objectives by which they will be delivered. Table 3 highlights the inter-relationship between detailed objectives and the aforementioned overarching strategies.

**Table 2:** Rhondda Cynon Taf County Borough Council Core and Detailed Flood Risk Management Objectives

RCTCBC Core Objectives				RCTCBC Detailed Objective
1) Risk Based Approach	2) Develop Understanding	3) Raise Awareness	4) Planning Policy	
				1 Reduce distress by decreasing the population exposed to flood risk.
				2 Reduce community disruption by reducing the amount of residential and commercial property exposed to flood risk.
				3 Reduce risk to life by reducing the number of people exposed to risk of flooding of significant depth and velocity.
				4 Reduce disruption to critical infrastructure or support the preparation of plans to allow their operation to be maintained.
				5 Improve or not detrimentally affect water quality
				6 Where possible, improve naturalness - reducing modifications to channels, water bodies and, where appropriate, create or enhance natural floodplain storage linked to nature conservation and landscape initiatives.
				7 Ensure projects are designed and constructed in a sustainable way.
				8 Maintain, or where possible, improve the status of Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSIs), Sites of Importance for Nature and Conservation (SINC) sites and contribute to the RCT biodiversity action plan.
				9 Explore the potential benefits of reducing flood risk through the use of innovative land management techniques.
				10 Provide clarity of stakeholder's responsibilities with regard to flooding and, where possible, seek to support stakeholders in carrying out their responsibilities.
				11 Develop a better understanding of the risks of flooding from surface runoff, groundwater and ordinary watercourses and plan how best to communicate and share information with communities and businesses on all forms of flooding.
				12 Promote resilience at property/community level
				13 Ensure that emergency plans are prepared at local and community levels as required and that response to and recovery from flood incidents is effective.
				14 Ensure that RCT works in partnership with other Risk Partners and works collaboratively with adjacent authorities
				15 Provide flood risk management plans for each area subject to flood risk.
				16 Ensure that investment decisions for the implementation of flood risk management schemes are made on a consistent prioritised basis subject to cost benefit analysis.

**Table 3:** Rhondda Cynon Taf County Borough Council detailed objectives and comparison to NFRMS and RCTCBC Community Strategy and sustainable development objectives

RCTCBC Detailed Objective		National Flood Risk Management Strategy Objectives	RCTCBC Community Strategy Ambitions				Sustainable Development		
			Improve waste management	Improve housing conditions and access	Tackle basic environmental problems	Encourage public awareness and responsibility	Social	Economic	Environmental
1	Reduce distress....	Reducing consequences			✓		✓	✓	
2	Reduce community disruption....		✓	✓			✓	✓	
3	Reduce risk to life....				✓		✓		
4	Reduce disruption to critical infrastructure....		✓	✓			✓	✓	✓
5	Improve/no detriment to water quality....				✓		✓	✓	✓
6	Improve naturalness....			✓	✓				✓
7	Sustainable projects....		✓		✓		✓	✓	✓
8	Maintain/enhance SACs, SSSIs, etc....			✓	✓	✓	✓	✓	✓
9	Land management....			✓	✓		✓	✓	✓
10	Clarity of stakeholder responsibilities....	Raising awareness				✓	✓	✓	✓
11	Increased understanding of local flood risk....				✓	✓	✓	✓	
12	Property/community resilience....					✓	✓	✓	
13	Local and community emergency plans....	Provide effective response				✓	✓	✓	✓
14	Partnership working....		✓			✓	✓	✓	
15	Flood risk management plans....	Prioritising investment	✓	✓	✓	✓	✓	✓	✓
16	Prioritised investment....			✓	✓			✓	

### 3.3.2 Actions and Measures within the Local Flood Risk Management Strategy

The detailed objectives are being delivered through the implementation 38no. measures which are to be implemented in the short (0-20 years), medium (20-50 years) and long term (50-100 years). The measures include both structural and non-structural activities.

The measures have been under the following seven high level themes:

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

The table below outlines the 38no. measures put forward within the Local Flood Risk Management Strategy.

**Table 4:** Local Flood Risk Management Strategy Measures

LFRMS Measure	Measure Title
<b>Development and Planning Adaptation</b>	
1	Establish SuDS Approval Body
2	Water cycle strategy
3	Rhondda Cynon Taf Local Development Plan, Strategic Flood Consequence Assessment and Supplementary Planning Guidance
4	Planning Policy Wales and TAN15
<b>Flood forecasting, warning and response</b>	
5	Flood warning
6	Flood awareness
7	Emergency response plans
8	Community flood plans
9	Multi-Agency flood plans
<b>Land, cultural and environmental management</b>	
10	Land management
11	Environmental enhancement
12	Water level management plan
13	Habitat creation

**Table 4 continued:** Local Flood Risk Management Strategy Measures

<b>LFRMS Measure</b>	<b>Measure Title</b>
<b>Asset management and maintenance</b>	
14	System asset management plans
15	Enforcement of private surface water sewers
16	Power to request Information and civil sanctions
17	Assert register and records
18	Designation of structures
19	SuDS adoption
20	Consenting of structures to Ordinary Watercourses
21	Enforcement to maintain flow in watercourses
22	Enactment of Land Drainage Byelaws
23	Cause incidental flooding for purpose of flood risk management
24	Construction of flood defences
<b>Studies, assessment and plans</b>	
25	Investigation of flooding incidents
26	Local property-level flood mitigation – resilience
27	Local property- level flood mitigation – resistance
28	Pre-feasibility studies/project appraisals
29	Catchment Flood Risk Management Plans
30	Surface Water Flood Modelling
31	Reservoir Flood Plans
32	Flood Risk Management Plans
33	Flood Risk and Hazard Maps
<b>High level awareness and engagement</b>	
34	Partnership Working
35	Community/public engagement/consultation
<b>Monitoring</b>	
36	Habitat Monitoring
37	Weather pattern monitoring
38	Flow monitoring

The full summary of the 38no. measures are presented in Appendix B.

### **3.4 Who we work with to manage flood risk**

Flood risk management should not be left solely to certain organisations; collaboration of all stakeholders, including residents and businesses, is required to manage flood risk. It is therefore vital that stakeholders know of what they can go along with and what they are expected to do to help manage flood risk.

#### **3.4.1 Risk Management Authorities**

'Risk Management Authorities' are certain organisations which have responsibilities around flooding, both new ones from the Flood and Water Management and longstanding ones from previous legislation. A list of the Risk Management Authorities is provided below.

Natural Resources Wales (Formerly the Environment Agency Wales)

The Lead Local Flood Authority (Rhondda Cynon Taf County Borough Council)

The Water Company (Dwr Cymru Welsh Water)

#### **Additional Stakeholders - Internal Partners**

- Spatial Planning Department
- Development Control
- Highways Infrastructure
- Streetcare
- Emergency Planning
- Countryside
- Public Health & Protection
- Building Control
- ICT
- Corporate Estates
- Customer Services

#### **Additional Stakeholders - External Partners**

- Flood Risk Management Wales (The Regional Flood and Coastal Committee [RFCC] in Wales)
- Emergency services
- Network Rail
- SWTRA – South Wales Trunk Road Agency
- CADW
- National Farmers Union
- Local Partnerships, forums and community groups
- Association of British Insurers
- Utility providers

- Land Owners/Estate Owners/Riparian Owners
- Country, Land and Business Association
- South East Wales Flood Risk Management Group (SEWFRMG)
- Housing Associations
- Natural Resources Wales (formerly Countryside Council for Wales, Forestry Commission Wales and Environment Agency Wales)
- Brecon Beacons Park Authority
- National Flood Forum
- Local Resilience Forum
- SuDS Working Group for Wales
- Cardiff University/Cardiff Metropolitan University/University of Glamorgan
- Association of Drainage Authorities
- Professional Institutions

### **3.4.2 Powers and Responsibilities of Risk Management Authorities**

All of the Risk Management Authorities have the following duties and power:

- Duty to be subject to scrutiny from lead local flood authorities' democratic processes;
- Duty to co-operate with other risk management authorities in the exercise of their flood and coastal erosion risk management functions, including sharing flood risk management data;
- Power to take on flood and coastal erosion functions from another risk management authority when agreed by both sides;
- Duty to be subject to scrutiny from the Lead Local Flood Authorities' democratic processes. The key committee is the Safer and Stronger Communities Policy and Scrutiny Committee;
- Duty to inform their own Cabinets and Committees about the progress and implications of flood risk management work in the area.

Co-operation with other risk management authorities includes the following:

- Discuss with other risk management authorities before designating structures and features to ensure consistency;
- Report flood assets, as defined by agreed criteria, as and when they are revealed to officers;
- Assist with Flood Investigation Reports where required;
- Provide local knowledge to SuDS Approval Officers regarding applications in their area;
- Ensure that members of the public who are trying to contact another organisation are swiftly put through to the appropriate organisation;
- Easy sharing of information and data.

This list is not exhaustive but if there is any dispute about whether an activity can reasonably be expected from a Flood Risk Management Authority, the issue will be brought to 'Flood Risk Management Wales' (the RFCC).

## **3.5 Flood Risk Management Functions**

### **3.5.1 Natural Resources Wales**

Historically the Environment Agency (precursor to Natural Resources Wales) led on the management of the risks of flooding from main rivers and the sea. However, as a consequence of the Flood and Water Management Act 2010 certain changes have been made to their role and remit. In addition to flooding from rivers and the sea, Natural Resources Wales has new operational responsibilities in relation to coastal erosion and a wider oversight role for all flood and coastal erosion risk management in Wales.

This change means that Natural Resources Wales has a dual role:-

- 1 Operational responsibilities for flooding from main rivers, the sea and coastal erosion.
- 2 Oversight responsibilities in relation to all flood and coastal erosion risk management in Wales

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

As part of their oversight role, Natural Resources Wales will lead on the provision of technical advice and support to other Risk Management Authorities. They will also lead on national initiatives such as Flood Awareness Wales, the national raising awareness programme, and be the single point of contact for enquiries and information on flood risk, currently being piloted via their new Floodline warning service.

The Flood and Water Management Act 2010 places a number of statutory duties on Natural Resources Wales including:

- 1 Co-operating with other authorities, including sharing data;
- 2 Reporting to the Minister on flood and coastal erosion risk in Wales including the application of the National Strategy; and
- 3 The establishment of Regional Flood and Coastal Committees.

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

- 1 Powers to request information
- 2 The ability to raise levies for local flood risk management works, via the Regional Flood and Coastal Committees
- 3 Powers to designate certain structures or features that affect flood or coastal erosion risk
- 4 The expansion of powers to undertake works to include broader risk management actions; and
- 5 The ability to cause flooding or coastal erosion under certain conditions.

This new allocation of responsibilities is also consistent with Natural Resources Wales' role in relation to the Flood Risk Regulations 2009, which allocates specific responsibility for conducting assessments in relation to mapping and planning the risks of flooding from main rivers, the sea and reservoirs to Natural Resources Wales, as well as providing guidance to Local Authorities on these matters for flooding from other sources.

Under the Regulations, Natural Resources Wales also takes on an assessment and coordination role at a national level, ensuring the correct information is passed back to the European Commission.

### **3.5.2 Lead Local Flood Authority – Rhondda Cynon Taf County Borough Council**

Within the Flood and Water Management Act 2010, Rhondda Cynon Taf County Borough Council has been established as the Lead Local Flood Risk Authority for its administrative area.

As defined in the Flood and Water Management Act 2010, RCT is responsible for managing what is termed, its 'local flood risk'. This includes the risk of flooding from ordinary watercourses, surface runoff and groundwater.

Local Authorities have always had certain responsibilities in relation to ordinary watercourses, and in practice most Local Authorities took the lead in dealing with surface water flooding incidents prior to the changes contained within the Flood and Water Management 2010. This is, however, the first time responsibility for the risk of flooding from surface runoff has been allocated to anybody in law.

The Flood and Water Management Act 2010 places a number of statutory duties on Local Authorities in their new role as LLFAs including:

- 1 The preparation of local flood risk management strategies
- 2 A duty to comply with the National Strategy
- 3 To co-operate with other authorities, including sharing data
- 4 A duty to investigate all flooding within its area, insofar as a LLFA consider it necessary or appropriate
- 5 A duty to maintain a register of structures and features likely to affect flood risk;
- 6 A duty to contribute to sustainable development; and
- 7 Consenting powers on ordinary watercourses.

In addition to these each LLFA has a number of what are called permissive powers. These are powers that allow them to do something, but do not compel them to and include:

- 1 Powers to request information;
- 2 Powers to designate certain structures or features that affect flood or coastal erosion risk;
- 3 The expansion of powers to undertake works to include broader risk management actions; and
- 4 The ability to cause flooding or coastal erosion under certain conditions.

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

### **3.5.3 Water Company – Dwr Cymru Welsh Water**

Water companies, when exercising their flood or coastal erosion risk management functions in relation to an area within Wales, must have regard to the relevant Local Strategies and any associated guidance.

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.

No changes have been made to the operational arrangements for water and sewerage companies in respect of flood risk.

The Flood and Water Management Act 2010 places a number of statutory duties on Water and Sewerage Companies including:

- 1 A duty to act consistently with the National Strategy;
- 2 A duty to have regard to the content of the relevant Local Strategy; and
- 3 Co-operation with other Authorities, including sharing data.

Water and sewerage companies often hold valuable information which could greatly aid the understanding of flood risks faced by communities across Wales.

## 4.0 WHY DO WE HAVE TO PRODUCE A FLOOD RISK MANAGEMENT PLAN?

As detailed within Section 2.3, we are currently in the first cycle of the Flood Risk Regulations 2009 and have already completed the Preliminary Flood Risk Assessment and published the updated Flood Maps for Surface Water. The Flood Risk Management Plans represent the final output of this cycle and must be published by December 2015.

### 4.1 Preliminary Flood Risk Assessment

The Preliminary Flood Risk Assessment (PFRA) is a high level screening exercise that compiled information on significant local flood risk from past and future floods, based on readily available information. The scope of the PFRA was to consider flooding from surface runoff, ground water and ordinary watercourses, and any interaction these sources have with main rivers with the aim of identifying flood risk areas as set out under the European Flood Directives (see section 3.6).

The PFRA used the Flood Map for Surface Water (FMfSW), a flood model containing two flood events (1 in 30 annual chance and 1 in 200 annual chance) and two depth bandings (greater than 0.1m and greater than 0.3m). These maps highlighted areas at risk of surface water flooding.

Using this dataset, the assessment was carried out based on 1km grid squares. DEFRA and WG identified significant criteria and thresholds to be used for defining flood risk areas. These criteria are presented in Table 5 below.

**Table 5:** Flood risk threshold used to identify future consequences of flooding

'Significant harmful consequences' defined as greater than....	Description
200 People or	Flooded to a depth of 0.3m during a rainfall event with a 1 in 200 chance of occurring (or 0.5%)
20 Non - Residential or	
1 critical service	

The methodology was based on using national flood risk information to identify 1km squares where local flood risk exceeded the defined threshold; called "blue" squares.

The indicative flood risk areas use clusters formed from all 3 km squares that contain 4 or more 1km square above the flood risk thresholds (blue squares), that are touching, which contain locations where there has been historical flooding or the data indicates that a flood could occur that satisfies the criteria for the flood risk thresholds.

Where a cluster of these grid squares leads to an area where flood risk is most concentrated, and over 5,000 people are predicted to be at risk of flooding, this area has been identified as an Indicative Flood Risk Area.

Initial counts for Rhondda Cynon Taf County Borough Council were undertaken by the Environment Agency and the key flood risk indicators for Rhondda Cynon Taf County Borough Council were calculated for the indicative flood risk area as follows:

- 34,838 people at risk;
- 2,529 non-residential properties at risk; and
- 84 pieces of critical infrastructure at risk.

Following a review of the counts by Rhondda Cynon Taf County Borough Council, four additional “blue” squares were added to the indicative flood risk area. The revised counts following the addition of the squares were:

- 37,805 people at risk;
- 2,890 non-residential properties at risk; and
- 96 pieces of critical infrastructure at risk.

The shape of the indicative flood risk area generally mirrors the valley topography of Rhondda Cynon Taf County Borough Council and generally follows the settlements. A plan displaying the EA Wales squares, additional squares added by the review by Rhondda Cynon Taf County Borough Council and the indicative flood risk area are presented in Figure 9.

**As a result of the assessment, Rhondda Cynon Taf County Borough Council was identified as having a Flood Risk Area and are therefore required to undertake the production of the Flood Risk Management Plan under the Flood Risk Regulations 2009.**

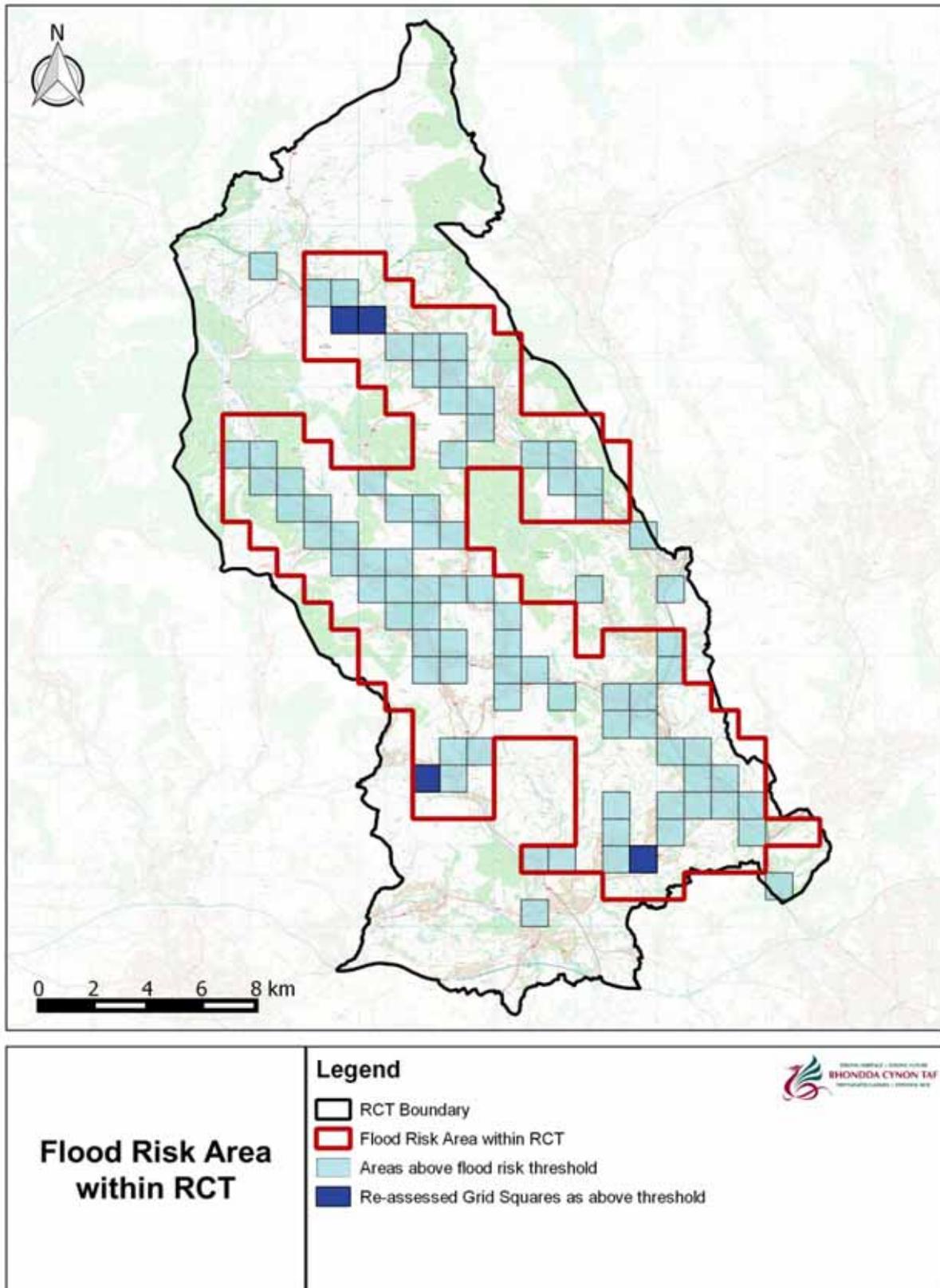
As part of the PFRA, significant historic flooding events within the Borough were considered. To determine what constitutes a significant flooding event, DEFRA, Welsh Government and the Environment Agency set key flood risk indicators which define a flood risk area in Wales as having 5,000 people at risk or an individual 1km square with at least 200 people (approximately 84 properties) or 20 businesses or 1 critical services at risk.

For the PFRA, RCTCBC determined that a locally significant event which has had harmful consequences is defined as one where 8 or more residential properties are flooded internally. This is approximately an order of magnitude below the flood risk thresholds used for future flood risk, 84 properties, which is considered as nationally significant.

37no. historic flood events have been considered to have had “locally significant harmful consequences” and of these, 7no. had nationally “significant harmful consequences”.

For further information regarding the PFRA or to view the document please visit RCTCBC website at [www.rctcbc.gov.uk/flooding](http://www.rctcbc.gov.uk/flooding).

**Figure 9:** Indicative Flood Risk Area within Rhondda Cynon Taf County Borough Council



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## 4.2 Updated Flood Maps for Surface Water

As detailed within Section 2.3, under Part 3 of the Flood Risk Regulations 2009, Natural Resources Wales have a duty to prepare for each flood risk area Flood Hazard and Flood Risk maps related to risk of flooding from the sea, main rivers and reservoirs. LLFA's have a duty to prepare Flood Hazard and Flood Risk maps related to surface water flooding for the flood risk areas identified within the PFRA.

A service level agreement was signed between Welsh Government (WG), Natural Resources Wales (NRW) and the Environment Agency (EA) for the production of these maps. JBA Consultants were contracted to produce the maps. The maps were completed last autumn and published as required under the Flood Risk Regulations 2009 in December 2013. These can be viewed online at <http://watermaps.environment-agency.gov.uk> and following the link for Risk of Flooding from Surface Water.

The uFMfSW contain data including three flood events (1 in 30 (3.3%), 1 in 100 (1%) and 1 in 1000 (0.1%) in any given year), flood extents, flood depths, flow velocity, hazard rating and flow direction.

The extents of flooding for the three flood events have been used and represent the maximum flood extends shown on the depth, velocity and hazard maps. These maps provide information including detail about the level of risk. These are (annual probability is shown in brackets):

- High – each year, the area has a chance of flooding of greater than 1 in 30 (3.3%);
- Medium – each year, the area has a chance of flooding between 1 in 100 (1%) and 1 in 30 (3.3%); and
- Low – each year, the area has a chance of flooding of between 1 in 1000 (0.1%) and 1 in 100 (1%).

The risk maps have been generated from the uFMfSW and the National Receptors Dataset (NRD), with three types of map showing:

- Risk to People;
- Risk to Economic Activity; and
- Risk to Natural and Historic Environment.

To answer the question 'how many properties lie in areas at risk of flooding from surface water?', Rhondda Cynon Taf County Borough Council have counted properties where at least 50% of the external perimeter of that property (buffered by 2m) is in contact with any part of the mapped flood extent, regardless of depth (i.e. no depth threshold). It is considered that this will provide a good base line for considering the risk posed by flooding.

For further information on the production of the uFMfSW and associated datasets, please refer to the EA documents 'What is the updated Flood Map for Surface Water?' and 'The updated Flood Map for Surface Water (uFMfSW) Property Points dataset'.

### 4.3 How are we drawing conclusions from the uFMfSW?

For the purpose of this Flood Risk Management Plan, Rhondda Cynon Taf County Borough Council has been divided into 52no. community areas to aid in the assessment of flood risk within the authority.

**Table 6:** Community Areas within Rhondda Cynon Taf County Borough Council

Community Area	Area (Hectares)	Population*	Intersects with Flood Risk Area
Aberaman North	432	5,854	Yes
Aberaman South	1,255	5,172	Yes
Abercynon	917	6,723	Yes
Aberdare East	673	7,708	Yes
Aberdare West/Llwydcoed	2,183	9,797	Yes
Beddau	507	4,134	Yes
Brynna	1,242	3,776	Yes
Church Village	182	4,557	Yes
Cilfynydd	413	3,010	Yes
Cwm Clydach	487	3,135	Yes
Cwmbach	608	4,705	Yes
Cymmer	516	6,108	Yes
Ferndale	380	4,731	Yes
Gilfach Goch	603	3,541	Yes
Glyncoch	208	3,039	Yes
Graig	315	2,693	Yes
Hawthorn	453	3,988	Yes
Hirwaun	392	4,397	Yes
Llanharan	1,085	3,661	Yes
Llanharry	742	3,840	No
Llantrisant Town	968	4,792	Yes
Llantwit Fardre	990	5,896	Yes
Llwynypia	259	2,423	Yes
Maerdy	1,060	3,666	Yes
Mountain Ash East	850	3,243	Yes
Mountain Ash West	351	4,916	Yes
Penrhiwceiber	213	6,354	Yes
Pentre	578	5,877	Yes
Penygraig	484	5,920	Yes
Penywaun	373	3,097	Yes
Pontyclun	1,190	7,638	Yes
Pontypridd Town	234	3,046	Yes
Porth	370	6,481	Yes
Rhigos	7,416	1,774	Yes
Rhondda	689	4,949	Yes
Rhydfelin Central	372	4,728	Yes
Taffs Well	674	3,760	Yes
Talbot Green	205	2,895	Yes

**Table 6 continued:** Community Areas within Rhondda Cynon Taf County Borough Council

Community Area	Area (Hectares)	Population*	Intersects with Flood Risk Area
Tonteg	587	4,265	Yes
Tonypandy	334	4,004	Yes
Tonyrefail East	1,480	6,056	Yes
Tonyrefail West	976	5,929	Yes
Trallwng	226	4,124	Yes
Trealaw	286	4,373	Yes
Treforest	378	7,102	Yes
Treherbert	2,157	6,674	Yes
Treorchy	1,331	8,498	Yes
Tylorstown	590	5,323	Yes
Tyn-y-nant	92	3,464	Yes
Ynyshir	441	3,826	Yes
Ynysybwl	1,955	4,846	Yes
Ystrad	717	6,399	Yes

\* NRD Residential dwellings multiplier 2.35

#### 4.4 What is being counted?

To determine the risk posed to people, economic activity and the environment within RCTCBC, the following receptors have been considered when undertaking the counts.

**Table 7:** Summary list of receptors to be counted

<b>RISK TO PEOPLE AND PROPERTIES</b>
Number of People in area
Number of Services
<b>ECONOMIC ACTIVITY</b>
Number of Non Residential Properties
Number of Airports
Length of Roads (km)
Length of Railways (km)
Agricultural Land – grades 1, 2 and 3 (hectares)
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>
Number of EU designated Bathing Waters within 50m
Number of EPR Installations within 50m
Area of Special Area of Conservation within area (ha)
Area of Special Areas of Protection within area (ha)
Area of Ramsar site within area (ha)
Area of World Heritage Sites within area (ha)
Area of Sites of Special Scientific Interest within area (ha)
Area of Parks and Gardens within area (ha)
Area of Scheduled Ancient Monuments within area (ha)
Number of Listed Buildings within area
Number of Licensed Abstractions within area

**Table 8:** Receptors within community areas

	Aberaman North	Aberaman South	Abercynon	Aberdare East	Aberdare West/ Llwydcoed	Beddau	Brynna	Church Village	Clifynydd	Cwm Clydach	Cwmbach	Cymmer	Ferndale	Gilfach Goch
<b>RISK TO PEOPLE AND PROPERTIES</b>	<b>IN FLOOD RISK AREA</b>													
People (n) (multiplier 2.35)	5,854	5,172	6,723	7,708	9,797	4,134	3,776	4,557	3,010	3,135	4,705	6,108	4,731	3,541
Services	6	9	18	17	16	3	6	4	6	3	10	9	6	9
<b>ECONOMIC ACTIVITY</b>														
Non Residential Properties	289	469	550	815	799	286	394	296	222	196	356	365	312	210
Airports	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roads (km)	0	0	7	0	1	0	7	0	4	0	0	0	0	0
Railways (km)	0	2	6	1	4	1	3	0	0	0	2	0.6	0	0
Agricultural Land (hectares)	0	23	0	0	0	0	321	0	0	0	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>														
Bathing Waters	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPR Installations	0	0	1	0	1	0	0	0	0	0	2	0	0	0
Special Area of Conservation (SAC)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ramsar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
World Heritage Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0	25	12	30	0	0	0	0	6	0	0
Parks and Gardens	0	0	0	0	20	0	0	0	0	0	0	0	0	0
Scheduled Ancient Monuments	0	0.01	0	0.4	7	0.04	2	0	0.1	0	1	0	8	0
Listed Buildings	3	3	3	39	25	5	2	2	1	0	0	10	3	0
Licensed Abstractions	0	0	0	1	5	0	2	0	0	2	1	0	0	0

Status: Final

Table 8 continued: Receptors within community areas

	Glyncoch	Graig	Hawthorn	Hirwaun	Llanharan	Llantrisant Town	Llantwit Fardre	Llwynypia	Maerdy	Mountain Ash East	Mountain Ash West	Penrhwiцеiber	Pentre	Penygraig
<b>RISK TO PEOPLE AND PROPERTIES</b>	<b>IN FLOOD RISK AREA</b>													
People (n) (multiplier 2.35)	3,039	2,693	3,988	4,397	3,661	4,792	5,896	2,423	3,666	3,243	4,916	6,354	5,877	5,920
Services	5	1	15	11	8	18	6	6	3	5	7	6	9	5
<b>ECONOMIC ACTIVITY</b>														
Non Residential Properties	110	246	522	321	516	688	657	272	296	278	335	254	368	438
Airports	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roads (km)	0	0	9	3	0	0	0	0	0	0	0	0	0	0
Railways (km)	2	1	0	3	3	2	0	1	0	0	2	2	1	0
Agricultural Land (hectares)	0	0	0	0	0.5	3	0	0	0	67	72	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>														
Bathing Waters	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPR Installations	0	0	1	0	0	1	1	0	0	0	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	4	0	0	0	0	0	0	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ramsar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
World Heritage Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	12	0	4	0	109	0	19	0	0	0	0	0	0
Parks and Gardens	0	0	0	0	21	0	0	0	0	0	0	0	0	0
Scheduled Ancient Monuments	0	16	0	3	0.04	9	0	0	1	0	0.02	0	1	0
Listed Buildings	4	8	3	4	18	13	2	3	0	5	2	4	5	1
Licensed Abstractions	0	0	1	0	3	2	0	0	2	1	0	0	0	0

Table 8 continued: Receptors within community areas

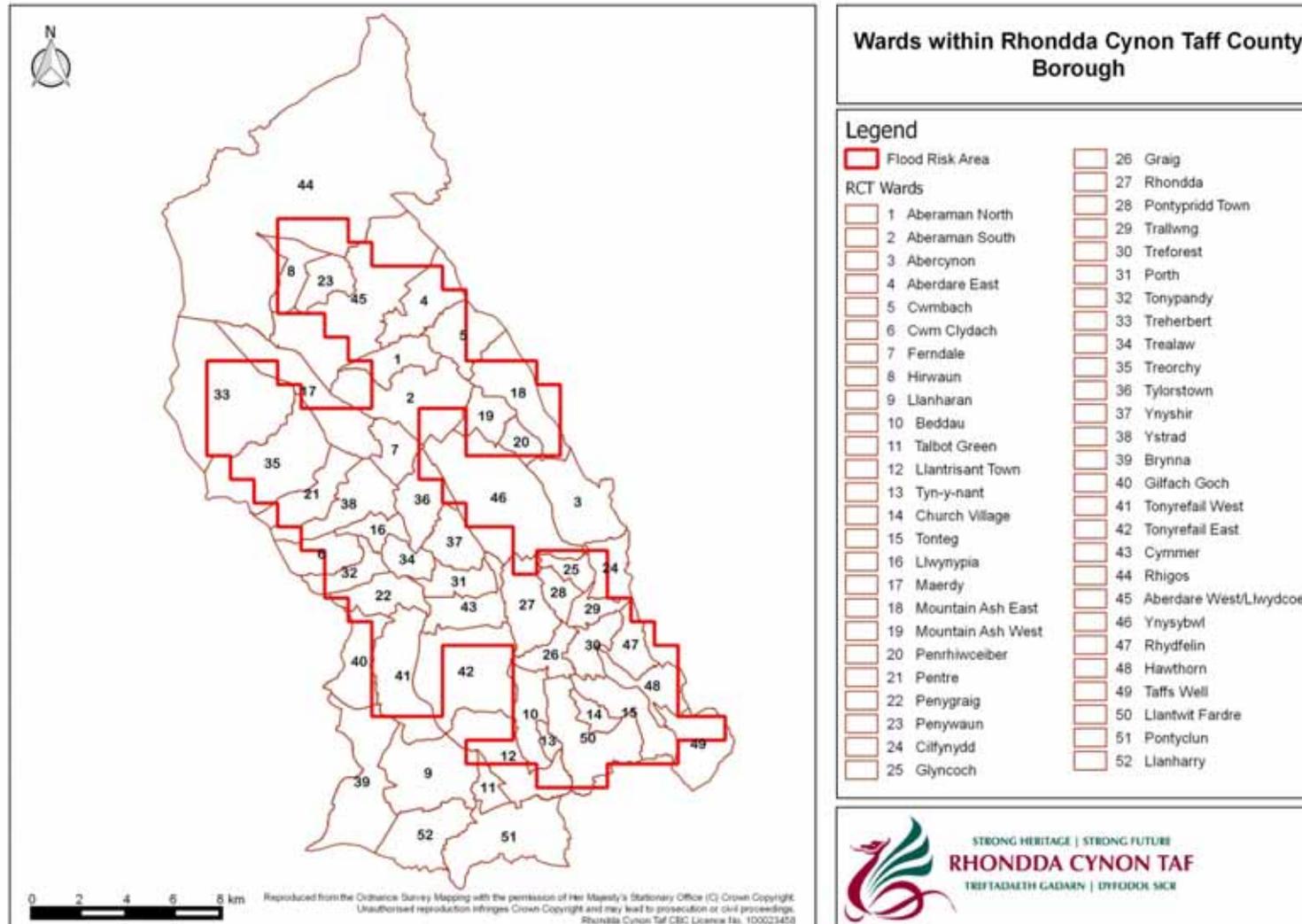
	Penywaun	Pontypridd Town	Porth	Rhigos	Rhondda	Rhydfelin	Taffs Well	Talbot Green	Tonteg	Tonybandy	Tonyrefail East	Tonyrefail West	Trallwng	Trealaw
<b>RISK TO PEOPLE AND PROPERTIES</b>	<b>IN FLOOD RISK AREA</b>													
People (n) (multiplier 2.35)	3,097	3,046	6,481	1,774	4,949	4,728	3,760	2,895	4,265	4,004	6,056	5,929	4,124	4,373
Services	3	8	14	12	6	5	6	7	6	6	10	9	8	5
<b>ECONOMIC ACTIVITY</b>														
Non Residential Properties	157	521	478	969	477	154	606	352	496	379	613	506	289	277
Airports	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roads (km)	0.5	0	0	14	0	0.3	8	0	0	0	0	0	5	0
Railways (km)	1	2	3	1	3	0	1	1	5	0	0	0	0	3
Agricultural Land (hectares)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>														
Bathing Waters	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EPR Installations	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	243	0	0	1	0	0	0	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ramsar	0	0	0	0	0	0	0	0	0	0	0	0	0	0
World Heritage Sites	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	977	0	0	1	0	0	0	151	80	0	0
Parks and Gardens	0	0	0	0	0	0	0	0	0	0	0	0	16	0
Scheduled Ancient Monuments	0.1	0.01	0.0004	92	0.2	0.4	0.2	0	0.2	0	1	0	1	0
Listed Buildings	0	28	16	13	9	0	15	1	0	4	6	5	9	4
Licensed Abstractions	0	0	0	8	0	0	1	0	1	0	0	0	0	0

Status: Final

**Table 8 continued:** Receptors within community areas

	Treforest	Treherbert	Treorchy	Tylorstown	Tyn-y-nant	Ynyshtir	Ynysybwl	Ystrad	Llanharry	Pontyclun
<b>RISK TO PEOPLE AND PROPERTIES</b>	<b>IN FLOOD RISK AREA</b>								<b>NOT IN FLOOD RISK AREA</b>	
People (n) (multiplier 2.35)	7,102	6,674	8,498	5,323	3,464	3,826	4,846	6,399	3,840	7,638
Services	10	8	8	9	5	3	6	6	6	12
<b>ECONOMIC ACTIVITY</b>										
Non Residential Properties	556	444	791	326	131	211	451	393	446	990
Airports	0	0	0	0	0	0	0	0	0	0
Roads (km)	2	0	0	0	0	0	0	0	6	8
Railways (km)	3	1	3	0	0.2	0	0.5	2	2	3
Agricultural Land (hectares)	0	0	0	0	0	0	0	0	583	941
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>										
Bathing Waters	0	0	0	0	0	0	0	0	0	0
EPR Installations	0	0	0	0	0	0	0	0	0	1
Special Area of Conservation (SAC)	0	0	0	0	0	0	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0	0	0	0	0	0	0
Ramsar	0	0	0	0	0	0	0	0	0	0
World Heritage Sites	0	0	0	0	0	0	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	192	156	0	0	0	0	0.2	0	9
Parks and Gardens	0	0	0	0	0	0	0	0	0	88
Scheduled Ancient Monuments	0.002	5	3	0	0	6	0	0.2	0.09	2
Listed Buildings	40	5	5	1	0	2	3	2	2	26
Licensed Abstractions	0	6	3	1	0	0	10	2	2	3

**Figure 10:** Location of community areas within Rhondda Cynon Taf County Borough Council



#### **4.5 Flood Investigation Areas**

Community areas have been introduced to assess flood risk within boundaries to provide understanding to the unitary authority; however, it is understood that flood risk does not respect administrative boundaries. To formally assess flood risk, 137no. flood investigation areas have been identified within the Borough. It is anticipated that these areas will allow more project specific measures to be implemented. The flood investigation areas are presented in Appendix A and the areas and their proposed measures are summarised within the community area overviews in Section 10, where relevant.

## 5.0 HOW WE WILL MANAGE FLOOD RISK

### 5.1 Flood Risk Management Plan Measures for Managing Flood Risk

The detailed objectives and measures outlined within the Rhondda Cynon Taf County Borough Council's LFRMS have been adopted by this FRMP to manage flood risk within the authority. These measures and the corresponding reference to the LFRMS detailed objectives are reiterated in Table 9.

**Table 9:** Rhondda Cynon Taf County Borough Council Flood Risk Management Plan Measures

FRMP Measure	Measure Title	Cross-reference to LFRMS objective
1	Establish SuDS Approval Body	1,2,5,6,7,8
2	Water cycle strategy	1,2,3,4,5,6,7,8,9,10
3	Rhondda Cynon Taf Local Development Plan, Strategic Flood Consequence Assessment and Supplementary Planning Guidance	1, 2, 5, 6, 7, 8, 12
4	Planning Policy Wales and TAN15	1, 2, 3, 5, 6, 7, 8, 10, 11, 15
5	Flood warning	1, 2, 3, 4, 10, 11, 12
6	Flood awareness	1, 2, 3
7	Emergency response plans	10, 11, 13, 14
8	Community flood plans	10, 11, 12, 13, 14
9	Multi-Agency flood plans	4, 10, 11, 12, 13, 14
10	Land management	1, 2, 5, 6, 7, 7, 9, 10, 11, 15
11	Environmental enhancement	5, 6, 7, 8
12	Water level management plan	5, 6, 7, 8, 9, 11
13	Habitat creation	3, 4, 5, 6, 7, 8, 9
14	System asset management plans	1,2,3,4
15	Enforcement of private surface water sewers	1,2,3,4
16	Power to request Information and civil sanctions	1, 2, 3, 4, 11
17	Assert register and records	4, 10, 11
18	Designation of structures	1, 2, 3, 4, 10
19	SuDS adoption	1, 2, 3, 4, 5, 6, 7

**Table 9 (continued):** Rhondda Cynon Taf County Borough Council Flood Risk Management Plan Measures

FRMP Measure	Measure Title	Cross-reference to LFRMS objective
20	Consenting of structures to Ordinary Watercourses	1, 2, 3, 4, 5, 6, 7
21	Enforcement to maintain flow in watercourses	1, 2, 3, 4
22	Enactment of Land Drainage Byelaws	1, 2, 3, 4
23	Cause incidental flooding for purpose of flood risk management	1, 2, 3, 4
24	Construction of flood defences	1, 2, 3, 4, 7
25	Investigation of flooding incidents	11
26	Local property-level flood mitigation – resilience	12
27	Local property- level flood mitigation – resistance	12
28	Pre-feasibility studies/project appraisals	1, 2, 3, 4, 7, 9, 16
29	Catchment Flood Risk Management Plans	11,14
30	Surface Water Flood Modelling	11
31	Reservoir Flood Plans	4, 10, 12, 13, 14
32	Flood Risk Management Plans	1, 2, 3, 4, 5, 6, 8, 9, 15
33	Flood Risk and Hazard Maps	11, 15
34	Partnership Working	14
35	Community/public engagement/consultation	10,11
36	Habitat Monitoring	5, 6, 7, 8, 9
37	Weather pattern monitoring	11
38	Flow monitoring	11

## 5.2 Strategic Environmental Screening

A Strategic Environmental Assessment<sup>1</sup> has previously been undertaken as part of the implementation of the objectives detailed within the Local Flood Risk Management Strategy

The aim of the Strategic Environmental Assessment was to identify potentially significant environmental effects created as a result of the implementation of the Strategy upon 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”, as required by the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 (The SEA Regulations).

<sup>1</sup><http://www.rctcbc.gov.uk/en/relateddocuments/publications/flooding/sea-assessment-environment-report-vol-1.pdf>

As detailed in Section 5.1 of the report, the measures that were implemented within the strategy to deliver the objectives have been adopted for this Flood Risk Management Plan. Following a screening of the objectives and measures implemented within the Flood Risk Management Plan, it is considered that the objectives are the same and there are no amendments to receptors potentially influenced by the implementation of this plan. In conclusion, it is considered that the previous Strategic Environmental Assessment is still relevant for this plan and that there is no requirement to undertake a new Strategic Environmental Assessment.

The Flood Risk Management Plan seeks to identify site specific locations where the implementation of physical measures may be undertaken. Where site specific physical intervention is undertaken, the works will be subject to an Environmental Impact Assessment to ensure that there are no significant environmental effects of the works.

### 5.3 Flood Risk Management Plan Measures and EU reporting codes

It is a requirement of the European Floods Directive, that the Flood Risk Management Plan shall address four aspects of flood risk management, focusing on prevention, protection, preparedness and recovery and review.

**Preventing:** by avoiding putting people or the environment at risk of flooding, for example, one way of preventing risks arising would be by not building homes in areas that can be flooded.

**Preparing:** by taking actions that prepare people for flooding, for example, by improving awareness of flood risk, or by providing warning and forecasting for floods so that people can take precautions to safeguard their valuables.

**Protecting:** by protecting people from the risk of flooding. For example, by the maintenance or refurbishment of existing defences or using waterproof boards over doors and airbricks, people can protect their properties from the damage caused by flood water.

**Recovery and review:** by learning from when flooding happens and how to recover from it, for example, by improving the availability of recovery services such as providing temporary accommodation, after flooding has occurred.

Table 10 details the four aspects and the European Union reporting codes.

In order to accord with the legislative requirements Rhondda Cynon Taf County Borough Council have attributed the 38no. adopted measures to the EU reporting codes and this is presented in Table 10.

**Table 10: Required aspects of flood risk management and EU reporting codes**

<b>M1 No Measure</b>		
M11		No Measure is proposed to reduce flood risk in the Area Potentially Susceptible to Flood Risk or other defined area.
<b>M2 Prevention</b>		
M21	Avoidance	Measure to prevent the location of new or additional receptors in flood prone areas, such as land use planning policies or regulation.
M22	Removal or relocation	Measures to remove receptors from flood prone areas, or to relocate receptors to areas of lower hazard
M23	Reduction	Measure to adapt receptors to reduce the adverse consequences in the event of a flood actions building, public networks, etc.
M24	Other prevention	Other measures to enhance flood risk prevention (may include, flood risk modelling and assessment, flood vulnerability assessment, maintenance programmes or policies, etc).
<b>M3 Protection</b>		
M31	Natural management / runoff and catchment management	Measures to reduce the flow into natural or artificial drainage systems, such as overland flow interceptors and or storage, enhancement of infiltration, etc and including in-channel, flood plain works and the reforestation of banks, that restore natural systems to help slow flow an store water
M32	Water flow regulation	Measures involving physical intervention to regulate flows, such as construction, modification or removal of water retaining structures (e.g. dams or other on-lone storage areas or development of existing flow regulation rules), and which have significant impact on the hydrological regime.
M33	Channel, Coastal and floodplain works	Measures involving physical interventions to freshwater channels, mountain streams estuaries coastal waters and flood prone areas of land, such construction, modifications or removal of structure or the alteration of channels, sediment dynamics management, dykes, etc.
M34	Surface Water Management	Measures involving physical interventions to reduce surface water flooding, typically, but not exclusively, in an urban environment, such as enhancing artificial drainage capacity or through sustainable drainage systems (SuDS).
	Other Protection	Other measures to enhance protection against flooding, which may include flood defences asset maintenance programmes or policies.
<b>M4 Preparedness</b>		
M41	Flood Forecasting and Warning	Measures to establish or enhance a flood forecasting or warning system.
M42	Emergency Event Response Planning/ Contingency Planning	Measures to establish or enhance flood event institutional emergency response planning.
M43	Public Awareness and Preparedness	Measures to establish the public awareness or preparedness for flood events.
M44	Other Preparedness	Other measures to establish or enhance preparedness for flood events to reduce adverse consequences.
<b>M5 Recovery and Review</b>		
M51	Individual and societal recovery	Clean up and restoration activities (buildings, infrastructure, etc) Health and mental health supporting action, inc. Managing stress Disaster financial assistance (grants, tax) inc. Disaster legal assistance, disaster unemployment assistance Temporary or permanent relocation, other.
M52	Environment recovery	Clean up and restoration activities (with several sub topics as mould protection, well-water safety and securing hazardous material containers).
M53	Other recovery and review	Lessons learnt from flood events Insurance policies Other
<b>M6 Other</b>		
M61	Other	

**Table 11:** Summary of Rhondda Cynon Taf County Borough Council FRMP Measures and attributed EU reporting code

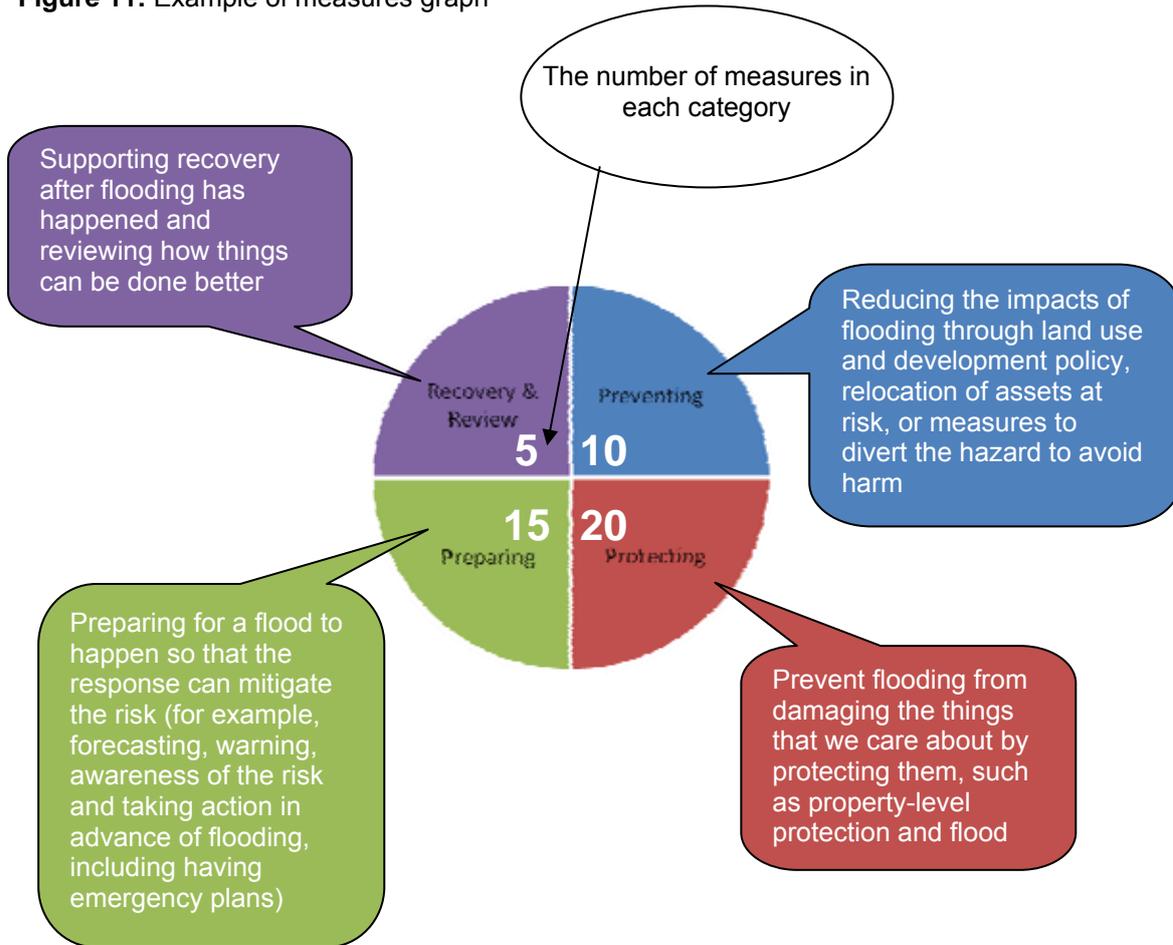
FRMP Measure No.	RCT Measure Name	EU reporting code
1	Establish SuDS Approval Body	M34 (Protection) Surface Water Management
2	Water Cycle Strategy	M31 (Protection) Natural flood management/run off and catchment management
3	Rhondda Cynon Taf Local Development Plan, Strategic Flood Consequences Assessment and Supplementary Planning Guidance	M21 (Prevention) Avoidance
4	Planning Policy Wales and TAN15	M21 (Prevention) Avoidance
5	Flood Awareness	M43 (Preparedness) Public Awareness and Preparedness
6	Flood Warning	M41 (Preparedness) Flood Forecasting and Warning
7	Emergency Response Plans	M42 (Preparedness) Emergency Event Response Planning/Contingency Planning
8	Community Flood Plans	M43 (Preparedness) Public Awareness and Preparedness
9	Multi-Agency Flood Plans	M42 (Preparedness) Emergency Event Response Planning/Contingency Planning
10	Land Management	M34 (Protection) Surface Water Management
11	Environmental Enhancement	M23 (Prevention) Reduction
12	Water Level Management Plan	M32 (Protection) Water Flow Regulation
13	Habitat Creation	M23 (Prevention) Reduction
14	Systems Asset Management Plans	M44 (Preparedness) Other Preparedness
15	Enforcement on Private Surface Water Sewers	M24 (Prevention) Other Prevention
16	Power to request information and civil sanctions	M44 (Preparedness) Other Preparedness
17	Asset Register and Records	M44 (Preparedness) Other Preparedness
18	Designation of Structures	M35 (Protection) Other Protection
19	SuDS Adoption	M34 (Protection) Surface Water Management
20	Consenting of Structures to Ordinary Watercourses	M21 (Prevention) Avoidance
21	Enforcement to maintain flow in watercourses	M21 (Prevention) Avoidance
22	Enactment of Land Drainage Byelaws	M21 (Prevention) Avoidance

**Table 11 continued:** Summary of Rhondda Cynon Taf County Borough Council FRMP Measures and attributed EU reporting code

FRMP Measure No.	RCT Measure Name	EU reporting code
23	Cause incidental flooding for purposes of flood risk management	M31 (Protection) Natural flood management/run off and catchment management
24	Construction of flood defences	M33 (Protection) Channel, Coastal and Floodplain Works
25	Investigation of Flooding Incidents	M44 (Preparedness) Other Preparedness
26	Local property-level flood mitigation - Resilience	M43 (Preparedness) Public Awareness and Preparedness
27	Local property-level flood mitigation - Resistance	M43 (Preparedness) Public Awareness and Preparedness
28	Pre-Feasibility Studies/Project Appraisals	M35 (Protection) Other Protection
29	Catchment Flood Risk Management Plan	M31 (Protection) Natural flood management/run off and catchment management
30	Surface Water Flood Modelling	M24 (Prevention) Other Prevention
31	Reservoir Flood Plans	M24 (Prevention) Other Prevention
32	Flood Risk Management Plans	M24 (Prevention) Other Prevention
33	Flood Risk and Hazard Maps	M24 (Prevention) Other Prevention
34	Partnership working	M44 (Preparedness) Other Preparedness
35	Community/Public Engagement/Consultation	M43 (Preparedness) Public Awareness and Preparedness
36	Habitats Monitoring	M53 (Recovery and Review) Other Recovery and Review
37	Weather Pattern Monitoring	M24 (Prevention) Other Prevention
38	Flow Monitoring	M24 (Prevention) Other Prevention

Following the assessment of the uFMfSW, a number of proposed or ongoing measures may be attributed to help manage flood risk. This enables accurate recording and monitoring of identified measures. Each plan enclosed within the following sections will have an associated graph providing ease of understanding for the number of measures attributed, as example of such a graph is presented in the figure below.

**Figure 11:** Example of measures graph



## **6.0 HOW THIS FLOOD RISK MANAGEMENT PLAN HAS BEEN CO-ORDINATED?**

In order to ensure good co-ordination of the Flood Risk Management Plan, a number of existing and specifically organised groups were used.

### **6.1 Working Groups**

#### **6.1.1 The Flood Risk Management Plans Working Group**

This group was established to ascertain what was required to be incorporated in the Flood Risk Management Plan by the Flood Risk Regulations 2009 and to provide direction for the implementation the plan. The group was attended by the 8no. local authorities in Wales who had a designated flood risk area under the PFRA, and other regulatory bodies who have a requirement under the Flood Risk Regulations to undertake the plan, these included:

- Blaenau Gwent County Borough Council;
- Caerphilly County Borough Council;
- Cardiff City Council;
- City and County of Swansea;
- Merthyr Tydfil County Borough Council;
- Natural Resources Wales;
- Neath Port Talbot County Borough Council;
- Rhondda Cynon Taf County Borough Council;
- Torfaen County Borough Council;
- Welsh Government; and
- Welsh Local Government Association.

The attendance of Natural Resources Wales at the group was crucial to ensure co-ordination between the lead local flood authorities and Natural Resources Wales Flood Risk Management Plans. The group also shared work programmes to ensure delivery of the respective Flood Risk Management plans within the timescales outlined in the Flood Risk Regulations 2009.

### **6.1.2 The Flood Risk Management Plan Task and Finish Group**

The Flood Risk Management Plan working group was set up to discuss the technical requirements of the plans, notably how to draw conclusions from the updated Flood Maps for Surface Water. The group was attended by the following regulatory bodies:

- City and County of Swansea;
- Merthyr Tydfil County Borough Council;
- Natural Resources Wales;
- Neath Port Talbot County Borough Council;
- Rhondda Cynon Taf County Borough Council; and
- Welsh Local Government Association.

### **6.1.3 The South East Wales Regional Framework Group**

This group was utilised to share best practise and to feed back to lead local flood authorities who were not designated as a flood risk area by their PFRA, from the Flood Risk Management Working Group and Task and Finish Group. This group is attended by:

- Blaenau Gwent County Borough Council;
- Caerphilly County Borough Council;
- Caldicot and Wentloog Levels IDB;
- Cardiff City Council;
- Dwr Cymru Welsh Water;
- Merthyr Tydfil County Borough Council;
- Monmouthshire County Borough Council;
- Natural Resources Wales;
- Newport City Council;
- Powys County Borough Council;
- Rhondda Cynon Taf County Borough Council;
- The Vale of Glamorgan Council;
- Torfaen County Borough Council; and
- Welsh Local Government Association.

#### **6.1.4 Miscellaneous Collaboration**

In addition to regular meetings with other regulatory bodies, internal collaboration was undertaken within Rhondda Cynon Taf County Borough Council to determine whether other departments were happy with the content of the Flood Risk Management Plan, throughout its conception.

In addition to the formal Flood Risk Management Plan Group meetings, a number of ad hoc independent meetings were held between lead local flood authorities, Welsh Local Government Association and Dwr Cymru Welsh Water were held. These meetings were undertaken to discuss more trivial matters regarding the Plans.

## **6.2 Co-ordination with River Basin District**

Under the requirements of the Water Framework Directive, the Environment Agency and Natural Resources Wales have a duty to prepare River Basin Management Plans for each river basin district within England and Wales.

The Water Framework Directive requires measures to be taken to encourage the sustainable use of water and to protect and improve inland surface waters, groundwaters and coastal waters. Further information regarding the Water Framework Directive is provided in Section 2.5.

It is a requirement of the European Floods Directive (Directive 2007/60/EC) that flood risk management plans have a description of the co-ordination process with the Water Framework Directive.

A river basin district is an area of land, or catchment, which drains into a single major river system. In smaller countries, such as the UK, it can be a group of smaller river catchments that neighbour each other in a relatively distinct regional area. It is also common for the river basin districts to include proximate coastal waters within their designation. A catchment is an area with several, often interconnected water bodies (rivers, lakes, groundwater and coastal waters). Many of the problems facing our water environment are best understood and tackled at a catchment level.

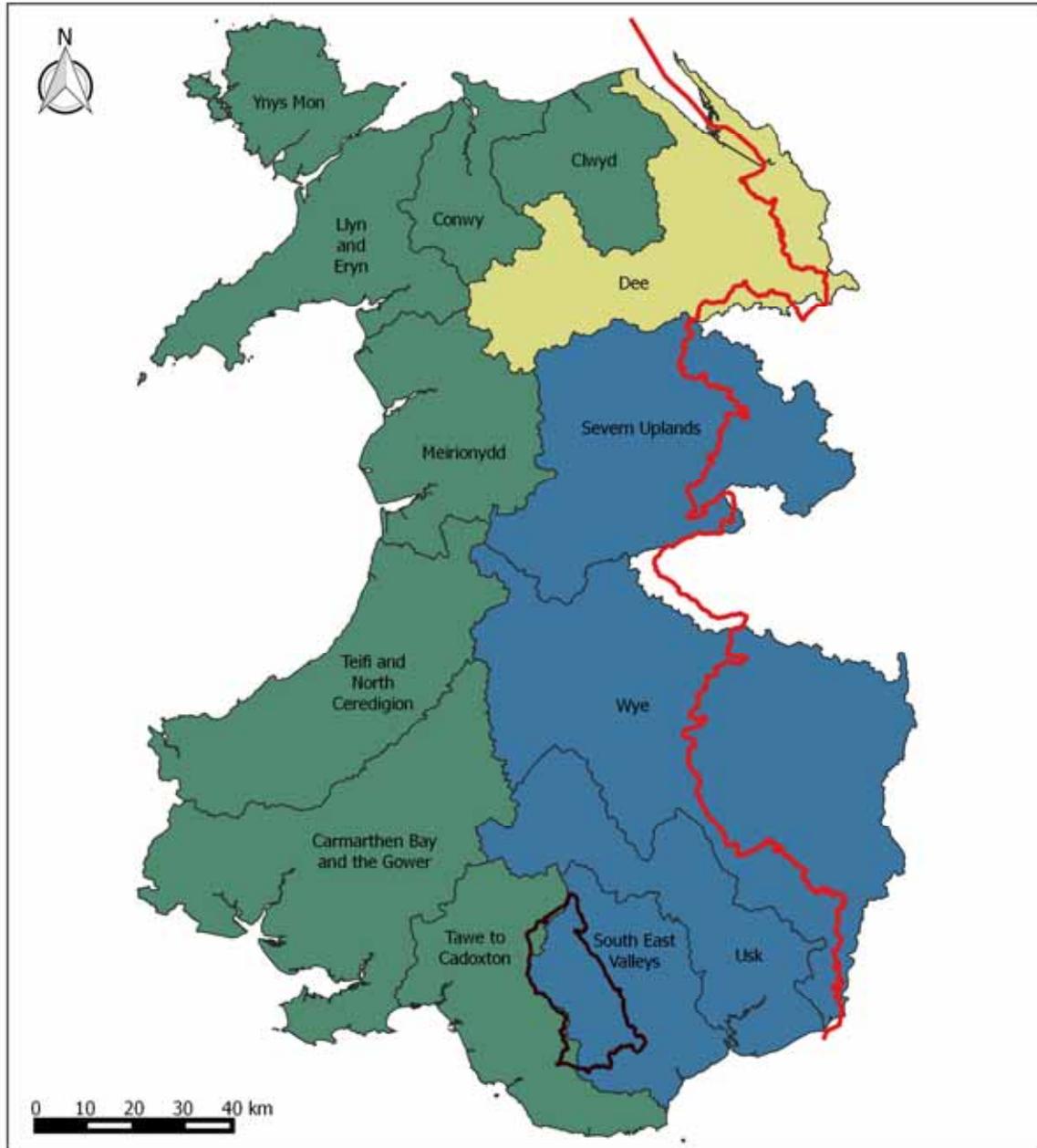
There are three River Basin Districts, either partly or fully within Wales, these are The Severn, Western Wales and Dee. Figure 12 shows the location of Rhondda Cynon Taf County Borough Council with reference to the river basin districts. Rhondda Cynon Taf County Borough Council is situated predominantly within the Severn River Basin District; however, two small areas of the authority fall within the Western Wales River Basin District.

To better understand and tackle the problems within the river basin districts, Natural Resources Wales operate at a management catchment level. This approach provides a more effective engagement at a local level. Rhondda Cynon Taf is situated almost entirely within the South East Wales Management Catchment of the Severn River basin District. Two small areas of land within Rhondda Cynon Taf County Borough Council, situated within the Western Wales River Basin District, fall within the within the Upper Neath Catchment and Ogmere to Tawe Catchment, in the northwest and southwest of the authority, respectively.

The Severn River Basin District Management Plan and the consideration of the measures proposed within the document are discussed further within Section 6.3. The Western Wales River Basin District Management Plan is not considered further within this document.

The Severn River Basin Flood Risk Management Plan and the consideration of the objectives within the document are discussed further in Section 6.4. The Western Wales Flood Risk Management Plan does not consider options within Rhondda Cynon Taf County Borough Council. Whilst an area of Rhondda Cynon Taf County Borough Council does fall within the Western Wales River Basin District, the boundary of the River Basin District does not intersect the Flood Risk Area within Rhondda Cynon Taf County Borough Council. Due to this, there is no information held regarding Rhondda Cynon Taf within the Western Wales Flood Risk Management Plan and no further consideration of the plan is given within this document.

**Figure 12:** Water Framework Directive River Basin Districts and Management Catchments within Wales



**Legend**

- RCT Boundary
- Wales-England Border

**WFD River Basin Districts**

- Dee
- WesternWales
- Severn

**Wales River Basin Districts and Management Catchments**



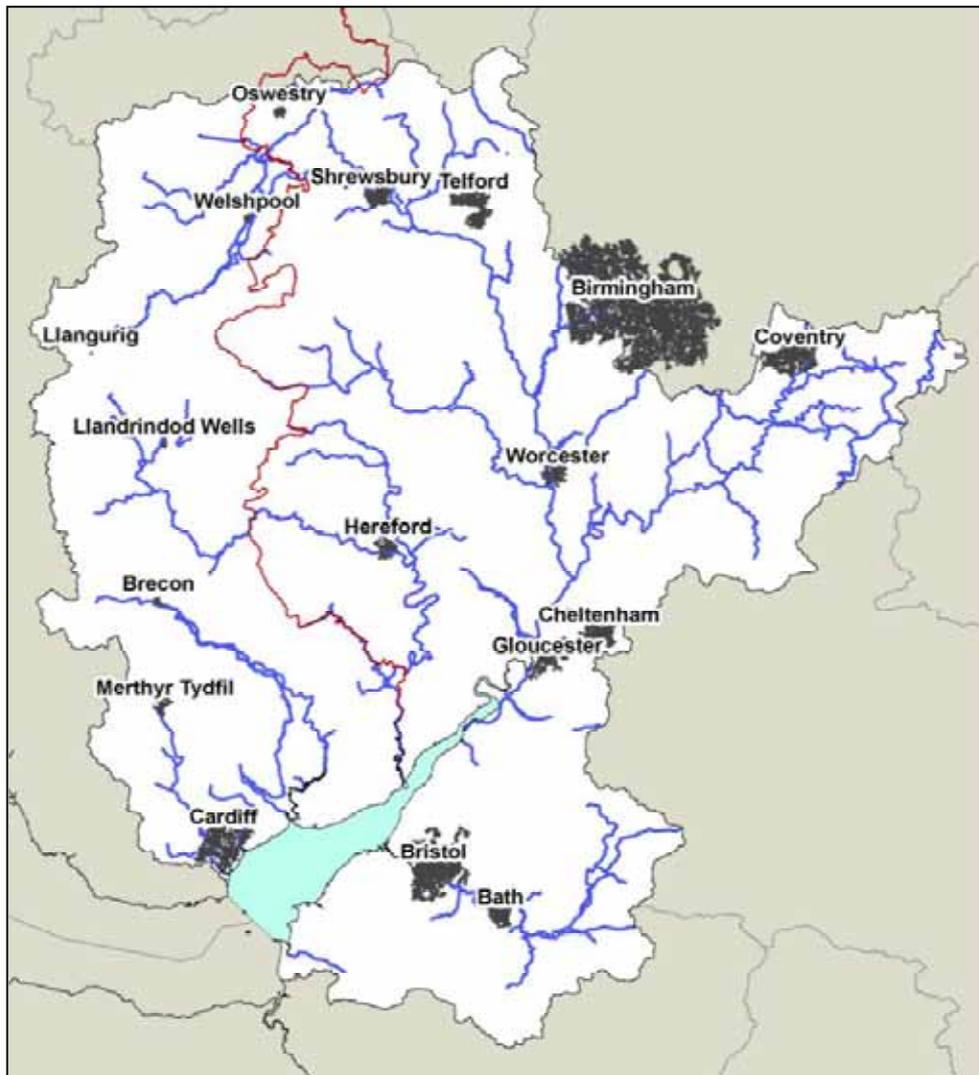
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### 6.2.1 Severn River Basin District

The Severn River Basin District is home to over 5.3 million people and covers an area of 21,590km<sup>2</sup>. One third of the district is located within Wales. The River Severn is the longest river in Britain and flows into the Severn Estuary. The district also includes the rivers of southeast Wales, including the Wye, Usk and Taff and those in the counties of Avon and Somerset that drain into the Severn Estuary.

There are a number of major urban centres within the district, including Bristol, Cardiff and Coventry. Much of the RBD, however, is rural in nature, particularly within the Welsh Borders. Approximately 80% of the land is managed for agriculture and forestry. Whilst agriculture dominates the landscape, it actually makes up a small part of the economy, with main sectors relating to business, transport, health and industry.

**Figure 7:** Severn River Basin Plan



### **6.3 The Severn River Basin District Management Plan**

The first cycle of the Severn River Basin District River Basin Management Plan was published in 2009. The Water Framework Directive requires the plans to be reviewed and updated every 6 years. The updated River Basin Management Plan draft has been prepared in partnership between the Environment Agency and Natural Resources Wales.

The draft Severn River Basin District Management Plan is available via the Environment Agency website ([www.gov.uk/government/organisations/environment-agency](http://www.gov.uk/government/organisations/environment-agency)).

#### **6.3.1 Measures within the Severn River Basin District Management Plan**

To encourage the sustainable use of water and to protect and improve inland surface waters, groundwaters and coastal waters, the Severn River Basin District Management Plan has proposed a number of new measures under the following headings:

- Physical modifications;
- Manage pollution from waste water;
- Manage pollution from towns, cities and transport;
- Improve the natural flow and level of water;
- Manage invasive non-native species; and
- Manage pollution from rural areas.

A full breakdown of the proposed measures is presented in Table 11.

#### **6.3.2 Co-ordination with the Severn River Basin District Management Plan**

As part of the development of the Severn River Basin District Management Plan, a consultation commenced in October 2014 and ended in April 2015, providing an opportunity for comment. Rhondda Cynon Taf County Borough Council has previously responded to the consultation.

Rhondda Cynon Taf County Borough Council has sought to provide a co-ordinated approach by linking measures within this Flood Risk Management Plan to measures and objectives proposed within the Severn River Basin Management Plan. The table below provides an overview of the relevant measures where Rhondda Cynon Taf County Borough Council believes there is a potential for a co-ordinated approach.

**Table 12:** Link between Severn River Basin District Management Plan and Rhondda Cynon Taf County Borough Council Flood Risk Management Plan measures

Severn River Basin District Management Plan Measure title and category*	Linked Flood Risk Management Plan Measure title	FRMP Measure Number
<b>Physical Modifications</b>		
Removal or easement of barriers to fish migration	Environment Enhancement	11
Removal or modification of engineering structures	Environment Enhancement	11
Improvement to condition of channel/bed and/or banks/shoreline	<i>No proposed linked measure</i>	
Improvement to condition of riparian zone and /or wetland habitats	<i>No proposed linked measure</i>	
Changes to operation and maintenance	<i>No proposed linked measure</i>	
Vegetation management	Land Management	10
Dredging and silt management	<i>No proposed linked measure</i>	
Sustainable aggregate extraction	<i>No proposed linked measure</i>	
Sustainable marine development	<i>No proposed linked measure</i>	
Complete first cycle investigations	<i>No proposed linked measure</i>	
<b>Manage Pollution from Waste Water</b>		
Reduce diffuse pollution at source	Establish SuDS Approval Body	1
Reduce point source pollution pathways	Establish SuDS Approval Body	1
Mitigate/remediate point source impacts on receptor	Establish SuDS Approval Body	1
Reduce point source pollution at source	Establish SuDS Approval Body	1
Complete first cycle and new investigations	<i>No proposed linked measure</i>	
Develop and implement nutrient management plans	<i>No proposed linked measure</i>	
<b>Manage pollution from towns, cities and transport</b>		
Reduce diffuse pollution pathways	Establish SuDS Approval Body	1
Mitigate/remediate diffuse pollution impacts on receptor	<i>No proposed linked measure</i>	
Complete first cycle and new investigations	<i>No proposed linked measure</i>	
<b>Improve natural flow and water level of water</b>		
Water demand management	<i>No proposed linked measure</i>	
Control pattern/timing of abstraction	<i>No proposed linked measure</i>	
Improvement to condition of channel/bed and/or banks/shoreline	<i>No proposed linked measure</i>	
Use alternative source/relocate abstraction or discharge	<i>No proposed linked measure</i>	
Sustainable access and recreation management – reduce the impact of water based and terrestrial activities	<i>No proposed linked measure</i>	
Complete first cycle and new investigations	<i>No proposed linked measure</i>	

**Table 12 continued:** Link between Severn River Basin District Management Plan and Rhondda Cynon Taf County Borough Council Flood Risk Management Plan measures

Severn River Basin District Management Plan Measure title and category*	Linked Flood Risk Management Plan Measure title	FRMP Measure Number
Early detection, monitoring and rapid response (to reduce the risk of establishment)	Land Management	10
	Habitats Monitoring	36
Mitigation, control and eradication (to reduce extent)	Land Management	10
	Habitats Monitoring	36
Complete first cycle and new investigations	<i>No proposed linked measure</i>	
Reduce diffuse pollution at source	Establish SuDS Approval Body	1
Mitigate/remediate diffuse pollution impacts on the receptor	Establish SuDS Approval Body	1
Sustainable woodland and forestry management	Land Management	10
Complete first cycle and new investigations	<i>No proposed linked measure</i>	
Develop and implement nutrient management plans	<i>No proposed linked measure</i>	

\*For further information regarding the Severn River Basin District River Management plan, reference should be made to the document “*Water for life and livelihoods, a consultation on the draft update to the river basin management plan for the Severn River Basin District*”

## 6.4 The Severn River Basin District Flood Risk Management Plan

The completion of a River Basin District Flood Risk Management Plan is a requirement of the Flood Risk Regulations 2009 for flood risk from main rivers, the sea and reservoirs. As the Severn River Basin District is situated within both England and Wales, the draft Severn River Basin Flood Risk Management Plan was undertaken in partnership between the Environment Agency and Natural Resources Wales.

The Severn River Basin District consultation on the draft Flood Risk Management Plan is available via the Natural Resources Wales website ([www.naturalresourceswales.gov.uk](http://www.naturalresourceswales.gov.uk)).

### 6.4.1 Objectives within the Severn River Basin District Management Plan

The objectives set out in the draft Severn River Basin District Flood Risk Management Plan are consistent with the Welsh Government National Flood and Coastal Erosion Risk Management Strategy objectives and these have been used to set the framework for flood and coastal erosion risk management work within Wales.

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

Natural Resources Wales has detailed seven objectives to help manage flood risk from main rivers, seas and reservoirs and these are presented in the table 12. The objectives were considered by taking into account the three main aspects of sustainable flood risk management:

Social: people and communities;

Economic: Potential cost and economic benefit;

Environment: cultural heritage, landscape and habitat diversity.

The draft Severn River Basin District Flood Risk Management Plan has used the same receptors for their consideration of flood risk as those detailed within Section 5.4 of this document.

**Table 13** Wales FRMP Objectives

FRMP Objective Number	Wales FRMP Objective	Link to Welsh Government National Flood and Coastal Erosion Risk Management Strategy Objectives	Principles of sustainability		
			People	Environment	Economy
Objective 1	Reduce the risk of harm to life from flooding to people and communities from main rivers and the sea	1, 3	Y		Y
Objective 2	Increase resilience of services, assets and infrastructure to the risk of flooding	1, 3	Y		Y
Objective 3	Improve understanding of flood risk so that decisions are based upon the best available information	1, 3	Y	Y	Y
Objective 4	Improve community awareness and resilience to flooding	2	Y		Y
Objective 5	Provide an effective and sustained response to flood events	3	Y		Y
Objective 6	Allocate funding and resources for all sources of flooding on a risk	4	Y	Y	Y
Objective 7	Incorporate the ecosystem approach into the delivery of flood risk management	1, 4	Y	Y	Y

#### 6.4.2 Co-ordination with the Severn Flood Risk Management Plan

As part of the development of the Severn Flood Risk Management Plan a consultation ran between October 2014 to April 2015 and provided an opportunity for comment. Rhondda Cynon Taf County Borough Council has previously responded to the consultation.

Rhondda Cynon Taf County Borough Council has sought to provide a co-ordinated approach considering the measures proposed within the Severn River Basin District Flood Risk Management Plan within Rhondda Cynon Taf County Borough Council. The table below provides an overview of the relevant objectives and measures where Rhondda Cynon Taf County Borough Council believes there is a potential for a co-ordinated approach.

The Severn River Basin Flood Risk Management Plan has proposed a delivery plan to help manage the risk of flooding within the South East Wales catchment. Within the boundary of Rhondda Cynon Taf County Borough Council, there are three communities that have measures attributed to them and these are provided in the table below.

**Table 14:** Summary of Natural Wales Resources ongoing and proposed measures within Rhondda Cynon Taf County Borough Council

Location	Source	Measures	Measure Type	Link to SRBD FRMP objective*	Timing	Priority	Measure Status	Responsible Authority
Tregorchy	Main River	Undertake initial assessment and feasibility work for reducing flood risk	M3 – Protection	1, 2	Current	Very High	Not Started Proposed	Natural Resources Wales
		Update Hydraulic Model	M3 – Protection	3	Current	Very High	On-going	Natural Resources Wales
Rhondda	Main River	Undertake initial assessment and feasibility work for reducing flood risk	M3 – Protection	1, 2	Current	Very High	Not Started Proposed	Natural Resources Wales
		Update Hydraulic Model	M3 – Protection	3	Current	Very High	On-going	Natural Resources Wales
Trehafod	Main River	Undertake initial assessment and feasibility work for reducing flood risk	M3 – Protection	1, 2	Current	Very High	Not Started Proposed	Natural Resources Wales
		Update Hydraulic Model	M3 – Protection	3	Current	Very High	On-going	Natural Resources Wales
		Maintain completed community flood plan	M4 – Preparedness	1, 4, 5	Current	Very High	On-going	Natural Resources Wales

\*This FRMP objective link is specific to the Severn River Basin District Flood Risk Management Plan

## **7.0 RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL – BOROUGH WIDE**

This section looks at the flood risk posed to the whole of Rhondda Cynon Taf County Borough Council.

### **7.1 Overview**

Rhondda Cynon Taf County Borough Council is Unitary Authority situated within the valleys of South East Wales and is the second largest authority in Wales, formed in 1996 from former Borough of Rhondda, Cynon Valley and Taff Ely, excluding the areas of Pentyrch and Creigiau, which were incorporated into Cardiff City Council. Rhondda Cynon Taff covers an area of approximately 42,400 Hectares with a population of 234,300 (census 2011).

The borough is situated within the South East Valleys management catchment of the Severn River Basin District and is comprised of four main catchments, the Rhondda, Cynon, Taf and Ely situated in the west centre and east, respectively. The catchments of Rhondda Cynon Taf are characterised by steep and narrow valleys with development reserved to the gentler gradients at the valley floor.

### **7.2 Conclusions from the uFMfSW**

There are 250,907 people and 406 services within Rhondda Cynon Taf County Borough Council. Of these 7,623 and 57 services are at risk of flooding (considering the maximum extent of flooding). The highest areas of risk are confined to the valley floors of the Rhondda, Cynon and Taf valleys and those areas adjacent to watercourses.

Generally, the uFMfSW show flooding to areas that is coincidental with historic flooding incidents reported to Rhondda Cynon Taf County Borough Council. The highest risk is associated with ordinary watercourses and the breaching of banks due to the lack of capacity.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Rhondda Cynon Taf County Borough Council are presented below.

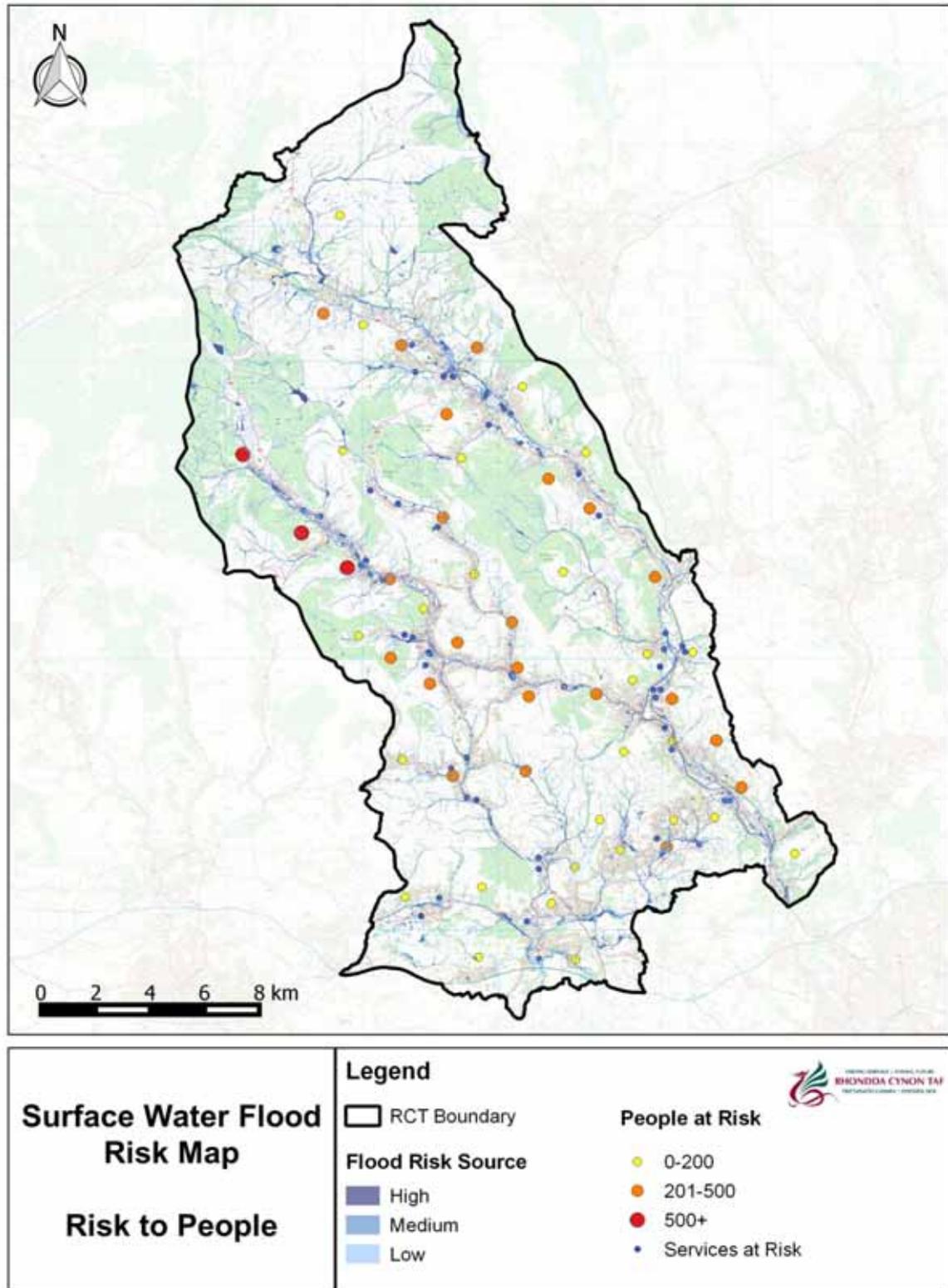
**Table 15:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Rhondda Cynon Taf County Borough Council

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	250,907	7,623	6,559	26,682
Services	406	57	10	12
<b>RISK TO ECONOMIC ACTIVITY</b>				
Non Residential Properties	21,905	850	638	2,216
Airports	0	0	0	0
Roads (km)	217	8	2	14
Railways (km)	69	4	3	3
Agricultural Land (hectares)	2,013	38	31	82
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	8	5	0	0
Special Area of Conservation (SAC)	248	6	1	21
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	1,183	35	23	57
Parks and Gardens	144	3	1	5
Scheduled Ancient Monuments	163	2	1	57
Listed Buildings	368	27	5	27
Licensed Abstractions	57	14	1	7
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	229			
External	829			
Highway	1468			

**Table 16:** Summary of Flood Risk Management Plan Measures for Rhondda Cynon Taf County Borough Council – Borough wide

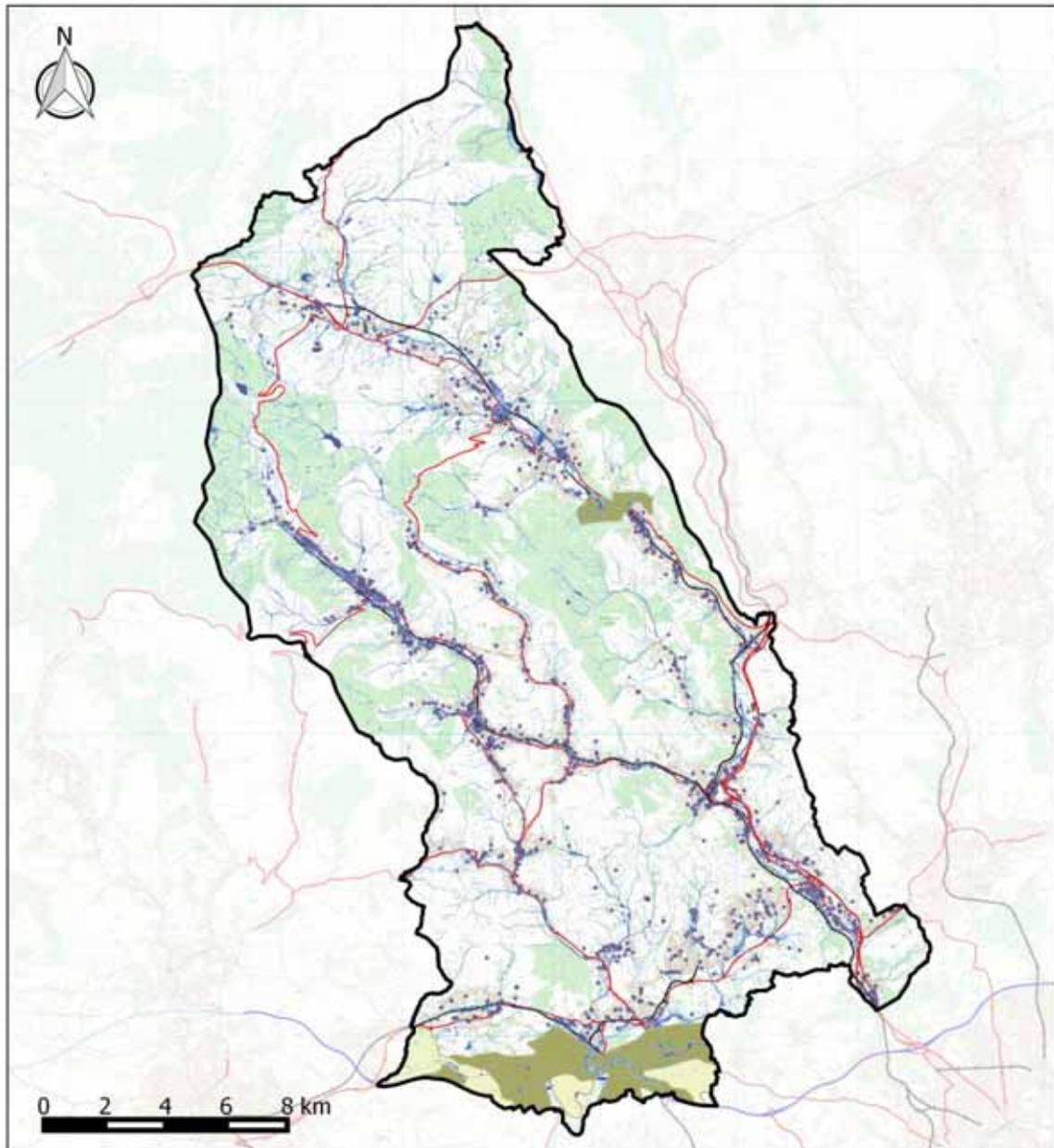
Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status
Rhondda Cynon Taf County Borough Council – Borough Wide	Local	1	Establish SUDs Approval Body	M3 – Protection	2015-2021	Ongoing
		2	Water Cycle Strategy	M3 – Protection	2015-2021	Ongoing
		3	RCTCBC Local Development Plan	M2 – Prevention	2015-2021	Ongoing
		4	Planning Policy Wales	M2 – Prevention	2015-2021	Ongoing
		5	Flood Awareness	M4 – Preparedness	2015-2021	Ongoing
		14	System Asset Management Plans	M4 – Preparedness	2015-2021	Ongoing
		15	Enforcement of private water sewers	M2 – Prevention	2015-2021	Ongoing
		16	Power to request information and civil sanctions	M4 – Preparedness	2015-2021	Ongoing
		17	Asset register and records	M4 – Preparedness	2015-2021	Ongoing
		20	Consenting on ordinary watercourses	M2 – Prevention	2015-2021	Ongoing
		21	Enforcement to maintain flow in watercourses	M2 – Prevention	2015-2021	Ongoing
		22	Enactment of Land Drainage Byelaws	M2 – Prevention	2015-2021	Ongoing
		25	Investigation of Flooding incidents	M4 – Preparedness	2015-2021	Ongoing
		32	Flood Risk Management Plans	M4 – Preparedness	2015-2021	Ongoing
		33	Flood Risk and Hazard Maps	M2 – Prevention	2015-2021	Complete
		34	Partnership Working	M4 – Preparedness	2015-2021	Ongoing
37	Weather pattern monitoring	M2 - Prevention	2015-2021	Ongoing		

**Figure 13:** Rhondda Cynon Taf County Borough Council uFMfSW: Risk to people



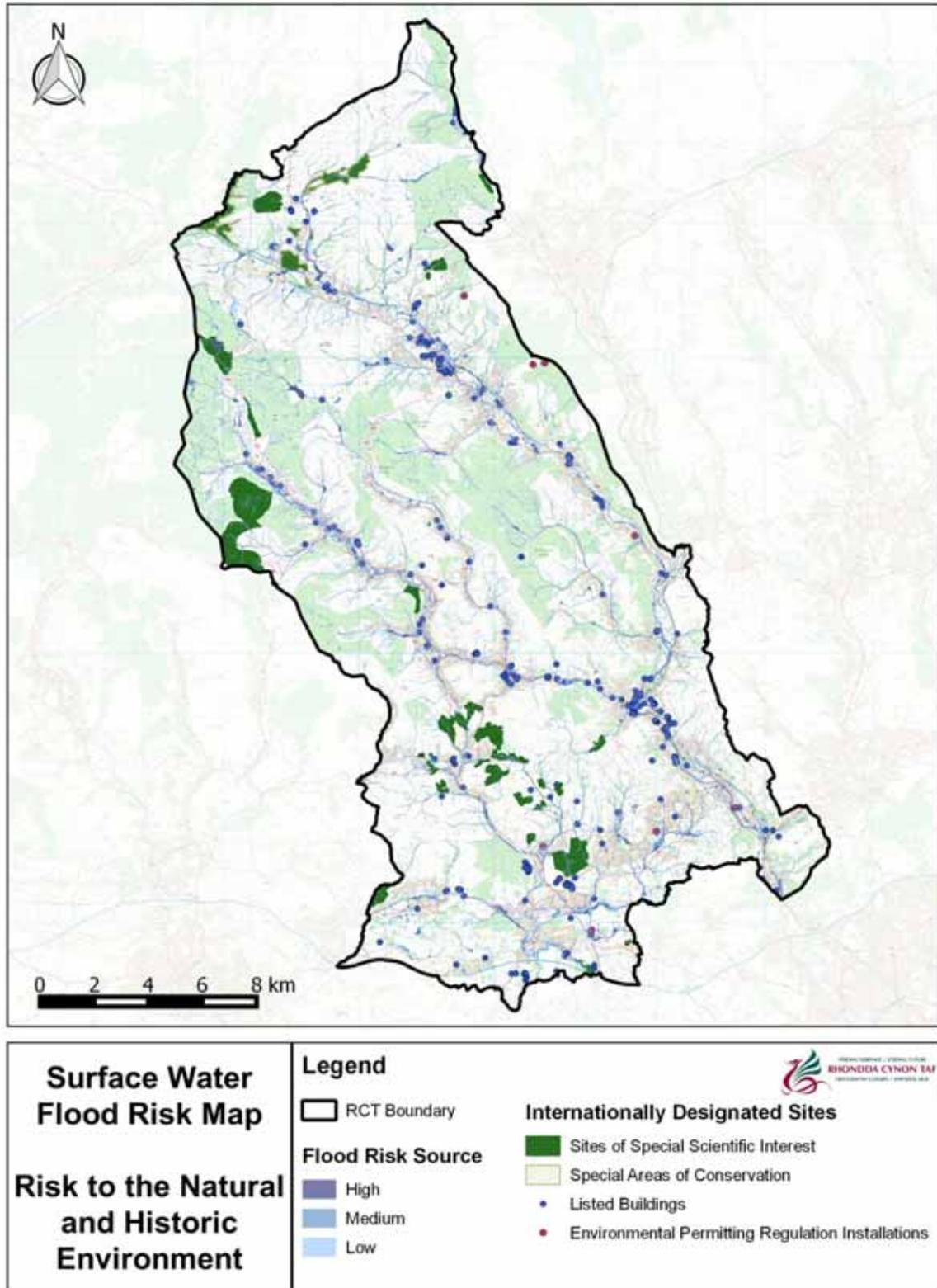
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**Figure 14:** Rhondda Cynon Taf County Borough Council uFMfSW: Risk to economic activity



<p><b>Surface Water Flood Risk Map</b></p> <p><b>Risk To Economic Activity</b></p>	<p><b>Legend</b></p> <p>□ RCT Boundary</p> <p><b>Flood Risk Source</b></p> <p>■ High</p> <p>■ Medium</p> <p>■ Low</p>	<p><b>Economic Activity</b></p> <p>• Non-Residential Properties</p> <p>— Railways</p> <p>— A Road</p> <p>— Motorway</p> <p>■ Agricultural Land Classification Grade 2</p> <p>■ Agricultural Land Classification Grade 3</p>	
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**Figure 15:** Rhondda Cynon Taf County Borough Council uFMfSW: Risk to the natural and historical environment



## 8.0 RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL – FLOOD RISK AREA

### 8.1 Overview

This section looks at the flood risk posed within Rhondda Cynon Taf County Borough Council's Indicative Flood Risk Area.

The Flood Risk Area is situated within the unitary authority of Rhondda Cynon Taf County Borough Council and is discussed in detail within Section 5.1. The Flood Risk Area covers approximately 21,175 Ha and has a population of approximately.

The Flood Risk Area broadly covers the valley floors of the Rhondda, Cynon and Taf Catchments but does not extend to cover much the upper Rhondda catchment, principally excluding the community area of Rhigos, and a large proportion the Ely River catchment in the southwest of the authority.

### 8.2 Conclusions from the uFMfSW

There are 205,385 people and 298 services within Rhondda Cynon Taf County Borough Council's Flood Risk Area. Of these 7,024 and 6 services are at risk of flooding (considering the maximum extent of flooding). The highest areas of risk are confined to the valley floors of the Rhondda, Cynon and Taf valleys and those areas adjacent to watercourses.

Generally, the uFMfSW show flooding to areas that is coincidental with historic flooding incidents reported to Rhondda Cynon Taf County Borough Council. The highest risk is associated with ordinary watercourse and the breaching of banks due to the lack of capacity within the valley floors.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Rhondda Cynon Taf County Borough Council's Flood Risk Area are presented below.

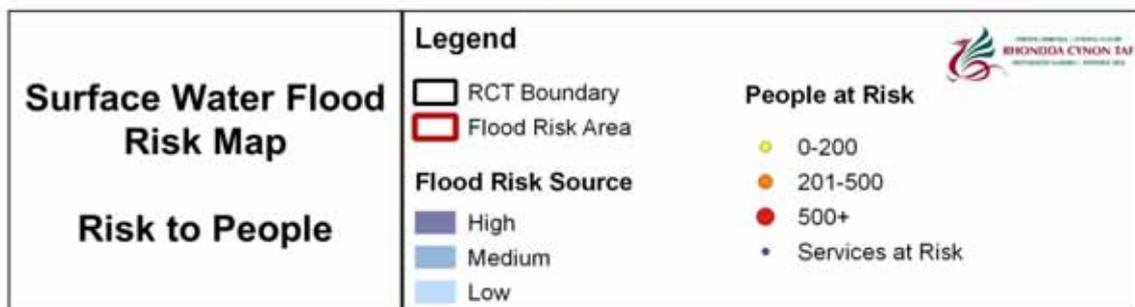
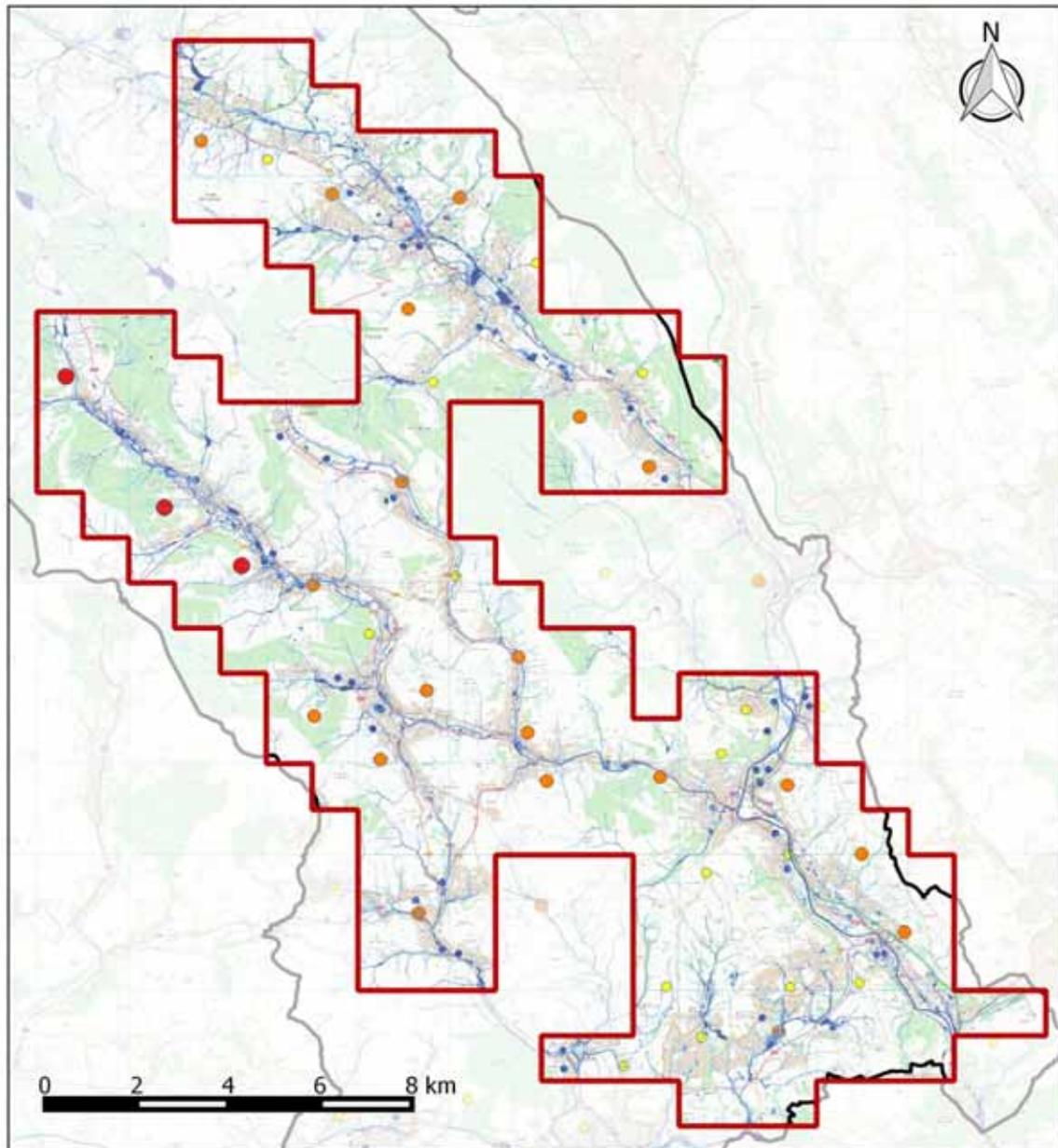
**Table 17:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Rhondda Cynon Taf County Borough Council's Flood Risk Area

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	205,385	7,024	6,141	24,005
Services	298	6	9	52
<b>RISK TO ECONOMIC ACTIVITY</b>				
Non Residential Properties	15,822	726	554	1,853
Airports	0	0	0	0
Roads (km)	29	3	1	6
Railways (km)	46	3	2	2
Agricultural Land (hectares)	163	7	5	15
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	3	3	0	0
Special Area of Conservation (SAC)	7	0	0	1
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	473	7	4	19
Parks and Gardens	36	1	1	3
Scheduled Ancient Monuments	53	1	1	2
Listed Buildings	277	25	5	22
Licensed Abstractions	24	5	0	2
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	201			
External	727			
Highway	1232			

**Table 18:** Summary of Flood Risk Management Plan Measures for Rhondda Cynon Taf County Borough Council – Flood Risk Area

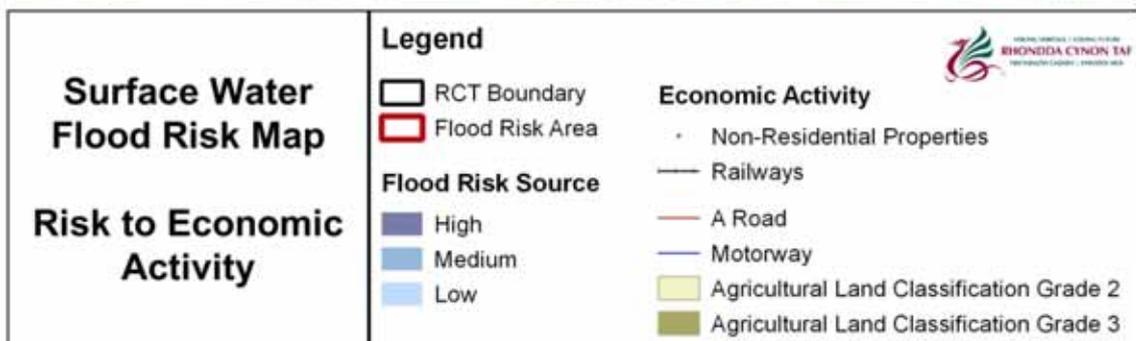
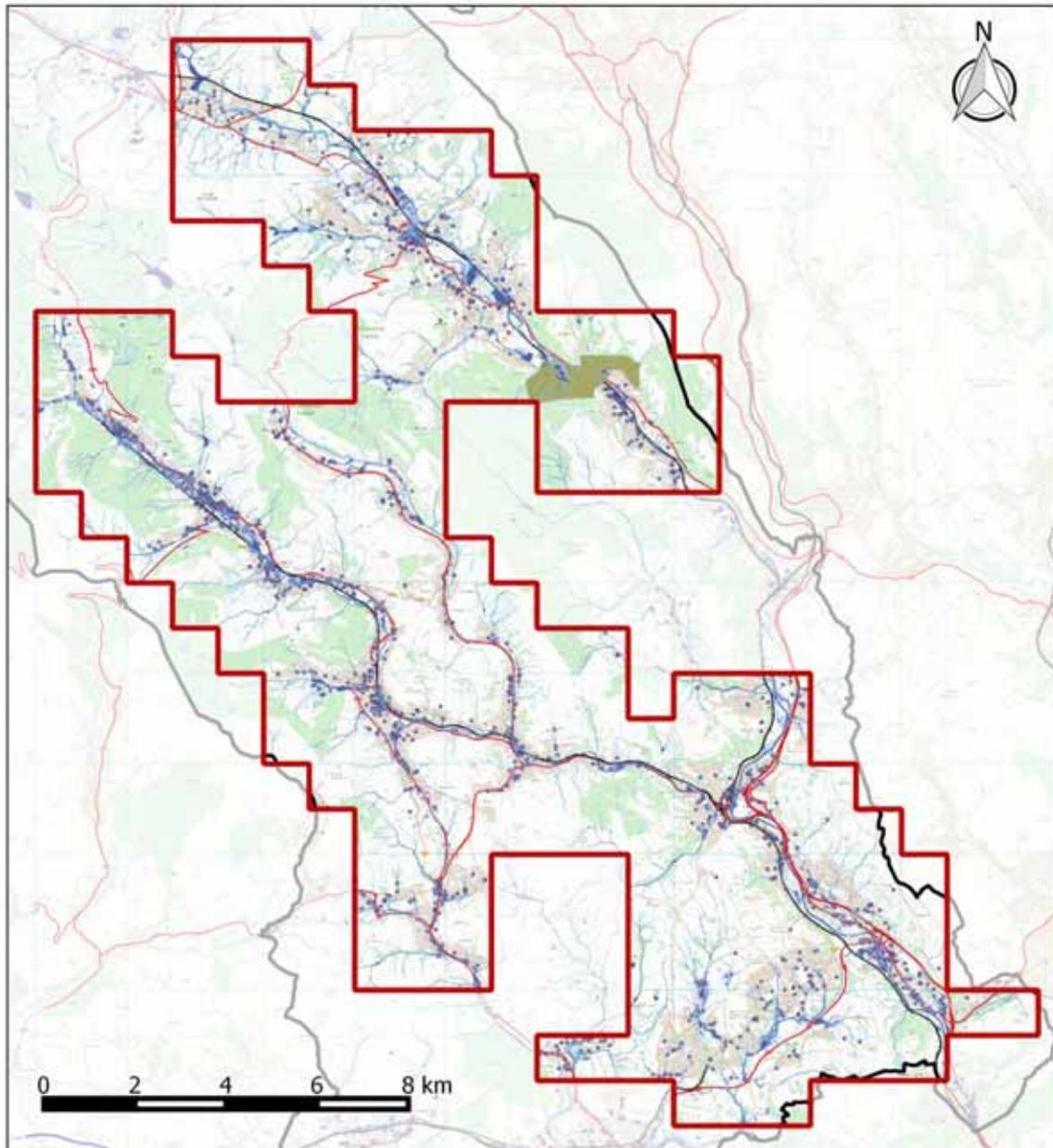
Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status
Rhondda Cynon Taf County Borough Council – Borough Wide	Local	1	Establish SUDs Approval Body	M3 – Protection	2015-2021	Ongoing
		2	Water Cycle Strategy	M3 – Protection	2015-2021	Ongoing
		3	RCTCBC Local Development Plan	M2 – Prevention	2015-2021	Ongoing
		4	Planning Policy Wales	M2 – Prevention	2015-2021	Ongoing
		5	Flood Awareness	M4 – Preparedness	2015-2021	Ongoing
		14	System Asset Management Plans	M4 – Preparedness	2015-2021	Ongoing
		15	Enforcement of private water sewers	M2 – Prevention	2015-2021	Ongoing
		16	Power to request information and civil sanctions	M4 – Preparedness	2015-2021	Ongoing
		17	Asset register and records	M4 – Preparedness	2015-2021	Ongoing
		20	Consenting on ordinary watercourses	M2 – Prevention	2015-2021	Ongoing
		21	Enforcement to maintain flow in watercourses	M2 – Prevention	2015-2021	Ongoing
		22	Enactment of Land Drainage Byelaws	M2 – Prevention	2015-2021	Ongoing
		25	Investigation of Flooding incidents	M4 – Preparedness	2015-2021	Ongoing
		32	Flood Risk Management Plans	M4 – Preparedness	2015-2021	Ongoing
		33	Flood Risk and Hazard Maps	M2 – Prevention	2015-2021	Complete
		34	Partnership Working	M4 – Preparedness	2015-2021	Ongoing
37	Weather pattern monitoring	M2 - Prevention	2015-2021	Ongoing		

**Figure 16:** Rhondda Cynon Taf County Borough Council Indicative Flood Risk Area uFMfSW: Risk to people



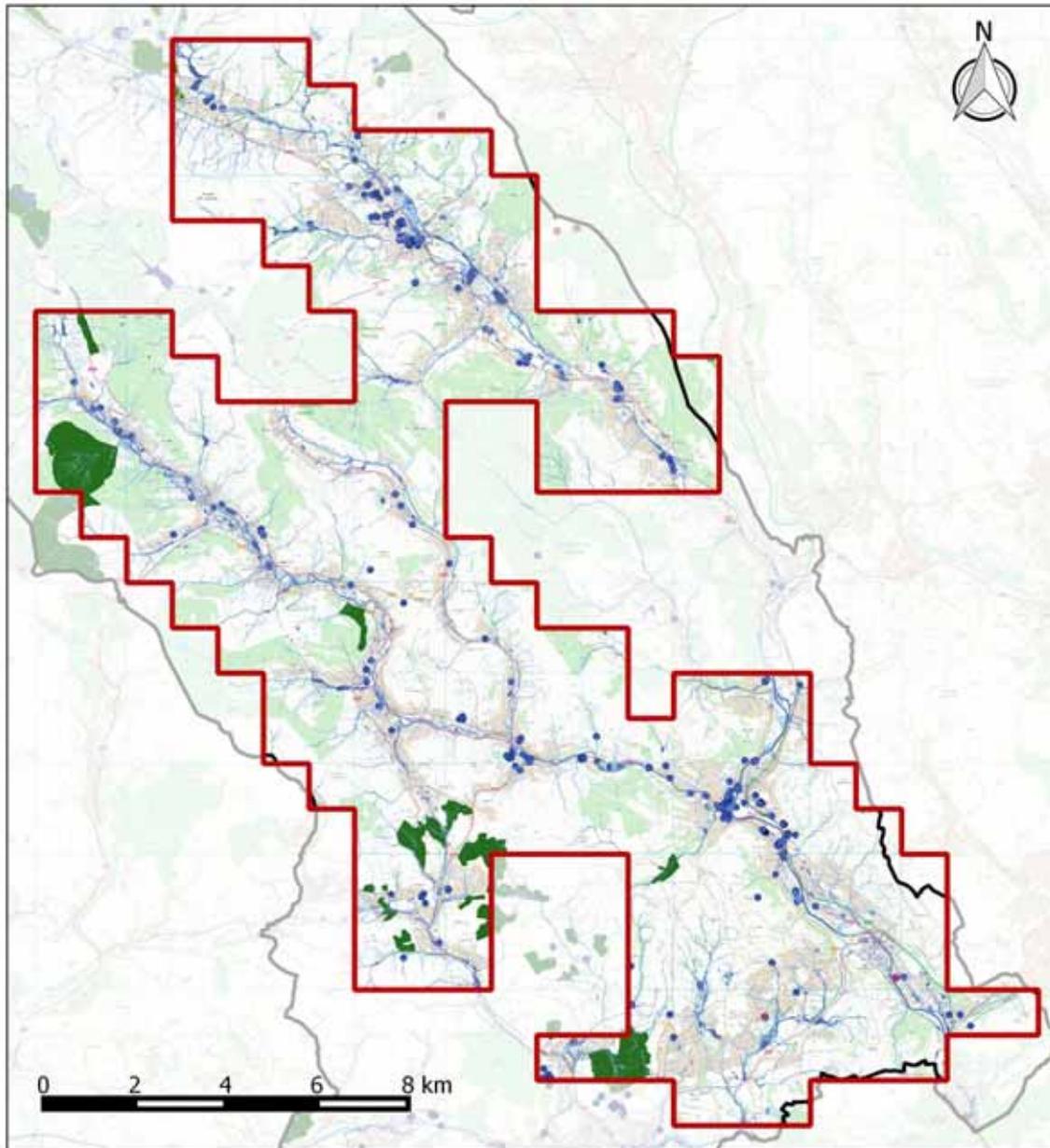
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**Figure 17:** Rhondda Cynon Taf County Borough Council Indicative Flood Risk Area uFMfSW: Risk to economic activity



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**Figure 18:** Rhondda Cynon Taf County Borough Council Indicative Flood Risk Area uFMfSW: Risk to the natural and historical environment



<p><b>Surface Water Flood Risk Map</b></p> <p><b>Risk to the Natural and Historic Environment</b></p>	<p><b>Legend</b></p> <p> RCT Boundary</p>	<p><b>Internationally Designated Sites</b></p> <p> Sites of Special Scientific Interest</p> <p> Special Areas of Conservation</p> <p> Listed Buildings</p> <p> Environmental Permitting Regulation Installations</p>
	<p><b>Flood Risk Source</b></p> <p> High</p> <p> Medium</p> <p> Low</p>	

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## **9.0 COMMUNITY AREAS**

This section looks at the flood risk posed to individual community areas. Further information on the community areas can be found in Section 5.3.

### **9.1 Aberaman North**

#### **9.1.1 Overview**

Aberaman North is situated in the northern sector of Rhondda Cynon Taf County Borough Council to the south of Aberdare. Aberaman North covers an area of 432Ha and the maximum elevation is 350m AOD. The area contains approximately 2,491 residential dwellings and a population of 5,854.

The majority of the Aberaman North has remained in a natural state, owing to the steep topography, and proximate areas have remained undeveloped. Residential development is situated in the east of Aberaman North, with the town of Aberaman. St Gwynno Forest is located in the west of the area.

Aberaman North is situated within the Afon Cynon Catchment. Aberaman North is drained to the east by the Nant Gwawr with its catchment covering the vast majority of the area. The Nant Gwawr flows west to east and is partly culverted through the town of Aberaman, discharging into the River Cynon. Aberaman North is bounded by the Afon Cynon in the east.

Several minor watercourses also issue within the Nant Gwawr catchment and are culverted through Aberaman.

The west of the site is a steep catchment that drains into the River Aman Fach and is fed by minor watercourses. The River Aman Fach runs along the western boundary of the community area. Aberaman North is also bounded by the River Aman Fach in the west.

The underlying Geology of the site is the Rhondda Beds Upper Carboniferous Coal Measures, comprising sandstones and mudstones and coal. Glacial Till is present along the major watercourses and Alluvial Deposits are present along the Afon Cynon.

### 9.1.2 Conclusions for the UFMfSW

Aberaman North covers approximately 432Ha with a total population of 5,854. Just over 3% of the population of Aberaman North are at high risk of surface water flooding.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

The updated Maps for Surface Water Flooding indicate that the highest risk posed to people and properties within Aberaman North is broadly associated with the Nant Gwawr with flood risk observed along the length of the watercourse. The flooding is likely sourced from culvert inlets and potential bank breaches. Commonly, the flow path is along roads with risk noted along sections of Gwawr Street, Cardiff Road, Curre Street and Cardiff Road.

The flood risk presented within the uFMfSW correlates with historic external and highway flooding incidents reported to Rhondda Cynon Taf within the area of the Nant Gwawr.

A low to high risk is noted within the town of Aberaman and Godreaman, in particular surface runoff noted along Brook Street, Mount Street and Hill Street. A separate flow path is also noted to pose a low to high risk at the junction of Park Road and Lewis Street, Cynon Street and Wyndham Crescent.

A low to high flood risk is represented along Llanddewi Street, Brecon Street, Brecon Place, Lower Station Street and Lower Street.

An average correlation between the uFMfSW and historic flood incidents is noted away from the Nant Gwawr.

Significant flooding is noted to occur to the east of the A4059, downstream of the Nant Gwawr, within the flood plain of the Afon Cynon. This flooding may also have contributions from Main River flooding. No properties, economic or environmental receptors are affected by this flooding.

The historic flooding incidents reported broadly correlate with requests for gully clearance with minimal incidents of highway flooding associated with the areas of high risk.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Aberaman North are presented in the table below.

**Table 19:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Aberaman North

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	5,854	202	164	766
Services	6	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	289	7	8	33
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	3	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	19			
Highway	38			

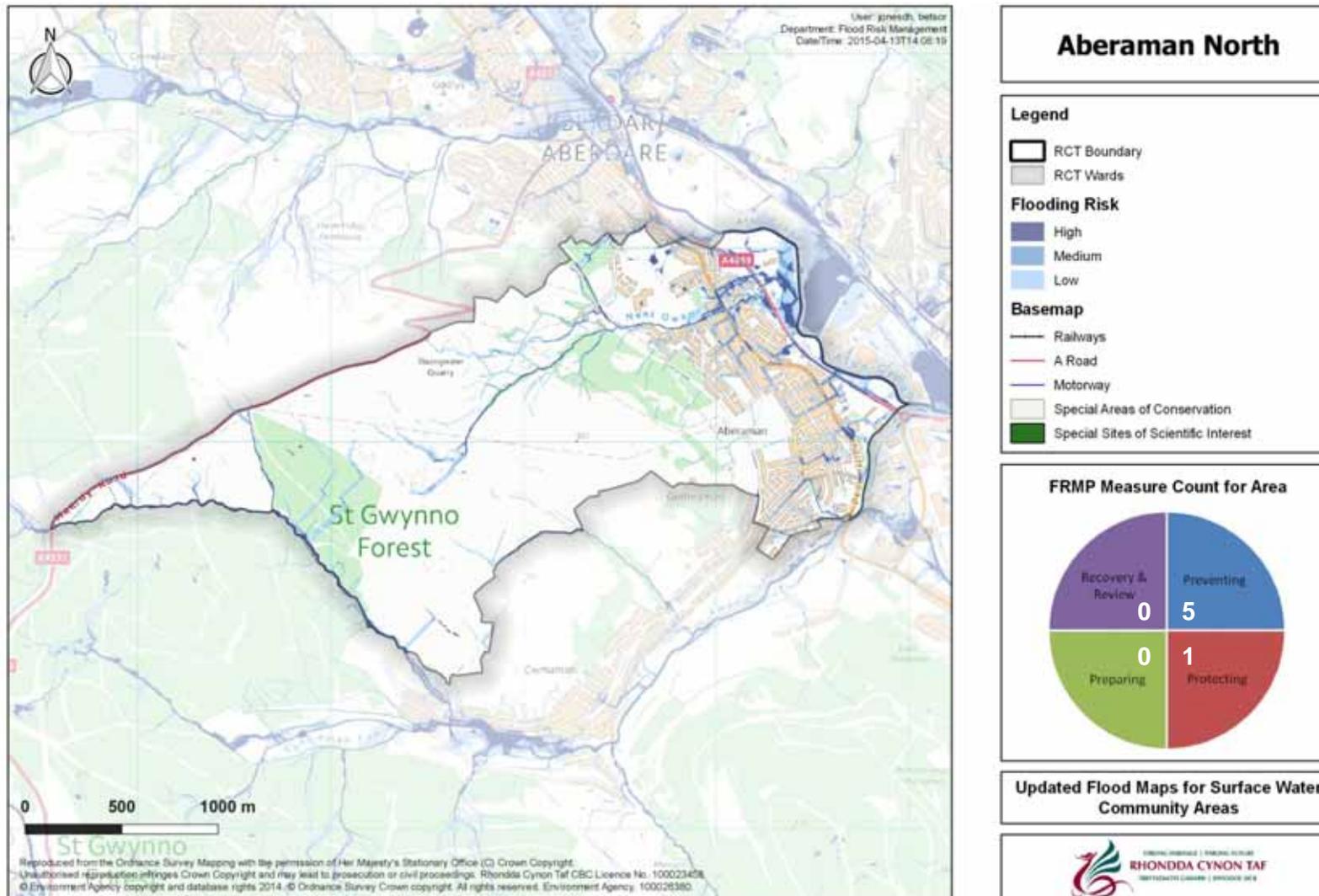
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Aberaman North and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 20:** Summary of Flood Risk Management Plan Measures for Aberaman North

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0001	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0002	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Ongoing/Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Completed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0003	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0004	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 19:** Aberaman North uFMfSW. Risk to people, economic activity and environmental receptors



## **9.2 Aberaman South**

### **9.2.1 Overview**

Aberaman South is situated in the centre of Rhondda Cynon Taf County Borough Council with the towns of Abercwmboi and Cwmaman. Aberaman South covers an area of and has a maximum elevation of approximately 436m AOD. The area has a population of approximately 5,172.

Aberaman South is predominately a rural environment with the highlands to the west and south of the site comprising part of Saint Gwynno Forest. Residential development is situated within the valley floors of the Aman River and the Afon Cynon. A small industrial estate is located adjacent to the Afon Cynon in the east of the area.

Aberaman South is situated within the Afon Cynon Catchment and is drained by the Aman River. The vast majority of the area forms the steep sided catchment of the Aman River, which is fed by three significant tributaries of the Ffyrnant, Nant Aman Fawr and the Nant Aman Fach. The Aman River is culverted in sections beneath Cwmaman.

The underlying Geology of the site is the Rhondda, Hughes and Llynfi Beds of the Upper Carboniferous Coal Measures, comprising sandstones and mudstones and coal. Glacial Till is present along the valley floors of major watercourses and Alluvial Deposits are present along the Afon Cynon in the west of the area. Peat is present in the highlands, within Saint Gwynno Forrest in the northwest.

The characteristics of the area create a “flashy” response to storm events, with short intense summer rainfall being critical for the area.

### **9.2.2 Conclusions for the UFMfSW**

Aberaman South covers approximately 1,254Ha with a total population of 5,172. Just over 9% of the population of Aberaman South are at high risk of surface water flooding.

The most significant risk of flooding is noted within Cwmaman, with a low to high flood risk contributable to area at the confluence of the Nant Aman Fawr and Nant Aman Fach.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Aberaman South are presented in the table below.

**Table 21:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Aberaman South

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People	5,172	463	94	940
Services	9	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	469	8	7	16
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	2	0.007	0.004	0
Agricultural Land (hectares)	23	1	0.3	2
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.01	0	0	0
Listed Buildings	3	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	6			
External	22			
Highway	55			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Aberaman South and their proposed Flood Risk Management Plan measures are presented in the table below.

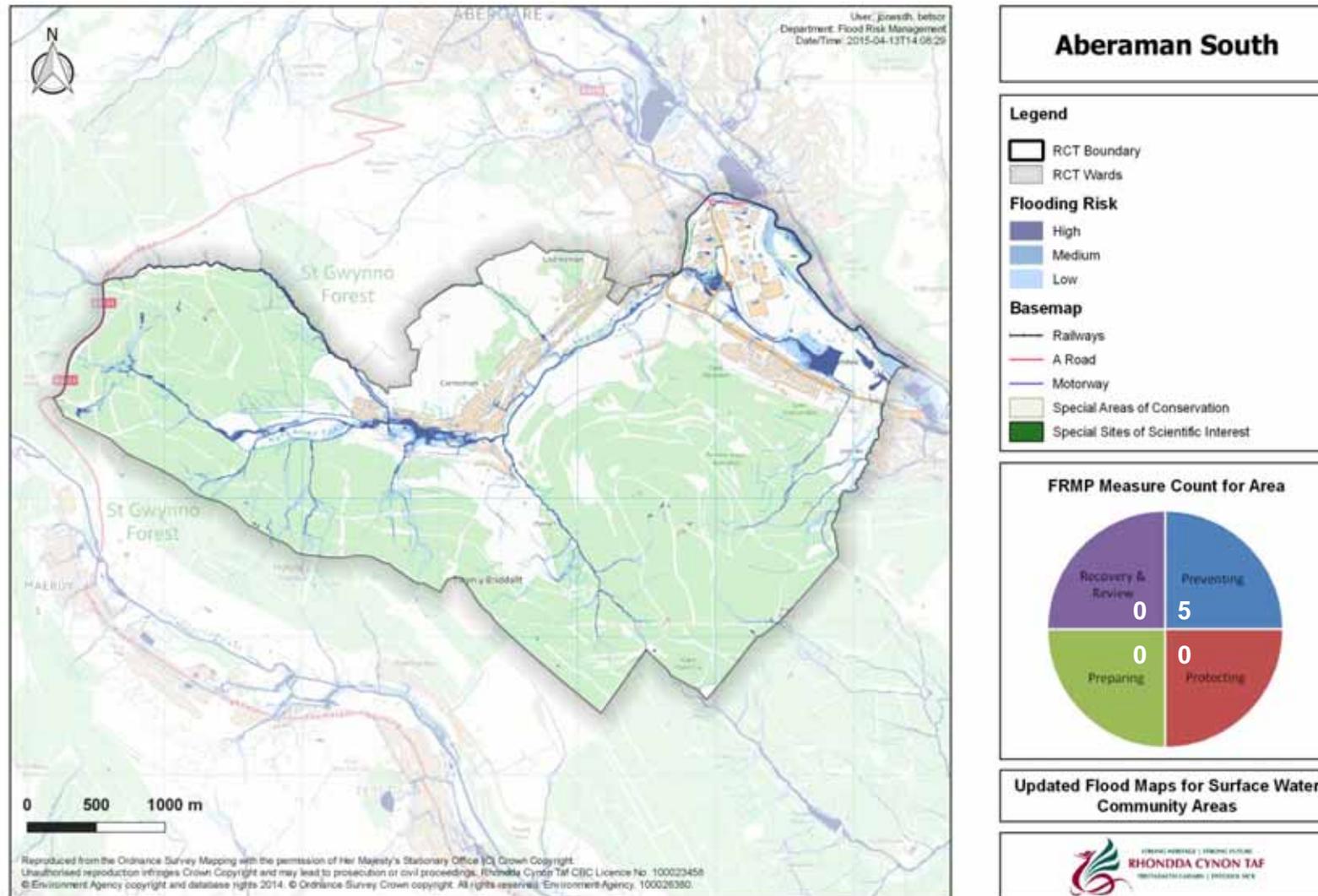
Further information regarding the flood investigation area is presented in Appendix A.

**Table 22:** Flood Risk Management Plan Measures for Aberaman South

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0004	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0005	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0006	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0007	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural resources Wales
RCT0008	Surface Runoff	30	Surface Water Modelling	M24 (Prevention)			Proposed

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 20:** Aberaman South uFMfSW. Risk to people, economic activity and environmental receptors



## **9.3 Abercynon**

### **9.3.1 Overview**

Abercynon is situated in the centre of Rhondda Cynon Taf County Borough Council to the south of Mountain Ash. The site covers an area of approximately 917Ha and has a maximum elevation of 282m AOD. Abercynon contains approximately 2,861 residential dwellings and has a population of approximately 6,723.

Abercynon is predominantly rural due to the steep topography of the highlands in the west, which comprise primarily of forested areas. Residential areas are confined to the valley floor of the Afon Taf and the Afon Cynon. A large section of the south of Abercynon is comprised of the Craig-Evan-Leyshon Common with a number of farms located here, but is largely uninhabited.

Abercynon is located within two Catchments; the Afon Cynon and the Afon Taf. Much of Abercynon is situated around the confluence of the Afon Cynon and the Afon Taf. Afon Cynon is fed by the Nant y Fedw and other unnamed watercourses in the north of the site, many of which are culverted in sections beneath Ynysboeth.

There are several minor unnamed watercourses also culverted through Abercynon and Ynysboeth.

The underlying geology of Abercynon is the Hughes and Brithdir Beds of the Upper Carboniferous Coal Measures which is comprised of coal, sandstones and mudstones. Alluvial deposits are found along the Afon Cynon and the southern section of the Afon Taf. Glaciofluvial deposits and Glacial Till are present along the valley floor of major watercourses, with Glacial Till extending up onto the Craig-Evan-Leyshon common.

### 9.3.2 Conclusions for the UFMfSW

Abercynon covers an area of approximately 917Ha and has a total population of 6,723. About 3% of Abercynon are at high risk of surface water flooding.

The UFMfSW indicates that the highest risk posed to people and properties within Abercynon is broadly associated with the Nant-Y-Fedw within Ynysboeth. The flooding is sourced from the culvert inlet with the flow path beginning here. The flow path is predominantly along roads with significant risk to streets just below the culvert inlet of the Nant-Y-Fedw.

There is also a significant risk of flooding in the centre of the community area. To the east of the railway line and railway station, there are a number of properties at medium to high risk of flooding.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Abercynon are presented in the table below.

**Table 23:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Abercynon

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	6,723	228	113	569
Services	18	2	1	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	550	15	10	25
Airports	0	0	0	0
Roads (km)	7	1	0.4	1
Railways (km)	6	0	0.5	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	1	1	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	3	1	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	3			
External	17			
Highway	39			

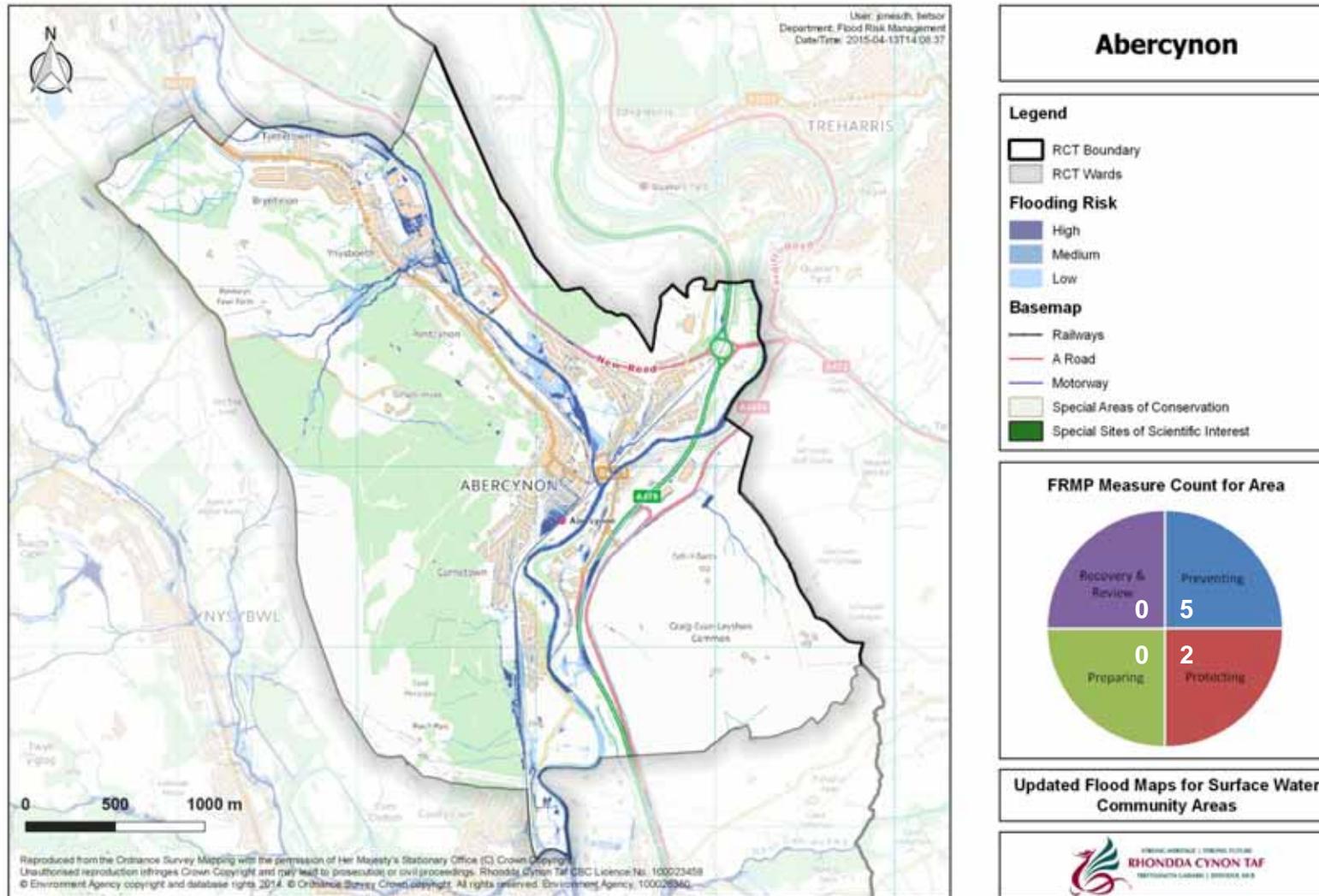
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Abercynon and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 24:** Summary of Flood Risk Management Plan Measures for Abercynon

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0009	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Ongoing	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Completed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0010	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0011	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0129	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 21:** Abercynon uFMfSW. Risk to people, economic activity and environmental receptors



## **9.4 Aberdare East**

### **9.4.1 Overview**

Aberdare East is situated in the north of Rhondda Cynon Taf County Borough Council with the town of Aberdare situated in the west of the community area. Aberdare East covers an area of approximately 673Ha and a maximum elevation of 429m AOD. The area contains approximately 3,280 residential dwellings and has a population of approximately 7,708.

Aberdare East is predominantly rural with residential areas confined to the valley floor of the Afon Cynon owing to the steep topography of the valley sides. The main residential area is the town of Aberdare, situated upon the banks of the Afon Cynon. The small, linear residential community of Aberrant has developed along Abernant Road, which is parallel to the Nant y Wenallt.

Aberdare East is located within the Afon Cynon Catchment, with the northeast boundary broadly following the line of the watershed shared with the Afon Taf. The community area is drained by the Nant y Wenallt with its catchment covering the majority of the eastern side of the area, discharging into the Afon Cynon at Aberdare. The Afon Dare drains the western area and is partially culverted beneath Aberdare, discharging into the Afon Cynon a short distance downstream of the Nant y Wenallt.

The south east of the community area is drained by a separate network of minor watercourses that eventually drain into the Aberdare Canal.

The underlying geology of Aberdare East consists predominantly of the Middle Carboniferous Coal Measures consisting of Coal, Mudstone, Siltstone and Sandstone. Also present are the Rhondda and Llynfi beds of the Upper Carboniferous Coal Measures. Alluvial Deposits are found along the Afon Cynon and partially along the Dare River. Glacial Till is present across much of the valley.

### 9.4.2 Conclusions for the UFMfSW

Aberdare East covers an area of approximately 673Ha and has a total population of 7,708. About 7% of Aberdare East is at high risk of surface water flooding.

The most apparent source of flooding is noted to be ordinary watercourse flooding, sourced from culvert inlets and the breach of watercourse embankments. Flow paths within the community area are commonly linear and are consistent with ordinary watercourse alignment.

A low to high surface water flood risk is observed within the centre of Aberdare's residential development. The source of flooding is anticipated to be associated with the culvert inlets upon the Main River designated Dare River and an unnamed ordinary watercourse situated to the north of the Dare River. The flow path generally follows the roads with a number of streets at medium to high risk of flooding.

The area of Gadlys is also at a low to high risk of flooding from surface water, anticipated to be associated with the culvert inlet of the unnamed watercourse situated adjacent to Glan Road, running through the residential development.

Surface water flood risk is also presented in the south of Aberdare town centre, with flood flows notably associated with both Monk Street and Elizabeth Street. A low to high flood risk is also noted along Abernant Road and in the area of Wenallt Road.

There is reasonable correlation between the extents of the uFMfSW and historic flooding events, notably historic highway flooding reported to Rhondda Cynon Taf in Aberdare town centre.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Aberdare East are presented in the table below.

**Table 25:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Aberdare East

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	7,708	566	435	980
Services	17	2	2	3
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	815	138	74	100
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	1	0.02	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.4	0	0	0
Listed Buildings	39	3	2	12
Licensed Abstractions	1	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	10			
External	23			
Highway	44			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Aberdare East and their proposed Flood Risk Management Plan measures are presented in the table below.

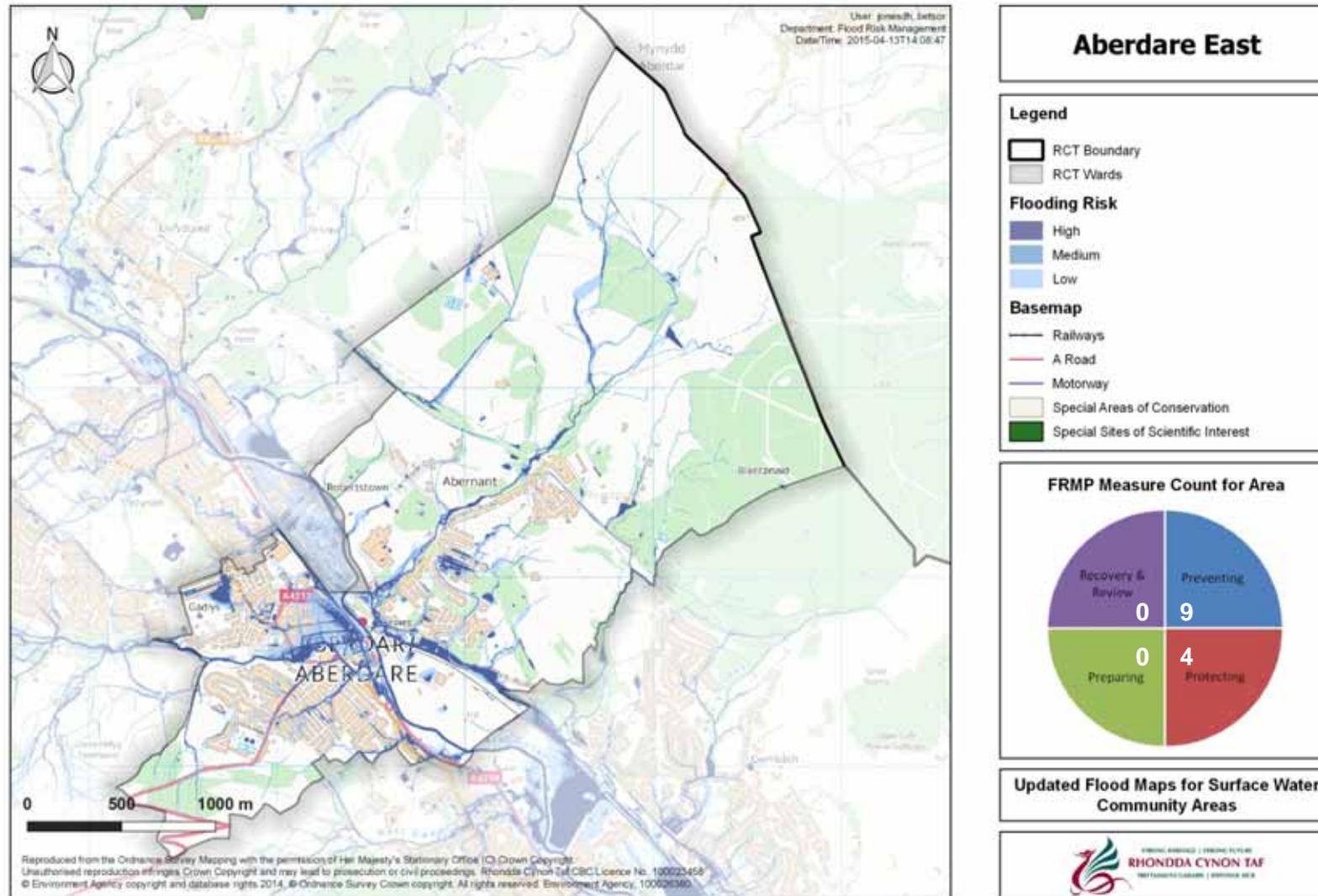
Further information regarding the flood investigation area is presented in Appendix A.

**Table 26:** Summary of Flood Risk Management Plan Measures for Aberdare East

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0001	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0012	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0013	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0014	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0016	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0031	Local / Main River*	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0032	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 22:** Aberdare East uFMfSW. Risk to people, economic activity and environmental receptors



## **9.5 Aberdare West/Llwydcoed**

### **9.5.1 Overview**

Aberdare West/Llwydcoed is located in the north of Rhondda Cynon Taf County Borough Council, immediately to the north of Aberdare East. Aberdare West/Llwydcoed covers an area of approximately 2183Ha and has a maximum elevation of 393m AOD. The area contains approximately 4,169 residential dwellings and a population of approximately 9,797.

The majority of Aberdare West/Llwydcoed has remained in a natural state with highlands remaining in a rural setting. Residential development is located adjacent to two main rivers in the central area of the Aberdare West/Llwydcoed. The residential areas of Llwydcoed and Trecynon are situated to the north and south of the Afon Cynon, respectively, whilst Cwmdare is located to the north of the Afon Dare.

The community area is broadly situated within the WFD management catchment of the Cynon and is drained by two Main Rivers, the Afon Cynon itself in the north and the Afon Dare in the south, which discharges into the Afon Cynon south of the area in the town of Aberdare. The northeast community area boundary is broadly consistent with the watershed of the Afon Taff catchment. The southwest of the community area forms part of the Afon Rhondda Fach catchment.

The Dare Valley Country Park covers the majority of the west of Aberdare West/Llwydcoed and two special sites of scientific interest are located in the north. A large landfill site is situated to the west of Llwydcoed in the east. There is also a small industrial estate to the north of Robertstown.

There are a number of minor ordinary watercourses which drain the west of Aberdare West/Llwydcoed, including the Nant y Gwyddel and the Nant y Derlwyn. The Afon Rhondda Fach and the Nant Rhydfelin form part of the boundary between the community areas of Aberdare West/Llwydcoed and Maerdy.

The underlying geology of the area consists of Llynfi Beds of the Lower, Middle and Upper Carboniferous Coal Measures, comprising Coal, Mudstone, Siltstone and Sandstone. Alluvial Deposits are found along the Afon Cynon and partially along the Dale River. Glacial Till is present across much of the valley.

### 9.5.2 Conclusions for the UFMfSW

Aberdare West/Llwydcoed covers an area of approximately 2,183Ha and has a total population of 9,797. About 3% of Aberdare West/Llwydcoed is at high risk of surface water flooding.

The uFMfSW indicate that flooding within Aberdare West/Llwydcoed is most commonly associated with ordinary watercourse inlets or breach of banking, notably the area around Cemetery Road and Trefelin in Trecynon.

Flood risk is noted in the area of Cwmdare Road and Cherry Drive in Cwmdare and Mill Street, Harriet Street, Broniestyn Terrace and Tudor Terrace in Trecynon, with accumulations upon the highway network. This flood risk is noted to also cause flooding to a length of the A4509, contributing to the flooding observed in Robertstown. The flood risk in Robertstown is likely a combination of flooding from both local and Main River sources.

A risk of flooding is presented at the roundabout of the A4509, which has sources attributed to both surface water and Main River flooding. This is consistent with historic flooding events reported to Rhondda Cynon Taf County Borough Council.

The UFMfSW indicated that there is also a high risk of flooding associated with the culvert inlets along the length of Bwlfa Road, notably the Nant Melyn and two unnamed ordinary watercourses.

The historic flooding events reported to Rhondda Cynon Taf County Borough Council have a good correlation with the flood risk presented within the uFMfSW.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Aberdare West/Llwydcoed are presented in the table below.

**Table 27:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Aberdare West/Llwydcoed

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	9,797	303	282	1,112
Services	16	0	1	3
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	799	23	20	82
Airports	0	0	0	0
Roads (km)	1	0.4	0.06	0.2
Railways (km)	4	0.007	0.08	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	1	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	25	0	2	2
Parks and Gardens	20	1	0.3	1
Scheduled Ancient Monuments	7	0.2	0.07	0.3
Listed Buildings	25	6	1	0
Licensed Abstractions	5	4	0	1
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	12			
External	47			
Highway	46			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Aberdare West/Llwydcoed and their proposed Flood Risk Management Plan measures are presented in the table below.

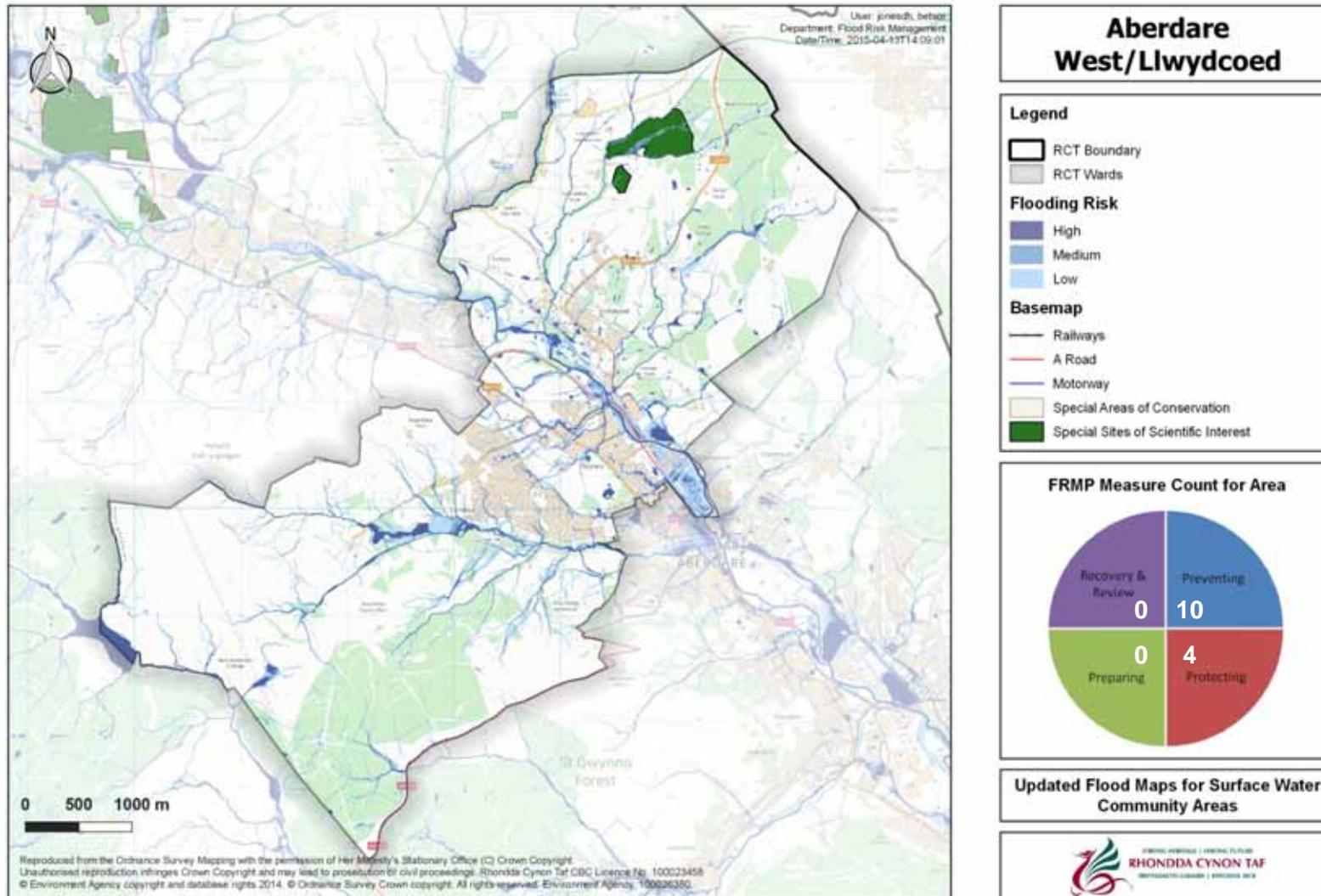
Further information regarding the flood investigation area is presented in Appendix A.

**Table 28:** Summary of Flood Risk Management Plan Measures for Aberdare West/Llwydcoed

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0012	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0015	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0016	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0017	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0018	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0019	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0126	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Ongoing	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Ongoing	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Ongoing	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Ongoing	RCTCBC
RCT0127	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Ongoing	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Ongoing	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Ongoing	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Ongoing	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 23:** Aberdare West/Llwydcoed uFMfSW. Risk to people, economic activity and environmental receptors



## **9.6 Beddau**

### **9.6.1 Overview**

Beddau is located in the south of Rhondda Cynon Taf County Borough Council, to the north of Llantrisant. It covers an area of 507Ha and has a maximum elevation of 253m AOD. Beddau has a population of approximately 4,134 and has approximately 1,759 residential dwellings.

Beddau is a predominantly rural community area with the town of Beddau situated in the south of the community ward, which is divided between Beddau community area in the west and Tyn-y-Nant community area in the east, along the length of Gwaun Miskin Road. Residential areas within Beddau include Tynant and Brynteg.

Rural areas are comprised of agricultural farm land with a Site of Special Scientific Interest located in the southwest of the area.

The Majority of Beddau is situated within the Afon Elai Catchment; however, the north includes a small section of the Afon Rhondda Catchment, draining to the north. A number of minor ordinary watercourses drain the north of Beddau, notably the Nant Castellau, which flows to the west and discharges into the Nant Muchudd to the southwest of Beddau. Two unnamed watercourses are sourced within the residential area, which discharge into the Nant Cymdda-Bach at the southern boundary of the community area.

The underlying geology consists of Brithdir and Hughes Beds of the Upper Carboniferous Coal Measures, which are formed of Coal, Mudstone, Siltstone and Sandstone. Also present is the Grovesend Formation, also formed of Mudstone, Siltstone and Sandstone. Glacial Till is present across much of Beddau.

### 9.6.2 Conclusions for the UFMfSW

Beddau covers an area of approximately 507Ha and has a total population of 4,314. About 2% of Beddau are at high risk of surface water flooding.

The UFMfSW indicate Beddau is at risk from surface water flooding in the areas of Beddau town, to the west of Gwaun Miskin Road, adjacent to Heol Seward and Manor Chase. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

A high flood risk is noted at Brynteg Lane, sourced from the culvert inlet of an unnamed watercourse.

There are few historic reports of flooding reported to Rhondda Cynon Taf County Borough Council within Beddau; however, a reasonable correlation between the uFMfSW and historic flood events is noted.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Beddau are presented in the table below.

**Table 29:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Beddau

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,134	78	59	289
Services	3	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	286	1	6	18
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	1	0.05	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	12	0.2	0.2	0.4
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.04	0	0	0
Listed Buildings	5	1	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	0			
External	7			
Highway	9			

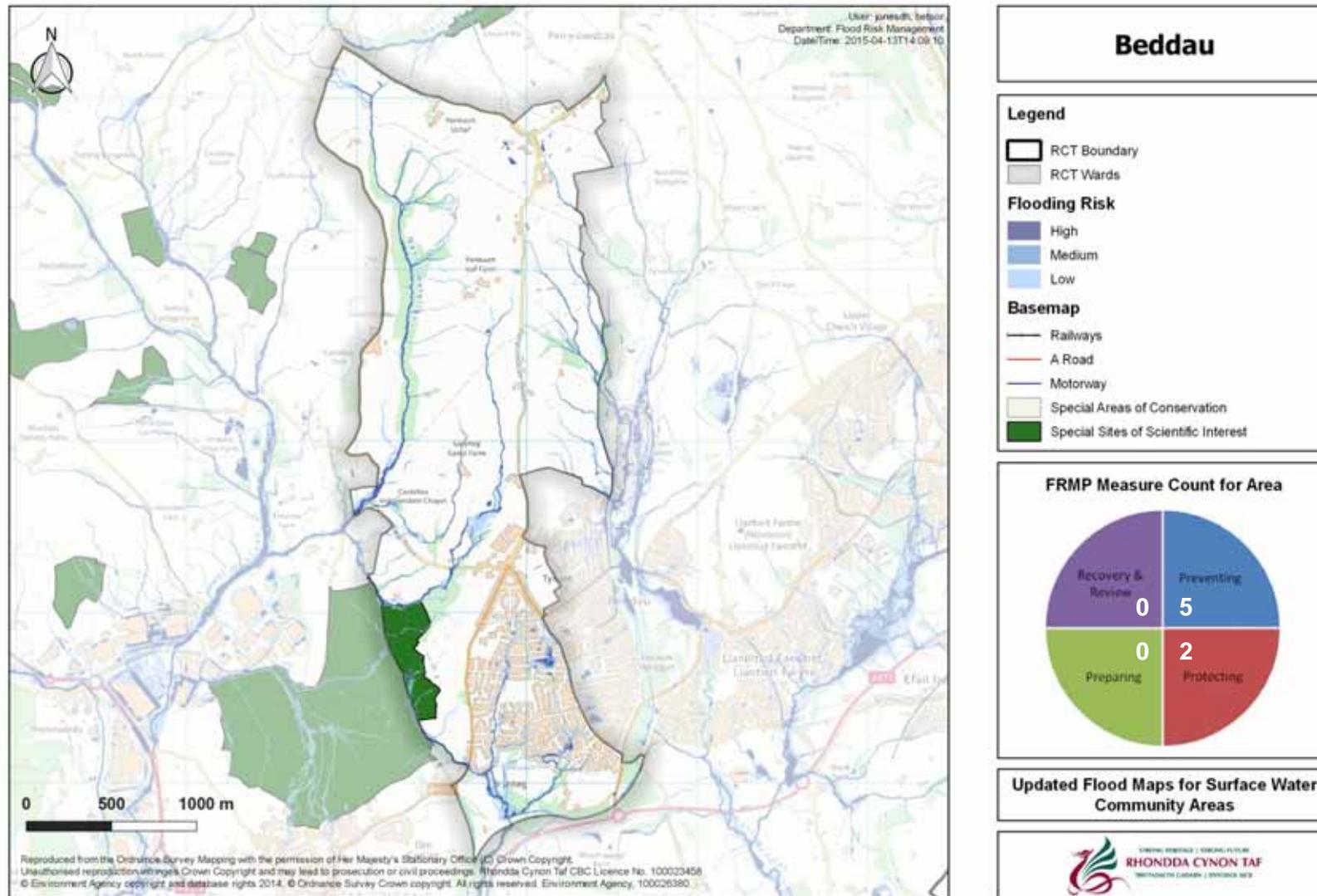
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Beddau and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 30:** Summary of Flood Risk Management Plan Measures for Beddau

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure status	Responsible Authority
RCT0020	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0051	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0114	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0115	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 24:** Beddau uFMfSW. Risk to people, economic activity and environmental receptors



## 9.7 Brynna

### 9.7.1 Overview

Brynna is located in the south west of Rhondda Cynon Taf County Borough Council, covering an area of approximately 1242Ha and has a maximum elevation of 277m AOD. Brynna has a population of approximately 3,776 and approximately 1,607 residential dwellings.

The area is predominantly rural with a SSSI site in the west and a large area of Agricultural Land Classification (ALC) Grades 2 and 3. The extent of the ALC in the south is most likely a result of the low lying land in this area; most under 65m AOD. The north of the community area is comprised of forestry and is undeveloped, owing to its steep topography.

Residential development is situated on either side of the Ewenni Fach, with Bryncae to the south and Brynna to the north.

Brynna is situated primarily within the Ogmere catchment of the Tawe to Cadaxton WFD management catchment of the West Wales River Basin District. Mynydd Maendy marks the watershed between the Ogmere catchment and the Ely catchment of the South East Valleys WFD management catchment in the northeast of Brynna, situated within the Severn River Basin District.

There are two Main Rivers within Brynna, the Nant Ciwc and the Ewenni Fach. The Nant Ciwc flows north to south and forms the western boundary of Brynna, discharging into the Ewenni Fach, to the west of Rhondda Cynon Taf County Borough Council. The slopes of the Mynydd Maendy are drained by the tributaries of the Nant Llanbad, which discharges into the Nant Ciwc in the west. .

The Ewenni Fach flows in an east-west direction through the middle of Brynna community area. Unnamed tributaries of short length are sourced within residential areas.

The underlying geology of Brynna consists of Llynfi, Rhondda and Brithdir beds of the Carboniferous Coal Measures. Also present are the Mercia Mudstone Group, and the Marros Group, consisting of Mudstone, Siltstone and Sandstone. The Oxwich Head Limestone Formation is also present in the south of the area. Alluvial Deposits are present along the watercourses of the Ewenni Face and The Nant Ciwc. Glacial Till is present across most of the valley, with sporadic patches of Peat also present.

### 9.7.2 Conclusions for the UFMfSW

Brynna covers an area of approximately 1,242Ha and has a total population of 3,776. About 1% of Brynna are at high risk of surface water flooding.

The UFMfSW indicate that there are few concentrated areas where risk posed to people and properties is situated. The flooding is sourced from surface runoff, notably along Williams Street and Gellifedi Road in Brynna and the A473 and Trenos Gardens in Bryncae.

There is a low to high risk of flooding across large sections of rural land within Brynna to the south of the A473, with no properties or environmental receptors affected by this flooding. Small areas of Agricultural Land Classification Grades 2 and 3 are at low to high risk of surface water flooding.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Brynna are presented in the table below.

**Table 31:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Brynna

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,776	38	24	110
Services	6	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	394	5	11	25
Airports	0	0	0	0
Roads (km)	7	0.01	0	0.004
Railways (km)	3	0.007	0.03	0.02
Agricultural Land (hectares)	321	5	4	4
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	30	0	2	0.4
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	2	0	0	0.01
Listed Buildings	2	0	0	0
Licensed Abstractions	2	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	6			
External	8			
Highway	16			

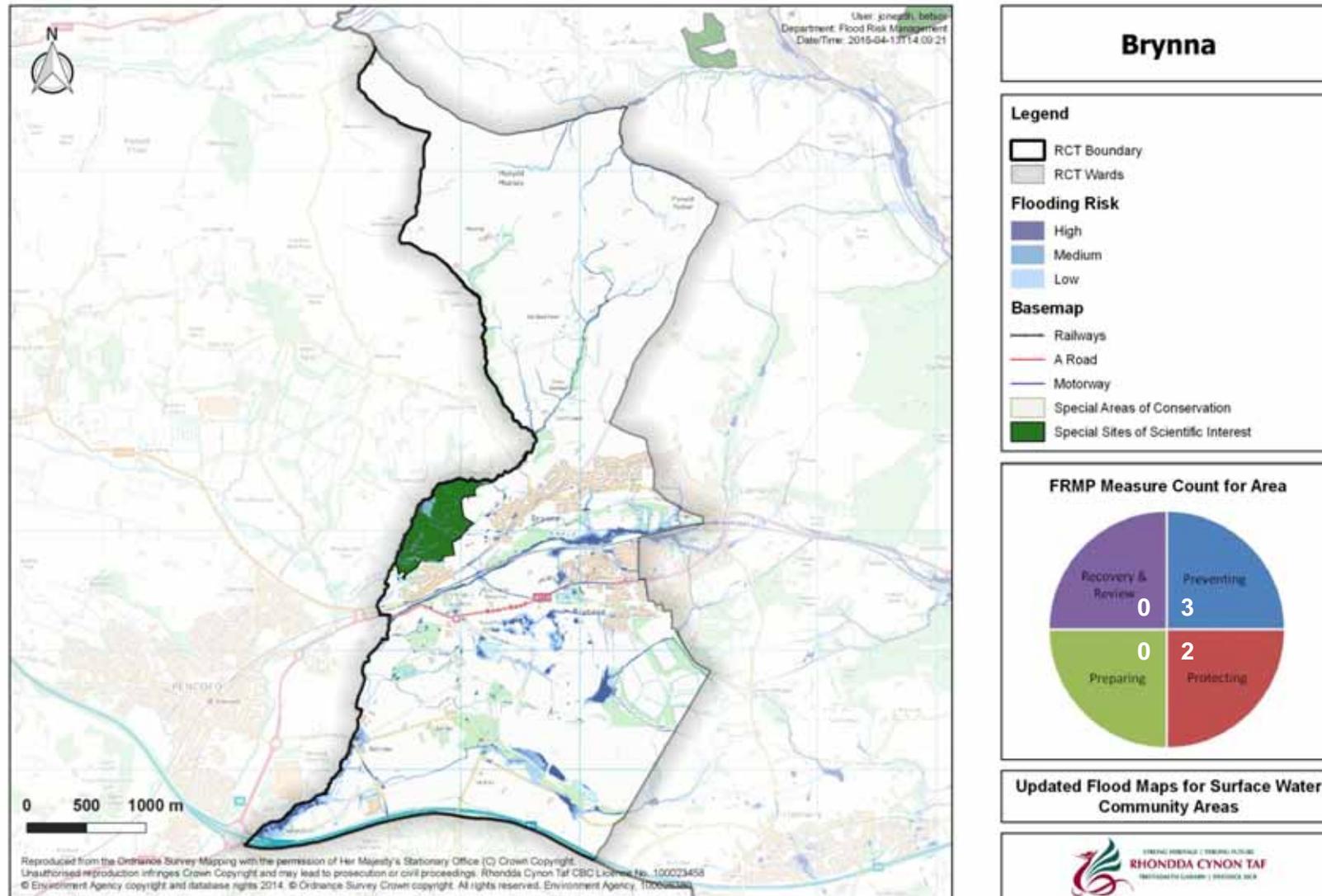
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Brynna and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 32:** Summary of Flood Risk Management Plan Measures for Brynna

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0021	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0022	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 25:** Brynna uFMfSW. Risk to people, economic activity and environmental receptors



## **9.8 Church Village**

### **9.8.1 Overview**

Church Village is located in the south east of Rhondda Cynon Taf County Borough Council with the towns of Upper Church Village, Dyffryn Dowlais and Tonteg. Church Village covers an area of approximately 182Ha and has a maximum elevation of 198m AOD. The area has approximately 1,939 residential dwellings and a population of approximately 4,557.

The relatively small community area is predominantly an urban environment with rural areas confined to the northern and southern extremities of the site.

Church Village lies wholly within the Ely Catchment. The site is drained from north to south by the Nant Ty-Crwyn through the centre of the area and the Nant yr Arian to the east. An unnamed watercourse issues within Dyffryn Dowlais with all three ordinary watercourse discharging into the Nant Dowlais Main River, which also forms the southern boundary of the community area.

The underlying geology consists of Hughes and Brithdir beds of the Upper Carboniferous Coal Measures, which are formed of Coal, Mudstone, Siltstone and Sandstone. Also present is the Grovesend Formation, also formed of Mudstone, Siltstone and Sandstone. Alluvial deposits are found along the Nant Dowlais and Glacial Till is present across much of the site.

### 9.8.2 Conclusions for the UFMfSW

Church Village covers an area of approximately 182Ha and has a total population of 4,557. About 1% of Church Village are at high risk of surface water flooding.

Surface water flood risk risk posed to people and properties within Church Village is anticipated to be sourced from ordinary watercourse and surface runoff. A low to high flood risk is noted at the culvert inlet of the Nant Ty-Crwyn, where it crosses under Brynhill Terrace. Flood flow paths are noted along St Illtyd's Road Pen-Yr-Eglwys and Heol Draw and onto the fields of Ysgol Gyfun Garth Olwg, before returning to the channel of the Nant Ty-Crwyn.

South of Ysgol Gyfun Garth Olwg, flood risk is anticipated to be from ordinary watercourse breaching of banks. Flood risk is presented by uFMfSW to land and residential properties to the south of Coed Dowlais, discharging into the Nant Dowlais.

A separate flow path presents flow risk along the Parade, Butterfly Close and Lan Y Cadno, combining in the area to the south of Coed Dowlais, detailed above.

The uFMfSW are noted to pose a flood risk to people and properties sourced from the culvert inlet of the Nant Yr Arian, where it crosses under Brynhill Terrace. Flood flow paths are noted along and adjacent to Wellfield Court and Cae Fardre.

A low to high flood risk is noted at the culvert inlet of the Nant Yr Arian where it is culverted beneath Main Road and under Brookdale Court. The anticipated flood flow path poses a risk to people and properties adjacent to Brookdale Court and Heol Celyn. The uFMfSW also indicate a significant amount of flooding in the south of the community area, within the floodplain of the Nant Dowlais. No properties, economic or environmental receptors are affected by this flooding.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Church Village are presented in the table below.

**Table 33:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Church Village

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,557	45	110	451
Services	4	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	296	5	7	23
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	2	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	10			
Highway	7			

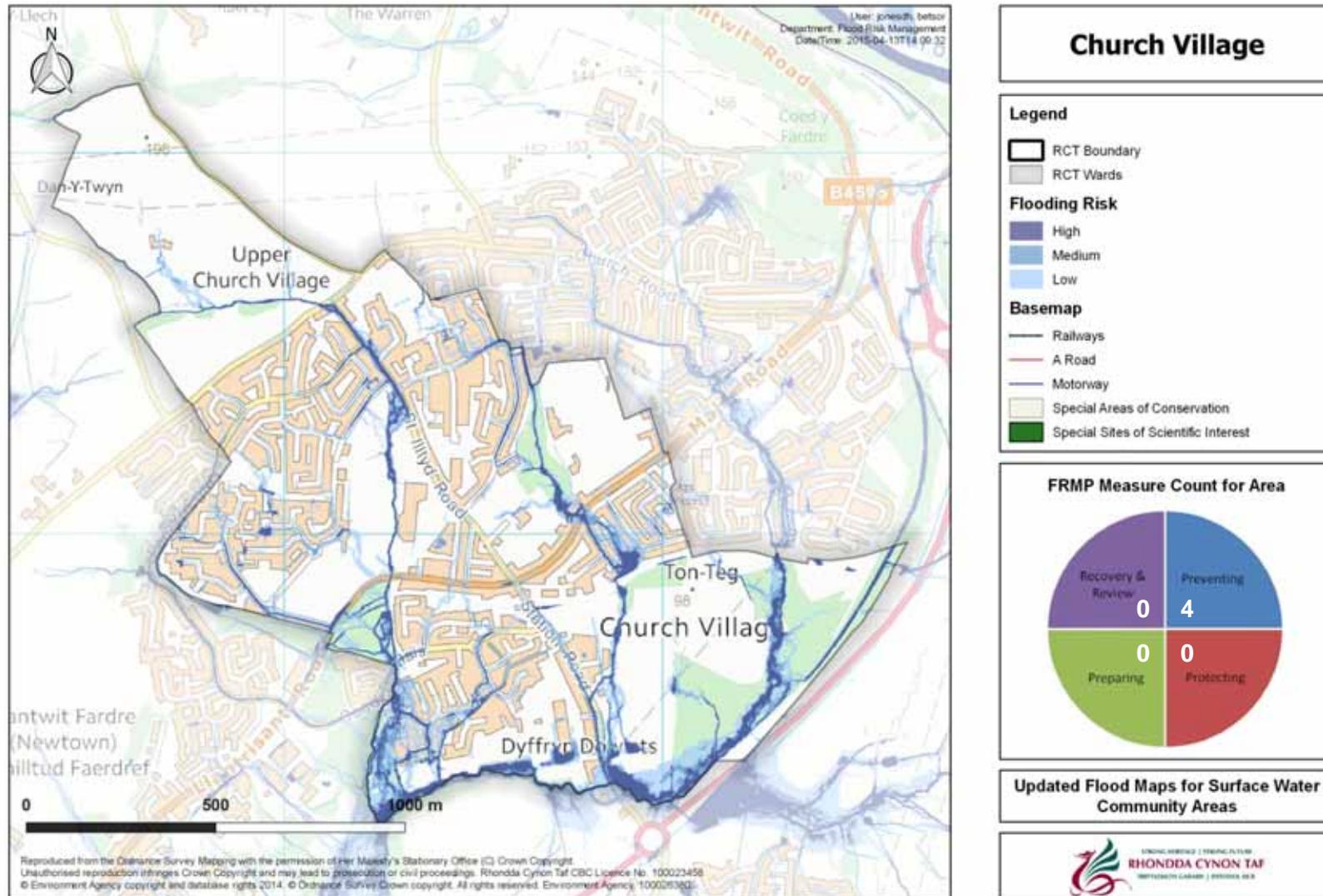
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Church Village and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 34:** Summary of Flood Risk Management Plan Measures for Church Village

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0023	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0024	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0025	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0080	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 26:** Church Village uFMfSW. Risk to people, economic activity and environmental receptors



## **9.9 Cilfynydd**

### **9.9.1 Overview**

Cilfynydd is located in the east of Rhondda Cynon Taf County Borough Council, situated to the north of Pontypridd. Cilfynydd covers an area of 413Ha and has a maximum elevation of 382m AOD. The area has approximately 1,280 residential dwellings and a population of approximately 3,010.

Cilfynydd is predominantly a rural environment owing to the steep topography of the higher elevations in the west, consisting of exposed moorland and areas of forested land.

The residential area of Cilfynydd is situated in the central western portion of the community area and is built back from Cilfynydd Road. The A470 runs parallel to the west of Cilfynydd Road and the Afon Taf lies further west again, broadly forming the western boundary of the community area.

Cilfynydd is primarily located within the Afon Taf Catchment, with the east of the area broadly following the highest elevations forming the watershed with the Rhymney catchment. The most significant watercourse within Cilfynydd is the Nant Cae-Dudwg which drains the north-east of the site and discharges into the Afon Taf. There are also a number of smaller unnamed watercourses which drain the slopes in the west and discharge into Nant Cae-Dudwg and the Afon Taf, which are culverted beneath development.

The underlying geology of Cilfynydd is the Hughes and Brithdir Beds of the Upper Carboniferous Coal Measures, which consist of Coal, Mudstone, Siltstone and Sandstone. Glacial Till follows the channel of Nant Cae-Dudwg and Glaciofluvial deposits are present along the western edge of the site.

### 9.9.2 Conclusions for the UFMfSW

Cilfynydd covers an area of approximately 413Ha and has a total population of 3,010. About 2% of Cilfynydd are at high risk of surface water flooding.

The highest risk posed to people and properties within Cilfynydd is broadly associated with the culvert inlet of the Nant Cae-Dudwg where it crosses under Cilfynydd Road. A high flood risk is presented to properties in this locality, adjacent to the Nant Cae-Dudwg and along Cilfynydd Road.

Flooding anticipated to be sourced from the 3no. unnamed watercourses culverted underneath Cilfynydd. Commonly, the flow path is along roads with a low to high risk associated along sections of Heol Cronfa, Heol Nant, Oakland Crescent, Silverhill Close, Bodwenarth Road, Jones Street, Mary Street, Park Place, Pant-Du Road and the A4054. Risk to people and property is noted adjacent to the road network.

A low to high risk of flooding is present within the floodplains of the Afon Taf; a result of breaching of the banks of the main river. No properties, economic or environmental receptors are affected by this flooding.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Cilfynydd are presented in the table below.

**Table 35:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Cilfynydd

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,010	56	68	291
Services	6	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	222	7	4	22
Airports	0	0	0	0
Roads (km)	4	0.4	0.2	1
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.1	0	0	0
Listed Buildings	1	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	3			
External	10			
Highway	9			

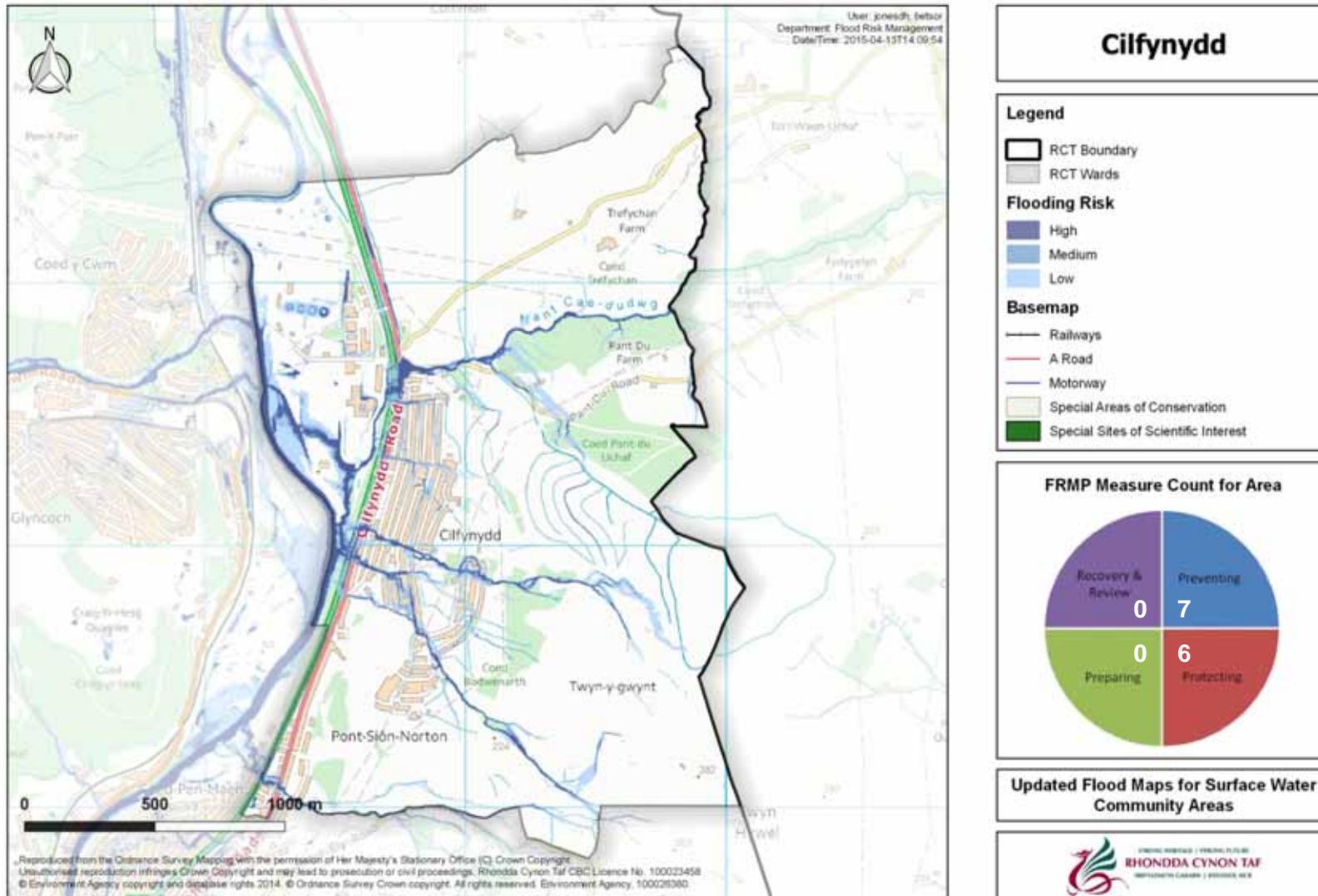
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Cilfynydd and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 36:** Summary of Flood Risk Management Plan Measures for Cilfynydd

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0026	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0027	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0095	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0130	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Completed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Completed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Completed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Completed	RCTCBC

**Figure 27:** Cilfynydd uFMfSW. Risk to people, economic activity and environmental receptors



## 9.10 Cwm Clydach

### 9.10.1 Overview

Cwm Clydach is located in the west of Rhondda Cynon Taf County Borough Council with the towns of Clydach Vale and Blaen Clydach. The site covers an area of 487Ha and has a maximum elevation of 455m AOD. Cwm Clydach has a population of approximately 3,135 and approximately 1,334 residential properties.

Cwm Clydach has remained in a natural state owing to the steep topography. The residential areas of Clydach Vale and Blaen Clydach are confined to the valley floor of the Nant Clydach. Areas surrounding these towns are predominantly a mixture of forestry and rough pasture.

The majority of the site is situated within the Afon Rhondda Catchment of the South East Valleys WFD management catchment of the River Severn River Basin District. However, the south and west boundary of the Cwm Clydach falls over the watershed into the Ogmore catchment of the Tawe to Cadaxton WFD management catchment of the Western Wales River Basin District.

The primary watercourse in Cwm Clydach is the Nant Clydach, flowing west to east, together with its tributaries, drains the steep catchment. The Nant Clydach discharges into the Afon Rhondda to the west of the community area in Tonypandy.

Networks of ordinary watercourses serve as the tributaries of the Nant Clydach, notably the Nant Caedafydd that broadly separates the residential areas of Clydach Vale and Blaen Clydach. Ordinary watercourses are noted to be culverted beneath residential development.

The underlying geology of Cwm Clydach is the Rhondda and Llynfi beds of the Upper Carboniferous Coal Measures which consist of Coal, Mudstone, Siltstone and Sandstone. Glacial Till follows the primary watercourses of the Nant Clydach and the Nant Caedafydd. Intermittent patches of Peat are also present across the highlands, within the forested areas.

### 9.10.2 Conclusions for the UFMfSW

Cwm Clydach covers an area of approximately 487Ha and has a total population of 3,135. About 2% of Cwm Clydach is at high risk of surface water flooding.

The most notable risk posed to people and properties within Cwm Clydach is broadly associated with the flood risk posed from the culvert inlet of the Nant Caedafydd. Flood flow paths follow the highway network, with risk posed to Clydach Road, Taff Terrace, Brynheulog Terrace and Glan-y-Llyn, eventually discharging into the lake within Nant Clydach. People and properties are at risk from low to high flooding adjacent to these roads.

A low to high surface water flood risk is also posed to Morton Terrace, Wern Street and High Street.

The UFMfSW also indicates a low to medium risk of flooding along the floodplain of the Nant Clydach. No properties, economic or environmental receptors are affected by this flooding.

There is a good correlation between historic flood incidents reported to Rhondda Cynon Taf County Borough Council and the uFMfSW.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Cwm Clydach are presented in the table below.

**Table 37:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Cwm Clydach

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,135	63	56	228
Services	3	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	196	5	5	14
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	0	0	0	0
Licensed Abstractions	2	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	10			
Highway	13			

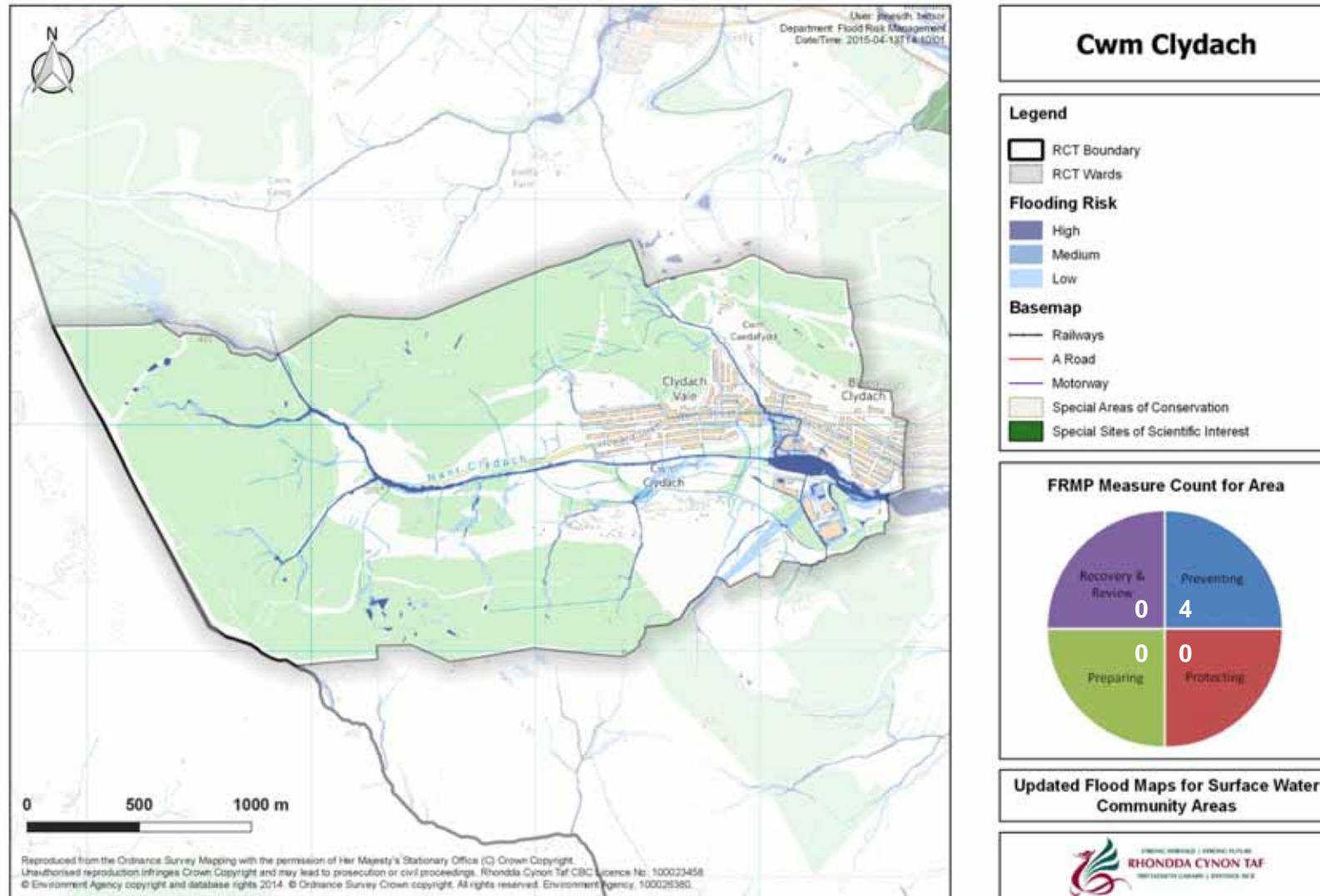
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Cwm Clydach and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 38:** Summary of Flood Risk Management Plan Measures for Cwm Clydach

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0028	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0029	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0085	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0136	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 28:** Cwm Clydach uFMfSW. Risk to people, economic activity and environmental receptors



## **9.11 Cwmbach**

### **9.11.1 Overview**

Cwmbach is located in the east of Rhondda Cynon Taf County Borough Council and covers an area of approximately 608Ha, with a maximum elevation of approximately 470m AOD. Cwmbach has a population of approximately 4,705 and 2,002 residential properties.

Cwmbach is predominantly a rural environment, owing to the steep topography and the higher elevations in the east. The residential area of Cwmbach is confined within the valley of the Afon Cynon. A small industrial estate is located between the Aberdare Canal and the Afon Cynon, in the west of the site.

Cwmbach is primarily located within the Afon Cynon Catchment, with its eastern catchment broadly consistent with the watershed with the Taff Valley. Cwmbach is situated within the South East Valleys WFD management catchment within the Severn River Basin District.

The Afon Cynon is the primary river, bordering the west of the site.

The Aberdare Canal, designated a Main River through Cwmbach, flows parallel to the Afon Cynon and discharges into it just south of Cwmbach train station. The southwest slopes of within Cwmbach are drained by several ordinary watercourse that drain into the Aberdare Canal, notably the Nant y Geugarn and the Nant y Groes. The ordinary watercourses are commonly culverted through residential development.

The northwest area of Cwmbach is drained by the Nant Pennar, discharging into the Afon Cynon in the adjacent community area of Mountain Ash East.

The underlying geology is the Rhondda and Llynfi beds of the Upper Carboniferous Coal Measures and the Middle Carboniferous Coal Measures, which all consist of Mudstone, Coal, Siltstone and Sandstone. Alluvial Deposits are present along the Afon Cynon, and Glacial Till is present across much of the valley.

### 9.11.2 Conclusions for the uFMfSW

Cwmbach covers an area of approximately 608Ha and has a total population of 4,705. About 4% of Cilfynydd are at high risk of surface water flooding.

The UFMfSW indicates the most significant flooding is largely associated with the floodplain of the two designated Main Rivers, the Afon Cynon and the Aberdare Canal, notably the area to the east of Cwmbach industrial estate. No properties, economic or environmental receptors are affected by this flooding.

Generally, flood risk is associated with ordinary watercourses within Cwmbach, notably from culvert inlets and bank breach. A high flood risk is presented associated with the Nant y Groes watercourse, with flood flows from the culvert inlet adjacent to Cwmbach Road. The flood flow path presents a high risk to Cwmbach Road and Tre Gwilym and a separate flow path over open space, joins at the hammerhead of Tre Gwilym. Canal Road has a high flood risk. Property is a risk of flooding adjacent to these roads and in the residential development at Cerdin.

A low to medium risk of flooding is present in along Craig-Y-Llyn Crescent, associated with the culvert inlet at the top of the road, on a tributary of the Nant u Geugarn. The flow path continues to pose a low flood risk to the length of Pinecroft Avenue and Kendal Close. At this location, the flow path splits with a low to medium flood risk along Ynyscynon Road and a high flood risk at Parkfield Road, Bracken Rise and Well Place.

A high flood risk, sourced from an ordinary watercourse, is noted to pool at the convergence of Cwmbach Road and Canal Road with properties adjacent to the highway at risk. A low to high flood risk is noted along Llangorse Road and is anticipated to be sourced from a bank breach from an unnamed watercourse to the north of the road.

Broadly, historic flood incidents to the highway reported to the council show good correlation with the uFMfSW. The correlation between the maps and internal and external flooding do not present a good correlation.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Cwmbach are presented in the table below.

**Table 39:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Cwmbach

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,705	172	71	435
Services	10	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	356	5	8	23
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	2	0.01	0.01	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	2	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	1	0	0	0
Listed Buildings	0	0	0	0
Licensed Abstractions	1	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	7			
External	23			
Highway	29			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Cwmbach and their proposed Flood Risk Management Plan measures are presented in the table below.

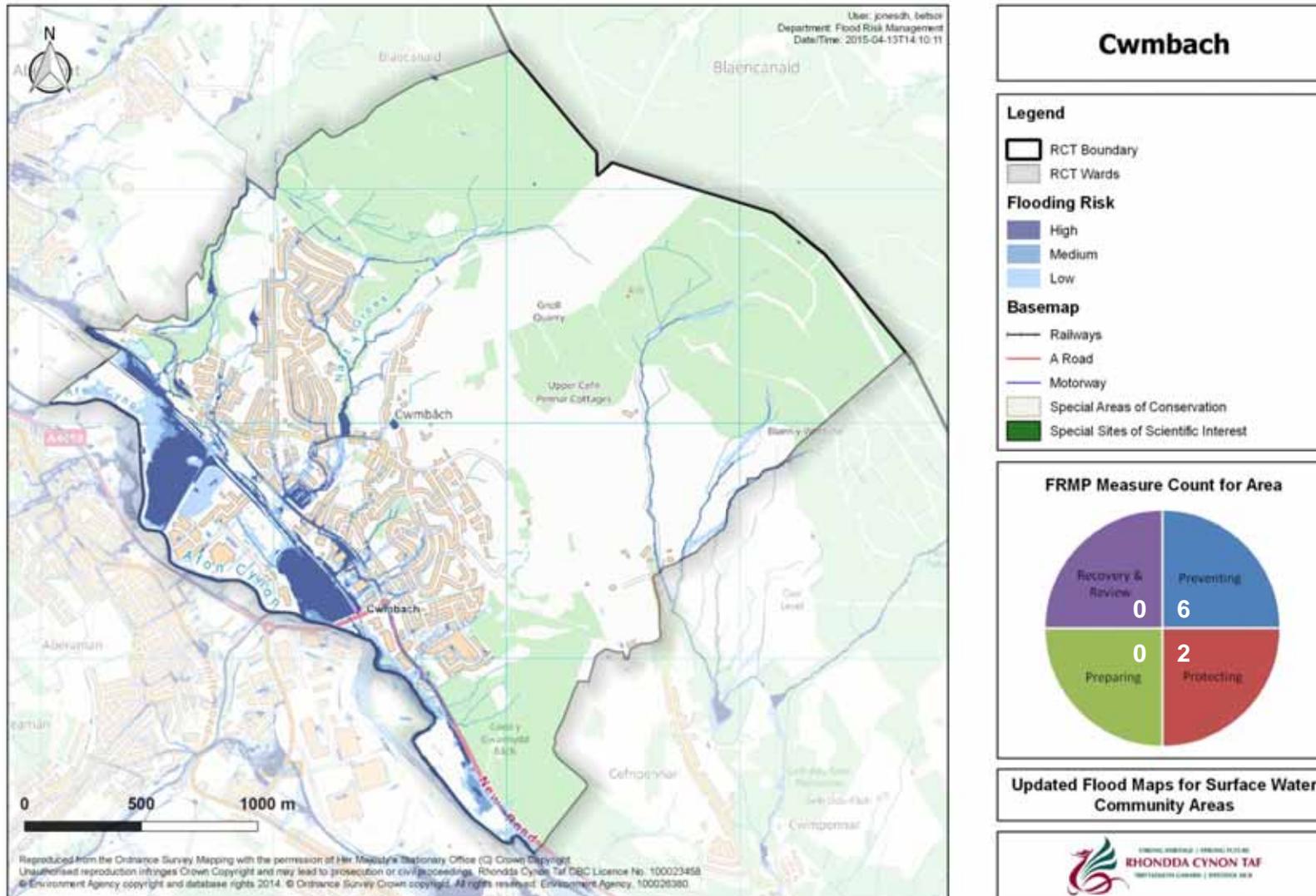
Further information regarding the flood investigation area is presented in Appendix A.

**Table 40:** Summary of Flood Risk Management Plan Measures for Cwmbach

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0030	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0031	Local / Main River*	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0032	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0033	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0128	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 29:** Cwmbach uFMfSW. Risk to people, economic activity and environmental receptors



## 9.12 Cymmer

### 9.12.1 Overview

Cymmer is situated in the centre of Rhondda Cynon Taf County Borough Council. The site covers an area of approximately 516Ha with a maximum elevation of approximately 350m AOD. Cymmer has 2,599 residential properties and a population of approximately 6,108.

Cymmer is predominantly a rural environment with residential development confined within the valley of the Afon Rhondda, including the south area of the town of Porth in the centre of the area. Other towns include Trehafod in the east, which is split between the community areas of Cymmer and Rhondda and Trebanog, situated in the southwest of the community area.

A part of the Rhos Tonyrefail Site of Special Scientific Interest is situated in the south eastern corner of Cymmer. Much of the area south of Porth is open moorland, forming the side of the Mynydd y Glyn and the area of the west of Porth forming the slopes of the Mynydd y Cymmer.

A thin finger of Cymmer stretches of the northeast of the community area along the slopes draining into the Nant Hafod, a tributary of the Afon Rhondda discharging into the Main River at Trehafod.

The site lies predominantly within the Rhondda catchment, with the Main River, Afon Rhondda, flowing along the northern boundary of Cymmer. The finger in the northeast expands into the catchment of the Afon Cynon for a short distance over the mountain. Finally, Trebanog sits on the watershed between the Afon Rhondda in the north and the Afon Elai in the south, with Edmondstown Road broadly following the crest. The community area of Cymmer is situated within the South East Valleys WFD management catchment and is within the Severn River Basin District.

There is an extensive network of minor unnamed watercourses which drain the Mynydd y Glyn, flowing north, that discharge into the Afon Rhondda. These ordinary watercourses are culverted under residential development, such as Trehafod, Britannia and Glynfach.

The underlying geology consists of the Rhondda and Llynfi beds of the Upper Carboniferous Coal Measures which are formed of Coal, Sandstone, Siltstone and Mudstone. Alluvial and Glaciofluvial Deposits are present along the Afon Rhondda. Glacial Till is present throughout the valley.

### 9.12.2 Conclusions for the uFMfSW

Cymmer covers an area of approximately 516Ha and has a total population of 6,108. About 1% of Cymmer are at high risk of surface water flooding.

A low to high surface water flood risk noted to the A4233 from Trebanog to Porth with a sporadic low risk presented to properties. A low to high flood risk within Porth is presented along High Street with risk to properties at High Street, St John's Street, Glynfach Road, Bedw Close and Lincoln Street.

There is a high risk to properties and highways in Trehafod resulting from Main River flooding, with the properties of Lewis Street and Wayne Street with the highest risk.

A group of properties adjacent to the Phillips Terrace are at medium to high risk of surface water flooding, resulting from the culvert inlet of an unnamed watercourse.

Properties within the area of Britannia are of a low risk from surface water flooding, with properties adjacent to Kensington Drive, sourced from a breach of a bank of an unnamed ordinary watercourse. The flood flow path from the breach contributes to a low flood risk to property at Brook Street, Eirw Road and Britannia Street. The source of flooding is anticipated to be a combination of surface water and Main River flooding.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Cymmer are presented in the table below.

**Table 41:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Cymmer

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	6,108	47	96	555
Services	9	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	365	1	5	21
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0.6	0.03	0.06	0.08
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	6	0.01	0.02	0.02
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	10	1	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	6			
External	21			
Highway	37			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Cymmer and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 42:** Summary of Flood Risk Management Plan Measures for Cymmer

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0034	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0071	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0074	Local / Main River*	10	Land Management	M34 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.



## **9.13 Ferndale**

### **9.13.1 Overview**

Ferndale is situated in the central region of Rhondda Cynon Taf County Borough Council with the towns of Ferndale and Blaenllechau. The site covers an area of 380Ha and has a maximum elevation of 432m AOD. Ferndale has a population of approximately 4,731 and approximately 2,013 residential properties.

The majority of Ferndale has remained in a natural state owing to the steep topography. Ferndale's residential development is confined to the base of the Afon Rhondda Fach valley between Mynydd y Ffaldau and Mynydd Ty'n-tyle, to the north and south respectively.

The Afon Rhondda Fach dissects the site through its centre, with Ferndale to the south and Blaenllechau to the north of the Main River. Oaklands Business Park is located in the southeast of the community area. Darran Park is located immediately to the south of Ferndale, notably with Llyn y Forwyn boating lake and associated recreational facilities.

Ferndale is situated almost exclusively in the Afon Rhondda Catchment; however, the north includes a small section that drains to the north into the Afon Cynon Catchment. The Main River within Ferndale is the Afon Rhondda Fach, flowing from the north-west to south-east of the site. The slopes of the Mynydd y Ffaldau and the Mynydd Ty'n-tyle form the part of the catchment of the Afon Rhondda Fach and a network of unnamed ordinary watercourse drain the hillsides, discharging into the Afon Rhondda Fach. Many of these watercourses are culverted beneath Ferndale's residential areas.

The underlying geology consists of the Rhondda Bed of the Upper Carboniferous Coal Measures which are formed of Coal Mudstone, Siltstone and Sandstone. Alluvial Deposits are present along the Afon Rhondda Fach with Glacial Till following the topography of the valley. Intermittent patches of peat are present across the highlands within forested areas.

### 9.13.2 Conclusions for the UFMfSW

Ferndale covers an area of approximately 380Ha and has a total population of 4,731. About 2% of Ferndale is at high risk of surface water flooding.

The UFMfSW indicates the risk posed to people and properties are noted within the southern area of Blaenllechau and central and southern areas of Ferndale. The source of flooding is broadly associated with the Afon Rhondda Fach and the Llyn Y Forwyn. The flow path is generally along roads.

A high risk of flooding sourced from surface water runoff with a flood flow path affecting the highway network and property along Llyn Crescent, Brook Street, Union Street, Dyffryn Street, New Street, Brown Street and Albany Street. This flooding combines with ordinary watercourse flooding at the valley floor, posing a risk to the Oaklands Business Park, finally discharging into the Afon Rhondda Fach to the southeast of the business park.

A high risk of surface water flooding is noted to the highway network and properties at Lake Street and Station Road. The source of the flooding is an amalgamation of surface runoff from the breach of the Llyn Y Forwyn Lake and the culvert inlet of an unnamed watercourse adjacent to Lake Street.

There is a low to medium flood risk within the centre of Blaenllechau, with properties at risk along Mountain Row and Long Row, sourced from surface runoff.

The maps indicate that there is also a high risk of flooding in the south of Blaenllechau associated with breached banks of the Afon Rhondda Fach. The flow path also follows the roads, particularly along Taff Street and Walter Street.

There is a reasonable correlation between historic flooding incidents and the uFMfSW, notably within the southern area of Ferndale.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Ferndale are presented in the table below.

**Table 43:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Ferndale

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,731	118	219	545
Services	6	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	312	18	13	32
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	8	0	0	0
Listed Buildings	3	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	17			
Highway	30			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Ferndale and their proposed Flood Risk Management Plan measures are presented in the table below.

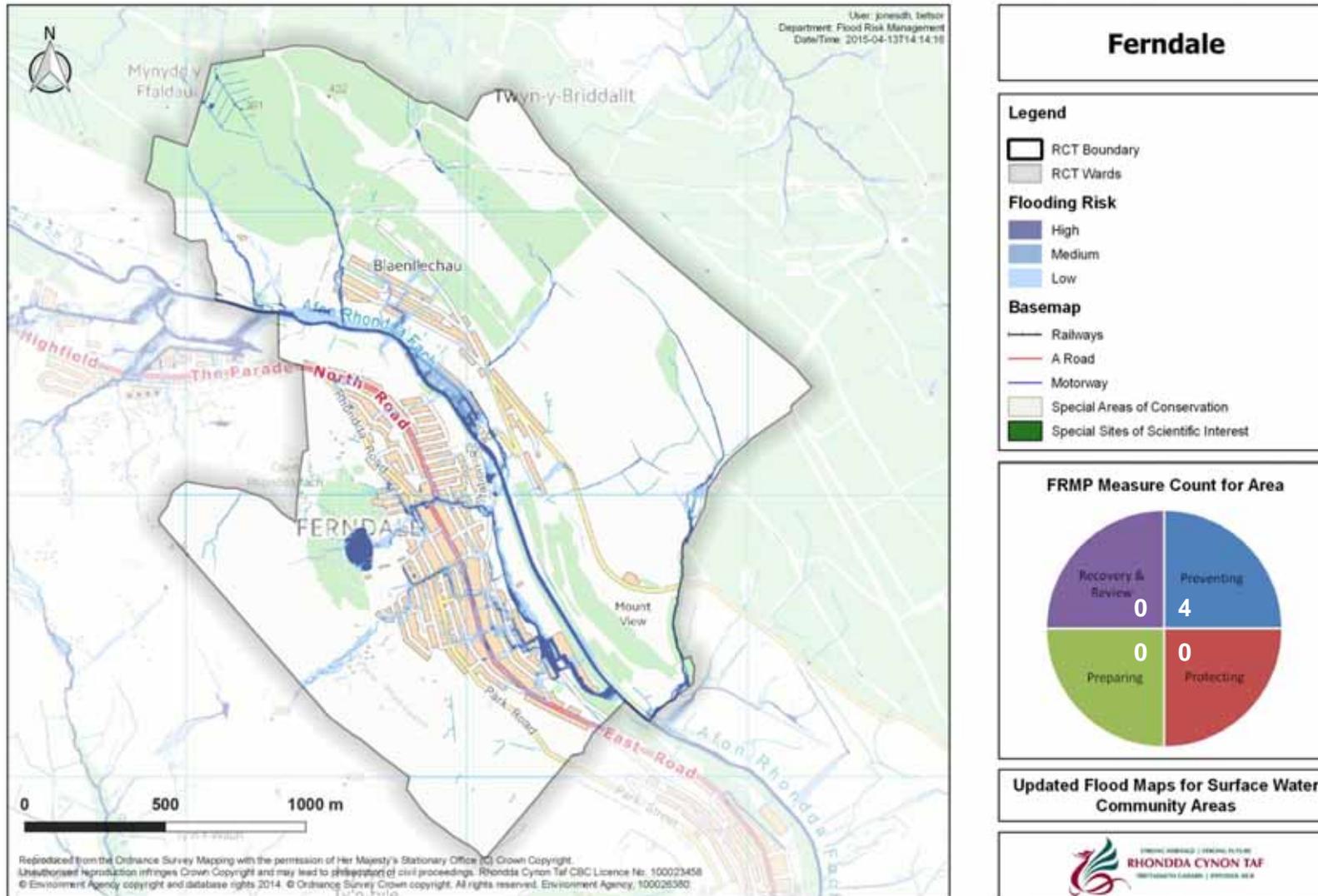
Further information regarding the flood investigation area is presented in Appendix A.

**Table 44:** Summary of Flood Risk Management Plan Measures for Ferndale

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0035	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0036	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0037	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0038	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 31:** Ferndale uFMfSW. Risk to people, economic activity and environmental receptors



## **9.14 Gilfach Goch**

### **9.14.1 Overview**

Gilfach Goch is located in the west of Rhondda Cynon Taf County Borough Council. The site covers an area of 603Ha with a maximum elevation of 348m AOD. Gilfach Goch has a population of approximately 3,541 and approximately 1,507 residential properties.

Gilfach Goch is predominantly a rural environment with much of the residential development situated along the western edge and central sector of the community area. This is in part due to the steep topography, but is also a result of the expanse of agricultural land reserved for the shallow gradients in the south. Hendreforgan has developed across the centre of the community area, and the western area of Gilfach Goch is situated along the northwest boundary of the community area.

Gilfach Goch community area is split north-south between the Tawe to Cadaxton WFD management catchment of the Western Wales River Basin District, draining into the Ogmore catchment, in the west and the South East Valleys WFD management catchment, draining into the Afon Elai catchment, of Severn River Basin District in the east.

The west of Gilfach Goch community area is bounded by the Ogwr Fach, flowing north to south, which also marks the boundary between Rhondda Cynon Taf County Borough Council and Bridgend County Borough Council. There is an extensive network of smaller unnamed watercourse throughout Gilfach Goch community area. The west of the site is drained by a network of unnamed watercourse discharging into the Ogwr Fach whilst the east drains to the Nant Erin Main River, feeding into the neighbouring community area of Tonyrefail West.

The underlying geology is the Hughes, Rhondda, Llynfi and Brithdir beds of the Upper Carboniferous Coal Measures, formed of Coal, Mudstone, Siltstone and Sandstone. Glacial Till covers a large section of the central sector of Gilfach Goch. Alluvial Deposits are present along the Ogwr Fach. There are also intermittent patches of Peat across the site.

### 9.14.2 Conclusions for the UFMfSW

Gilfach Goch covers approximately 603Ha with a total population of 3,541. Just under 1% of the population of Gilfach Goch are at high risk of surface water flooding.

Surface water flood risk within Gilfach Goch is a combination of surface runoff and ordinary watercourse. A low high flood risk is posed the centre of Hendreforgan along the Heathlands and Alfred Street, with a predominantly low risk posed to property.

Commonly, roads are at risk from flooding at culvert inlets, where ordinary watercourses are culverted beneath the road, notably along Gelli Arael Road and High Street.

A low risk of flooding is noted to occur in the east of Hendreforgan, along at Bryn-Hedd, Heol-Y-Bryn, Heol-Y-Mynydd, Heol Glyncoch and Heol-Y-Grug. Properties are at a low risk of flooding at the merging of Heol- Y-Mynydd and Bryn-Hedd.

Flood risk within agricultural land is contained to the watercourse channels.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Gilfach Goch are presented in the table below.

**Table 45:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Gilfach Goch

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,541	5	12	148
Services	9	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	210	1	0	5
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	0	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	12			
Highway	19			

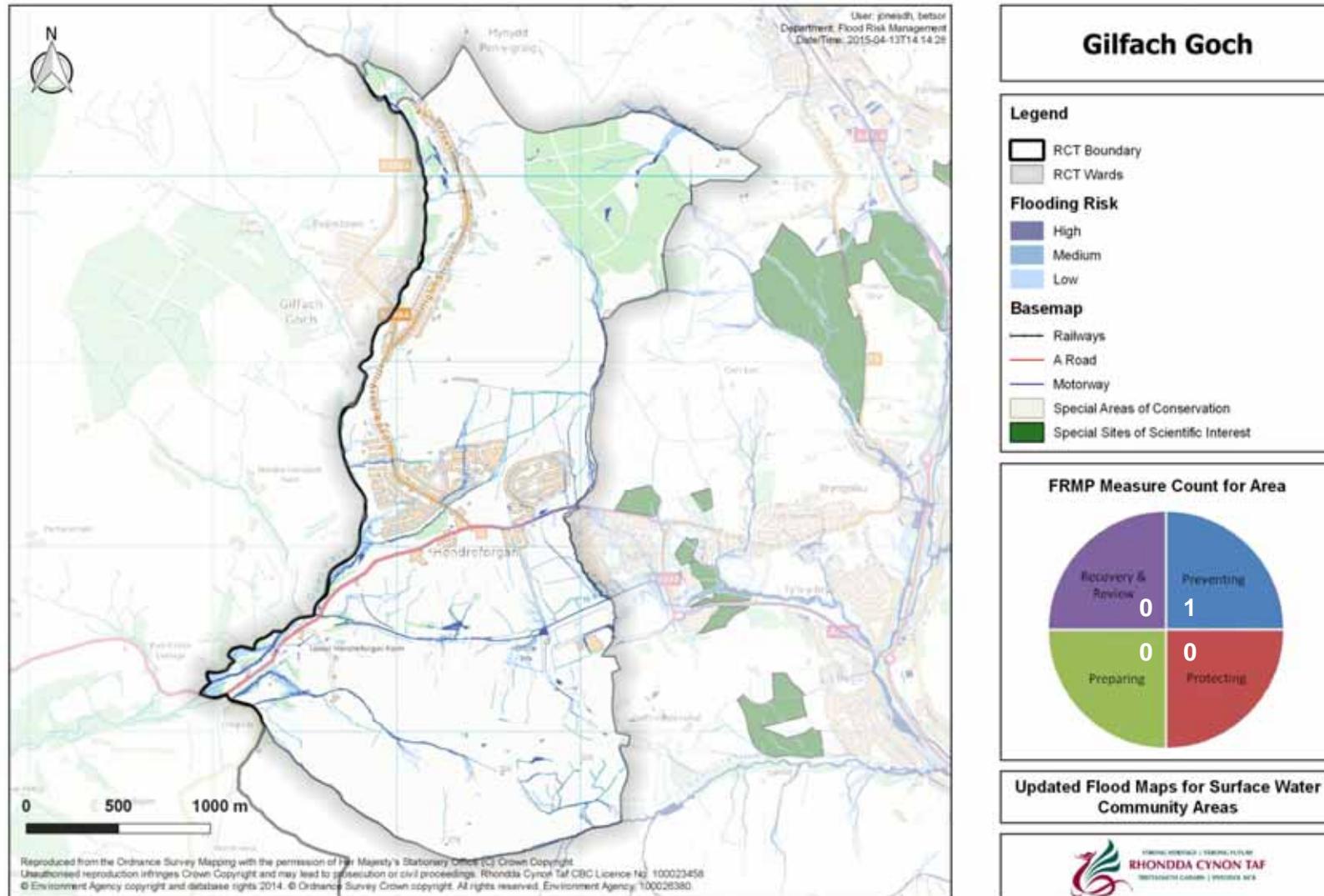
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Gilfach Goch and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 46:** Summary of Flood Risk Management Plan Measures for Gilfach Goch

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0090	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 32:** Gilfach Goch uFMfSW. Risk to people, economic activity and environmental receptors



## **9.15 Glyncoch**

### **9.15.1 Overview**

Glyncoch is situated in the east of Rhondda Cynon Taf County Borough Council with the town of Glyncoch situated in the centre of the community area. The site covers an area of 208Ha and has a maximum elevation of approximately 100m AOD. Glyncoch has approximately 1,293 residential properties and a population of approximately 3,039.

The majority of the west of Glyncoch has remained in a natural state, owing to the steep topography. The large Craig-Yr-Hesg quarry is situated in the southern area of Glyncoch community area. Residential development is located on the valley floor. Remaining land is primarily forested, including Coed Craig-Yr-Hesg in the south of Glyncoch.

Glyncoch is split between the Catchments of the Afon Taf in the east and Afon Cynon in the west. The two Main Rivers within Glyncoch are the Nant Clydach, which flows west-east along the northern boundary of the community area, discharging into the Afon Taf in its north-eastern corner, which flows north-south, along Glyncoch's eastern boundary.

The Llys-Nant and Nant Tai'rheol, along with a number of smaller unnamed watercourses drain the catchment to the north and the west.

The underlying geology of Glyncoch is the Hughes and Brithdir beds of the Upper Carboniferous Coal Measures. These are formed of Coal, Mudstone, Siltstone and Sandstone. Glaciofluvial deposits and alluvial deposits are present along the major watercourses and River Terrace deposits are located along the Afon Taf. Glacial Till is also present along the major watercourses.

### 9.15.2 Conclusions for the UFMfSW

Glyncoch covers approximately 208Ha with a total population of 3,039. Just under 1% of the population of Glyncoch are at high risk of surface water flooding.

The highest risk posed to people and properties within Glyncoch is broadly associated with surface runoff within the town of Glyncoch. Roads most at risk of flooding are Pearson Crescent, High View Way, Porcher Avenue, Cefn Lane, Grovers Close, Garth Avenue and Ynysybwl Road. Properties adjacent to these roads are commonly a low to medium risk of flooding.

A low to high risk of flooding is noted to occur to the east of Ynysybwl Road within the flood plain of the Afon Taf. This flooding may also have contributions from Main River flooding. No properties or environmental receptors are affected by this flooding; however, it is likely that the railway is affected by this source.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Glyncoch are presented in the table below.

**Table 47:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Glyncoch

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,039	14	26	345
Services	5	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	110	1	1	13
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	2	0	0.04	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	4	4	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	2			
External	8			
Highway	11			

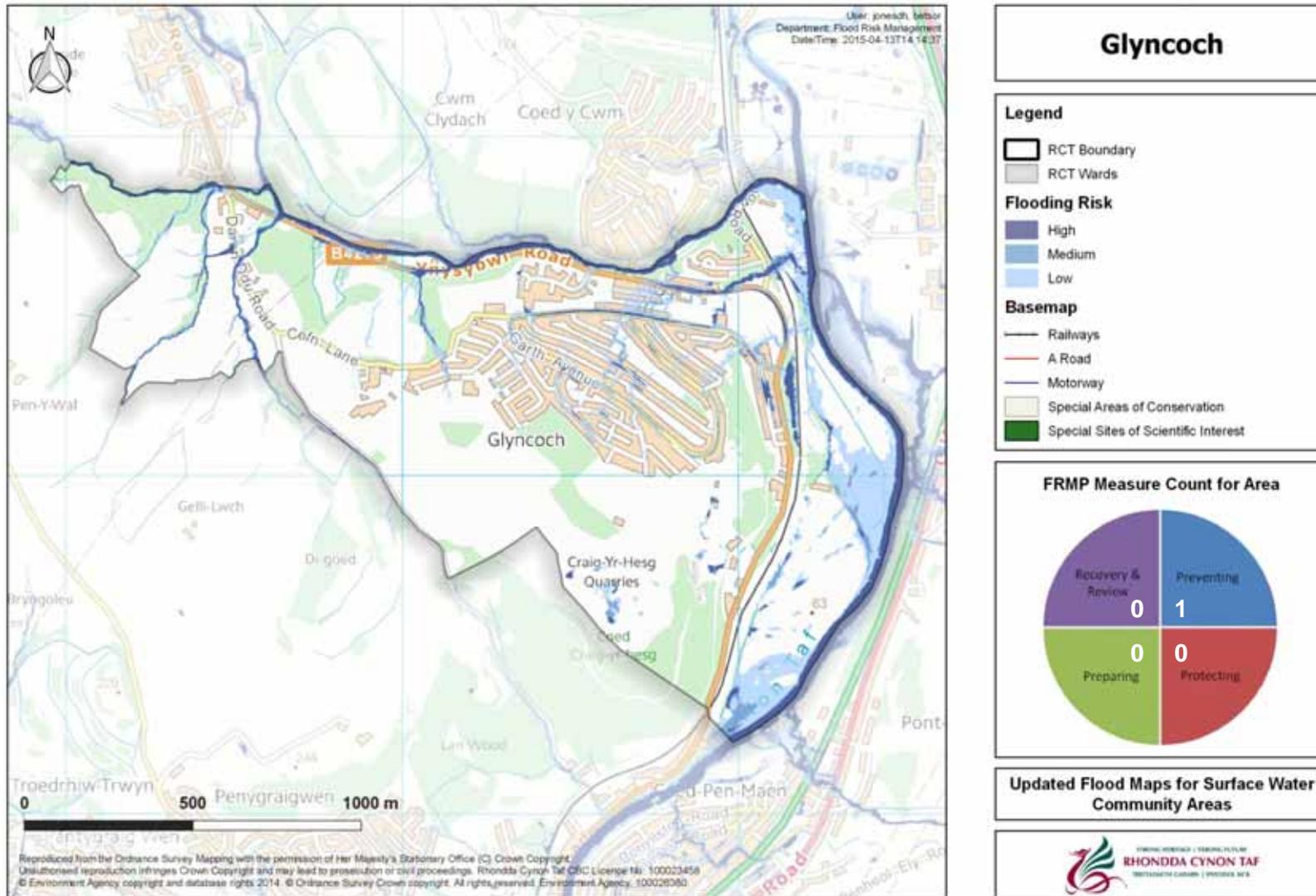
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Glyncoch and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 48:** Summary of Flood Risk Management Plan Measures for Glyncoch

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0118	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 33:** Glyncoch uFMfSW. Risk to people, economic activity and environmental receptors



## 9.16 Graig

### 9.16.1 Overview

Graig is situated in the central sector of Rhondda Cynon Taf County Borough Council. The site covers an area of 315Ha and has a maximum elevation of approximately 240m AOD. Graig has a population of approximately 2,693 and approximately 1,146 residential dwellings.

Graig has remained in a natural state due to historic land use. Of significance, Graig encompasses the residential area of Graig, part of the town of Pontypridd. Within the centre of the community area is the small residential community of Pen-y-coedcae. A large SSSI is present along the bank of the Nant Gelliwion, which is located in the northwest of Graig. Land use is predominantly agricultural, with a number of farms located in Graig. Forested areas are also present, largely found along the bank of the primary watercourse.

Graig is split between three WFD management catchments, the Afon Taf to the northeast, the Afon Ely to the south and the Afon Rhondda to the northwest. Graig is primarily between the Afon Taf and the Afon Rhondda Catchments.

The Main River, the Afon Taf, bounds the north of Graig and is predominately drained by the Nant Gelliwion, and its tributaries, which flows to southwest-northeast, discharging into the Afon Taf near Pontypridd town centre.

Few watercourses are present in the east and southeast of the site as this area forms the higher elevations that are the watershed between the catchments with the Afon Taf to the east and Afon Elai to the south.

The underlying geology is comprised of the Rhondda, Hughes and Brithdir beds of the Upper Carboniferous Coal Measures, which are formed of Sandstone, Coal, Siltstone and Mudstone. Glacial Till is present along the main watercourses. Glaciofluvial Deposits and Alluvial Deposits are also present along the Afon Taf, as well as River Terrace Deposits.

### 9.16.2 Conclusions for the UFMfSW

Graig covers approximately 315Ha with a total population of 2,693. Just under 1% of the population of Graig are at high risk of surface water flooding.

Within Graig, flood risk is associated with surface water runoff. A low to high flood risk is noted along lengths of High Street, Rickards Street, Rickards Terrace and Phillip Street. Properties adjacent to Rickards Street and Rickards Terrace are at a low to high risk from surface water flooding.

A high risk is posed to the valleys railway line, adjacent to Pontypridd railway station. Surface water flooding is then noted to flow onto Broadway, before discharging into the Afon Taf. A high risk of surface water flooding is noted near the railway underpass of High Street onto Broadway; however, it is likely that the underpass has not been modelled and the risk posed to this and the railway is overstated.

A reasonable correlation between historic flooding incidents reported to Rhondda Cynon Taf County Borough Council and the uFMfSW is noted.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Graig are presented in the table below.

**Table 49:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Graig

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	2,693	7	96	52
Services	1	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	246	1	1	9
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	1	0	0.03	0.01
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	12	1	0.2	1
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	16	0.03	0.02	0.1
Listed Buildings	8	1	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	5			
External	10			
Highway	14			

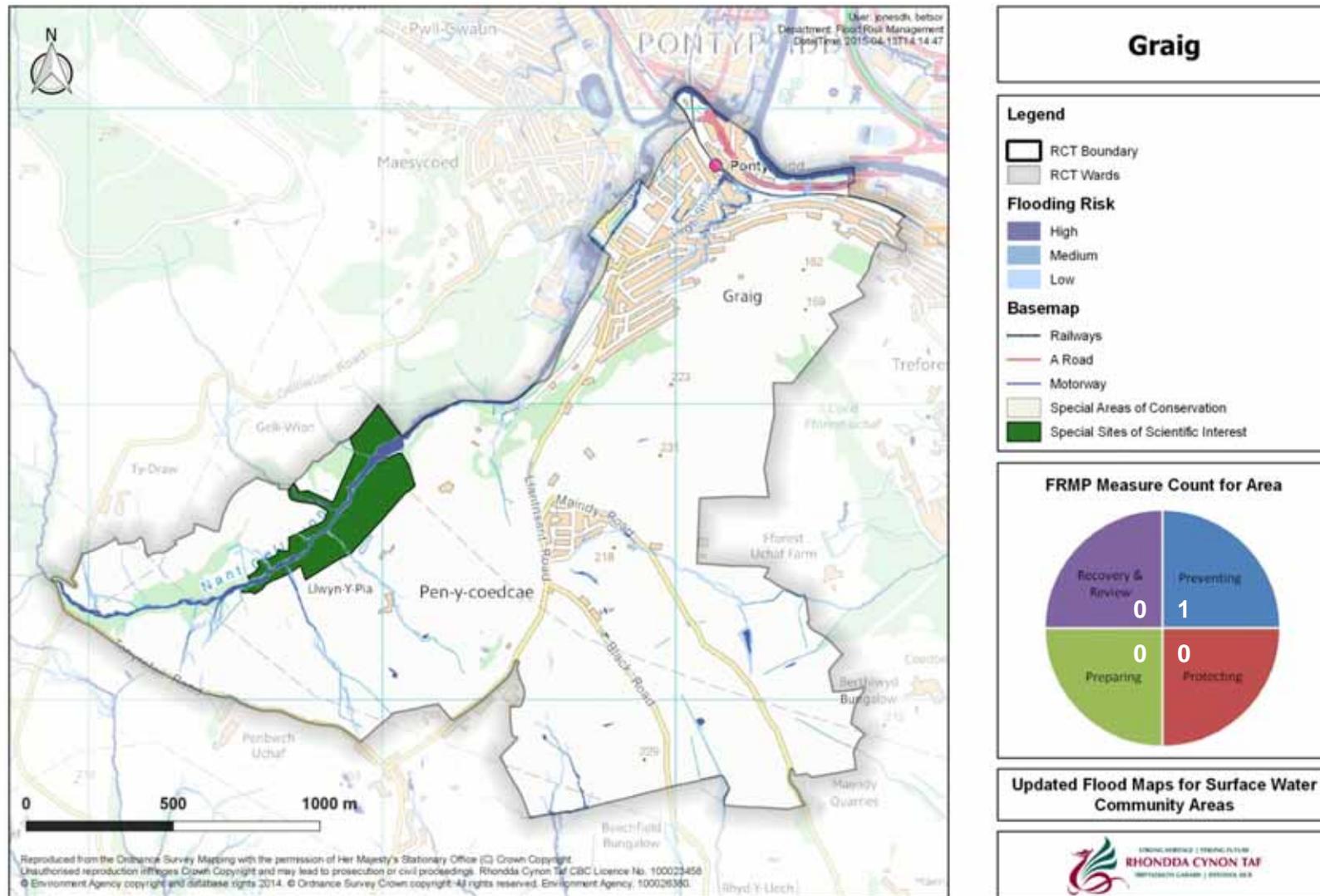
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Graig and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 50:** Summary of Flood Risk Management Plan Measures for Graig

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0039	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 34:** Graig uFMfSW. Risk to people, economic activity and environmental receptors



## **9.17 Hawthorn**

### **9.17.1 Overview**

The community area of Hawthorn is situated in the southeast of Rhondda Cynon Taf County Borough Council. The site covers an area of 453Ha, with a maximum elevation of approximately 250m AOD. Hawthorn has approximately 1,697 residential properties and a population of approximately 3,988.

Hawthorn has an irregular shape, with an elongate section stretching from the south of Glyntaff in the north to Treforest Industrial Estate in the south. The southeast of the community area extrudes to the northeast to encapsulate Upper Boat and the slopes of Mynydd Meio above.

The area of the extrusion is relatively rural, owing to its steep topography, with few farm houses and residential properties dotted on the hill side. The development of Hawthorn is reserved to the valley floor of the Afon Taf, which bounds the western edge. The A470 is located through the west of the site, running parallel with the Afon Taf. A large section of the Treforest industrial estate is present in the south of the site. The residential area of Hawthorn is located along the elongated section of the community area in the north.

Hawthorn is situated within the Afon Taf Catchment; with the higher elevations along the east of the community area following the watershed with the Afon Rhymney catchment.

Hawthorn is bound in the west by the Afon Taf; the only Main River in the community area. There is an extensive network of smaller unnamed watercourses, flowing east to west, draining the slopes of Mynydd Meio which discharge into the Afon Taf. A number of the minor watercourses are culverted and run beneath Upper Boat.

The underlying geology is the Brithdir and Hughes beds of the Upper Carboniferous Coal Measures, formed of Coal, Mudstone, Siltstone and Sandstone. The Grovesend Formation is also present, also formed of Mudstone, Siltstone and Sandstone. Glacial Till covers a large proportion of the valley floor.

### 9.17.2 Conclusions for the UFMfSW

Hawthorn covers approximately 453Ha with a total population of 3,988. Approximately 5% of the population of Hawthorn are at high risk of surface water flooding.

The UFMfSW indicates that the highest risk posed to people and properties within Hawthorn is broadly associated with surface runoff and culvert inlets with flood risk observed across much of the residential area of Hawthorn.

A high risk of flooding to the properties at Cae Nant Flats, sourced from a bank breach of an unnamed watercourse to the north of the site. Flooding to Cardiff Road and discharging into the Afon Taf.

To the north of the A470, areas of high risk are present along Ceiriog Crescent, Glyn-Dwr Avenue, Ash Square, Sycamore Street, Poplar Road, Maple Street and Warren Close. Properties adjacent to these roads are at risk from surface water flood flow running around the perimeter of the properties.

To the south of the A470, a low to medium flood risk to people and properties is noted adjacent to the Nant Lonydd, to the rear of Hawthorn Crescent. This flood risk is associated with the exceedance of the ordinary watercourse channel.

A combination of ordinary watercourse and surface water flood risk is posed to Laurel Avenue, Ynyslyn Road, Spencer Place, Fairfield Lane and Cardiff Road.

This flooding extends down with significant risk present along sections of Fairfield Lane and Cardiff Road, Ynyslyn Road, Laurel Avenue and Ynyscorrwg Road. It is possible that this flood risk also has contributions from the culvert inlet on the Nant Lonydd, beneath the A470.

Treforest Industrial estate is at a low to high risk of surface water flooding, anticipated to be sourced from both ordinary watercourse and surface runoff.

A low to high flood risk is noted along sections of the A470, of note is the Upper Boat roundabout on and off slip roads and a section of the road to the northwest of the roundabout.

Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting. It is difficult to distinguish between flooding sourced from surface water and flooding sourced from Main River.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is a worst case scenario.**

A summary of the counts for Hawthorn are presented in the table below.

**Table 51:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Hawthorn

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,988	183	266	506
Services	15	0	1	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	522	7	37	78
Airports	0	0	0	0
Roads (km)	9	0.6	0.4	2
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	1	1	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	3	0	0	0
Licensed Abstractions	1	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	2			
External	12			
Highway	19			

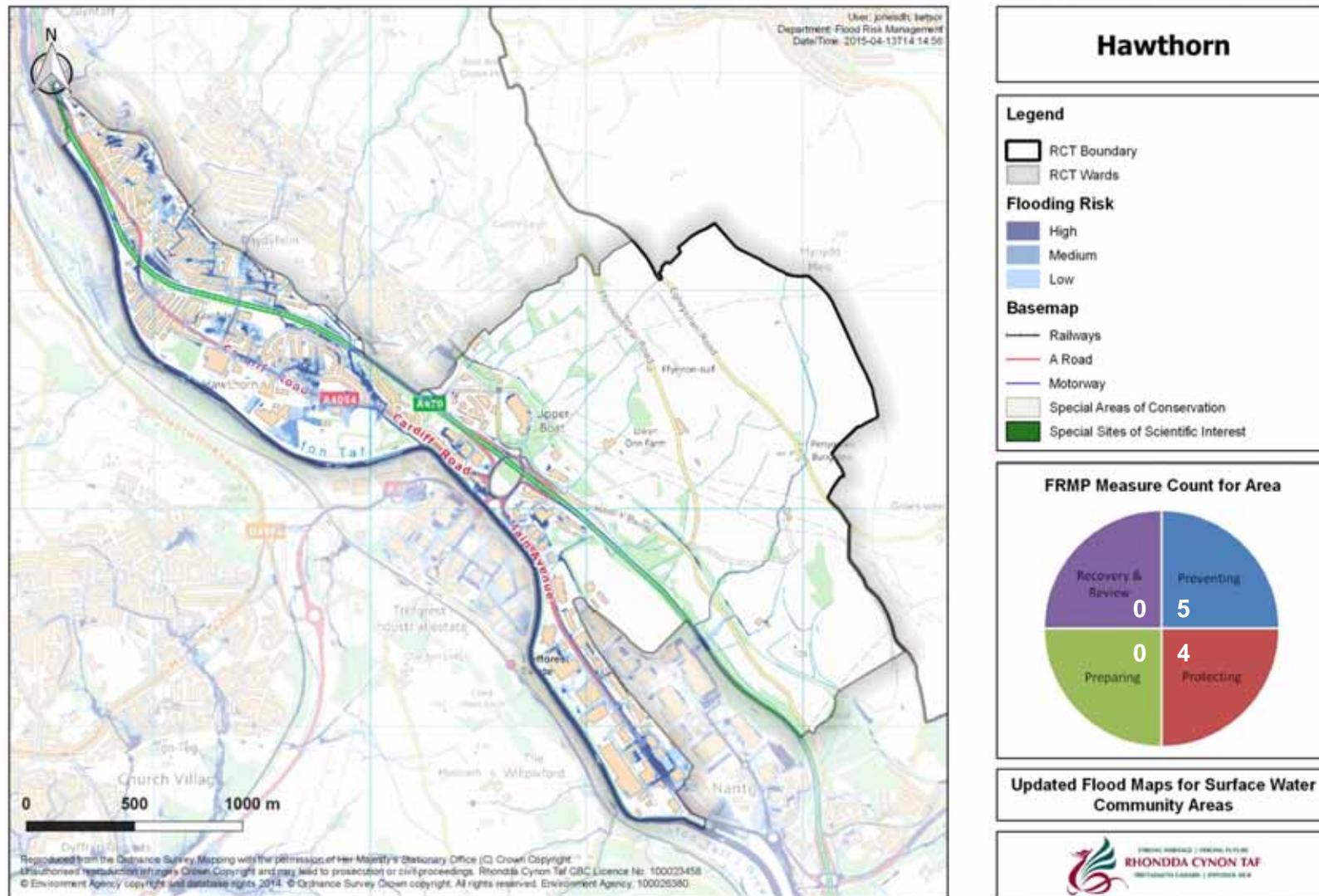
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Hawthorn and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 52:** Summary of Flood Risk Management Plan Measures for Hawthorn

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0075	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0076	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Completed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Completed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Completed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Completed	RCTCBC
RCT0132	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 35:** Hawthorn uFMfSW. Risk to people, economic activity and environmental receptors



## **9.18 Hirwaun**

### **9.18.1 Overview**

Hirwaun is situated in the north of Rhondda Cynon Taf County Borough Council, located to the north of Aberdare. The site covers an area of 392Ha and has a maximum elevation of approximately 512m AOD. Hirwaun has a population of approximately 4,397 and approximately 1,871 residential properties.

Hirwaun is predominantly a rural environment owing the steep topography in the south. The primary road, the A465, acts as a boundary between the residential developments in the north of Hirwaun and the rural southern areas. Hirwaun's rural area is not confined to the south; there is a SSSI site present to the east of the residential developments. A large quarry is present south of the A465 which also extends into the community area of Rhigos.

Hirwaun is situated primarily within the Afon Cynon Catchment. The site also extends to include a small section of the Afon Rhondda Catchment in the south and the Ogmore to Tawe Catchment of the West Wales River Basin District in the north-west. The Afon Cynon is the primary watercourse in Hirwaun and flows north to east. The Nant y Bwlch drains the higher elevations in the south and discharges into the Afon Cynon.

There are a number of minor unnamed watercourses which also drain the highlands in the south and discharge into the Afon Cynon. Many are partially culverted beneath Hirwaun's residential developments.

The underlying geology of Hirwaun are the Llynfi and Rhondda beds of the Upper Carboniferous Coal Measures, and the Middle and Lower Carboniferous Coal Measures, all consisting of Coal, Sandstone, Siltstone and Mudstone. Also present is the Bishopston Mudstone Formation. Glacial Till is present across much of the valley floor. Alluvial Deposits are present along the Afon Cynon. Intermittent patches of Peat are present on the summits of the southern highlands.

### 9.18.2 Conclusions for the UFMfSW

Hirwaun covers an area of approximately 392Ha with a total population of 4,397. Approximately 2% of the population of Hirwaun are at high risk of surface water flooding.

The uFMfSW indicate that the highest risk posed to people and properties within Hirwaun is broadly associated with the Afon Cynon with a significant flood risk observed across the length of the watercourse. There is a risk of flooding sourced from the culvert inlet on the Afon Cynon, in the north of the site. There is no discernible flow pattern here, with a ponding effect covering the roads of Richmond Drive and Devonshire Drive, and the surrounding wooded area.

A low to high risk of flooding is noted in the east of the site, to the north of the Afon Cynon. The flooding source is largely associated with potential bank breaches of the Afon Cynon; however, it is likely to have contributions from the culvert inlet to the north. The flow path generally follows the roads, with a significant risk along sections of Cae Felin Parc and Llys Cynon.

The map indicates a low to high risk of flooding along Station Road, Elm Grove and Cefndon Terrace. The flow path of this flood risk is similar to flood risks across the site, with a channel of water connecting a culvert inlet to the Main River.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Hirwaun are presented in the table below.

**Table 53:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Hirwaun

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,397	75	129	578
Services	11	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	321	4	7	26
Airports	0	0	0	0
Roads (km)	3	0.7	0.08	1
Railways (km)	3	0	0	0.9
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	4	0	0.01	1
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	4	0	0.05	1
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	3	0.2	0.4	1
Listed Buildings	4	1	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	0			
External	12			
Highway	18			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Hirwaun and their proposed Flood Risk Management Plan measures are presented in the table below.

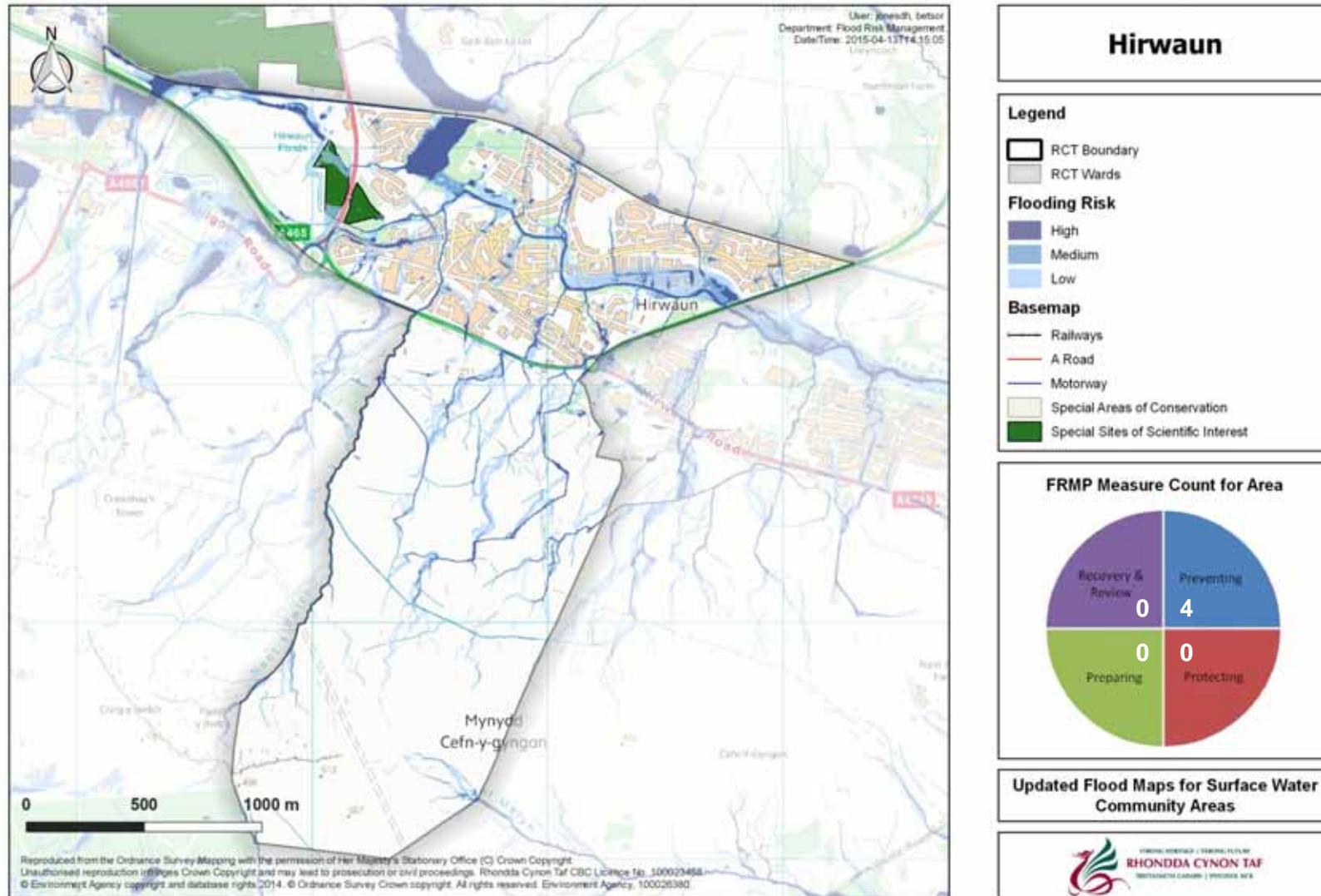
Further information regarding the flood investigation area is presented in Appendix A.

**Table 54:** Summary of Flood Risk Management Plan Measures for Hirwaun

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0040	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0041	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0042	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0072	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 36:** Hirwaun uFMfSW. Risk to people, economic activity and environmental receptors



## **9.19 Llanharan**

### **9.19.1 Overview**

Llanharan is located in the south Rhondda Cynon Taf County Borough Council, to the east of Llantrisant, with the towns of Llanharan, Dolau and Ynysmaerdy. The site covers an area of 1085Ha and has a maximum elevation of 266m AOD. Hirwaun has a population of approximately 3,661 and approximately 1,558 residential properties.

The majority of Llanharan has remained in a natural state owing to the presence of Mynydd Garthmaelwg in the north. Much of Llanharan is composed of agricultural land with a number of farms situated on the lowlands of the south. Llanharan is also heavily forested, especially in the north. Residential development is primarily located in the south-east and south-west of the site.

Llanharan is predominantly situated within the Afon Elai Catchment; however, a large section of the Ogmere to Tawe Catchment of the West Wales River Basin District is included in the west of Llanharan. There are two primary watercourses within Llanharan; the Afon Elai and the Ewenni Fach. Llanharan is bound to the east by the Afon Elai.

The highlands in the north are drained by a number of minor unnamed watercourses, discharging into both the Afon Elai in the north and Nant Melyn in the south.

The underlying geology of Llanharan is the Rhondda and Llynfi beds of the Upper Carboniferous Coal Measures and the Middle Carboniferous Coal Measures, all formed of Mudstone, Siltstone, Coal and Sandstone. Also present is the Mercia Mudstone Group. Glacial Till is present along the paths of major watercourses and along the lowlands in the south. Alluvial deposits are present along the Ewenni Fach and the Afon Elai.

### 9.19.2 Conclusions for the UFMfSW

Llanharan covers an area of approximately 1085Ha with a total population of 3,661. Just over 1% of the population of Llanharan are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Llanharan is broadly associated with the Ewenni Fach with a significant flood risk observed in the south-west of the site, and the Nant Melyn with a significant flood risk in the east of Llanharan.

There is a low to high flood risk across much of the floodplain in Dolau. The flooding source is largely associated with potential bank breaches of the Ewenni Fach. Also contributing to the flood risk here is the culvert inlet, causing a significant amount of flooding along sections of Llanharan Road. There are a number of properties at a low to high risk of flooding along sections of Bridgend Road and Jubilee Street which extends up on Talyfan Road.

There is a low to high flood risk noted on the floodplain of the Ewenni Fach in the north of Llanharan and the floodplain of the Nant Melyn in the east.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Llanharan are presented in the table below.**

**Table 55:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Llanharan

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,661	28	7	216
Services	8	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	516	16	15	42
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	3	0.6	0.4	0.7
Agricultural Land (hectares)	0.5	0.09	0.04	0.1
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	21	0	0.2	1
Scheduled Ancient Monuments	0.04	0	0	0
Listed Buildings	18	0	0	3
Licensed Abstractions	3	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	0			
External	5			
Highway	15			

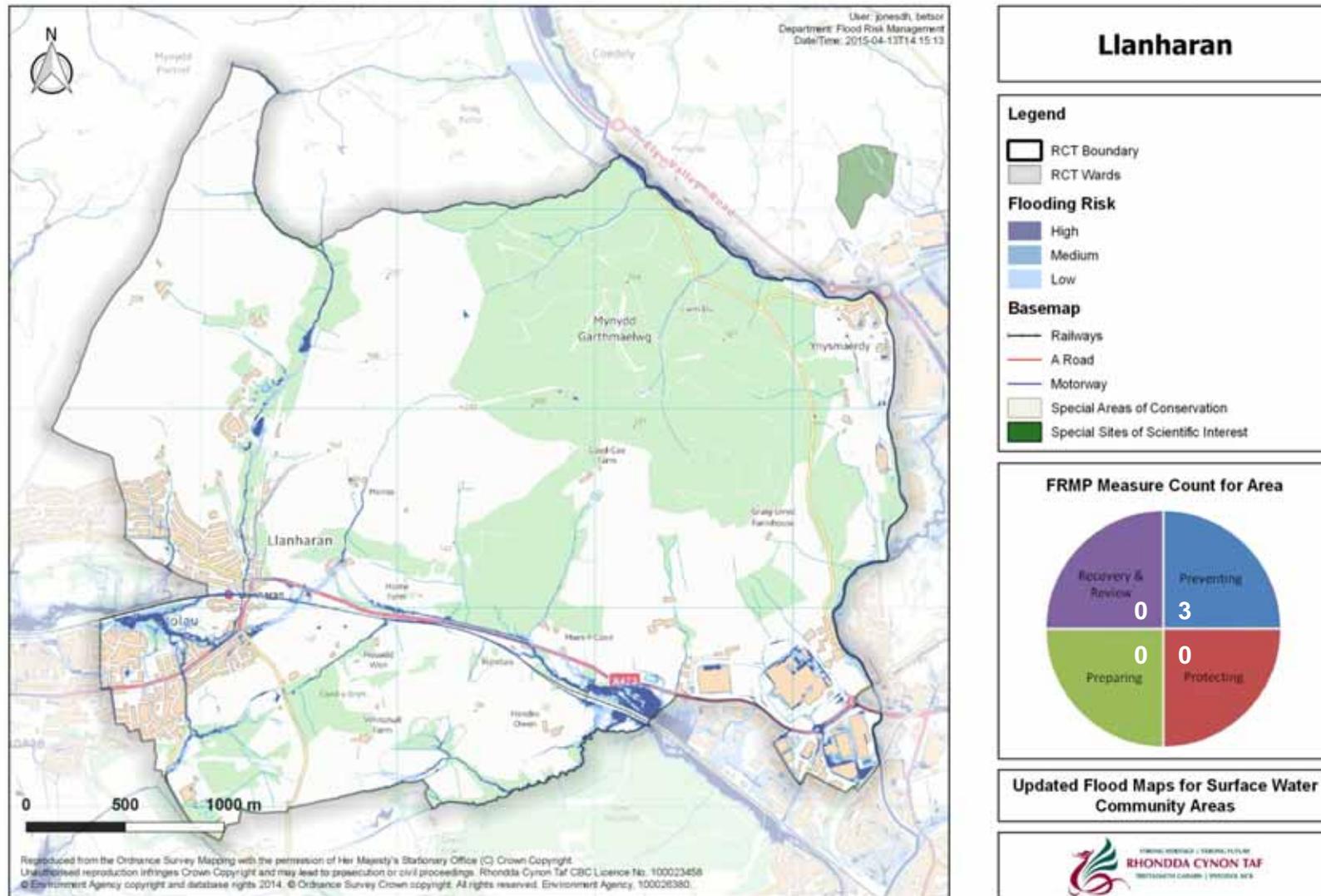
Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Llanharan and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 56:** Summary of Flood Risk Management Plan Measures for Llanharan

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0043	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0047	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0137	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 37:** Llanharan uFMfSW. Risk to people, economic activity and environmental receptors



## **9.20 Llanharri**

### **9.20.1 Overview**

Llanharri is located in the south of Rhondda Cynon Taf County Borough Council, to the east of Pontyclun. The site covers an area of 742Ha and has a maximum elevation of 113m AOD. Llanharri has a population of approximately 3,840 and approximately 1,634 residential properties.

Llanharri is predominantly a rural environment, owing the extent of agricultural land present within the site. Residential development of the town Llanharri is situated within close proximity of the primary road, the M4. The highlands in the north form part of the Coed Tre Castell. A large quarry is present in the southern sector of Llanharri.

The majority of Llanharri is located within the Afon Elai Catchment; however, the Ogmere to Tawe Catchment of the West Wales River Basin District is also included in the west of the site. The site is drained by Nant Melyn in the east and Nant Felin-Fach in the south. Llanharri is bound to the north by Nant Graean which drains the highlands in the north and discharges into Nant Melyn

There are a number of minor unnamed watercourses which drain the east of Llanharri.

The underlying geology consists of the Mercia Mudstone Group, the Marros Group, the Oxwich Head Limestone Formation, the Stormy Limestone Formation, the Cornelly Oolite Formation, the High Tor Limestone Formation, and the Caswell Bay Mudstone Formation. Glacial Till is present across the majority of Llanharri. Glaciolacustrine and Head Deposits are present along the Nant Rhydhalog and Nant Felin-Fach.

### 9.20.2 Conclusions for the UFMfSW

Llanharri covers an area of approximately 742Ha with a total population of 3,840. Just over 2% of the population of Llanharri are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Llanharri is broadly associated with the Nant Felin-Fach. It should be noted, however, that the flow path is not always discernible. There is a low to medium flood risk along sections of Beech Road, Ash Grovem Heol Pant Gwyn and Heol Ysgawen.

There is also a significant flood risk associated with the Nant Melyn along sections of Ash Grove, Meadow Drive, Llwyn On and Coedcae Lane. A significant proportion of the flood risk from the Nant Melyn, however, has little impact on residential or economic receptors. The majority of Llanharri is Agricultural Land Classification Grade Two and Three. A large proportion of the central sector of this land is at low to high risk of flooding which is associated to an unnamed minor watercourse.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Llanharri are presented in the table below.

**Table 57:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Llanharry

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,840	78	42	155
Services	6	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	446	3	3	38
Airports	0	0	0	0
Roads (km)	6	0	0.004	0.6
Railways (km)	2	0.03	0.006	0.04
Agricultural Land (hectares)	583	5	5	16
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.09	0	0	0
Listed Buildings	2	0	0	0
Licensed Abstractions	2	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	0			
External	3			
Highway	17			

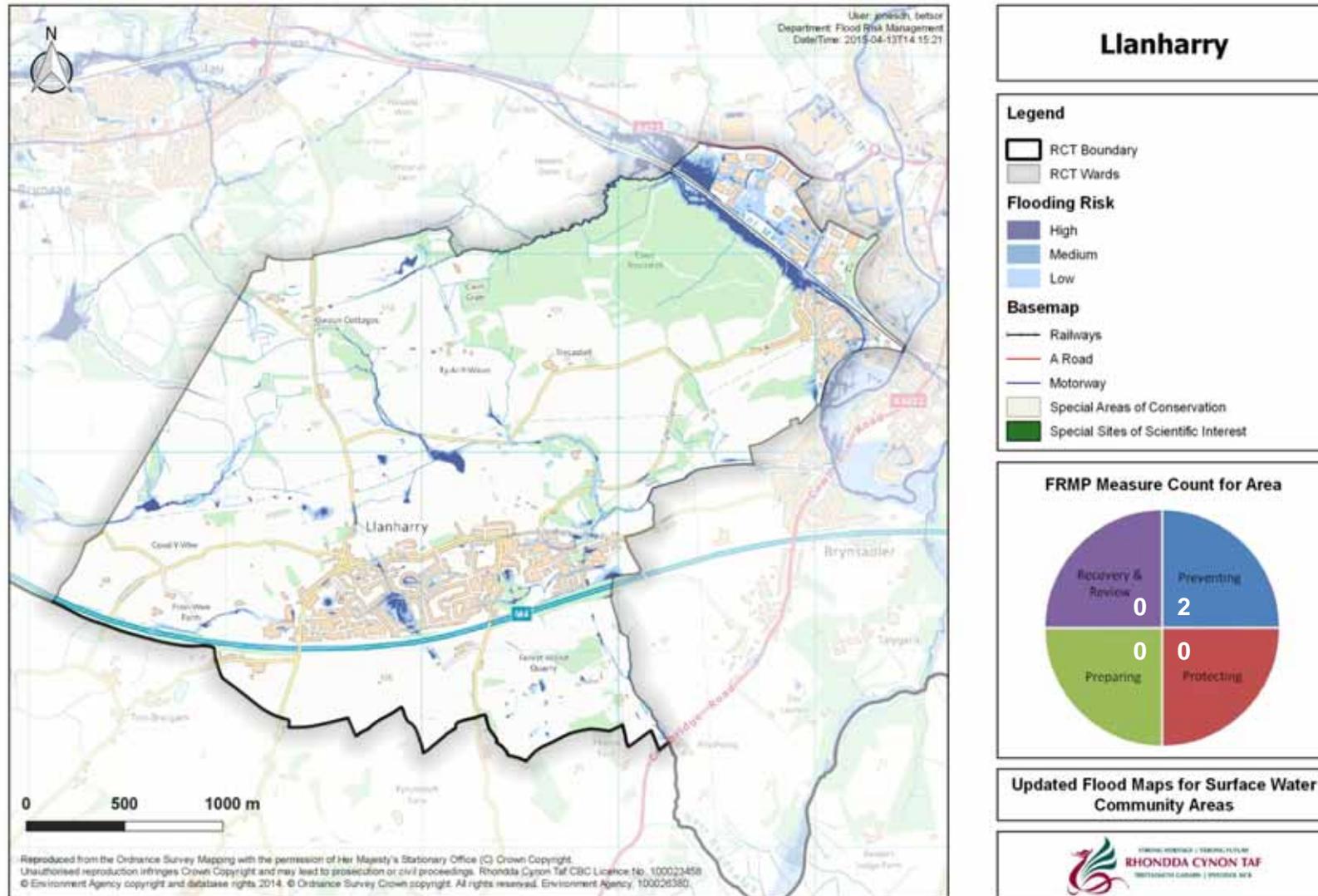
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Llanharry and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 58:** Summary of Flood Risk Management Plan Measures for Llanharry

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0044	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0137	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 38:** Llanharry uFMfSW. Risk to people, economic activity and environmental receptors



## **9.21 Llantrisant Town**

### **9.21.1 Overview**

Llantrisant Town is situated in the south of Rhondda Cynon Taf County Borough Council, to the north of Pontyclun. The site covers an area of 968Ha and has a maximum elevation of approximately 174m AOD. Llantrisant Town has a population of approximately 4,792 and approximately 2,039 residential properties.

The majority of Llantrisant Town has remained in a natural state with residential developments located primarily on the edge of major watercourses. A large industrial estate is located to the east of Ynysmaedy in the west of Llantrisant Town. The south east of the site is dominated by agricultural land.

Llantrisant is located within the Afon Elai Catchment and is drained to the north by Nant Muchudd and in the south by Nant Myddlyn and Afon Clun, which also acts as a boundary between Llantrisant Town and Pontyclun community area. There is an extensive network of minor unnamed watercourses which drain the Llantrisant Common in the centre of the site, which discharge into Nant Muchudd.

The underlying geology of Llantrisant Town is the Rhondda, Hughes and Brithdir beds of the Upper Carboniferous Coal Measures comprising Sandstone, Siltstone, Coal and Mudstone. Also present is the Grovesend Formation, the Middle Carboniferous Coal Measures and the Mercia Mudstone Group. Glacial Till is present across much of the valleys of major watercourses. Glaciofluvial and alluvial deposits are present along the Afon Elai and Nant Muchudd and Afon Clun. Intermittent patches of Peat are present across the forested areas of Llantrisant Town.

### 9.21.2 Conclusions for the UFMfSW

Llantrisant Town covers approximately 968Ha with a total population of 4,792. Just over 2% of the population of Llantrisant Town are at high risk of surface water flooding.

The highest risk posed to people and properties within Llantrisant Town is broadly associated with the Afon Clun and Nant Muchudd with flood risk observed along large sections of both watercourses. The flooding is sourced from potential bank breaches and culvert inlets. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

There is a low to high flood risk along sections of Cardiff Road, Fairland Close, Summerfield Drive, Greenlands Road, Southgate Avenue, Cottesmore Way, Silverton Drive, Grafton Drive, Cross Inn Road and the A473.

The UFMfSW indicates that there is a significant risk of flooding within the large industrial estate to the north of Llantrisant Common. The flood source is largely associated with potential bank breaches of the Nant Muchudd but also culvert inlets.

There is a low risk of flooding noted to occur across the SSSI of Llantrisant Common. The flood source is associated with the minor watercourses within the Common. No properties or economic receptors are affected by this flooding.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Llantrisant Town are presented in the table below.

**Table 59:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Llantrisant Town

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,792	80	85	383
Services	18	1	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	688	27	27	62
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	2	0.03	0	0
Agricultural Land (hectares)	3	0	0	0.06
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	1	1	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	109	0.2	4	6
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	9	0.1	0.02	0.07
Listed Buildings	13	0	0	1
Licensed Abstractions	2	0	0	1
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	1			
External	9			
Highway	26			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Llantrisant Town and their proposed Flood Risk Management Plan measures are presented in the table below.

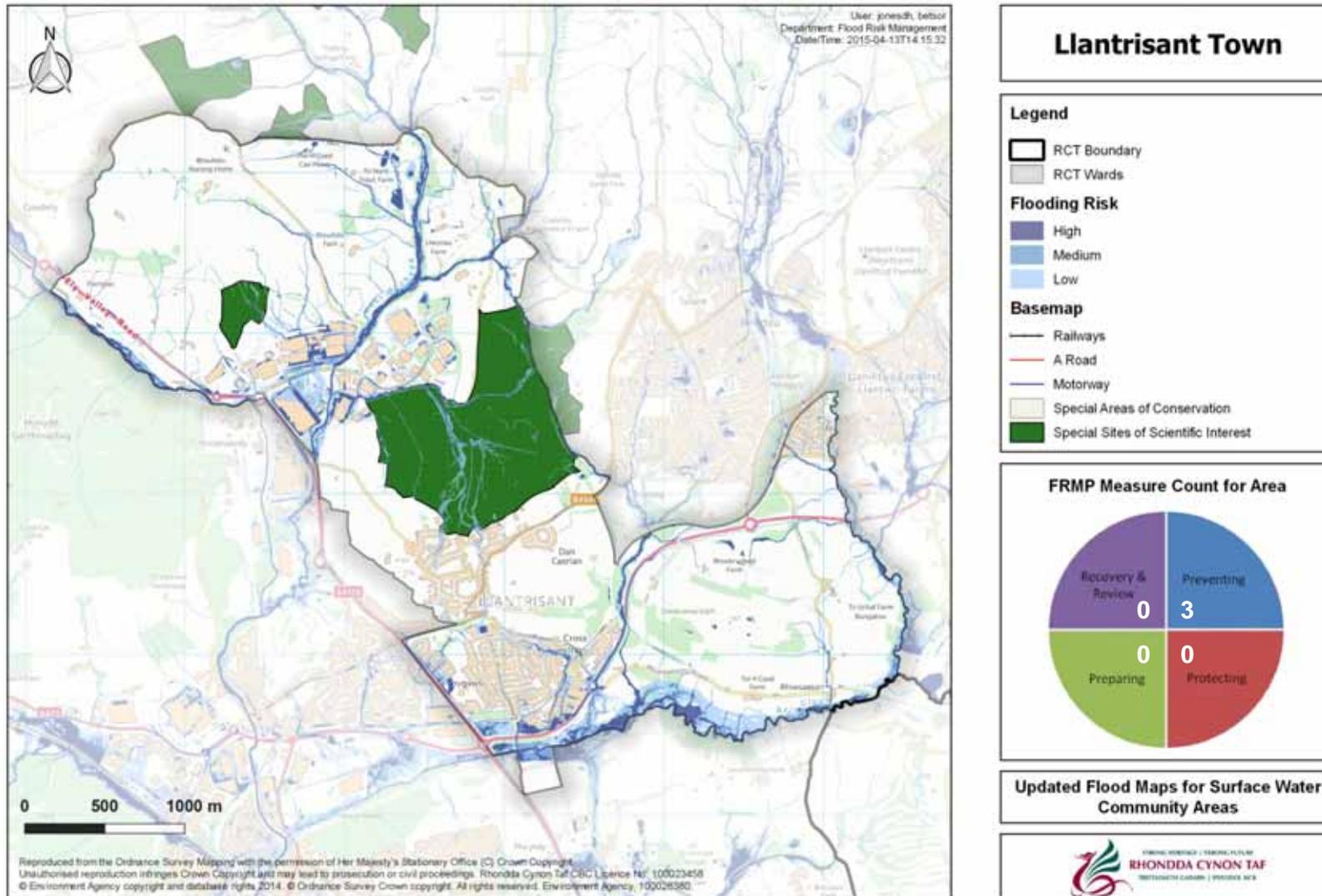
Further information regarding the flood investigation area is presented in Appendix A.

**Table 60:** Summary of Flood Risk Management Plan Measures for Llantrisant Town

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0045	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0046	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0047	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 39:** Llantrisant Town uFMfSW. Risk to people, economic activity and environmental receptors



## **9.22 Llantwit Fardre**

### **9.22.1 Overview**

Llantwit Fardre is situated in the southern sector of Rhondda Cynon Taf County Borough Council with the towns of Llantwit Fardre and Efail Isaf. The site covers an area of 990Ha with a maximum elevation of 200m AOD. Llantwit Fardre has approximately 2,509 residential properties and a population of approximately 5,896.

Llantwit Fardre is predominantly a rural environment owing to the extent of agricultural land within the site. The main residential development of Llantwit Fardre is situated primarily on the bank of Nant Dowlais in the centre of the site. With the exception of Efail Isaf, there are few other residential developments in Llantwit Fardre. An old Coking Plant, Cwm Works, remains on the north-western border.

The majority of Llantwit Fardre is located within the Afon Elai Catchment; however, a small section of the Afon Taf Catchment is included in the east of the site. The site is drained to the north by Nant Ty'rarlwydd which feeds into the primary watercourse, Nant Myddlyn. The Catchment of Nant Ty'rarlwydd covers much of the northern sector of the site. The east of Llantwit Fardre is drained by Nant y Felin and Nant Dowlais. Nant Dowlais discharges into Nant Myddlyn in the south-east of the site.

There are a number of minor unnamed watercourses which are partially culverted beneath the town of Llantwit Fardre.

The underlying geology of Llantwit Fardre consists of Brithdir and Hughes beds of the Upper Carboniferous Coal Measures and the Middle Carboniferous Coal Measures comprising Sandstone, Siltstone, Mudstone and Coal. Also present is the Grovesend Formation, also comprising Sandstone, Siltstone and Mudstone. Glacial Till is present across much of Llantwit Fardre. Alluvial Deposits are also present along Nant Dowlais and Nant Myddlyn.

### 9.22.2 Conclusions for the UFMfSW

Llantwit Fardre covers approximately 990Ha with a total population of 5,896. Approximately 1% of the population of Llantwit Fardre are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Llantwit Fardre is broadly associated with the Nant Dowlais with flood risk observed along the length of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches. The flow path is generally along roads with significant risk associated along sections of Queens Drive, Lancaster Drive, St Annes Drive, Crown Hill and York Drive. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

A low to high risk is noted across the old Cwm Works just north of Llantwit Fardre. The flood source here is largely attributed to the culvert inlets situated across the work's site.

A low to high flood risk is represented along the floodplain of the Nant Dowlais, to the north of the A473 attributed to potential bank breaches of the primary watercourse. No properties, economic or environmental receptors are affected by this flooding

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Llantwit Fardre are presented in the table below.

**Table 61:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Llantwit Fardre

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	5,896	35	92	531
Services	6	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	657	20	12	52
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	1	1	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	2	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	6			
External	27			
Highway	31			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Llantwit Fardre and their proposed Flood Risk Management Plan measures are presented in the table below.

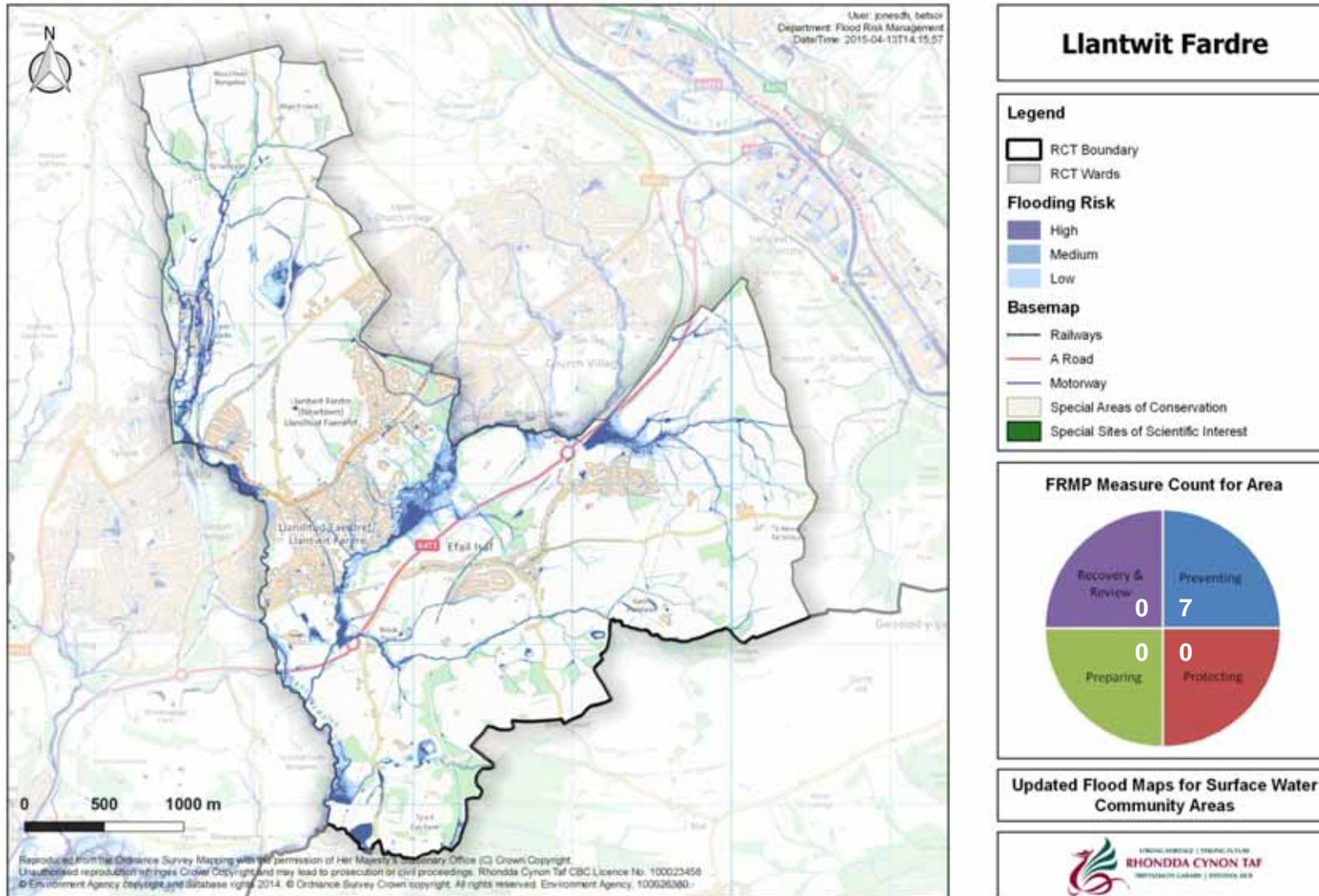
Further information regarding the flood investigation area is presented in Appendix A.

**Table 62:** Summary of Flood Risk Management Plan Measures for Llantwit Fardre

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0023	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0024	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0048	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0049	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0050	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Rescores Wales
RCT0051	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0116	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 40;** Llantwit Fardre uFMfSW. Risk to people, economic activity and environmental receptors



## **9.23 Llwynypia**

### **9.23.1 Overview**

Llwynypia is situated in the central sector of Rhondda Cynon Taf County Borough Council, to the north of Tonypany. The site covers an area of 259Ha with a maximum elevation of 351m AOD. Llwynypia has a population of approximately 2,423 and approximately 1,031 residential properties.

The majority of Llwynypia has remained in a natural state, owing to the steep topography of the highlands in the east and west and, as a result, proximate areas have remained undeveloped. A large SSSI is located on the highlands in the west. Residential development is confined to the base of the Afon Rhondda valley, present on both banks of the Afon Rhondda. There is a small industrial estate situated in the centre of Llwynypia.

Llwynypia is situated within the Afon Rhondda Catchment. Llwynypia is drained to the north by Nant y Gwiddon and to the south by Nant Clydach Fach. All watercourses discharge into the Afon Rhondda.

A number of unnamed watercourses also drain the western slopes and discharge into the Afon Rhondda. Most are culverted beneath Llwynypia.

The underlying geology is the Rhondda and Llynfi beds of the Upper Carboniferous Coal Measures comprising Mudstone, Coal, Sandstone and Siltstone. Glacial Till is present along the Afon Rhondda valley. Glaciofluvial and Alluvial Deposits are present along the Afon Rhondda. Peat is present on the highlands in the west, within forested areas.

### 9.23.2 Conclusions for the UFMfSW

Llwynypia covers approximately 259Ha with a total population of 2,423. Just over 2% of the population of Llwynypia are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Llantwit Fardre is broadly associated with the Afon Rhondda with flood risk observed along a number of sections of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches. Commonly, the flow path is along roads with significant risk associated along sections of Pontrhondda Avenue and Pontrhondda Road, Sherwood Street, Oakfield Terrace and Turberville Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic external and internal flooding incidents reported to Rhondda Cynon Taf.

A low to high risk is noted along the length of the railway line within Llwynypia. A low to high flood risk is also represented across the northern edge of the SSSI within Llwynypia. The flood risk is sourced from potential bank breaches of the Nant Y Gwiddon.

The map also indicates a low to high flood risk in the south of the site, along Llwynypia Road and the Terraces to the east. This flood source is largely associated with the culvert inlets within this area but it is likely there is also contribution from potential bank breaches of the Afon Rhondda.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Llwynypia are presented in the table below.

**Table 63:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Llwynypia

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	2,423	56	108	343
Services	6	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	272	18	8	30
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	1	0.4	0.2	0.3
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	19	0.07	0.03	0.3
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	3	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	5			
External	29			
Highway	44			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Llwynypia and their proposed Flood Risk Management Plan measures are presented in the table below.

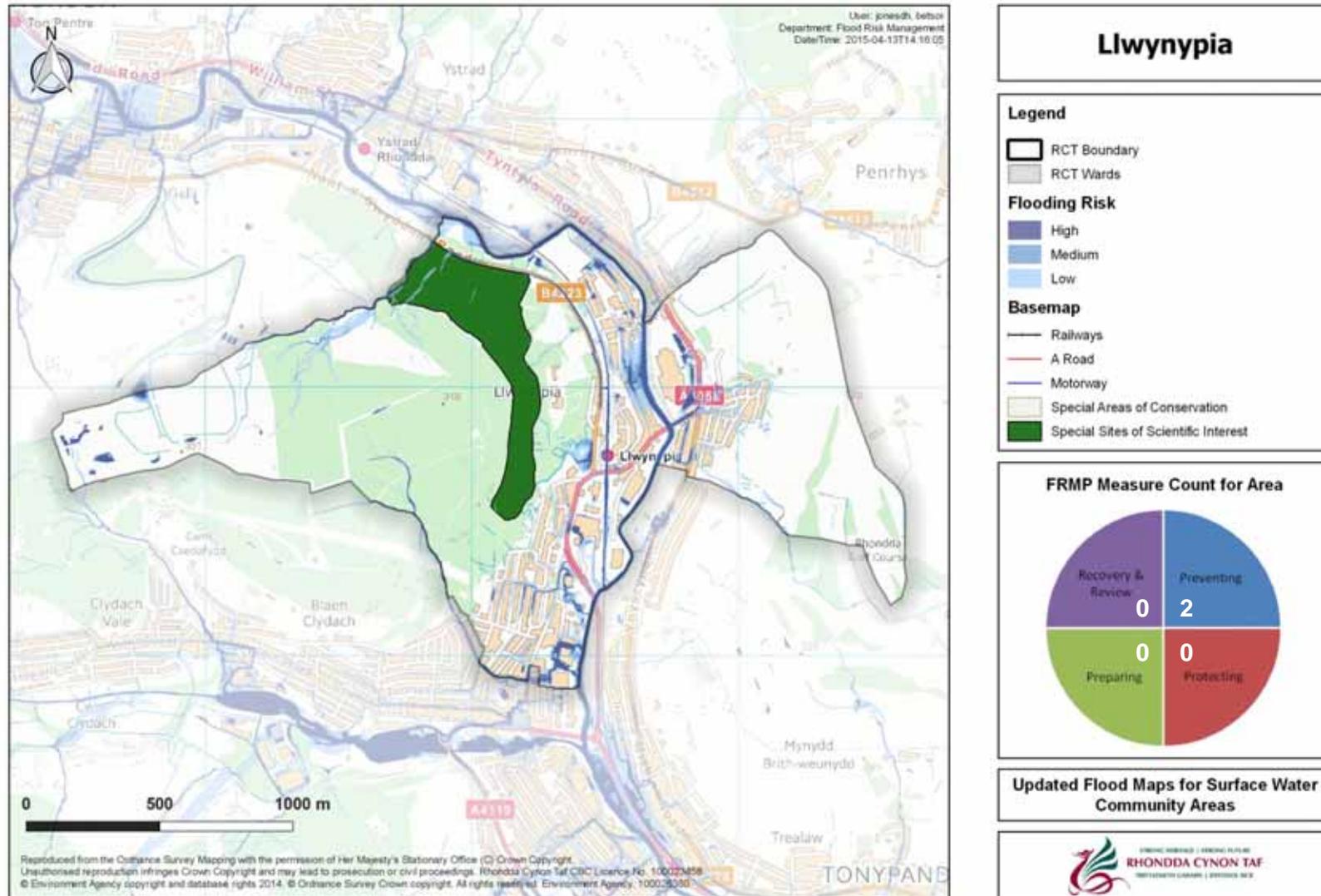
Further information regarding the flood investigation area is presented in Appendix A.

**Table 64:** Summary of Flood Risk Management Plan Measures for Llwynypia

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0052	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0085	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 41:** Llwynypia uFMfSW. Risk to people, economic activity and environmental receptors



## **9.24 Maerdy**

### **9.24.1 Overview**

The community area of Maerdy is situated in the northern sector of Rhondda Cynon Taf County Borough Council, to the east of Treorchy. The site covers an area of 1,060Ha with a maximum elevation of approximately 500m AOD. Maerdy has approximately 1,560 residential properties and a population of approximately 3,666.

The majority of Maerdy has remained in a natural state with residential development confined to the southern corner of the site. This is due to the steep topography of the highlands covering the whole of the northern sector of Maerdy. There are no residential developments across the northern sector of the site. St Gwynno Forest is located along the south-eastern edge of Maerdy. There is a small industrial estate located north of the residential development of Maerdy.

Maerdy is primarily located within the Afon Rhondda Catchment with a small section of the Afon Cynon Catchment included in the east. The primary watercourse, the Afon Rhondda Fach, flows from north to south through the centre of the site. Maerdy is drained to the north by a number of unnamed watercourses which discharge into the Afon Rhondda Fach. Nant Brynygelli drains the western slopes and discharges into the Llest-wen Reservoir.

A number of minor unnamed watercourses discharge into the Afon Rhondda Fach, in the south of the site, which are partially culverted beneath Maerdy.

The underlying geology of Maerdy is the Rhondda bed of the Upper Carboniferous Coal Measures comprising Sandstone, Siltstone, Mudstone and Coal. Glacial Till is present throughout the valley and up into the highlands in the north. Alluvial Deposits are present along much of the Afon Rhondda Fach.

### 9.24.2 Conclusions for the UFMfSW

Maerdy covers an area of approximately 1,060Ha and has a total population of 3,666. About 5% of Maerdy are at high risk of surface water flooding.

The most significant risk posed to people and properties within Maerdy is largely attributed to the Afon Rhondda Fach, but is also likely to be associated with culvert inlets. The flooding is sourced from breached banks and surface runoff. Commonly, the flow path is along roads with a high risk associated along sections of Park Road, School Street, Oxford Street and Maerdy Road.

The UFMfSW also indicate a significant amount of flooding in the east of the site, along the floodplain of the Afon Rhondda Fach and the industrial estates located here.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Maerdy are presented in the table below.

**Table 65:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Maerdy

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,666	172	71	435
Services	3	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	296	7	1	31
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	1	0	0	0
Listed Buildings	0	0	0	0
Licensed Abstractions	2	2	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	8			
External	22			
Highway	17			

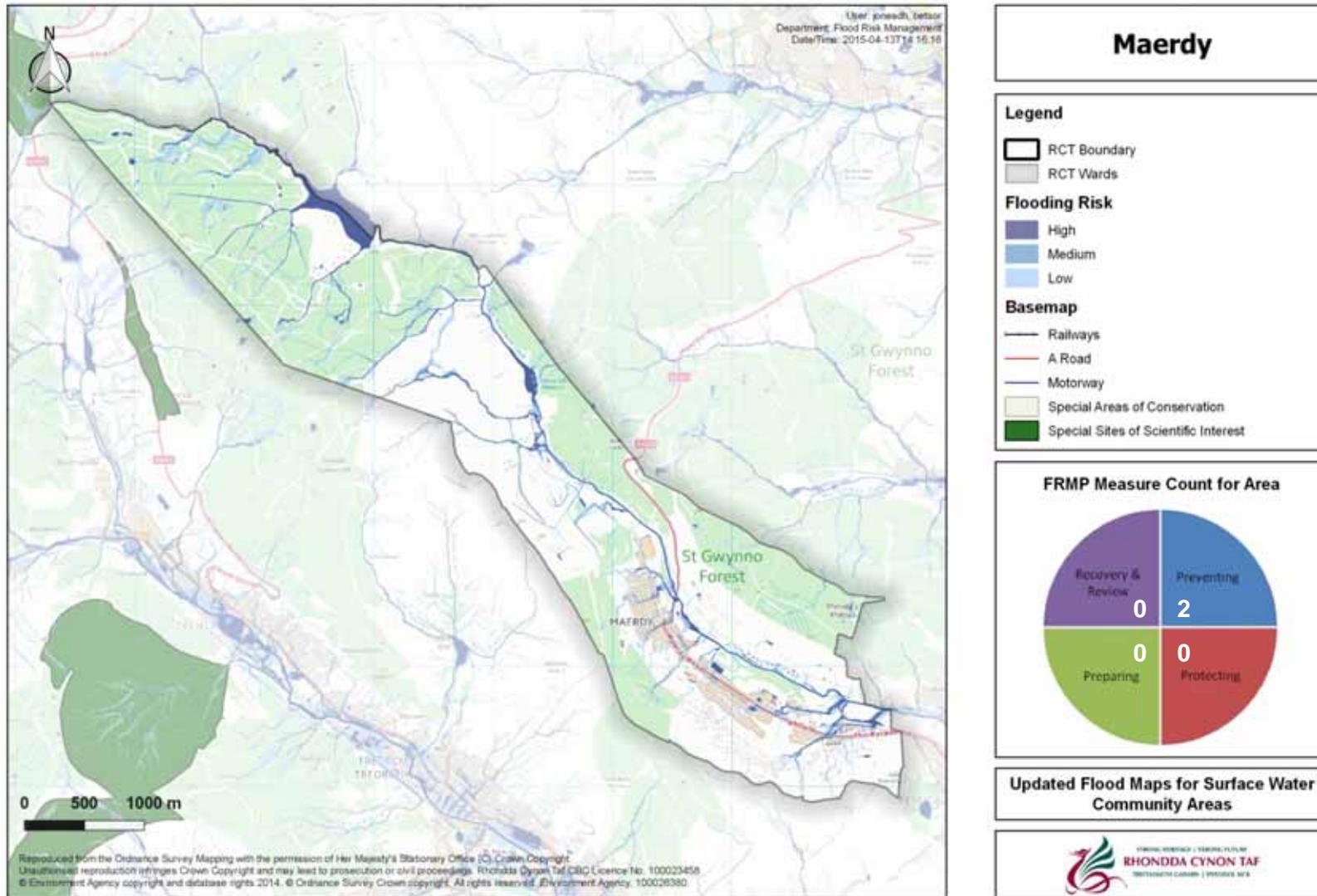
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Maerdy and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 66:** Summary of Flood Risk Management Plan Measures for Maerdy

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0053	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0054	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 42:** Maerdy uFMfSW. Risk to people, economic activity and environmental receptors



## **9.25 Mountain Ash East**

### **9.25.1 Overview**

Mountain Ash East is situated in the eastern sector of Rhondda Cynon Taf County Borough Council, with the town of Mountain Ash. The site covers an area of 850Ha and has a maximum elevation of 487m AOD. Mountain Ash East has a population of approximately 3,243 and approximately 1,380 residential properties.

Mountain Ash East is predominantly a rural environment owing to the steep topography of the highlands in the east. Residential development is confined to the Afon Cynon valley, along the west of the site. Coed Fforest-Uchaf and Coed Fforest-Isaf are located in the south. Aber-ffrwd Plantation and Gelli-ddu-fawr Plantation are located in the north. Both forests and plantations are adjacent to residential areas.

The majority of Mountain Ash East is situated within the Afon Cynon catchment; however, a small section of the Afon Taf catchment is included in the east. Mountain Ash East is bounded to the west by the Afon Cynon. The site is drained in the north and east by Nant Gelli-ddu and Nant y Ffrwd, respectively. All watercourses drain the eastern highlands and discharge into the Afon Cynon. Many minor watercourses are partially culverted beneath Mountain Ash.

The underlying geology is the Rhondda and Hughes Beds of the Upper Carboniferous Coal Measures comprising Coal, Sandstone, Siltstone and Mudstone. Glacial Till is present along major watercourses. Glaciofluvial and Alluvial Deposits are present along the Afon Cynon. Peat is also present on the highlands in the east.

### 9.25.2 Conclusions for the UFMfSW

Mountain Ash East covers approximately 850Ha with a total population of 3,243. Just over 2% of the population of Mountain Ash East are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Mountain Ash East is broadly associated with the Afon Cynon with flood risk noted along sections of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches. The flow path is generally along roads with significant risk associated along sections of the A4059, Jeffery Street, Dyffryn Road and Allen Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

A low to high risk is observed along Trem Y Dyffryn. The flooding here is most likely sourced from the culvert inlet located to the north of the residential street. A significant number of properties are at risk of flooding from this source.

A low to high flood risk is represented along small sections of the floodplain of the Afon Cynon, to the south of the A4059, as well as along sections of the highlands in the east of the site. The flooding is largely attributed to culvert inlets, but also potential bank breaches of the primary watercourse. No properties, economic or environmental receptors are affected by this flooding.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Mountain Ash East are presented in the table below.

**Table 67:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Mountain Ash East

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,243	49	42	176
Services	5	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	278	8	7	7
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	67	1	1	4
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	5	0	0	0
Licensed Abstractions	1	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	8			
External	5			
Highway	23			

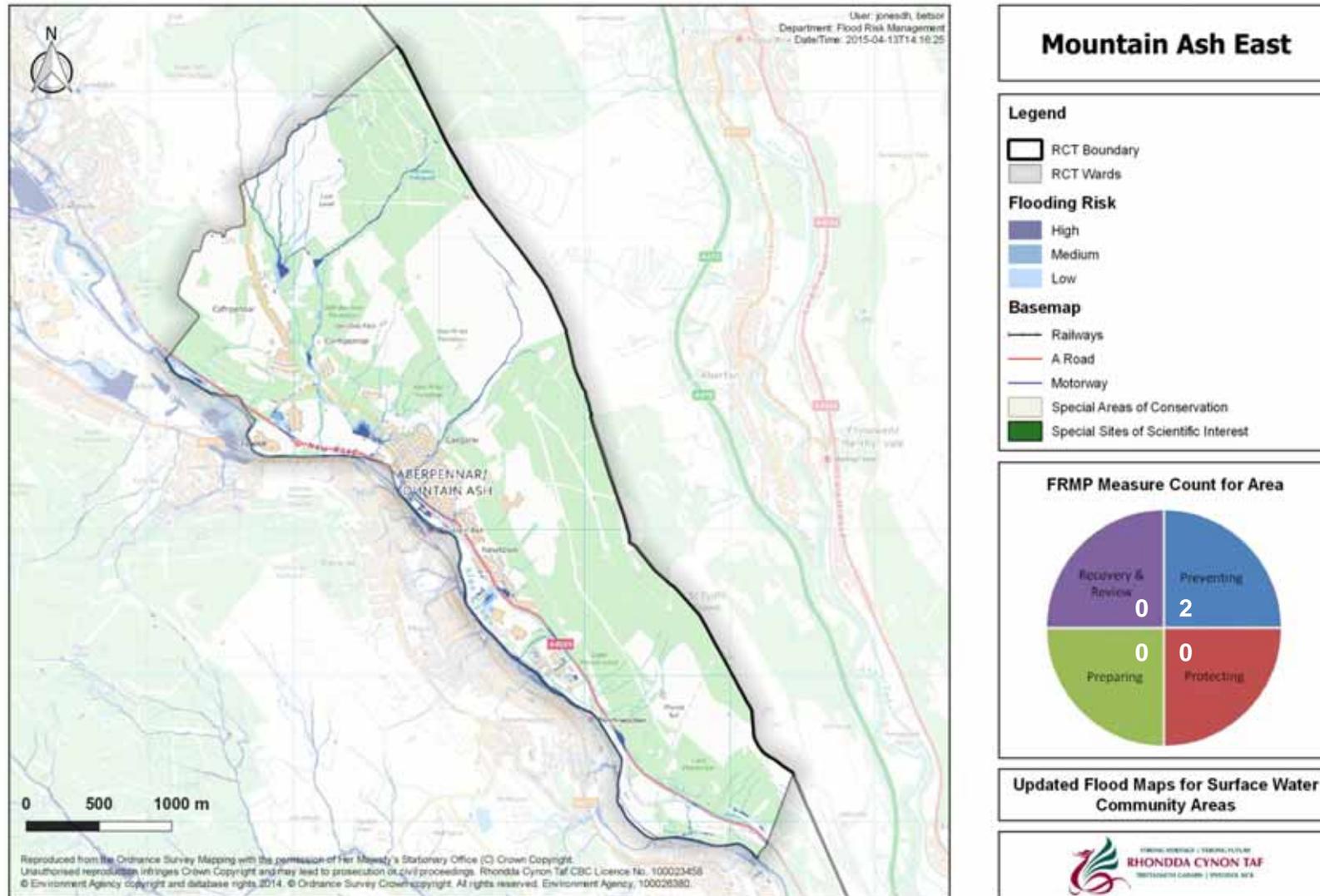
Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Mountain Ash East and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 68:** Summary of Flood Risk Management Plan Measures for Mountain Ash East

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0055	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0056	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 43:** Mountain Ash East uFMfSW. Risk to people, economic activity and environmental receptors



## **9.26 Mountain Ash West**

### **9.26.1 Overview**

Mountain Ash West is situated in the eastern sector of Rhondda Cynon Taf County Borough Council with the towns of Mountain Ash and Fernhill. The site covers an area of 351Ha and has a maximum elevation of 406m AOD. Mountain Ash West has a population of approximately 4,916 and approximately 2,092 residential properties.

The majority of Mountain Ash West has remained in a natural state owing to the steep topography of the highlands in the south-west. Residential properties are confined to the valley floor of the Afon Cynon. The highlands in the south-west are mostly forested with the Penrhiw-fer Plantation located in the centre of Mountain Ash West.

Mountain Ash West is situated within the Afon Cynon Catchment. The site is bounded to the north by the Afon Cynon, acting as a boundary between Mountain Ash East and Mountain Ash West. The highlands in the south-west are drained by Nant Cwm Boi and a number of minor unnamed watercourses. All watercourses flow from south-west to north-east and discharge into the Afon Cynon. Minor watercourses are partially culverted beneath Fernhill, Miskin and Darranlas.

The underlying geology of Mountain Ash West is the Rhondda and Hughes Beds of the Upper Carboniferous Coal Measures comprising Coal, Sandstone, Mudstone and Siltstone. Glacial Till is present along major watercourses. Alluvial and Glaciofluvial Deposits are present along the Afon Cynon. Peat is present on the highlands within forested areas.

### 9.26.2 Conclusions for the UFMfSW

Mountain Ash West covers approximately 351Ha with a total population of 4,916. Just over 2% of the population of Mountain Ash West are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Mountain Ash West is broadly associated with the Afon Cynon with flood risk noted along a number of sections of the watercourse. The flooding is sourced from potential bank breaches. The flow path is generally along roads with significant risk associated along sections of the Oxford Street, High Street, Woodland Street, Dyffryn Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

A low to high risk is observed within the town of Fernhill. The flooding is sourced primarily from culvert inlets. However Main River contribution is also likely. As before, the flow pattern is along roads with significant risk along sections of Glenboi, Fernhill and Aberdare Road. This flooding also extends across the floodplain of the Afon Cynon, flooding a small section of the Railway line.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Mountain Ash West are presented in the table below.

**Table 69:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Mountain Ash West

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,916	118	118	557
Services	7	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	335	10	5	64
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	2	0.1	0.06	0.05
Agricultural Land (hectares)	72	5	3	9
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.02	0	0	0
Listed Buildings	2	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	5			
External	16			
Highway	18			

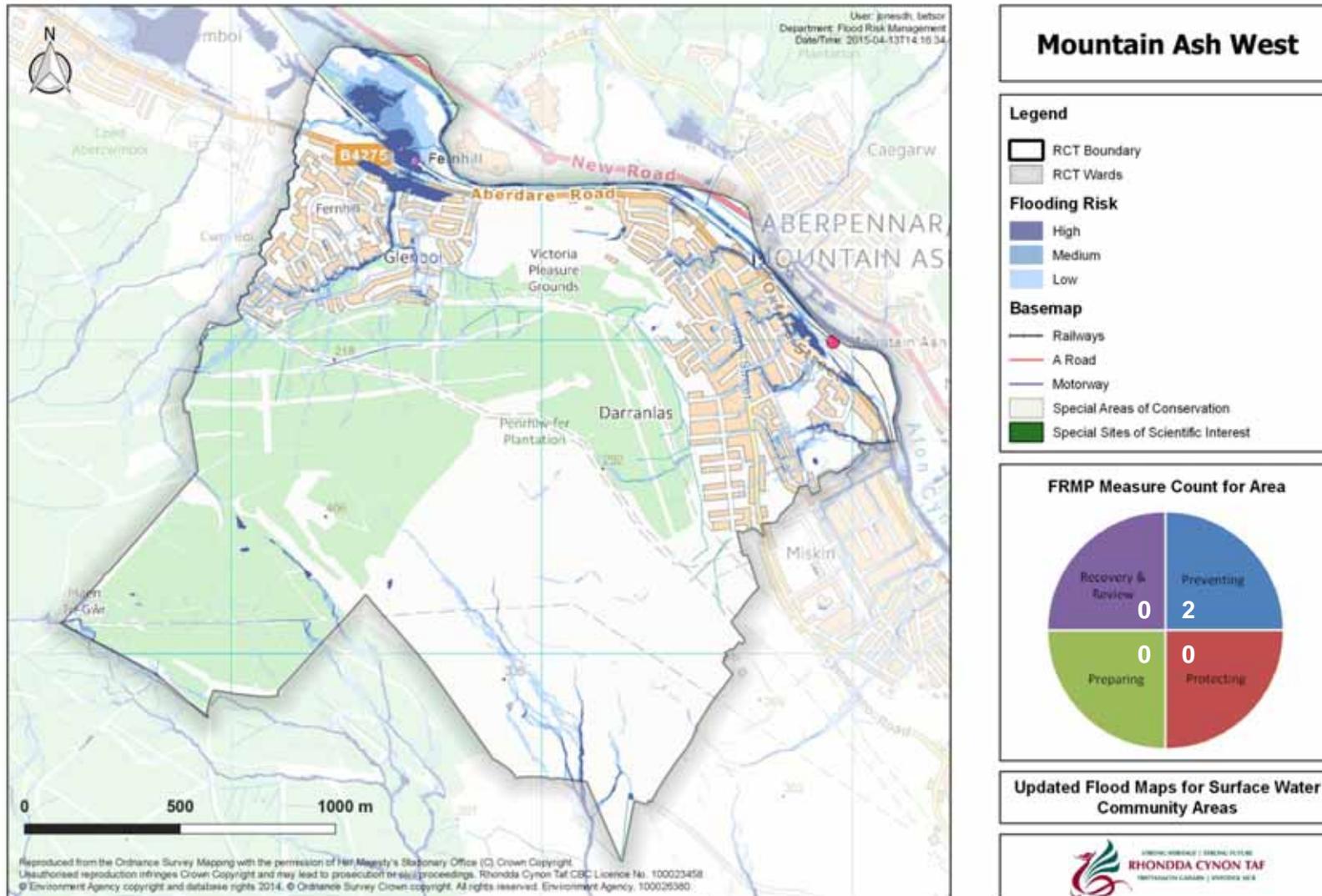
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Mountain Ash West and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 70:** Summary of Flood Risk Management Plan Measures for Mountain Ash West

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Priority	Type of Measure
RCT0057	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0059	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 44:** Mountain Ash West uFMfSW. Risk to people, economic activity and environmental receptors



## **9.27 Penrhiwceiber**

### **9.27.1 Overview**

Penrhiwceiber is located in the east of Rhondda Cynon Taf County Borough Council, to the south of Mountain Ash. The site covers an area of 213Ha and has a maximum elevation of 302m AOD. Penrhiwceiber has approximately 2,704 residential properties and a population of approximately 6,354.

The majority of Penrhiwceiber is residential development with rural areas reserved for the highlands in the west. Residential development is confined within the valley on the banks of the Afon Cynon.

Penrhiwceiber is situated within the Afon Cynon Catchment with the Afon Cynon acting as a boundary between the community areas of Penrhiwceiber and Mountain Ash East. The highlands in the south-east are drained by a number of minor unnamed watercourses which are partially culverted beneath Miskin and Penrhiwceiber. All watercourses discharge into the Afon Cynon.

The underlying geology is the Rhondda, Brithdir and Hughes Beds of the Upper Carboniferous Coal Measures comprising Coal, Sandstone, Siltstone and Mudstone. Glacial Till is present along major watercourses. Glaciofluvial and Alluvial Deposits are present along the Afon Cynon.

### 9.27.2 Conclusions for the UFMfSW

Penrhiwceiber covers approximately 213Ha with a total population of 6,354. Just over 1% of the population of Penrhiwceiber are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Penrhiwceiber is broadly associated with the Afon Cynon with flood risk noted along sections of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches. The flow path generally follows the roads with significant risk along sections of Bailey Street, Victoria Street, Miskin Road and Penrhiwceiber Road. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Internal properties have previously been flooded along Penrhiwceiber Road, commonly associated with blocked inlets.

A low to high risk is observed in the south of Penrhiwceiber. The flood risk here is largely associated with culvert inlets and it is likely that there are contributions from potential bank breaches of minor watercourses.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Penrhiwceiber are presented in the table below.

**Table 71:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Penrhiwceiber

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	6,354	38	92	780
Services	6	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	254	4	5	31
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	2	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	4	0	0	1
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	5			
External	15			
Highway	46			

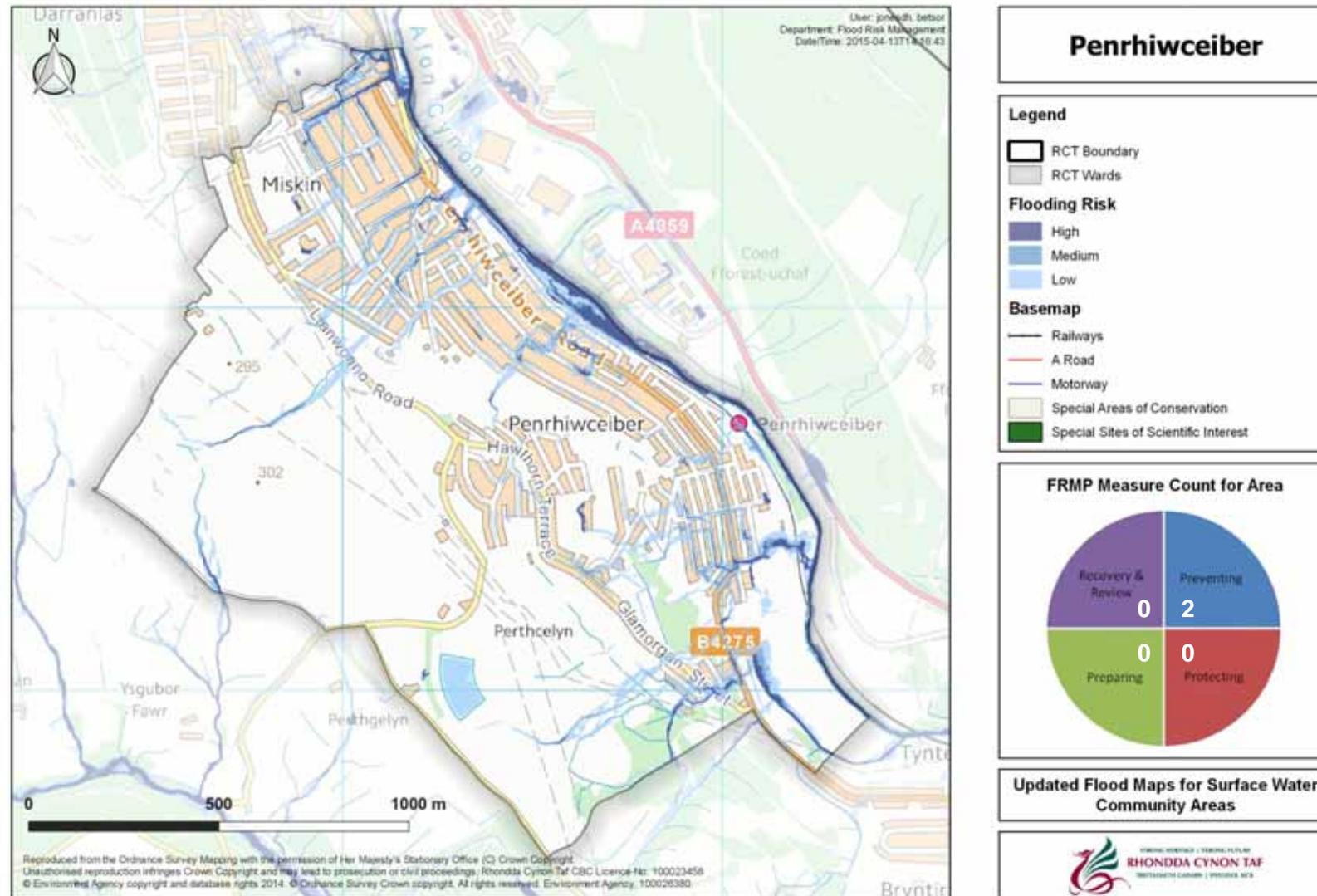
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Penrhiwceiber and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 72:** Summary of Flood Risk Management Plan Measures for Penrhiwceiber

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0058	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0059	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 45:** Penrhiwceiber uFMfSW. Risk to people, economic activity and environmental receptors



## **9.28 Pentre**

### **9.28.1 Overview**

The community area of Pentre is situated in the western sector of Rhondda Cynon Taf County Borough Council with the towns of Ton Pentre and Pentre, to the south of Treorchy. The site covers an area of 578Ha with a maximum elevation of 386m AOD. Pentre has a population of approximately 5,877 and approximately 2,501 residential properties.

The majority of Pentre is a rural environment with residential developments confined to the base of the Afon Rhondda valley. The surrounding highlands have a steep topography and are primarily forested. A small industrial estate is located adjacent to the Afon Rhondda

Pentre is primarily located within the Afon Rhondda Catchment. A small section of the Ogmore to Tawe Catchment of the Western Wales River Basin District is also included in the western edge of Pentre. The Afon Rhondda flows from north to south through the centre of Pentre.

The highlands to the west of the residential areas are drained by Nant lân which discharges into the Afon Rhondda. The catchment of Nant lân covers much of the east of Pentre. The highlands to the east are drained by Nant y Pentre which also discharges into the Afon Rhondda.

A number of minor unnamed watercourses also discharge into the Afon Rhondda, which are partially culverted beneath Ton Pentre and Pentre.

The underlying geology of Pentre is the Llynfi Beds of the Upper Carboniferous Coal Measures and the Middle Carboniferous Coal Measures comprising Coal, Siltstone, Sandstone and Mudstone. Glacial Till is present along major watercourses. Glaciofluvial and Alluvial Deposits are present along the Afon Rhondda. Peat is also present on the highlands within forested areas.

### 9.28.2 Conclusions for the UFMfSW

Pentre covers approximately 578Ha with a total population of 5,877. Just over 1% of the population of Pentre are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Pentre is broadly associated with the Afon Rhondda with flood risk noted along the length of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

The flow path generally follows the roads with significant risk across much of central Pentre. Streets on the north bank of the Afon Rhondda, which are at significant risk, include Lewis Street, Pleasant Street, Treharne Street and Volunteer Street. On the southern bank of the Afon Rhondda, there is significant risk along sections of Bailey Street, Maindy Road, Queen Street, Augusta Street, Crawshay Street, Church Street and Chapel Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Internal flooding incidents have previously been reported across central Pentre, commonly associated with blocked inlets.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Pentre are presented in the table below.

**Table 73:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Pentre

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	5,877	87	355	1389
Services	9	1	1	3
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	368	43	18	80
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	1	0.08	0.06	0.4
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	1	0	0	0.03
Listed Buildings	5	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	16			
External	28			
Highway	48			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Pentre and their proposed Flood Risk Management Plan measures are presented in the table below.

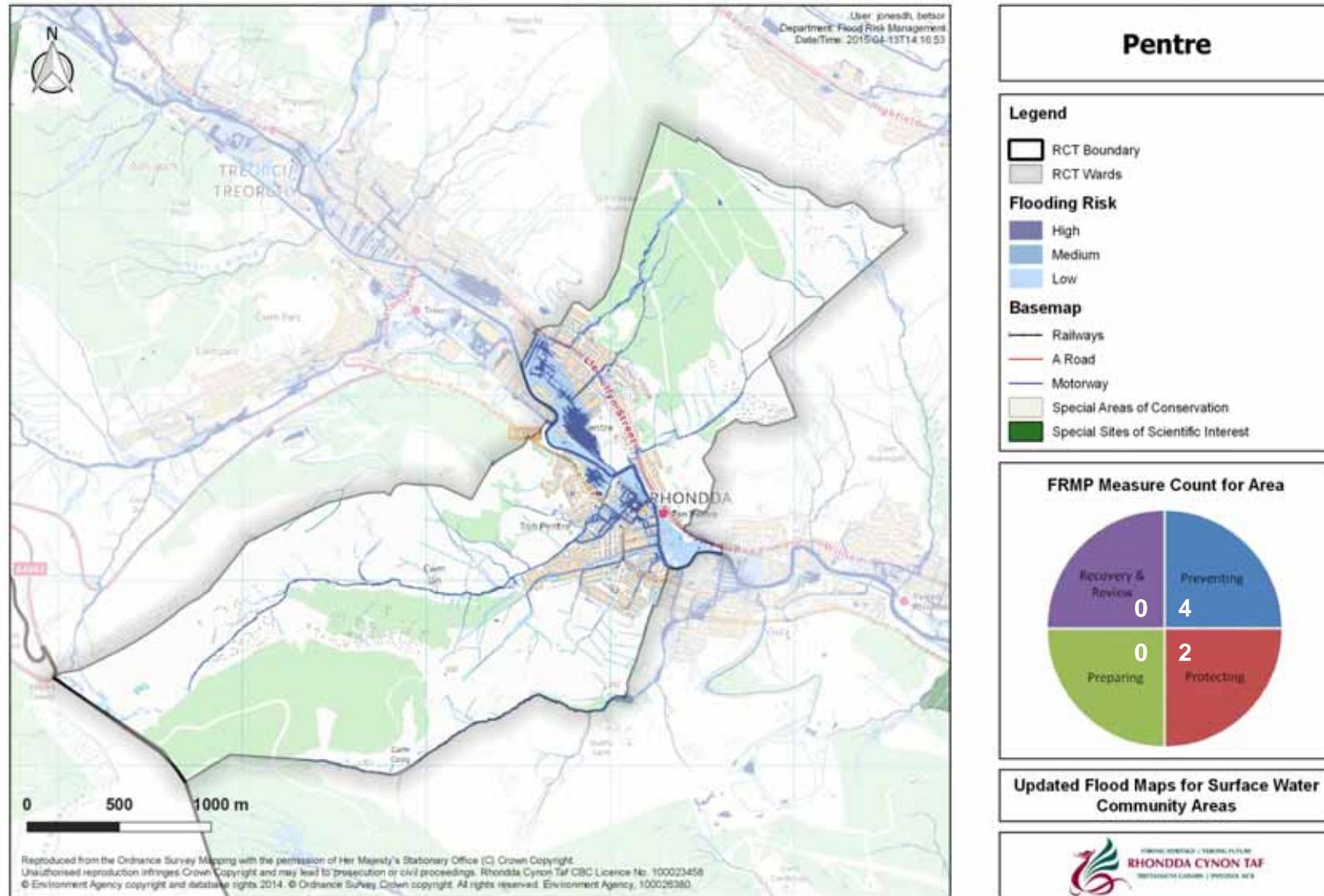
Further information regarding the flood investigation area is presented in Appendix A.

**Table 74:** Summary of Flood Risk Management Plan Measures for Pentre

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0060	Local / Main River*	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0061	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0121	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 46:** Pentre uFMfSW. Risk to people, economic activity and environmental receptors



## 9.29 Penygraig

### 9.29.1 Overview

Penygraig is located within the western sector of Rhondda Cynon Taf County Borough Council to the west of Tonypany. The site covers an area of 484Ha and has a maximum elevation of approximately 400m AOD. Penygraig has a population of approximately 5,920 and approximately 2,519 residential properties.

Penygraig is predominantly a rural environment owing the steep topography of the highlands in the east and west, including Mynydd Pen-y-Graig and Mynydd Dinas. Residential development is confined to the base of the valley, adjacent to the Afon Rhondda.

Penygraig is situated within three catchments; primarily the Afon Rhondda Catchment, but also includes small sections of the Afon Elai Catchment and the Ogmere to Tawe Catchment of the West Wales River Basin District. The site is drained to the north by Nant Gwyn, which discharges into the Afon Rhondda. The south of Penygraig is drained by Nant Ffrwdamws which is partially culverted beneath Williamstown and Penygraig and discharges into Nant Gwyn.

The underlying geology of Penygraig is the Rhondda and Llynfi Beds of the Upper Carboniferous Coal Measures comprising Coal, Sandstone, Siltstone and Mudstone. Glacial Till is present along primary watercourses and intermittent patches are present on Mynydd Pen-y-Graig. Peat is also present on the highlands.

### 9.29.2 Conclusions for the UFMfSW

Penygraig covers approximately 484Ha with a total population of 5920. Just over 2% of the population of Penygraig are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Penygraig is broadly associated with Surface Runoff with flooding primarily sourced from culvert inlets. The flow path generally follows the roads with significant risk across much of central Penygraig. There is significant risk along sections of Dinas Road, Penygraig Road, the A4119, Middle Street, Balaclava Court and Cross Street.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Penygraig are presented in the table below.

**Table 75:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Penygraig

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	5,920	143	143	590
Services	5	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	438	20	18	46
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	1	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	16			
Highway	27			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Penygraig and their proposed Flood Risk Management Plan measures are presented in the table below.

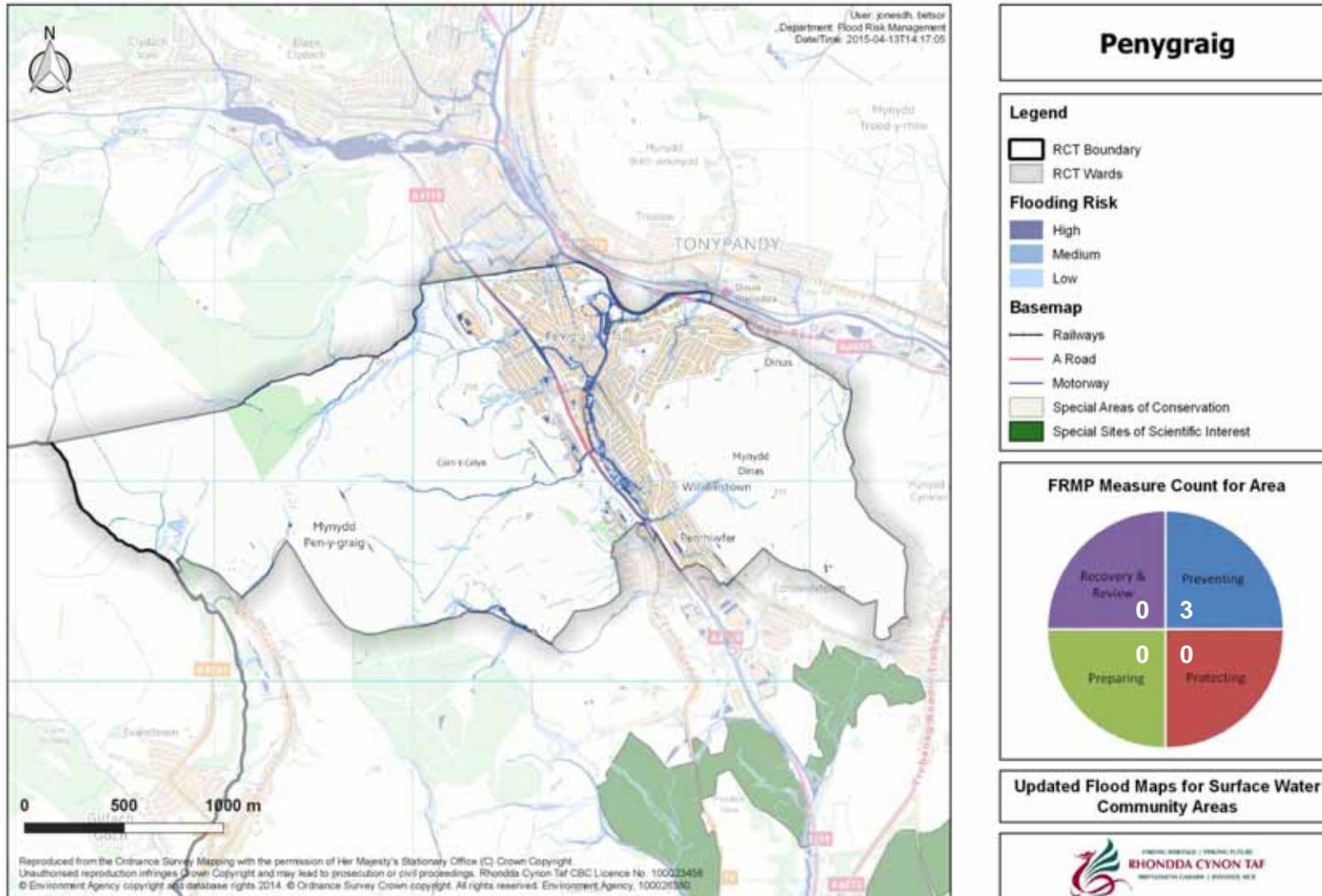
Further information regarding the flood investigation area is presented in Appendix A.

**Table 76:** Summary of Flood Risk Management Plan Measures for Penygraig

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0062	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0063	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0091	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 47:** Penygraig uFMfSW. Risk to people, economic activity and environmental receptors



## **9.30 Penywaun**

### **9.30.1 Overview**

The community area of Penywaun is situated within the northern sector of Rhondda Cynon Taf County Borough Council, to the north of Aberdare. Penywaun covers an area of 373Ha and has a maximum elevation of approximately 405m AOD. The site has a population of approximately 3,097 and approximately 1,318 residential properties.

Penywaun is predominantly a rural environment, owing to the steep topography of the highlands in the south, including Mynydd Cefn-y-Gyngon. Residential development is confined to the base of the valley, adjacent to the Afon Cynon.

Penywaun is situated within the northern sector of the Afon Cynon Catchment. The Afon Cynon flows west to east across the north of the site. Penywaun is drained to the north by Nant Hir which flows from north to south and discharges into the Afon Cynon. The southern highlands are drained by Nant y Wernddu which also discharges into the Afon Cynon.

The underlying geology is the Llynfi Bed of the Upper Carboniferous Coal Measures, and the Middle and Lower Carboniferous Coal Measures, all comprising of Sandstone, Mudstone, Coal and Siltstone. Glacial Till is present across much of the site. Alluvial Deposits are present along the Afon Cynon.

### 9.30.2 Conclusions for the UFMfSW

Penywaun covers an area of approximately 373Ha with a total population of 3,097. Approximately 4% of the population of Penywaun are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Penywaun is broadly associated with the Afon Cynon with flood risk noted along the length of the watercourse. The flooding is sourced from blocked inlets and potential bank breaches. The flow path generally follows the roads with significant risk along sections of Dan-Yr-Heol, Arfryn, Heol Caradoc and Hirwaun Road. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The map indicates that there is significant risk within the small residential estate in the east of the site, along sections of Trenant. The flood risk here is largely associated with a blocked culvert to the south of Hirwaun Road. However, contributions from Main River flooding are also likely.

There is evidence of bank breaching along the length of the Afon Cynon, within the floodplain. No properties, economic or environmental receptors are affected by this flooding.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Penywaun are presented in the table below.

**Table 77:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Penywaun

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,097	115	125	458
Services	3	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	157	2	3	19
Airports	0	0	0	0
Roads (km)	0.5	0.08	0.01	0.05
Railways (km)	1	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.1	0.05	0.01	0.02
Listed Buildings	0	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	1			
External	19			
Highway	21			

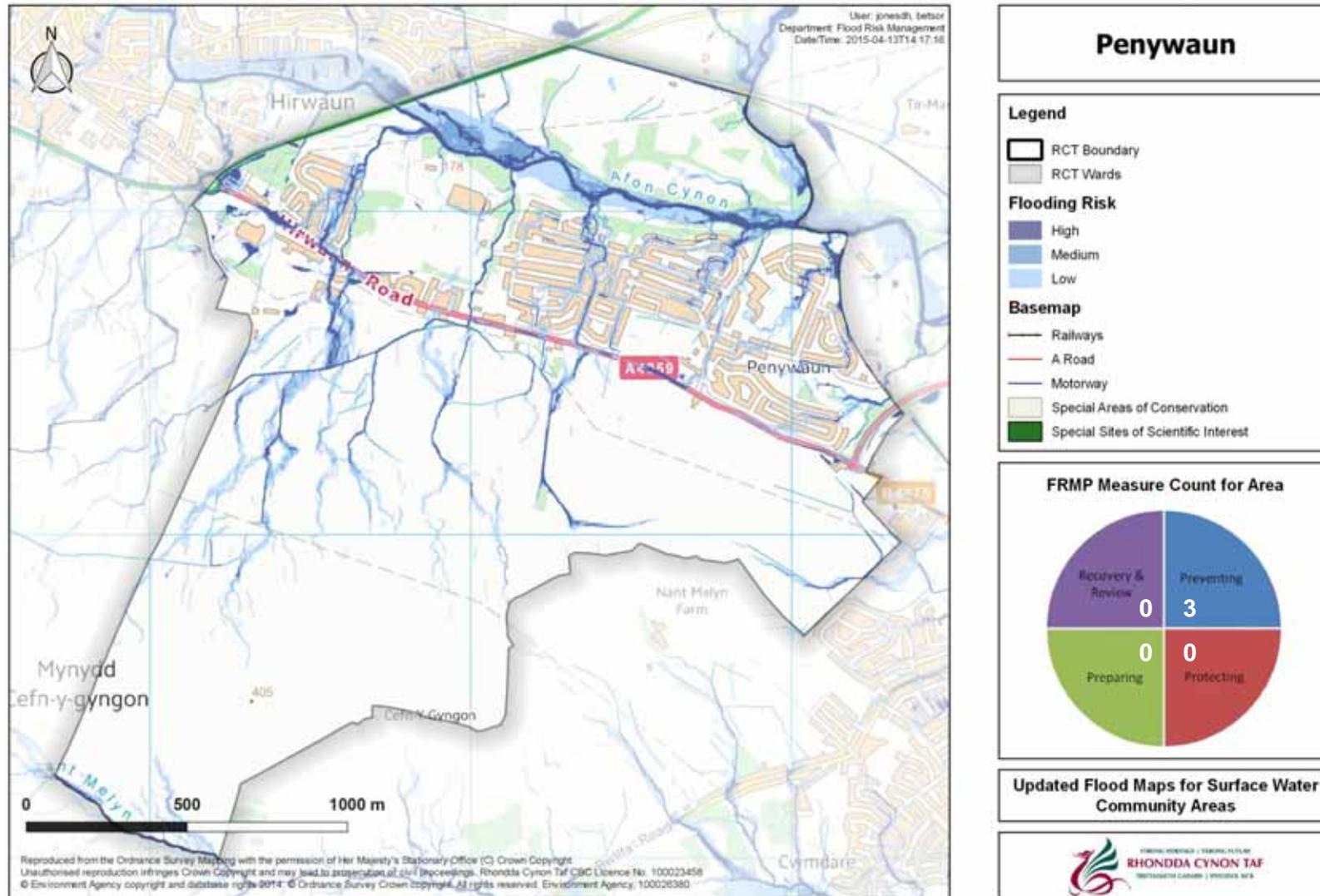
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Penywaun and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 78:** Summary of Flood Risk Management Plan Measures for Penywaun

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0064	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0065	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0066	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 48:** Penywaun uFMfSW. Risk to people, economic activity and environmental receptors



## **9.31 Pontyclun**

### **9.31.1 Overview**

Pontyclun is located in the southern sector of Rhondda Cynon Taf County Borough Council, to the south of Llantrisant. The site covers an area of 1,190Ha and has a maximum elevation of 86m AOD. Pontyclun has approximately 3,250 residential properties and a population of approximately 7,638.

The majority of Pontyclun is a rural environment owing to the extent of agricultural land, grades 2 and 3, present across much of the site. Residential development is primarily located within the central northern sector of Pontyclun, with intermittent residential and industrial developments present across the site. There are two SSSIs within Pontyclun.

Pontyclun lies within the Afon Elai Catchment. The Afon Elai flows from north to south, through the centre of the site. Pontyclun is bound to the north by the Afon Clun. The confluence between the Afon Clun and Afon Elai is located in the northern sector, adjacent to the town of Pontyclun. A number of minor unnamed watercourses drain the site to the south-east and discharge into the Afon Clun.

The underlying geology of Pontyclun is the Lower Carboniferous Coal Measures, the Mercia Mudstone Group, the Marros Group, the Hunts Bay Oolite Subgroup, the Cefnyrhendy Oolite Member the High Tor Limestone Formation, the Oxwich Head Limestone Formation, the Stormy Limestone Formation, the Cornelly Oolite Formation, the Caswell Bay Mudstone Formation, the Gully Oolite Formation, the Friars Point Limestone Formation, the Brofiscin Oolite Formation and the Barry Harbour Limestone Formation. Also present is the Castell Coch Limestone Formation, the Quartz Conglomerate Group, Cwrt-yr-Ala Formation, the Brownstones Formation and the Llanishen Conglomerate.

Glacial Till is present across much of the site. Alluvial Deposits are present along the Afon Clun and Afon Elai.

### 9.31.2 Conclusions for the UFMfSW

Pontyclun covers an area of approximately 1,190Ha with a total population of 7,638. Just under 1% of the population of Pontyclun are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Pontyclun is broadly associated with the Afon Elai with flood risk noted along the length of the watercourse. The flooding is sourced from potential bank breaches with flood risk confined largely within the floodplain. Where flood risk is evident within residential areas, the flow path generally follows the roads with low to high risk along sections of School Road, Heol Miskin, Tegfan and Ynysddu.

There is evidence of bank breaching along the length of the Afon Elai, and along sections of the Afon Clun and a minor tributary within the floodplains of each respective watercourse. No properties are affected by this flooding. Within the floodplain of the lower Afon Elai, there is a small SSSI which is impacted by flood risk. Agricultural Land Classification grades two and three cover the majority of Pontyclun and therefore is at significant flood risk across the floodplains.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Pontyclun are presented in the table below.

**Table 79:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Pontyclun

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	7,638	14	40	461
Services	12	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	990	3	7	45
Airports	0	0	0	0
Roads (km)	8	0.03	0.02	0.5
Railways (km)	3	0.1	0.2	0.07
Agricultural Land (hectares)	941	22	17	45
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	1	1	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	9	0	2	2
Parks and Gardens	88	1	0.3	1
Scheduled Ancient Monuments	2	0	0	0
Listed Buildings	26	0	0	1
Licensed Abstractions	3	0	0	2
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	0			
External	13			
Highway	11			

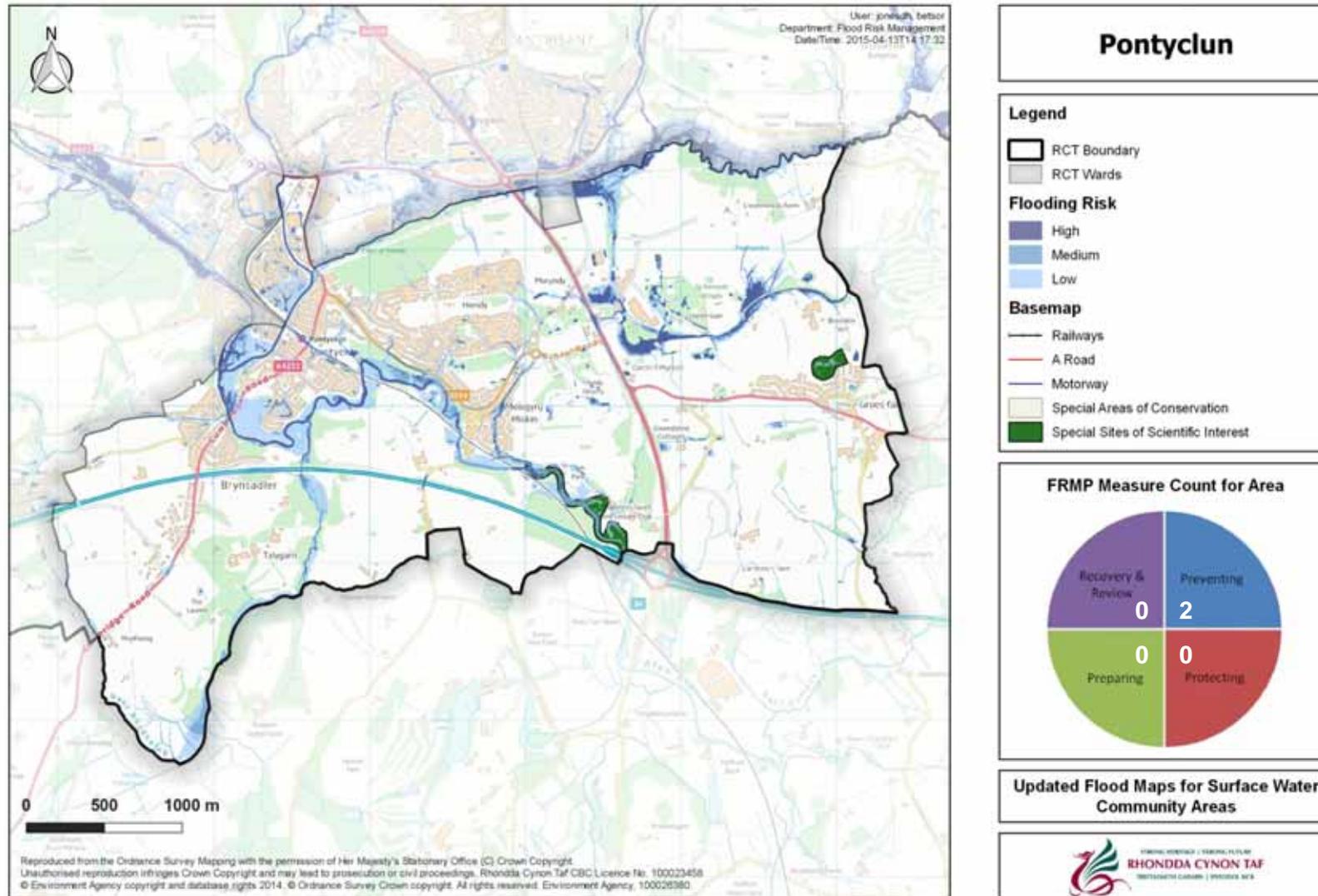
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Pontyclun and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 80:** Summary of Flood Risk Management Plan Measures for Pontyclun

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Priority	Type of Measure
RCT0067	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0068	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

**Figure 49:** Pontyclun uFMfSW. Risk to people, economic activity and environmental receptors



## **9.32 Pontypridd Town**

### **9.32.1 Overview**

Pontypridd Town is situated in the central sector of Rhondda Cynon Taf County Borough Council to the south of Abercynon. The site covers an area of 234Ha and has a maximum elevation of 244m AOD. Pontypridd Town has a population of approximately 3,046 and approximately 1,296 residential properties.

Pontypridd Town is predominantly a rural environment owing to the steep topography of the highlands in the northern sector. Residential development is confined to the base of the valley, adjacent to the confluence of the Afon Rhondda and Afon Taf. There are a number of forests present on the highlands in the north, including Di-Goed, Lan Wood and Coed Graig-yr-Hesg.

Pontypridd Town is split between the catchments of the Afon Taf, the Afon Cynon and the Afon Rhondda. The site is bound by the Afon Taf in the east. The confluence of the Afon Taf and Afon Rhondda is located at the southern point of the site. The north is drained by Nant Tai-rheol which discharges into Nant Clydach in the neighbouring community area of Glynoch.

A number of minor unnamed watercourses drain the highlands in the north and discharge into the Afon Taf, which are partially culverted beneath Pontypridd.

Pontypridd Town's underlying geology is the Hughes, Brithdir and Rhondda beds of the Upper Carboniferous Coal Measures comprising Sandstone, Siltstone, Coal and Mudstone. Glacial Till is present along major watercourses. Alluvial, Glaciofluvial and River Terrace Deposits are present along the Afon Rhondda and the Afon Taf. Peat is present on the highlands in the north.

### 9.32.2 Conclusions for the UFMfSW

Pontypridd Town covers approximately 234Ha with a total population of 3,046. Just over 1% of the population of Pontypridd Town are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Pontypridd Town is largely associated with the Afon Taf and Afon Rhondda with flood risk noted at the confluence. The flooding is sourced potential bank breaches. The flow path generally follows the roads with significant risk along sections of Mill Street and Taff Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The map also indicated a low to high flood risk throughout the town with no discernible source. It is therefore appropriate to associate this risk with surface runoff from the steep slopes to the north of Penygraigwen.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Pontypridd Town are presented in the table below.

**Table 81:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Pontypridd Town

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,046	45	28	174
Services	8	1	2	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	521	55	25	63
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	2	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.01	0.01	0	0
Listed Buildings	28	2	0	1
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	3			
External	17			
Highway	22			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Pontypridd Town and their proposed Flood Risk Management Plan measures are presented in the table below.

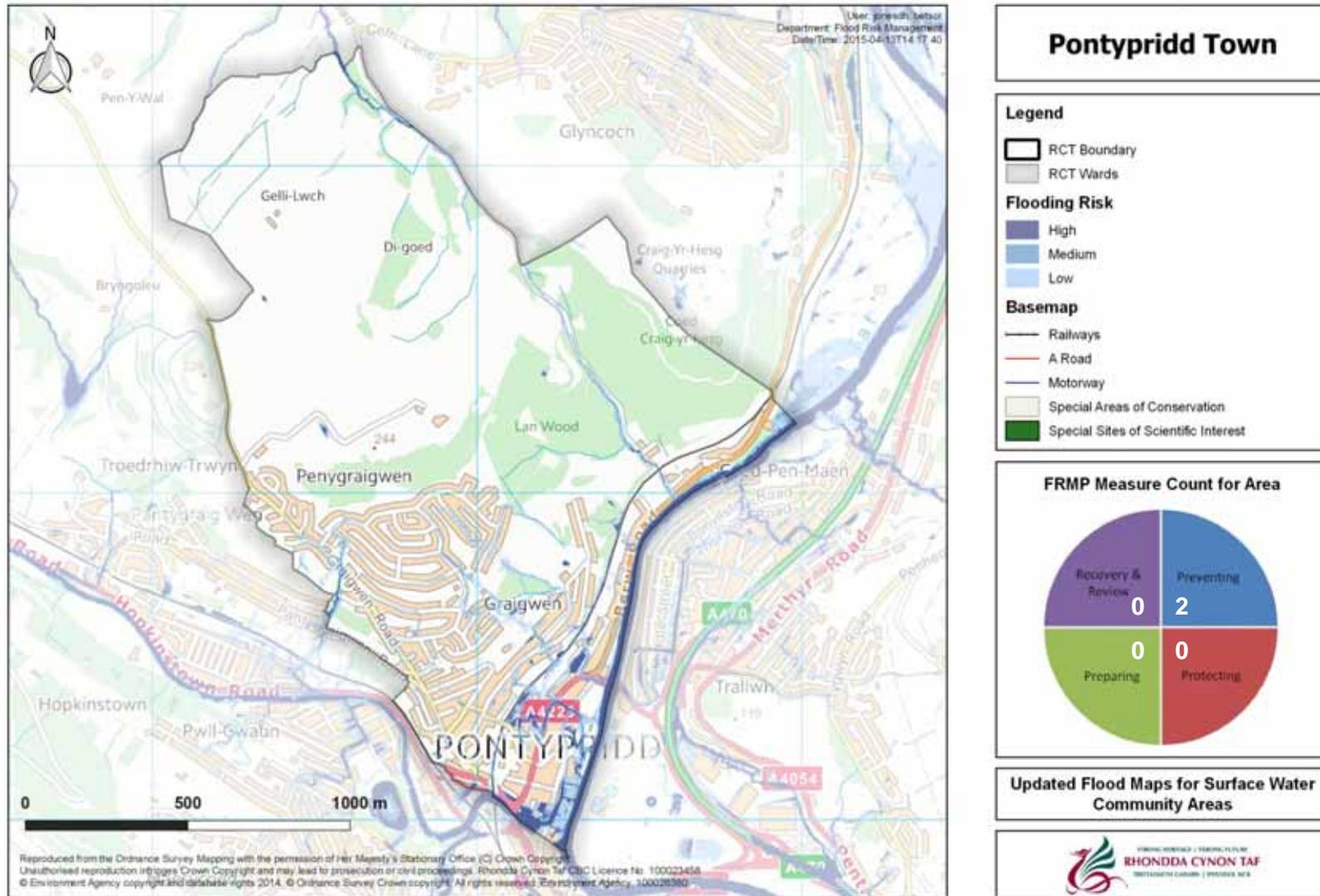
Further information regarding the flood investigation area is presented in Appendix A.

**Table 82:** Summary of Flood Risk Management Plan Measures for Pontypridd Town

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0069	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Rescores Wales
RCT0073	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 50:** Pontypridd Town uFMfSW. Risk to people, economic activity and environmental receptors



## **9.33 Porth**

### **9.33.1 Overview**

Porth is located in the central sector of Rhondda Cynon Taf County Borough Council to the east of Tonypany. The site covers an area of approximately 370Ha and has a maximum elevation of 336m AOD. Porth has a population of approximately 6,481 and has approximately 2,758 residential properties.

The majority of Porth is a rural environment. The highlands in the east and west of the site confine residential development to the base of the Afon Rhondda valley. A small industrial estate is present in the east of Porth, adjacent to the Afon Rhondda, and in the east, adjacent to Nant Graig Ddu.

Porth is located within the Afon Rhondda Catchment with the Afon Rhondda flowing north to south through the centre of the site. The site is drained in the west by Nant Graig Ddu which flows from west to east and discharges into the Afon Rhondda. The confluence of these primary watercourses is located at the centre Porths residential development.

A number of minor unnamed watercourses drain the highlands in the east and west and discharge into the Afon Rhondda and Nant Graig Ddu, which are partially culverted beneath residential areas.

The underlying geology of Porth is the Rhondda bed of the Upper Carboniferous Coal Measure comprising Sandstone, Siltstone, Mudstone and Coal. Glacial Till is present across the valleys of major watercourses. Glaciofluvial and Alluvial Deposits are present along the Afon Rhondda and Nant Graig Ddu.

### 9.33.2 Conclusions for the UFMfSW

Porth covers an area of approximately 370Ha with a total population of 6,481. Just over 1% of the population of Porth are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Porth is broadly associated with the Afon Rhondda and Afon Rhondda Fach with flood risk noted at the confluence. The flooding is sourced from potential bank breaches. The flow path generally follows the roads with a low to high risk along sections of Porth Street, Syphon, Mary Street, Cemetery Road, Aberrhondda road and North Road. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The map also indicates that there is a low to high flood risk in the east of the site. This flood risk is largely associated with the culvert inlets in the area. The flow path here, as before, follows the roads with significant risk along sections of Llwnycelyn Road, Lewis Terrace and Nythbran Terrace.

There is a low to high risk of flooding noted within the residential area surrounding the A4058. It is likely this flood risk is also associated with culvert inlets.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Porth are presented in the table below.

**Table 83:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Porth

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	6,481	85	56	510
Services	14	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	478	8	8	69
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	3	0.7	0.3	0.5
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.0004	0	0	0
Listed Buildings	16	2	1	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	14			
External	37			
Highway	55			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Porth and their proposed Flood Risk Management Plan measures are presented in the table below.

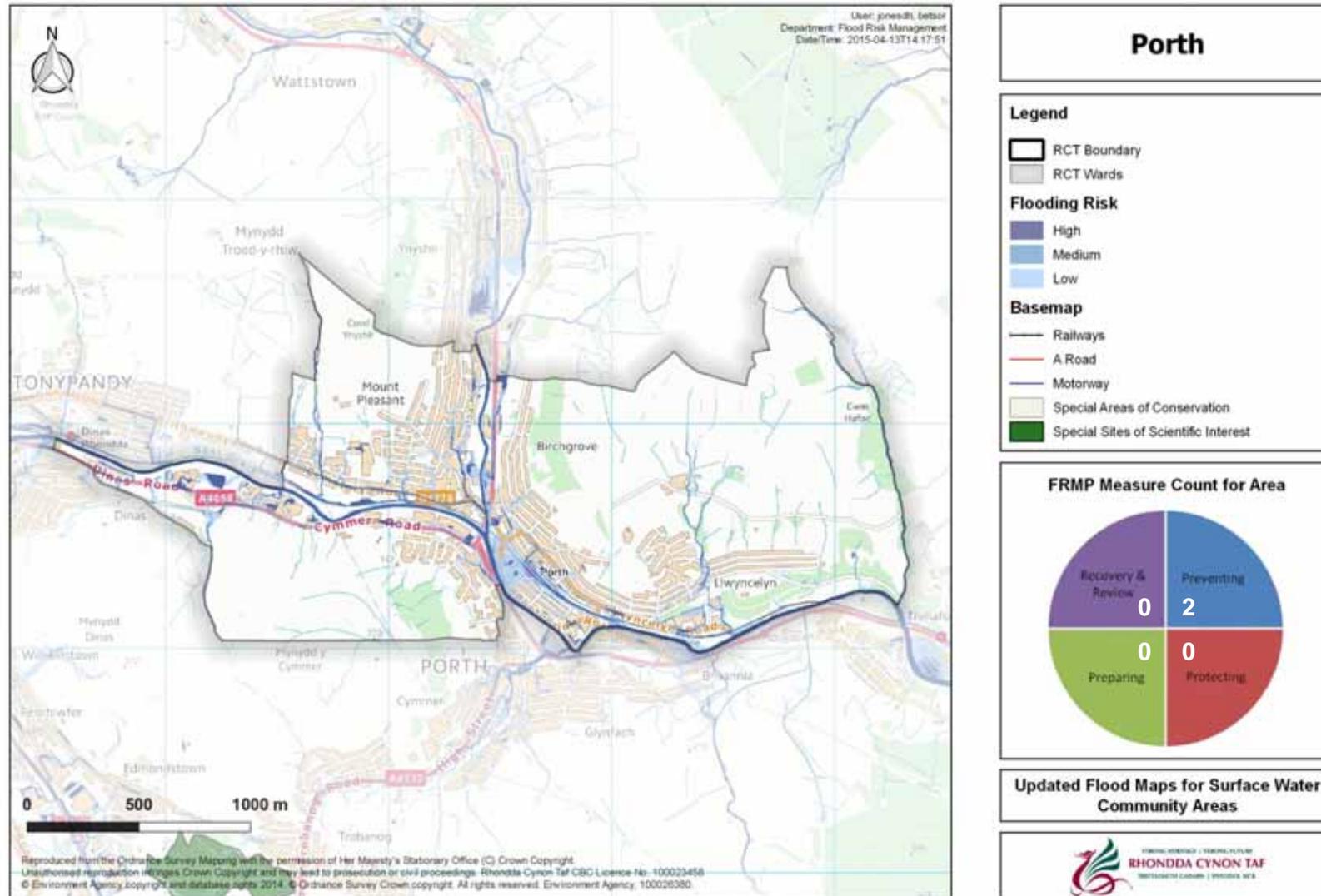
Further information regarding the flood investigation area is presented in Appendix A.

**Table 84:** Summary of Flood Risk Management Plan Measures for Porth

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Priority	Type of Measure
RCT0070	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0071	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 51:** Porth uFMfSW. Risk to people, economic activity and environmental receptors



## **9.34 Rhigos**

### **9.34.1 Overview**

Rhigos is located in the north of Rhondda Cynon Taf County Borough Council, to the north of Hirwaun. The site is the largest of RCT, covering 7,416Ha and has a maximum elevation of 586m AOD. The site also has the lowest population at approximately 1,774 and approximately 755 residential properties.

The majority of Rhigos is a rural environment owing to the steep topography across the site. There are nine SSSIs within Rhigos. Residential development is located primarily within the centre of the site, adjacent to primary watercourses. There is a large industrial estate located in the south of Rhigos and a large quarry in the central sector.

Rhigos is split between the Afon Cynon, Afon Taf and Ogmere to Tawe catchments; the latter belonging to the West Wales River Basin District. The site is covered in minor unnamed watercourses draining the extensive highlands. There are three primary watercourses. Sychryd drains the north, flowing south to north and discharging into Afon Mellte which acts as a boundary between RCT and Powys. The east is drained by Nant Cadlan which drains into the Afon Cynon downstream.

The underlying geology of Rhigos is the Rhondda Bed of the Upper Carboniferous Coal Measure, and the Middle and Lower Carboniferous Coal Measures, comprising Sandstone, Siltstone, Coal and Mudstone. Also present is the Bishopston Mudstone Formation, the Oyestermouth Formation, the Oxwich Head Limestone Formation, the Penderyn Oolite Member, the Dowlais Limestone Formation, the Abercribon Oolite Subgroup, the Grey Grits Formation, the Twrch Sandstone Formation, the Brownstone Formation and the Plateau Beds.

Glacial Till is present across much of the site. Alluvial Deposits are present along the Afon Cynon. Intermittent patches of Peat are present across the highlands.

### 9.34.2 Conclusions for the UFMfSW

Rhigos covers an area of approximately 7,416Ha with a total population of 1,774. Just under 1% of the population of Rhigos are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Rhigos is broadly associated with the Sychryd, the Afon Mellte and the Nant Cadlan with flood risk noted along sections of these watercourses. The flooding is sourced from culvert inlets and potential bank breaches of Main Rivers and the extensive network of minor tributaries. Due to the low number of residential developments within Rhigos, the flow path for many of the flood risks are not confined with roads, rather, they tend to follow the topography of the area.

Where flood risk is present within residential areas, the flow path generally does follow the roads with significant risk along sections of Rhigos Road, Fifth Avenue, Main Avenue and the A465. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

There is a very limited risk to residential properties within Rhigos with the site presenting the lowest count for residential properties at medium and high risk. There is, however, a low to high flood risk within many of the SSSIs across Rhigos.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Rhigos are presented in the table below.

**Table 85:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Rhigos

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	1,774	5	7	82
Services	12	1	1	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	969	44	19	65
Airports	0	0	0	0
Roads (km)	14	3	0.4	5
Railways (km)	1	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	243	6	5	19
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	977	0	13	21
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	92	1	1	5
Listed Buildings	13	0	0	0
Licensed Abstractions	8	3	0	1
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	3			
External	10			
Highway	28			

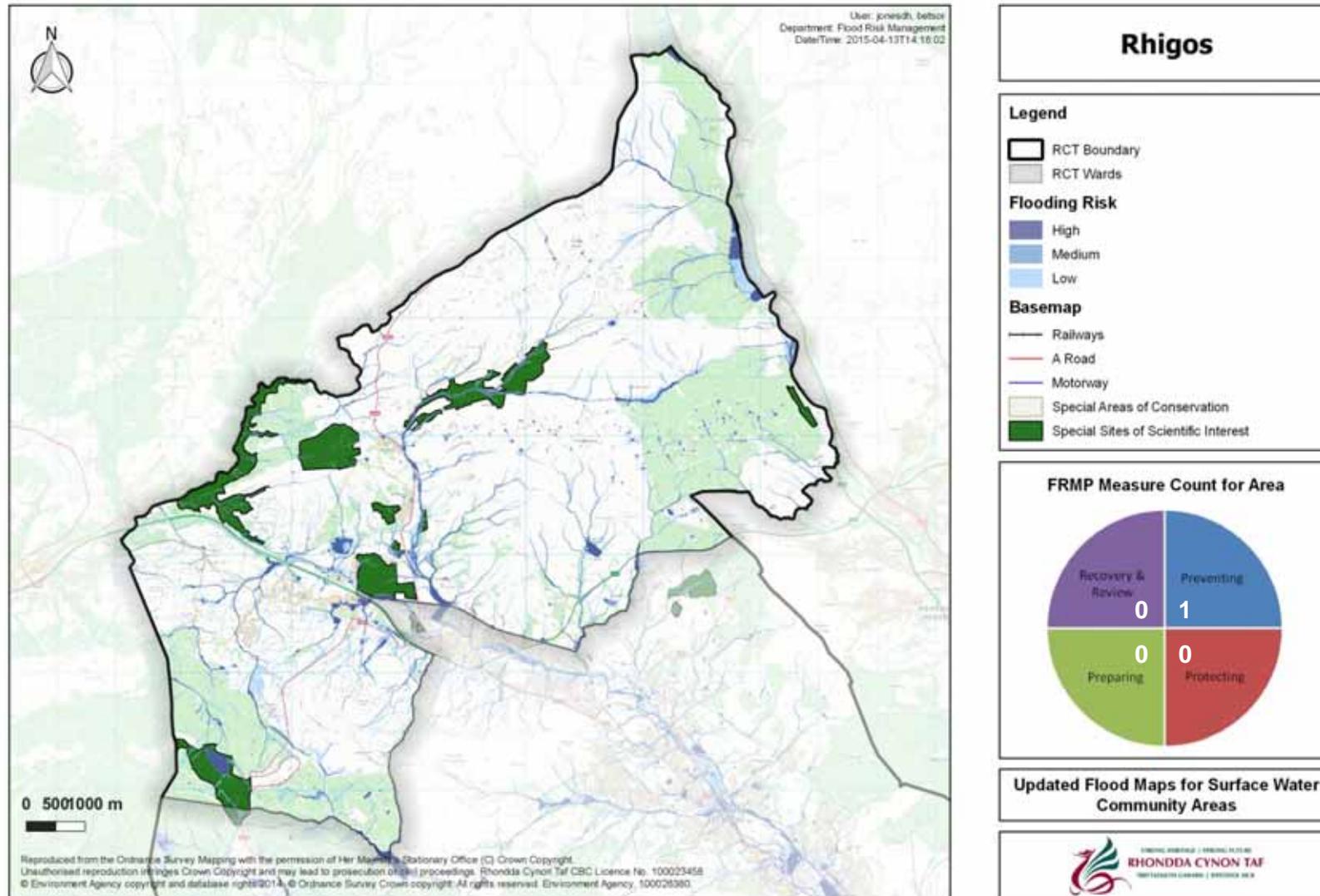
Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Rhigos and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 86:** Summary of Flood Risk Management Plan Measures for Rhigos

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0072	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 52:** Rhigos uFMfSW. Risk to people, economic activity and environmental receptors



## **9.35 Rhondda**

### **9.35.1 Overview**

The community area of Rhondda is located within the central sector of Rhondda Cynon Taf County Borough Council to the west of Pontypridd. The site covers an area of 689Ha and has a maximum elevation of 328m AOD. Rhondda has approximately 2,106 residential properties and a population of approximately 4,949.

Rhondda is predominantly a rural environment owing to the steep topography of the highlands in the north and south. Residential development is located primarily in the east, confined within the Afon Rhondda valley. There is a small industrial estate located in the centre of Rhondda, adjacent to the Afon Rhondda.

Rhondda is predominantly located within the Afon Rhondda Catchment; however, a small section of the Afon Cynon Catchment is included in the north. The Afon Rhondda flows from west to east across the centre of Rhondda. The site is bound by Nant Gwelliwion in the east. The highlands in the north are drained by Nant Blaenhenwysg which discharges into the Afon Rhondda.

A number of minor unnamed watercourses also drain the highlands in both the south and the north and are partially culverted beneath Trehafod, Hopkinstown and Maesycoed. All watercourses discharge into the Afon Rhondda.

The underlying geology is the Rhondda and Hughes Beds of the Upper Carboniferous Coal Measures comprising Coal, Sandstone, Siltstone and Mudstone. Glacial till is present along the valleys of major watercourses. Glaciofluvial and Alluvial Deposits are present along the Afon Rhondda. Intermittent patches of Peat are present across the highlands in the south, within forested areas.

### 9.35.2 Conclusions for the UFMfSW

Rhondda covers an area of approximately 689Ha with a total population of 4,949. About 4% of the population of Rhondda are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Rhondda is broadly associated with the Afon Rhondda with flood risk observed along the length of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches. Commonly, the flow path is along roads with significant risk associated along sections of the A4058 Sardis Road, Jenkins Street, Maesycoed Road, Upper Vaughan Street and Lee Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. A large number of highway flooding incidents have been noted within Rhondda, commonly associated with culvert inlets.

A low to high risk is noted within the town of Trehafod, in particular surface runoff noted along Trehafod Road, Colliery Street and Fountain Street. The flooding here is sources from blocked inlets and potential bank breaches.

The historic flooding incidents reported broadly correlate with requests for gully clearance with minimal incidents of highway flooding associated with the areas of high risk.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Rhondda are presented in the table below.

**Table 87:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Rhondda

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,949	179	155	573
Services	6	0	1	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	477	15	16	56
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	3	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.2	0	0	0
Listed Buildings	9	0	1	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	18			
Highway	48			

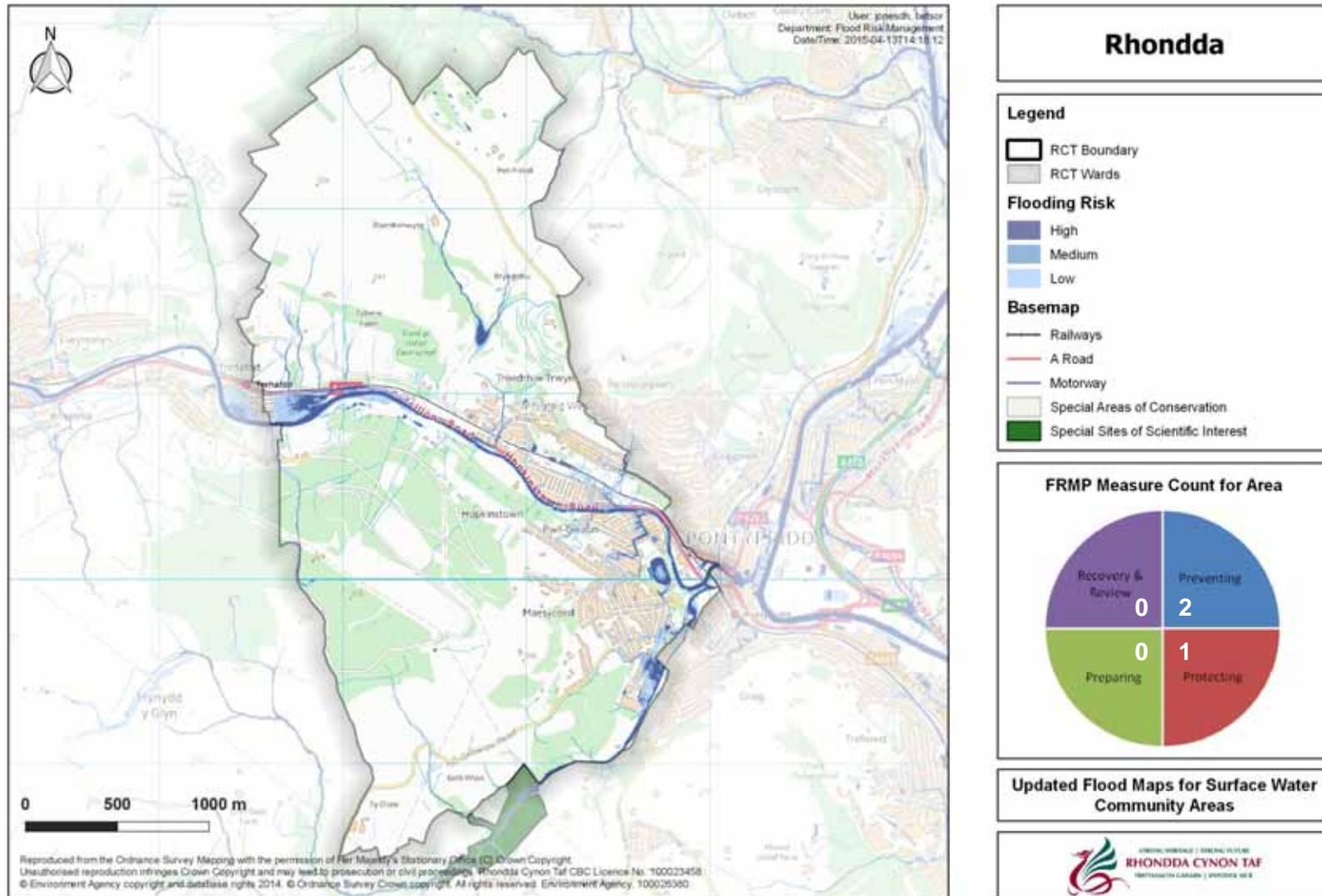
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Rhondda and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 88:** Summary of Flood Risk Management Plan Measures for Rhondda

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0073	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0074	Local / Main River*	10	Land Management	M34 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

**Figure 53:** Rhondda uFMfSW. Risk to people, economic activity and environmental receptors



## **9.36 Rhydfelin**

### **9.36.1 Overview**

Rhydfelin is situated in the east of Rhondda Cynon Taf County Borough Council, to the south-east of Pontypridd. The site covers an area of 372Ha and has a maximum elevation of approximately 378m AOD. Rhydfelin has a population of approximately 4,728 and approximately 2,012 residential properties.

The majority of Rhydfelin is a rural environment owing to the steep topography of the highlands in the north. Residential development is located in the east of Rhydfelin, confined to the base of the valley. The highlands are predominantly used for agricultural purposes with a number of farms located here.

Rhydfelin is predominantly located within the Afon Taf catchment; however, a small section of the Rhymney catchment is located in the east. All watercourses within Rhydfelin drain the highlands in the east, discharging into the Afon Taf. A number of minor unnamed watercourses are partially culverted beneath the town of Rhydfelin.

The underlying geology is the Brithdir Bed of the Upper Carboniferous Coal Measure comprising Sandstone, Siltstone, Coal and Mudstone. Glacial Till is present across much of the site. Glaciofluvial, Alluvial and River Terrace Deposits are present along the Afon Cynon.

### 9.36.2 Conclusions for the UFMfSW

Rhydfelin covers an area of approximately 372Ha with a total population of 4,728. Just over 1% of the population of Rhydfelin are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Rhydfelin is broadly associated with minor watercourses and culvert inlets with flood risk observed along sections of the unnamed watercourses. The flooding is sourced from culvert inlets and potential bank breaches. Commonly, the flow path is along roads with significant risk associated along sections of Beechwood Street, Dynea Road, Shakespeare Rise and Poets Close. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Internal properties have previously been flooded within Rhydfelin, commonly associated with blocked culverts.

The historic flooding incidents reported broadly correlate with requests for gully clearance with minimal incidents of highway flooding associated with the areas of high risk.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Rhydfelin are presented in the table below.

**Table 89:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Rhydfelin

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,728	26	56	489
Services	5	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	154	6	1	7
Airports	0	0	0	0
Roads (km)	0.3	0.1	0.05	0.1
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.4	0	0	0
Listed Buildings	0	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	1			
External	13			
Highway	9			

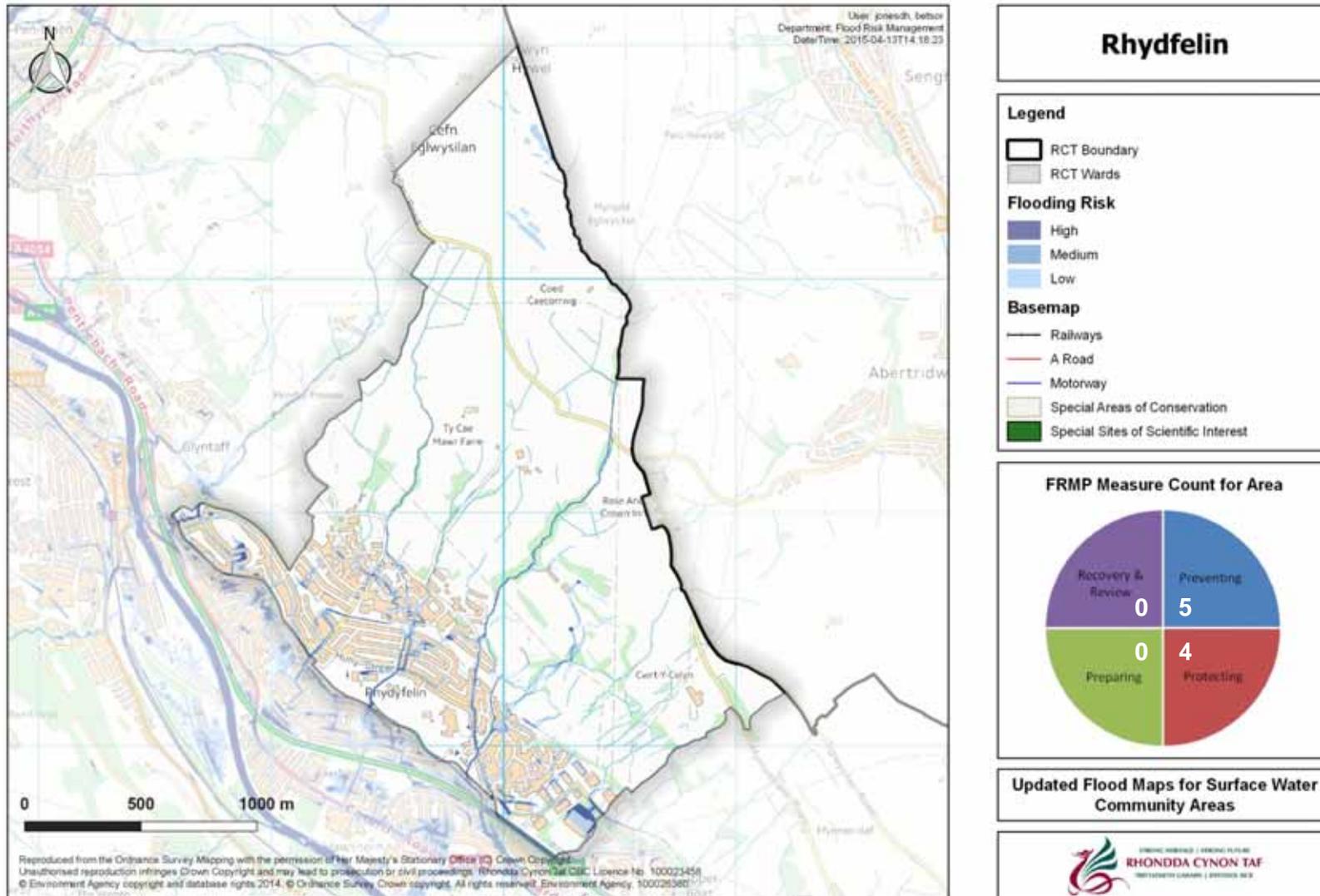
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Rhydfelin and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 90:** Summary of Flood Risk Management Plan Measures for Rhydfelin

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0075	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0076	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Completed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Completed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Completed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Completed	RCTCBC
RCT0132	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 54:** Rhydyfelin uFMfSW. Risk to people, economic activity and environmental receptors



## **9.37 Taffs Well**

### **9.37.1 Overview**

The community area of Taffs Well is located in the south-east of Rhondda Cynon Taf County Borough Council, to the south of Treforest. The site covers an area of 674Ha and has a maximum elevation of 273m AOD. Taffs Well has a population of approximately 3,760 and approximately 1,600 residential properties.

The majority of Taffs Well has remained in a natural state owing to the steep topography of the highlands in the centre of the site. Residential development is confined to the base of the Afon Taf and Nant Garw valleys. The centre of the site is dominated by the Craig yr Allt. There is a large industrial estate to the east of Nantgarw, adjacent to the Nant Garw.

Taffs Well lies predominantly within the Afon Taf Catchment. A small section of the Afon Rhydney is included in the east of the site. Taffs Well is partially bounded to the west by the Afon Taf. The south is drained by the catchment of the Nant y Brynau. The Nant y Brynau is partially culverted beneath Taffs Well and discharges into the Afon Taf. The north of Taffs Well is drained by the catchment of the Nant Garw.

There are several minor watercourses which are partially culverted beneath the industrial estate in Nantgarw which discharge into the Nant Garw.

The underlying geology of Taffs Well is the Hughes and Brithdir Beds of the Upper Carboniferous Coal Measure, and the Middle and Lower Carboniferous Coal Measure, all comprising Coal, Sandstone, Siltstone and Mudstone. Also present is the Marros Group, the Hunts Bay Oolite Subgroup and the Pembroke Limestone Group. Alluvial, Glaciofluvial and River Terrace Deposits are present along the Afon Taf. Glacial Till is present along major watercourses.

### 9.37.2 Conclusions for the UFMfSW

Taffs Well covers an area of approximately 674Ha with a total population of 3,760. Just over 1% of the population of Taffs Well are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Taffs Well is largely associated with culvert inlets with the flooding sourced from culvert inlets. Commonly, the flow path is along roads with significant risk within the town of Nantgarw associated along sections of the A468, Heol Crochendy, Oxford Street and Old Nantgarw Road. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

A low to high risk is noted within the town of Taffs Well, in particular surface runoff noted along the A470, Cemetery Road, Forest Road and Brynau Road. The flooding here is sources from culvert inlets and potential bank breaches.

The historic flooding incidents reported broadly correlate with requests for gulley clearance with a number of highway flooding incidents associated with the areas of high risk.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Taffs Well are presented in the table below.

**Table 91: Summary flood risk from surface water to people, economic activity and the natural and historic environment within Taffs Well**

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,760	38	89	313
Services	6	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	606	37	16	65
Airports	0	0	0	0
Roads (km)	8	2	0.1	2
Railways (km)	1	0.1	0	0.3
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	1	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	1	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.2	0	0	0
Listed Buildings	15	0	0	0
Licensed Abstractions	1	1	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	5			
External	11			
Highway	23			

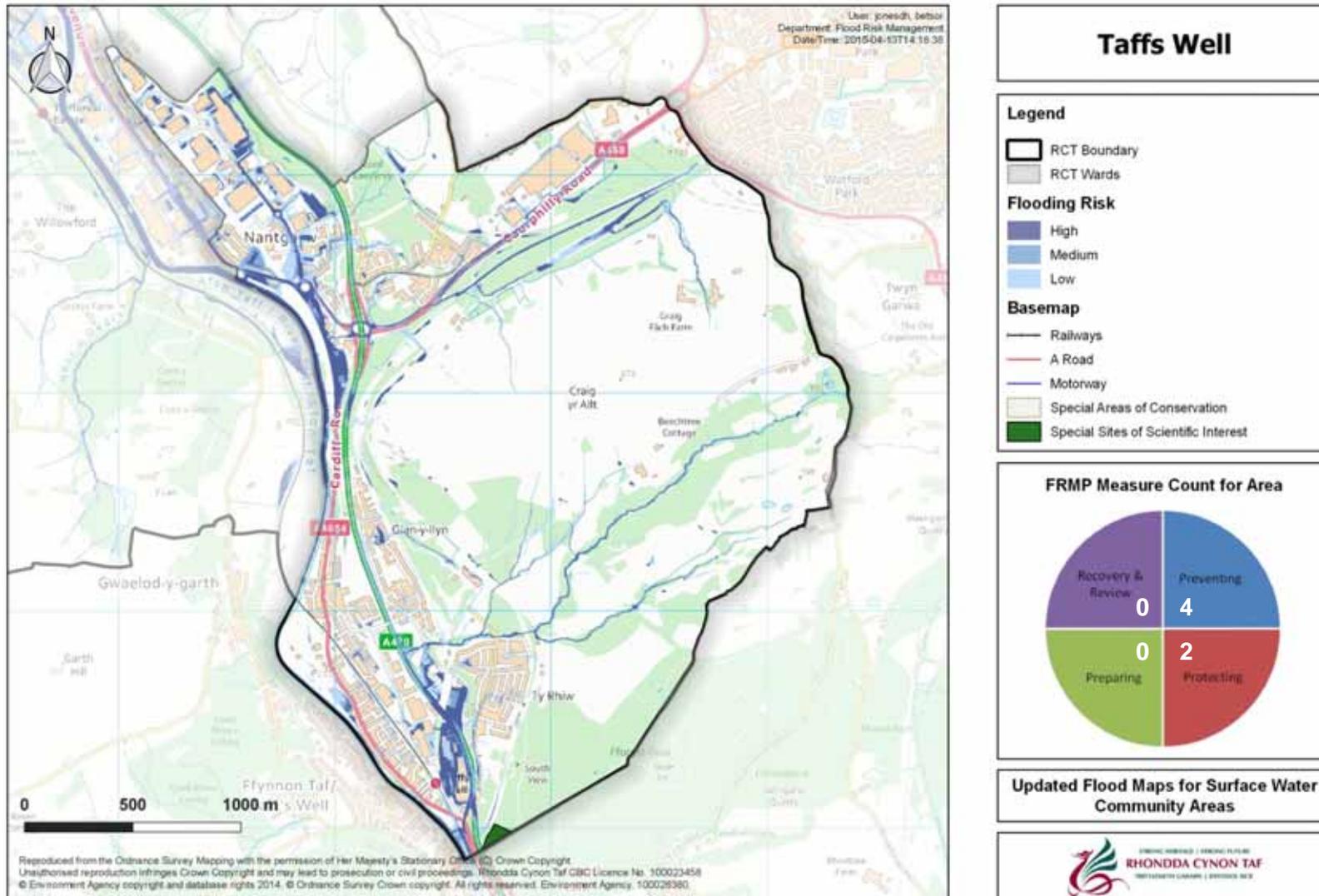
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Taffs Well and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 92:** Summary of Flood Risk Management Plan Measures for Taffs Well

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0077	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0078	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0124	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 55:** Taffs Well uFMfSW. Risk to people, economic activity and environmental receptors



## **9.38 Talbot Green**

### **9.38.1 Overview**

Talbot Green is situated in the southern sector of Rhondda Cynon Taf County Borough Council, to the west of Llantrisant. The site covers an area of 205Ha and has a maximum elevation of approximately 150m AOD. Talbot Green has a population of approximately 2,895 and approximately 1,232 residential properties.

The majority of Talbot Green is an urban environment with residential development dominating the site. The majority of the south-eastern edge of the site is comprised of a large retail park. There is a large golf course which forms the majority of the rural area in the north.

Talbot Green is situated within the Afon Elai Catchment. The Afon Elai bounds the site in the west, forming a border between Talbot Green and Llanharan. Talbot Green is bounded to the south by the Afon Clun. The north of the site is drained by the Nant Muchudd which discharges into the Afon Elai.

The underlying geology of Talbot Green is the Rhondda Bed of the Upper Carboniferous Coal Measure, and the Middle Carboniferous Coal Measure, all comprising Sandstone, Siltstone, Coal and Mudstone. Glacial Till is present across much of the site. Alluvial, Glaciofluvial and River Terrace Deposits are present along the Afon Elai and the Afon Clun.

### 9.38.2 Conclusions for the UFMfSW

Talbot Green covers an area of approximately 205Ha with a total population of 2,895. About 1% of the population of Talbot Green are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Talbot Green is broadly associated with the Afon Elai and the Afon Clun with flood risk observed along sections of each watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

Where flood risk occurs within residential areas, commonly, the flow path is along roads with significant risk associated along sections of Talbot Road, Lanelay Road, Cowbridge Road, Heol Y Gyfraith and Bronhaul. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with culvert inlets.

A low to high risk is noted across sections of the Llantrisant and Pontyclun Golf Club and south of the A473, within the floodplains of the Afon Elai and Afon Clun, respectively. The flooding here is sourced potential bank breaches.

The map also indicates a low to high flood risk in the north of Talbot Green with significant risk along sections of the A4119 and the road within the Royal Glamorgan Hospital. This flooding is sourced from potential bank breaches of the Nant Muchudd and blocked inlets.

The historic flooding incidents reported broadly correlate with requests for gully clearance with minimal incidents of highway flooding associated with the areas of high risk.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Talbot Green are presented in the table below

**Table 93:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Talbot Green

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	2,895	42	35	113
Services	7	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	352	5	5	19
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	1	0.0004	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	1	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	1			
External	3			
Highway	10			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Talbot Green and their proposed Flood Risk Management Plan measures are presented in the table below.

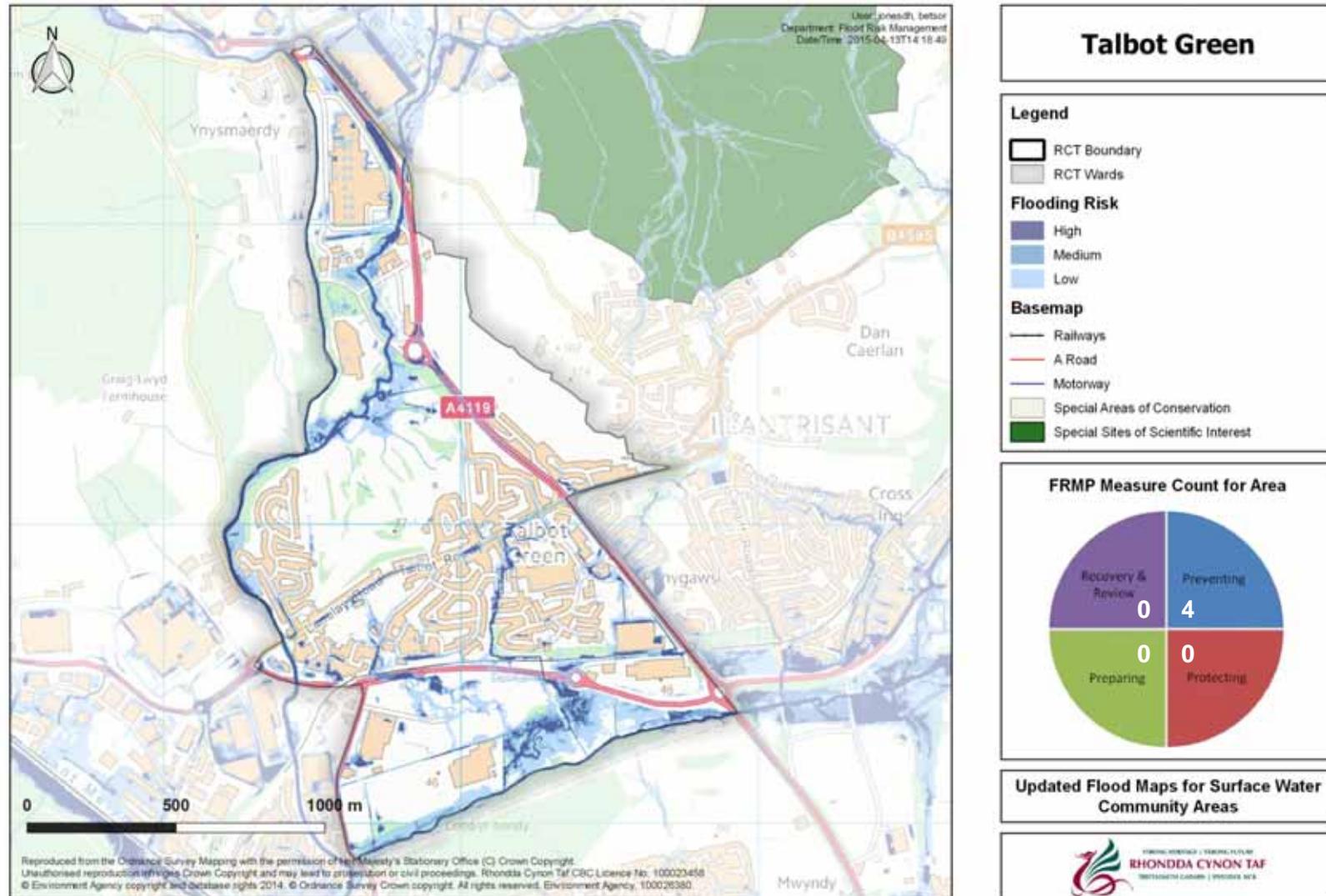
Further information regarding the flood investigation area is presented in Appendix A.

**Table 94:** Summary of Flood Risk Management Plan Measures for Talbot Green

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0046	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0047	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0068	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0079	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 56:** Talbot Green uFMfSW. Risk to people, economic activity and environmental receptors



## **9.39 Tonteg**

### **9.39.1 Overview**

The community area of Tonteg is located in the southern sector of Rhondda Cynon Taf County Borough Council to the east of Llantwit Fardre. The site covers an area of 587Ha and has a maximum elevation of 173m AOD. Tonteg has approximately 1,815 residential properties and a population of approximately 4,265.

The majority of Tonteg is a rural environment owing to the extent of both agricultural and forestry land. Residential area is located primarily in the west. The large Treforest industrial estate is located in the western sector of the site, on the bank of the Afon Taf. Coed y Gedrys is located in the south of the Tonteg.

Tonteg lies within the catchments of the Afon Taf and the Afon Ely. The site is bound to the east by the Afon Taf. Nant y Dall drains the site in the north, flowing west to east. Nant y Gedrys drains the site in the south, flowing west to east. All watercourses discharge into the Afon Taf.

There are a number of minor unnamed watercourses which are partially culverted beneath Tonteg and Treforest Industrial Estate and discharge into the Afon Taf.

The underlying geology is the Brithdir and Hughes Beds of the Upper Carboniferous Coal Measure, and the Middle Carboniferous Coal Measure, all comprising Sandstone, Siltstone, Coal and Mudstone. Also present is the Grovesend Formation, comprising Mudstone, Siltstone and Sandstone. Glacial Till is present across much of the south of the site. Glaciofluvial, Alluvial and River Terrace Deposits are present along the Afon Taf.

### 9.39.2 Conclusions for the UFMfSW

Tonteg covers an area of approximately 587Ha with a total population of 4,265. Just over 3% of the population of Tonteg are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Tonteg is broadly associated with the Afon Taf with significant flood risk observed along sections of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches of Main River and other minor watercourses. Flood risk commonly follows the flow path is along roads with significant risk associated along sections of Gwaelod-Y-Garth Road, Taffs Mead Road, Tonteg Road, Taffs Fall Road, Ford Road and Bridge Road.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with blocked culverts.

The map also indicates a low to high flood risk within the town of Tonteg, with significant risk along sections of Radnor Drive, The Rise, Ffordd Gerdinan, Ruthin Way and Ffordd-Y-Gollen. This Runoff extends down, across Main Road and along sections of Underhill Drive and Briar Way. The flooding is sourced from blocked inlets and surface runoff.

The historic flooding incidents reported broadly correlate with requests for gully clearance with minimal incidents of highway flooding associated with the areas of high risk.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Tonteg are presented in the table below**

**Table 95:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Tonteg

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,265	127	129	437
Services	6	0	1	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	496	7	13	86
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	5	0.09	0.07	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.2	0.02	0	0.01
Listed Buildings	0	0	0	0
Licensed Abstractions	1	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	2			
External	12			
Highway	9			

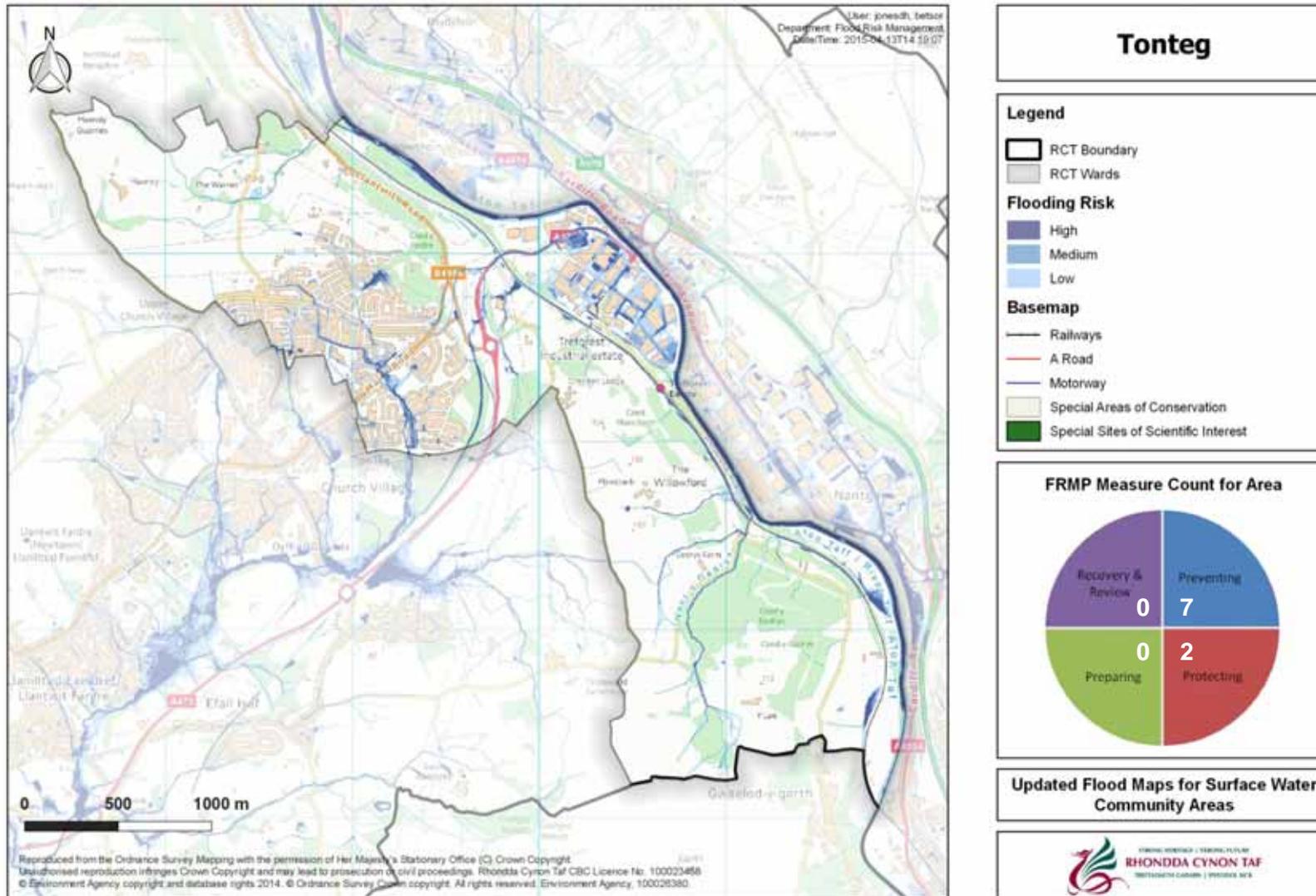
Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Tonteg and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 96:** Summary of Flood Risk Management Plan Measures for Tonteg

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0025	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0078	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0080	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0081	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0082	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0083	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 57:** Tonteg uMfSW. Risk to people, economic activity and environmental receptors



## **9.40 Tonypandy**

### **9.40.1 Overview**

Tonypandy is located in the western sector of Rhondda Cynon Taf County Borough Council to the south of Llwynypia. The site covers an area of 334Ha with a maximum elevation of 435m AOD. Tonypandy has approximately 1,704 residential properties and a population of approximately 4,004.

Tonypandy is predominantly a rural environment owing to the steep topography in the west and north, limiting the amount of development. Residential development is confined to the valley floors of the Afon Rhondda. The central and northern sectors of the site are predominantly forested. There is a small industrial estate located in the north on the bank of the Afon Rhondda.

The site is located predominantly within the Afon Rhondda Catchment. The western edge of the site, however, is located within the Ogmore to Tawe Catchment of the West Wales River Basin District. The site is bound to the east by the Afon Rhondda. The site is drained in the north by Nant Clydach which flows west to east and discharges into the Afon Rhondda. The highlands in the south are drained by Nant Gwyn which flows from west to east and also discharges into the Afon Rhondda.

The underlying geology is the Llynfi and Rhondda Beds of the Upper Carboniferous Coal Measure comprising Coal, Sandstone, Siltstone and Mudstone. Glacial Till is present across much of the site, both within the valley and on the highlands in the west. Intermittent patches of Peat are present on the highlands. Alluvial and Glaciofluvial Deposits are present along the Afon Rhondda.

### 9.40.2 Conclusions for the UFMfSW

Tonypandy covers an area of approximately 334Ha with a total population of 4,004. Just over 2% of the population of Tonypandy are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Tonypandy is broadly associated with the Afon Rhondda and Nant Clydach, with flood risk observed along sections of each watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

Commonly the flow path is along roads with significant risk associated along sections of the A4119, Gelli Road, Trinity Road, Parc Gellifaelog, Parc Place and Dunraven Street. Surface runoff is also present along sections of Court Street, Llwynypia Road, Church Street and Old Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Internal and Highway incidents have previously been reported commonly associated with blocked culverts.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Tonypandy are presented in the table below**

**Table 97:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Tonypanydy

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,004	75	162	505
Services	6	0	0	4
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	379	16	20	71
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	4	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	5			
External	5			
Highway	17			

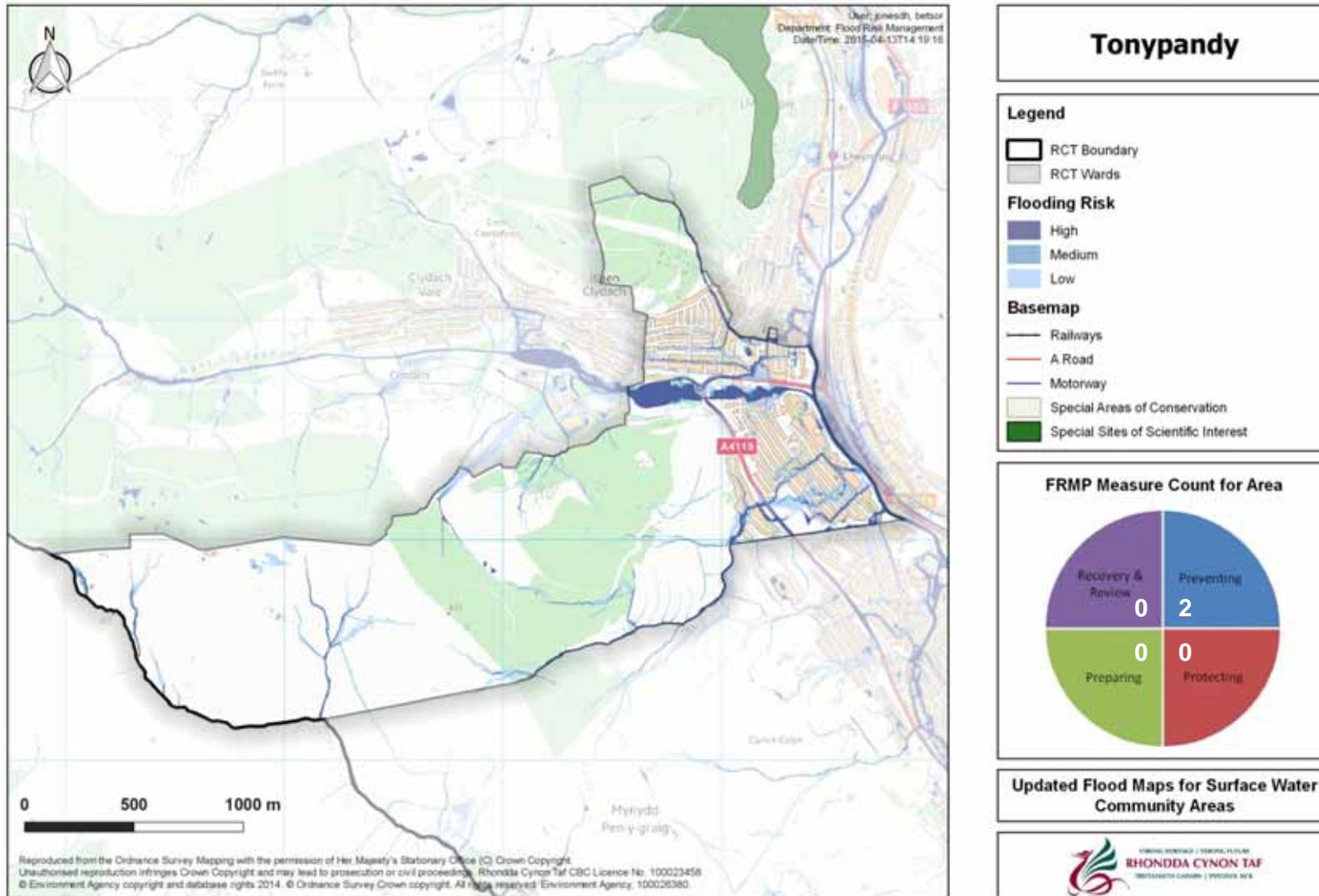
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Tonypanydy and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 98:** Summary of Flood Risk Management Plan Measures for Tonypanydy

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0085	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0086	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 58:** Tonypanydy uFMfSW. Risk to people, economic activity and environmental receptors



## **9.41 Tonyrefail East**

### **9.41.1 Overview**

Tonyrefail East is located in the central sector of Rhondda Cynon Taf County Borough Council with the towns of Tonyrefail and Thomastown. The site covers an area of 1,480Ha and has a maximum elevation of 377m AOD. Tonyrefail East has approximately 2,577 residential properties and a population of approximately 6,056.

Tonyrefail East is predominantly a rural environment owing to the vast extent of agricultural land. Residential development is located primarily in the west of the site, along the bank of the Afon Elai. There are a number of farms located across the rest of the site. There are 10 SSSIs across Tonyrefail East.

Tonyrefail East is situated within the catchments of the Afon Elai and Afon Rhondda. The Afon Elai is located along the western edge of the site, flowing north to south. The north of the catchment is drained by the Nant Muchudd with its catchment covering much of the site. The Nant Muchudd flows from north to south. Mynydd y Glyn, located in the north-east, is drained by the Nant Gwelliwion, flowing from west to east.

There are a number of unnamed minor watercourses which drain the highlands in the north and feed into the Nant Muchudd and Nant Gwelliwion.

The underlying geology is the Brithdir, Llynfi, Hughes and Rhondda Beds of the Upper Carboniferous Coal Measure, and the Middle Carboniferous Coal Measure, all comprising Coal, Sandstone, Siltstone and Mudstone. Glacial Till is present across much of the site. Intermittent patches of Peat are present across the site. Alluvial and Glaciofluvial Deposits are present along the Afon Elai.

### 9.41.2 Conclusions for the UFMfSW

Tonyrefail East covers an area of approximately 1,480Ha with a total population of 6,056. Approximately 1% of the population of Tonyrefail East are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Tonyrefail East is broadly associated with the Afon Elai with flood risk observed along sections of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

Where flood risk occurs within residential areas, commonly, the flow path is along roads with significant risk associated along sections of St John's Road, Mill Street, Collenna Road, Pritchard Street, Parkland Road and Station Road. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with blocked culverts.

A low to high risk is noted within the town of Thomastown. The flooding here is sourced potential bank breaches and blocked inlets. The flow path commonly follows the roads with flood risk along sections of Heol Isaf, Gwern Heulog, Tylcha Ganol and the A4119.

The maps indicate a significant flood risk across several of the SSSIs within Tonyrefail East; broadly associated with the Nant Muchudd.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Tonyrefail East are presented in the table below**

**Table 99:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Tonyrefail East

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	6,056	47	118	524
Services	10	0	1	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	613	11	11	35
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	151	0.3	4	5
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	1	0	0	0
Listed Buildings	6	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	5			
External	18			
Highway	40			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Tonyrefail East and their proposed Flood Risk Management Plan measures are presented in the table below.

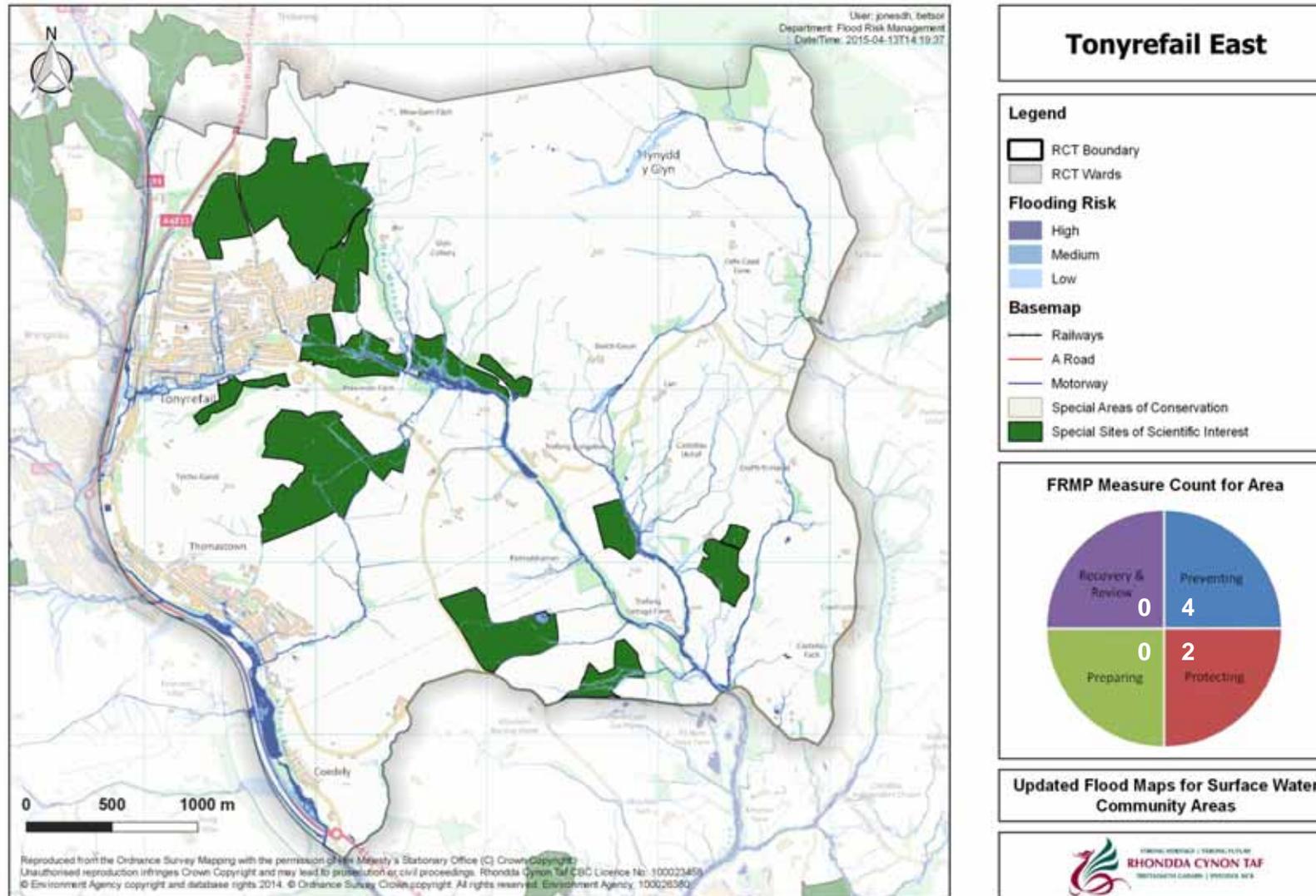
Further information regarding the flood investigation area is presented in Appendix A.

**Table 100:** Summary of Flood Risk Management Plan Measures for Tonyrefail East

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0087	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0088	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0092	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 59:** Tonyrefail East uFMfSW. Risk to people, economic activity and environmental receptors



## **9.42 Tonyrefail West**

### **9.42.1 Overview**

Tonyrefail West is situated within the central sector of Rhondda Cynon Taf County Borough Council to the south of Porth. The site covers an area of 976Ha and has a maximum elevation of approximately 300m AOD. Tonyrefail West has a population of approximately 5,929 and approximately 2,523 residential properties.

Tonyrefail West is primarily a rural environment owing to the extent of agricultural land, and the highlands in the north. Residential development is located across the centre of the site, on the banks of the Nant Erin. There is a small industrial estate located in the southern sector of the residential development. There are also 4 SSSIs across Tonyrefail West.

Tonyrefail West is situated primarily within the Afon Elai Catchment; however, a small section in the north includes the Afon Rhondda Catchment and a small section in the south includes the Ogmore to Tawe Catchments on the West Wales River Basin District.

The Afon Elai borders the west of the site flowing north to south. The west of the site is drained by a number of major watercourses, including the Nant Cae'rgwerlas in the north, the Nant Erin in the central sector, and the Nant Llanilid in the south. All watercourses discharge into the Afon Elai in the west.

The underlying geology is the Brithdir, Llynfi, Hughes and Rhondda Beds of the Upper Carboniferous Coal Measure, and the Middle Carboniferous Coal Measure, all comprising Coal, Sandstone, Siltstone and Mudstone. Glacial Till is present across much of the site. Intermittent patches of Peat are present across the site. Alluvial and Glaciofluvial Deposits are present along the major watercourses.

### 9.42.2 Conclusions for the UFMfSW

Tonyrefail West covers an area of approximately 976Ha with a total population of 5,929. Just over 1% of the population of Tonyrefail West are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Tonyrefail West is broadly associated with the Afon Elai and the Nant Erin with flood risk observed along sections of each watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

Where flood risk occurs within residential areas, commonly, the flow path is along roads with significant risk associated along sections of Gilfach Road, Nant Erin, the A4093, Penrhiwfer Road, Arthur Street and Bryn Rhedyn and Pembroke Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with blocked culverts.

The maps indicate a significant flood risk across several of the SSSIs within Tonyrefail West; broadly associated with the Afon Elai, the Nant Cae'rgwerlas and the Nant Erin

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Tonyrefail West are presented in the table below**

**Table 101:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Tonyrefail West

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	5,929	71	103	632
Services	9	0	0	7
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	506	20	10	60
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	80	2	1	5
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	5	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	23			
Highway	50			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Tonyrefail West and their proposed Flood Risk Management Plan measures are presented in the table below.

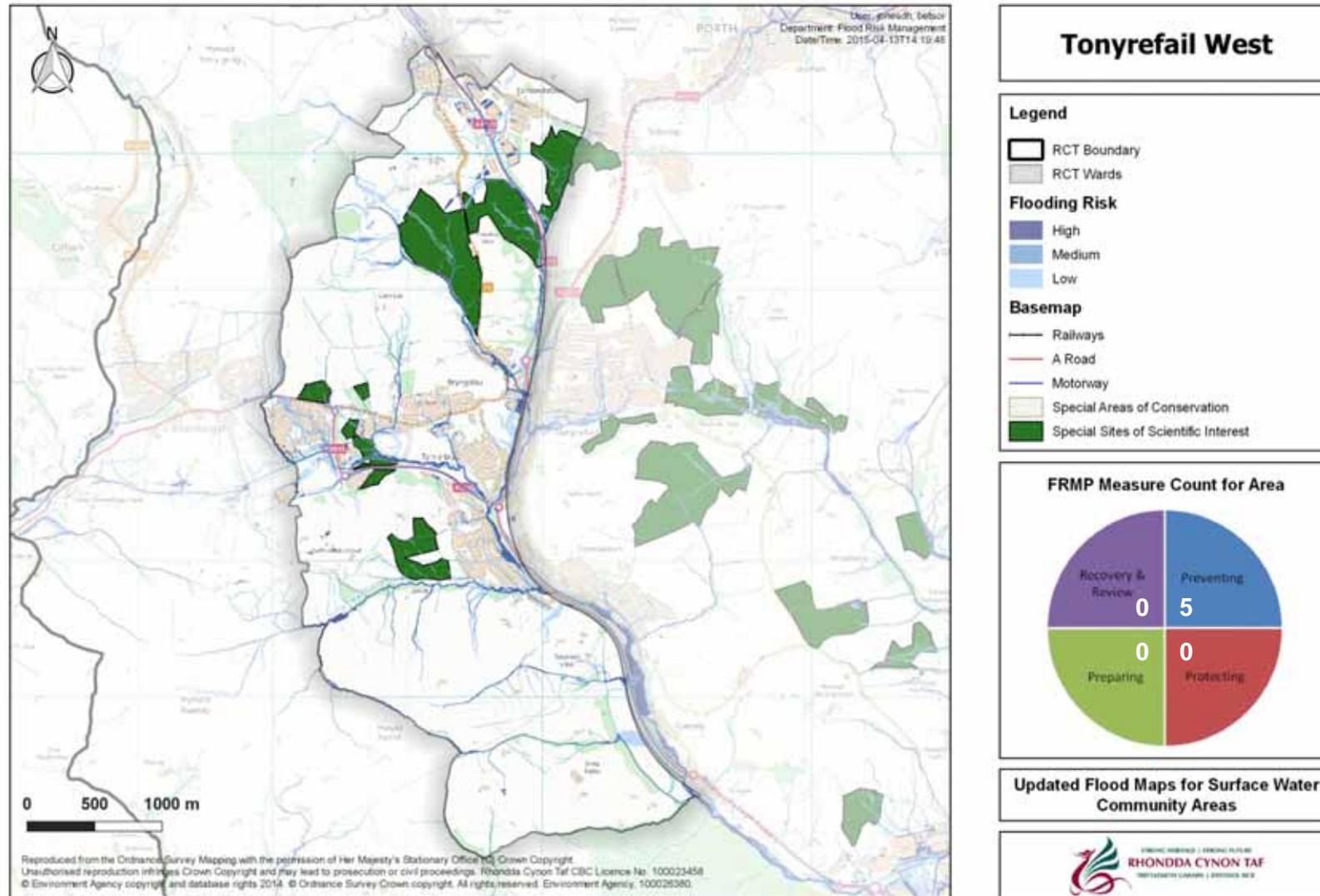
Further information regarding the flood investigation area is presented in Appendix A.

**Table 102:** Summary of Flood Risk Management Plan Measures for Tonyrefail West

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0089	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0090	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0091	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0092	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0093	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 60:** Tonyrefail West uFMfSW. Risk to people, economic activity and environmental receptors



## **9.43 Trallwng**

### **9.43.1 Overview**

Trallwng is located in the eastern sector of Rhondda Cynon Taf County Borough Council, to the east of Pontypridd. The site covers an area of 226Ha and has a maximum elevation of 378m AOD. Trallwng has a population of approximately 4,124 and approximately 1,755 residential properties.

The relatively small site is split between urbanised and rural areas. Residential development is situated within the valley floor of the Afon Taf. Land in the east has remained largely undeveloped, with the exception of a large golf course and a number of agricultural fields, owing to the steep topography of Cefn Eglwysilan.

Trallwng lies within the Afon Taf Catchment. The Afon Taf bounds the site to the west, flowing north to south. The highlands in the east are drained by the Ely Brook and a number of unnamed minor watercourses, flowing from east to west, which are partially culverted beneath the residential development of Trallwng. All watercourses discharge into the Afon Taf.

The underlying geology is the Hughes and Brithdir Beds of the Upper Carboniferous Coal Measure comprising Sandstone, Siltstone, Coal and Mudstone. Glacial Till is present along major watercourses. Alluvial, Glaciofluvial and River Terrace Deposits are present along the Afon Taf.

### 9.43.2 Conclusions for the UFMfSW

Trallwng covers an area of approximately 226Ha with a total population of 4,124. Approximately 4% of the population of Trallwng are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Trallwng is broadly associated with culvert inlets across the east of the residential development and inlets and surface runoff.

Commonly, the flow path is along roads with significant risk associated along sections of the A470, Coedpenmaen Road, Basset Street, Thurston Road, Bonvilston Road, East Street, North Street and West Street. This flood risk also extends down along Ynysangharad Road and Pentrebach Road. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. A large number of Highway incidents have previously been reported, commonly associated with culvert inlets.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Trallwng are presented in the table below**

**Table 103:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Trallwng

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,124	183	118	479
Services	8	0	0	3
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	289	11	3	24
Airports	0	0	0	0
Roads (km)	5	1	0.1	1
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	16	0.3	0.3	2
Scheduled Ancient Monuments	1	0.01	0.01	0.01
Listed Buildings	9	3	0	2
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	6			
External	8			
Highway	26			

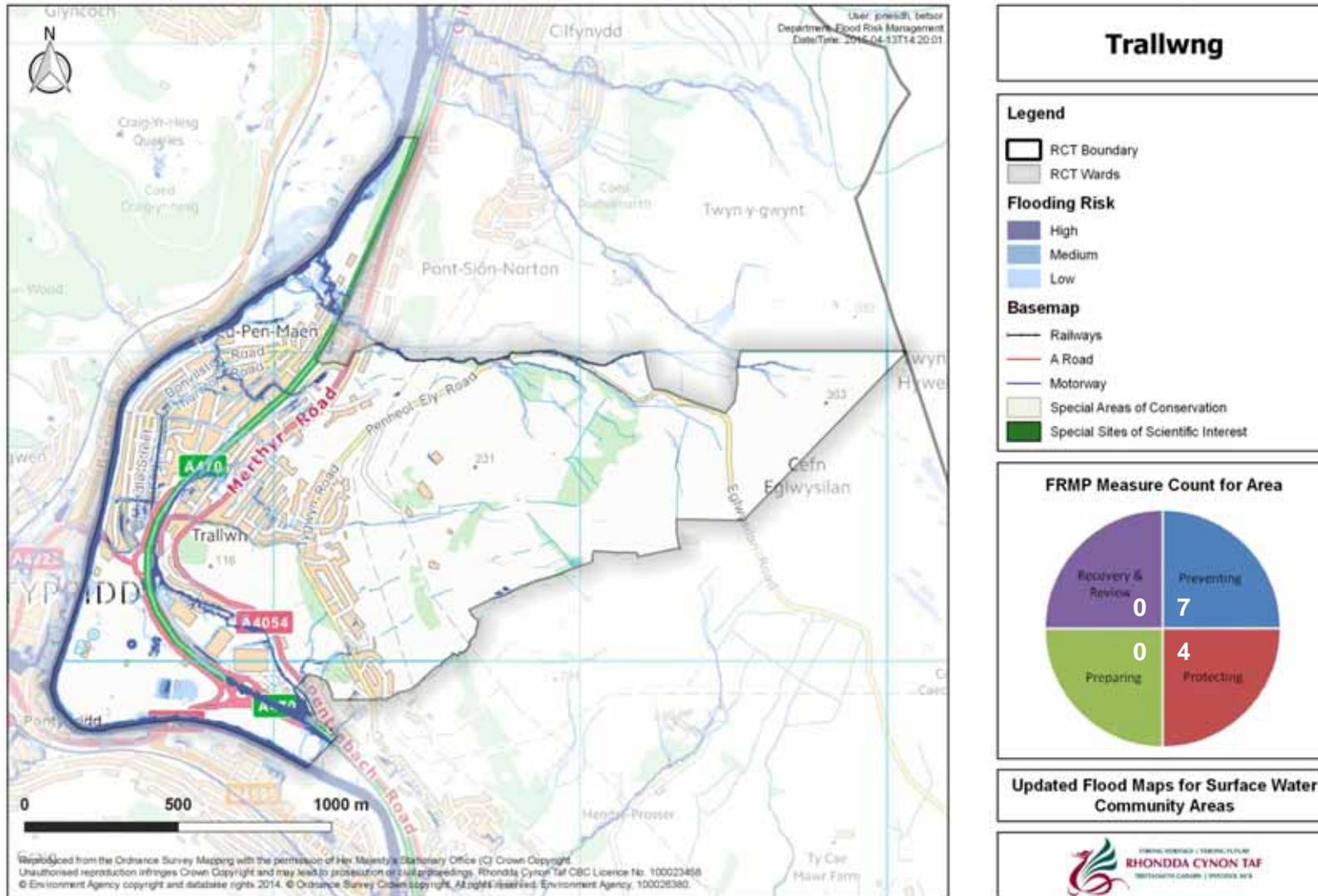
Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Trallwng and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 104:** Summary of Flood Risk Management Plan Measures for Trallwng

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0094	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0095	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		RCT0096	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021
RCT0097	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0131	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 61:** Trallwng uFMfSW. Risk to people, economic activity and environmental receptors



## **9.44 Trealaw**

### **9.44.1 Overview**

Trealaw is located in the central sector of Rhondda Cynon Taf County Borough Council with the town of Tonypany. The site covers an area of 286Ha and has a maximum elevation of 328m AOD. Trealaw has approximately 1,861 residential properties and a population of approximately 4,373.

The majority of Trealaw is a rural environment owing to the steep topography in the northern sector. Residential development is confined to the valley floor of the Afon Rhondda. The highlands in the north have remained largely undeveloped, with the exception of Rhondda Golf Course.

Trealaw is situated within the catchment of the Afon Rhondda. The site is bounded to the south and west by the Afon Rhondda. The highlands in the north are drained by the Nant Brithweunydd and a number of minor unnamed watercourses which are partially culverted beneath Tonypany. All watercourses discharge into the Afon Rhondda.

The underlying geology is the Rhondda and Llynfi Beds of the Upper Carboniferous Coal Measure comprising Coal, Mudstone, Siltstone and Sandstone. Glacial Till is present along major watercourses. Peat is also present on the highland within forested land. Glaciofluvial and Alluvial Deposits are present along Afon Rhondda.

#### 9.44.2 Conclusions for the UFMfSW

Trealaw covers an area of approximately 286Ha with a total population of 4,373. Just over 3% of the population of Trealaw are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Trealaw is broadly associated with the Afon Rhondda with flood risk observed along sections of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

Commonly, the flow path is along roads with significant risk associated along sections of Brithweunydd Road, Brynteg Terrace, Nile Road, Misikin Road, Trealaw Road, Heather Close and the A4058. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with culvert inlets.

The map also indicates a low to high risk of flooding in the northern edge of the site. The flooding is sourced from culvert inlets and generally, the flow path is along roads with sections at risk along Ynyscynon Road.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Trealaw are presented in the table below.

**Table 105:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Trealaw

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,373	110	66	512
Services	5	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	277	21	10	19
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	3	1	0.5	0.5
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	4	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	18			
Highway	44			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Trealaw and their proposed Flood Risk Management Plan measures are presented in the table below.

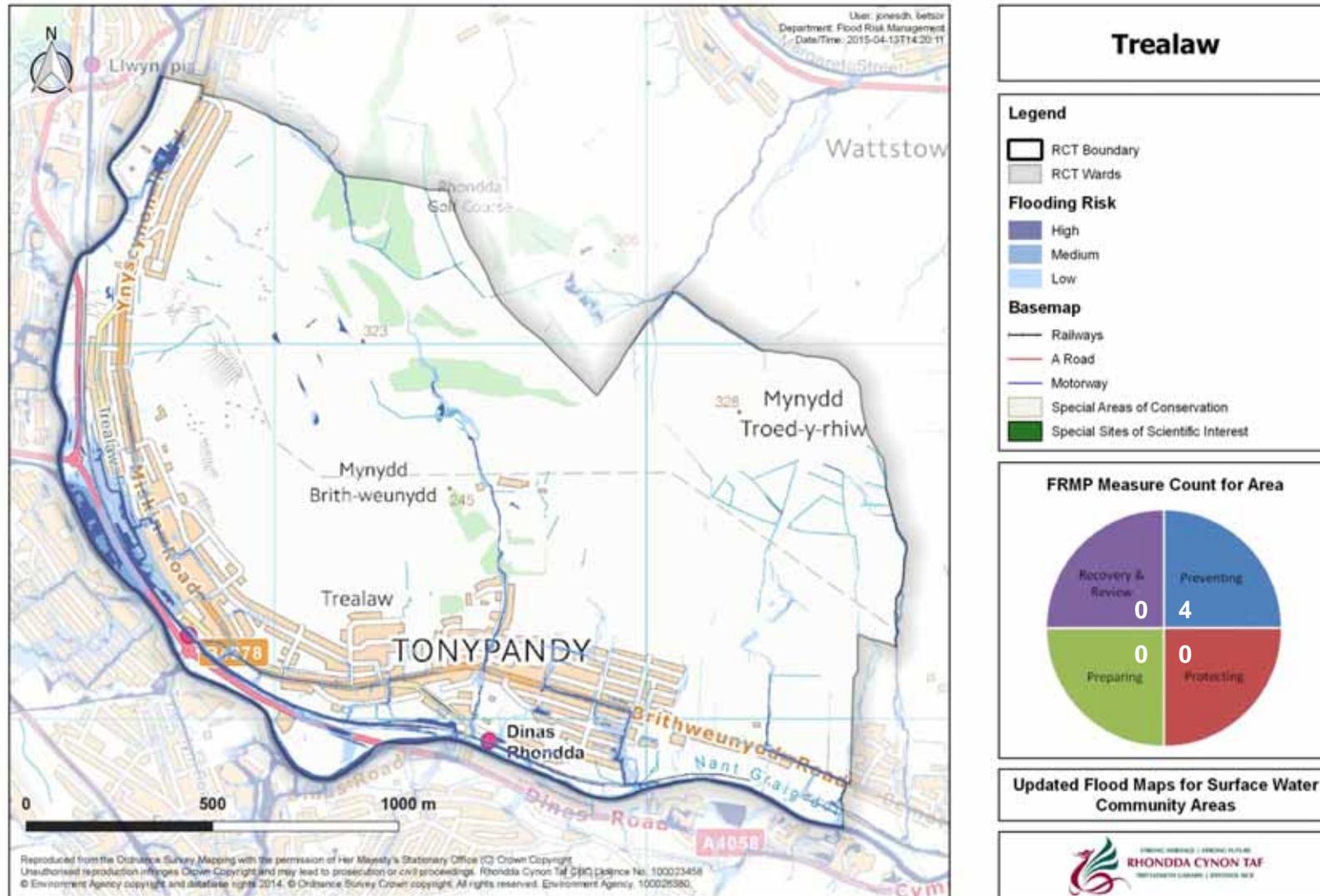
Further information regarding the flood investigation area is presented in Appendix A.

**Table 106:** Summary of Flood Risk Management Plan Measures for Trealaw

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Priority	Type of Measure
RCT0052	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0098	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0099	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0100	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 62:** Trealaw uFMfSW. Risk to people, economic activity and environmental receptors



## **9.45 Treforest**

### **9.45.1 Overview**

The community area of Treforest is located in the southern sector of Rhondda Cynon Taf County Borough Council, to the south of Pontypridd. The site covers an area of 378Ha and has a maximum elevation of 309m AOD. Treforest has a population of approximately 7,102 and approximately 3,022 residential properties.

Treforest is split between rural areas to the east and west, and residential development through the centre of the site, owing to the relatively wide floodplain of the Afon Taf in this area and subsequent gentle topography. The University of South Wales is present in the west of Treforest; however, the campus spreads across the entire site.

Treforest is situated within the Afon Taf catchment. The site is drained through the centre by the Afon Taf, which flows from north to south. The highlands of the east are drained by a number of minor watercourses which are partially culverted beneath residential developments.

The highlands in the west are drained by the Nant y Fforest which discharges into the Afon Taf and is partially culverted beneath residential development.

The underlying geology is the Brithdir, Rhondda and Hughes Beds of the Upper Carboniferous Coal Measure which is formed of Sandstone, Coal, Siltstone and Mudstone. Glacial Till is present along major watercourses. Intermittent patches of Peat are present on the highlands, within forested areas. Alluvial, Glaciofluvial and River Terrace Deposits are present along the Afon Taf.

### 9.45.2 Conclusions for the UFMfSW

Treforest covers an area of approximately 378Ha with a total population of 7,102. Just under 1% of the population of Treforest are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Treforest is broadly associated with the Afon Taf with flood risk observed along sections of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

In general, the flow path is along roads with significant risk associated along sections of the A473, Meadow Street, New Park Terrace, Collins Terrace and Broadway. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with blocked culverts.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Treforest are presented in the table below**

**Table 107:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Treforest

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	7,102	33	52	338
Services	10	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	556	7	13	51
Airports	0	0	0	0
Roads (km)	2	0.06	0.08	0.3
Railways (km)	3	0.03	0.03	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.002	0	0	0
Listed Buildings	40	2	0	3
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	1			
External	9			
Highway	31			

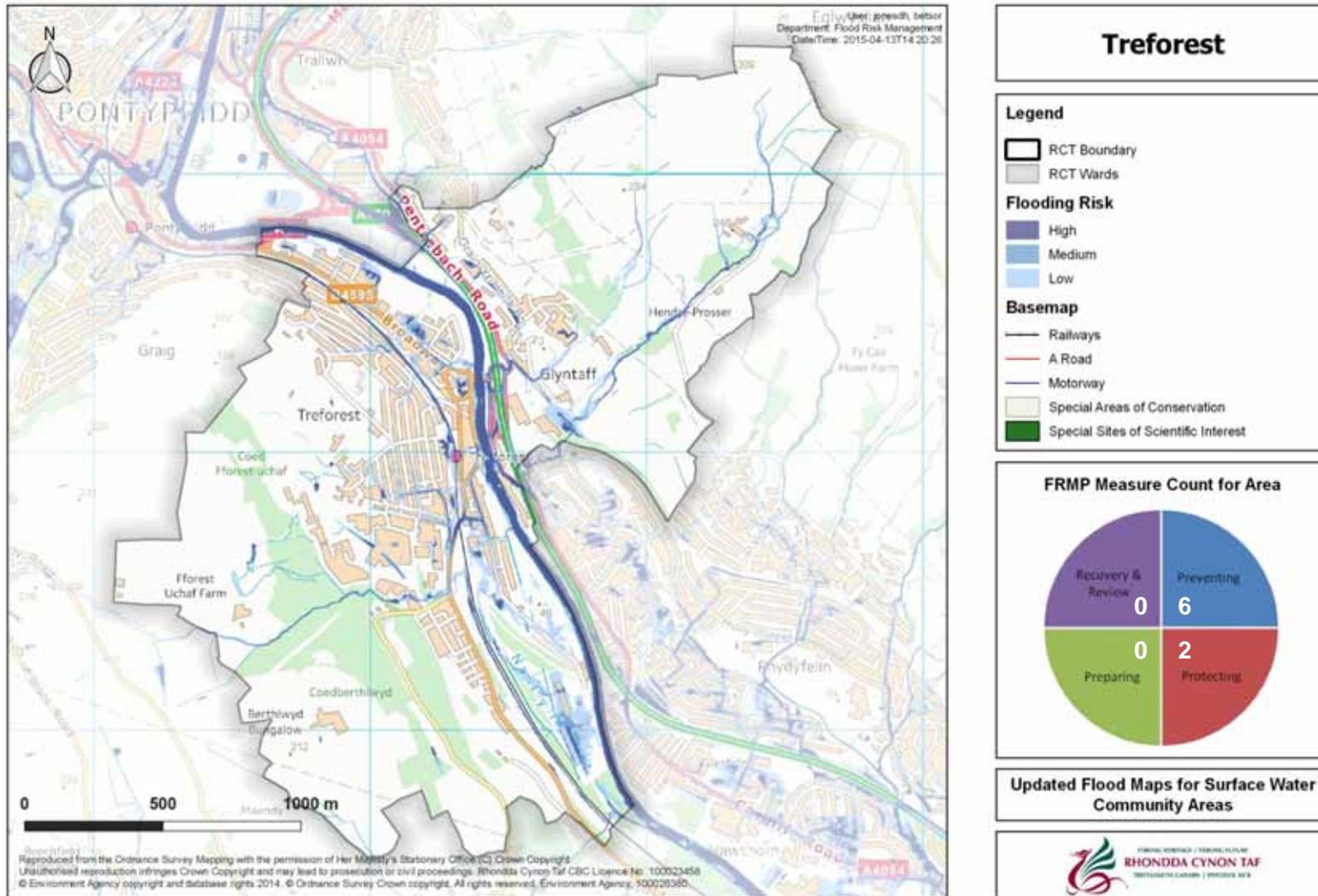
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Treforest and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 108:** Summary of Flood Risk Management Plan Measures for Treforest

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0094	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0101	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0102	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0125	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0132	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 63:** Treforest uFMfSW. Risk to people, economic activity and environmental receptors



## **9.46 Treherbert**

### **9.46.1 Overview**

Treherbert is situated in the north-western sector of Rhondda Cynon Taf County Borough Council, to the north of Treorchy. The site covers an area of 2,157Ha and has a maximum elevation of 534m AOD. Treherbert has a population of approximately 6,674 and approximately 2,840 residential properties.

The majority of Treherbert is a rural environment owing to the steep topography of the highlands which surround the site. Residential development is confined to the valley floor of the Afon Rhondda and is surrounded by Mynydd Tynewydd, Mynydd Blaenrhondda and Mynydd Ystradffernol. Treherbert has some of the steepest topography in RCT and as a result, the highlands have remained undeveloped. There is a small industrial estate in the south. A large SSSI is present in the south which crosses the border into the community area of Treorchy.

Treherbert is situated primarily within the Afon Rhondda Catchment; however, the western edge of the site includes a small section of the Ogmere to Tawe catchment of the West Wales River Basin District. The source of the Afon Rhondda is located in the highlands in the north of Treherbert, which is fed by the Nant Melyn, Nant Carnfoesen and Nant Garreg-lwyd. The highlands in the west are drained by the Nant Selsig. The catchment of the Nant Selsig covers much of the western sector of the site.

The surrounding highlands are drained by a large network of minor unnamed watercourses which discharge into the major watercourses.

The underlying geology of Treherbert is the Rhondda and Llynfi Beds of the Upper Carboniferous Coal Measure comprising Coal, Sandstone, Siltstone and Mudstone. Also present is the Middle Carboniferous Coal Measure, also comprising Sandstone, Siltstone, Coal and Mudstone. Glacial Till is present along major watercourses and across the highlands. Large sections of Peat are also present across the highlands. Alluvial and Glaciofluvial Deposits are present along the Nant Selsig and Afon Rhondda.

### 9.46.2 Conclusions for the UFMfSW

Treherbert covers an area of approximately 2,157Ha with a total population of 6,674. Approximately 10% of the population of Treherbert are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Treherbert is largely associated with the Afon Rhondda with significant flood risk observed along the length of the watercourse. The flooding is sourced from potential bank breaches and blocked inlets.

Commonly, the flow path is along roads; however, the risk is so great in certain areas that there is no discernible flow path. There is significant risk associated along sections of the B4522, Baglan Street and Margaret Street. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways and internal properties in the area have previously been flooded, commonly associated with blocked culverts.

A significant risk is noted within the area surrounding Treherbert Railway Station. There is a high flood risk associated along sections of Station Road, Taff Street, Emmanuel Close and David Street.

The maps indicate a significant flood risk across the three SSSIs within Treherbert. The flood risk is sourced from potential bank breaches and culvert inlets.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Treherbert are presented in the table below

**Table 109:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Treherbert

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	6,674	667	609	1833
Services	8	2	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	444	58	78	73
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	1	0.001	0.03	0.1
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	192	2	2	8
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	5	0.02	0	0.2
Listed Buildings	5	0	0	1
Licensed Abstractions	6	2	0	1
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	5			
External	23			
Highway	30			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Treherbert and their proposed Flood Risk Management Plan measures are presented in the table below.

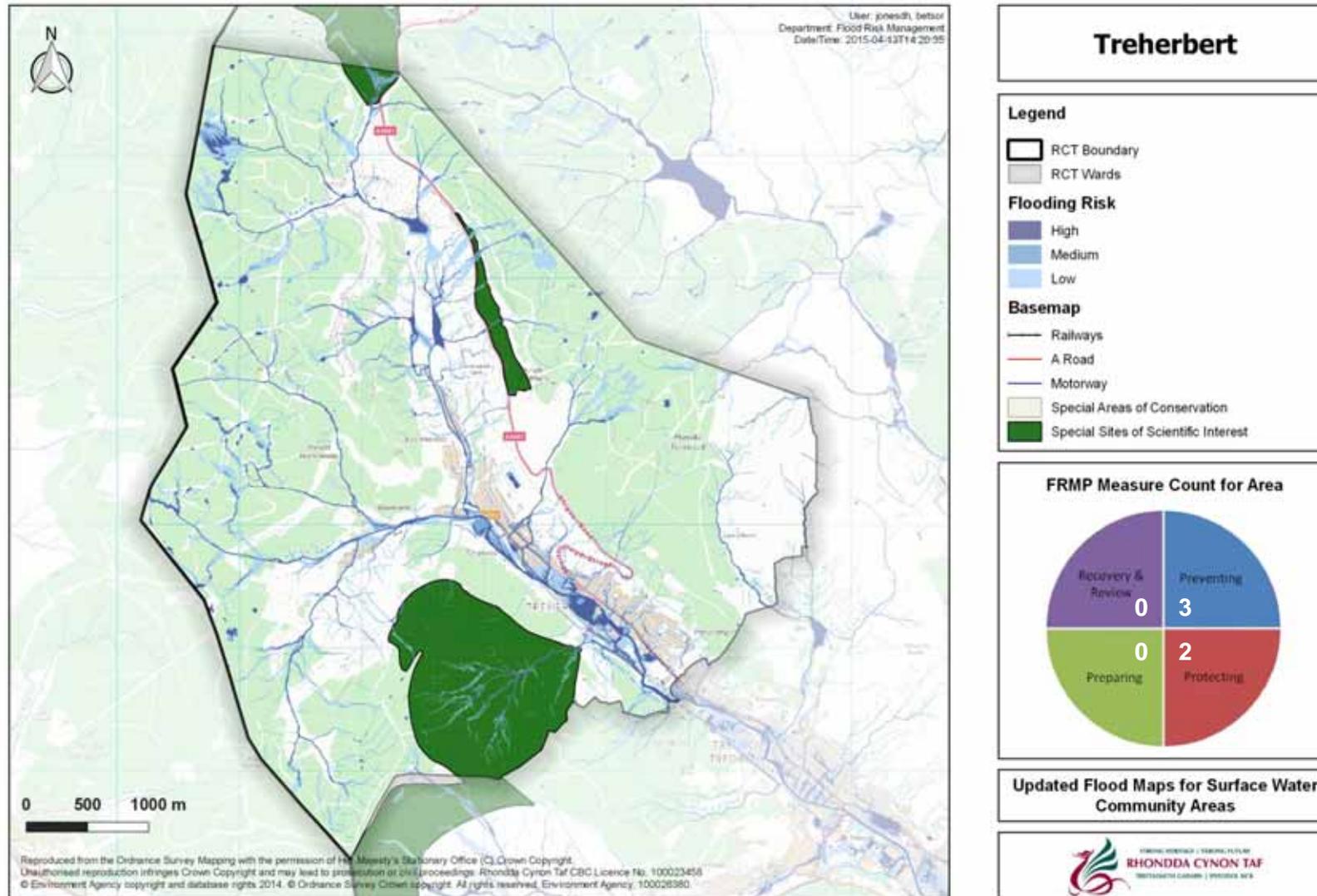
Further information regarding the flood investigation area is presented in Appendix A.

**Table 110:** Summary of Flood Risk Management Plan Measures for Treherbert

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Priority	Type of Measure
RCT0103	Local / Main River*	10	Land Management	M34 (Protection)	2016-2021	Proposed	
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0104	Local / Main River*	10	Land Management	M34 (Protection)	2016-2021	Proposed	
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0105	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 64:** Treherbert uFMfSW. Risk to people, economic activity and environmental receptors



## 9.47 Treorchy

### 9.47.1 Overview

The community area of Treorchy is located in the western sector of Rhondda Cynon Taf County Borough Council, to the south of Treherbert. The site covers an area of 1,331Ha and has a maximum elevation of 559m AOD. Treorchy has approximately 3,616 residential properties and a population of approximately 8,498.

Treorchy is predominantly a rural environment which is a result of the steep topography in both the west and the east. Residential development is confined to the base of the Afon Rhondda valley. There is a large industrial estate in the town of Ynyswen, on the bank of the Afon Rhondda, and another in the south of Treorchy, also on the bank of the Afon Rhondda. There is a large SSSI in the north which crosses the border into the community area of Treherbert.

The majority of Treorchy is situated within the Afon Rhondda Catchment; however, the west of the site includes a small section of the Ogmere to Tawe catchment of the West Wales River Basin District. The Afon Rhondda flows through the centre of the site, from north to south. The highlands in the west are drained by the Nant Cwm-Parc; a heavily modified channel which discharges into the Afon Rhondda. The highlands in the east are drained by the Nant Orci. The catchment of the Nant Orci covers much of the north-eastern sector of the site.

There are a number of minor unnamed watercourses which drain the highlands and discharge into the Afon Rhondda.

The underlying geology is the Llynfi and Rhondda Beds of the Upper Carboniferous Coal Measure, comprising Sandstone, Siltstone, Coal and Mudstone. Also present is the Middle Carboniferous Coal Measure, also comprising Sandstone, Mudstone, Coal and Siltstone. Glacial Till is present along major watercourses and across the highlands. Peat is also present on the highlands. Alluvial and Glaciofluvial Deposits are present along the Afon Rhondda. An Alluvial Fan Deposit is present in the centre of Treorchy, adjacent to the Afon Rhondda.

### 9.47.2 Conclusions for the UFMfSW

Treorchy covers an area of approximately 1,331Ha with a total population of 8,498. Approximately 10% of the population of Treorchy are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Treorchy is broadly associated with the Afon Rhondda with significant flood risk observed along the length of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

Commonly, the flow path pattern follows the roads with significant risk associated along sections of Ynyswen Road, Bute Street, Dumfries Street, Stuart Street, Howard Street, Senghenydd Street, Herbert Street, Clark Street and Cardiff Street. There is also a lower risk across much of the site. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with culvert inlets.

Surface runoff is also noted along sections of High Street and Regent Street. There is a low to high risk across an old industrial estate on the northern side of the Railway line. The flooding for both risks is sourced from potential bank breaches and culvert inlets.

The map also indicates a significant flood risk associated with the Nant Cwm-Parc. As before, the flow path pattern commonly follows the roads with significant risk along sections of Station Road, Clare Road, Park Crescent and Lower Terrace.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Treorchy are presented in the table below**

**Table 111:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Treorchy

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	8,498	865	543	1831
Services	8	0	0	2
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	791	60	46	220
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	3	0.5	0.4	0.2
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	156	0	3	6
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	3	0.05	0.006	0.06
Listed Buildings	5	0	0	1
Licensed Abstractions	3	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	9			
External	29			
Highway	77			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Treorchy and their proposed Flood Risk Management Plan measures are presented in the table below.

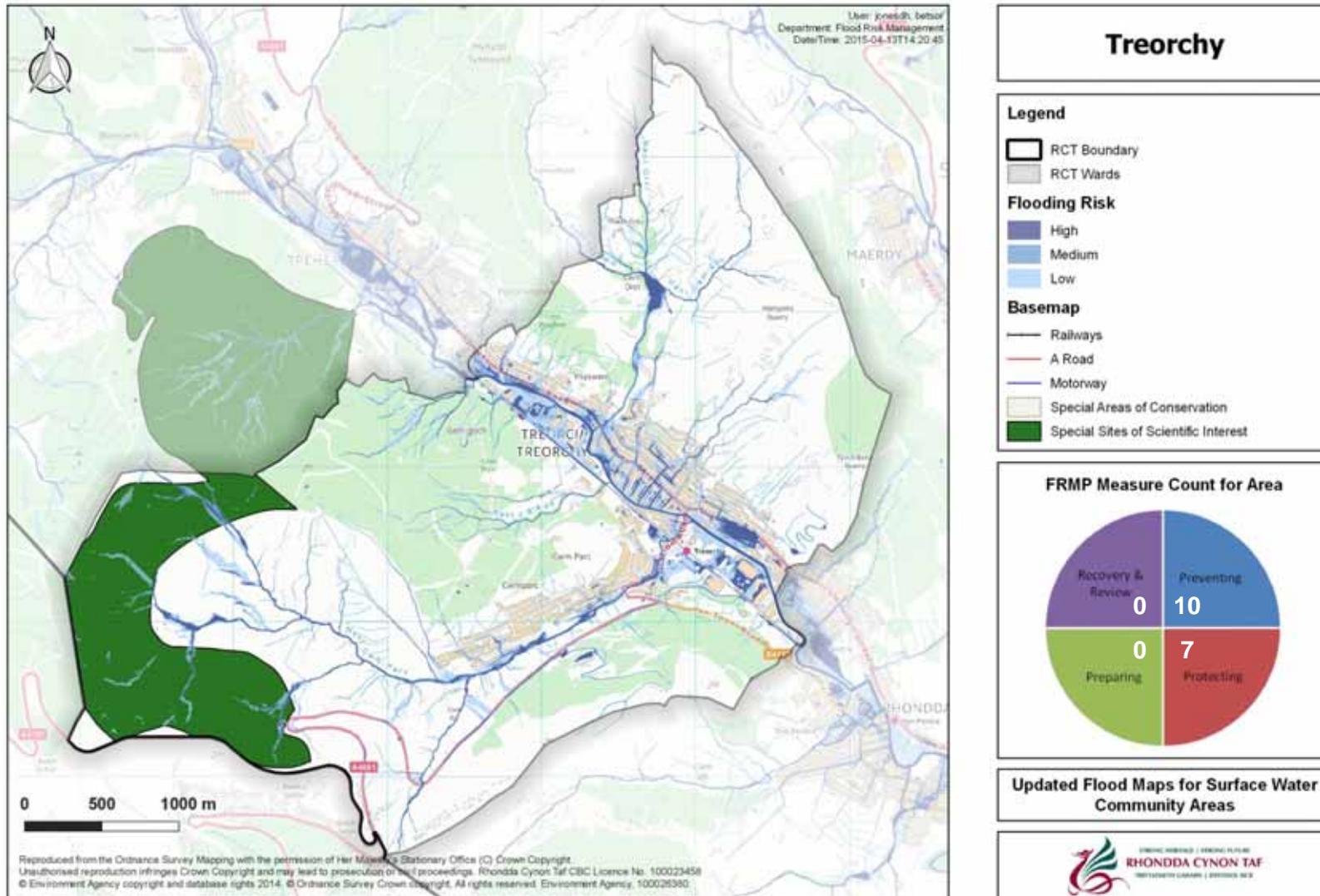
Further information regarding the flood investigation area is presented in Appendix A.

**Table 112:** Summary of Flood Risk Management Plan Measures for Treorchy

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0060	Local / Main River*	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT084	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0106	Local / Main River*	10	Land Management	M34 (Protection)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0107	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0108	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0109	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0133	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0134	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 65:** Treorchy uFMfSW. Risk to people, economic activity and environmental receptors



## **9.48 Tylorstown**

### **9.48.1 Overview**

Tylorstown is located in the central sector of Rhondda Cynon Taf County Borough Council, to the north of Tonypany. The site covers an area of 590Ha and has a maximum elevation of 402m AOD. Tylorstown has a population of approximately 5,323 and approximately 2,265 residential properties.

The majority of Tylorstown is a rural environment. This is due to the steep topography of the highlands in the east and west. Therefore, residential development is confined mostly to the floor of the Afon Rhondda Valley, with the exception of the Village of Penrhys, which is situated on the highlands in the west. The forest in the north of the site forms part of the St Gwynno Forest.

Tylorstown is primarily located within the Afon Rhondda Catchment. There is, however, a small section in the east which includes the Afon Cynon Catchment. The Afon Rhondda Fach flows from north to south through the centre of the site.

The highlands are drained by a number of small unnamed watercourses. All watercourses discharge into the Afon Rhondda Fach.

The underlying geology of Tylorstown is the Rhondda and Brithdir Beds of the Upper Carboniferous Coal Measure, which is formed of Siltstone, Sandstone, Mudstone and Coal. Glacial Till is present along major watercourses and across the western highlands. Peat is present on the eastern highlands, within forested land. Glaciofluvial and Alluvial Deposits are present along the Afon Rhondda Fach.

### 9.48.2 Conclusions for the UFMfSW

Tylorstown covers an area of approximately 590Ha with a total population of 5,323. Just over 3% of the population of Tylorstown are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Tylorstown is broadly associated with the Afon Rhondda Fach. The flooding is sourced from potential bank breaches and blocked inlets. Commonly, the flow path is along roads with significant risk associated along sections of the A4233, Llewellyn Street and Grove House Court. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with culvert inlets.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Tylorstown are presented in the table below

**Table 113:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Tylorstown

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	5,323	134	73	447
Services	9	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	326	6	1	12
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	1	0	0	0
Licensed Abstractions	1	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	2			
External	19			
Highway	24			

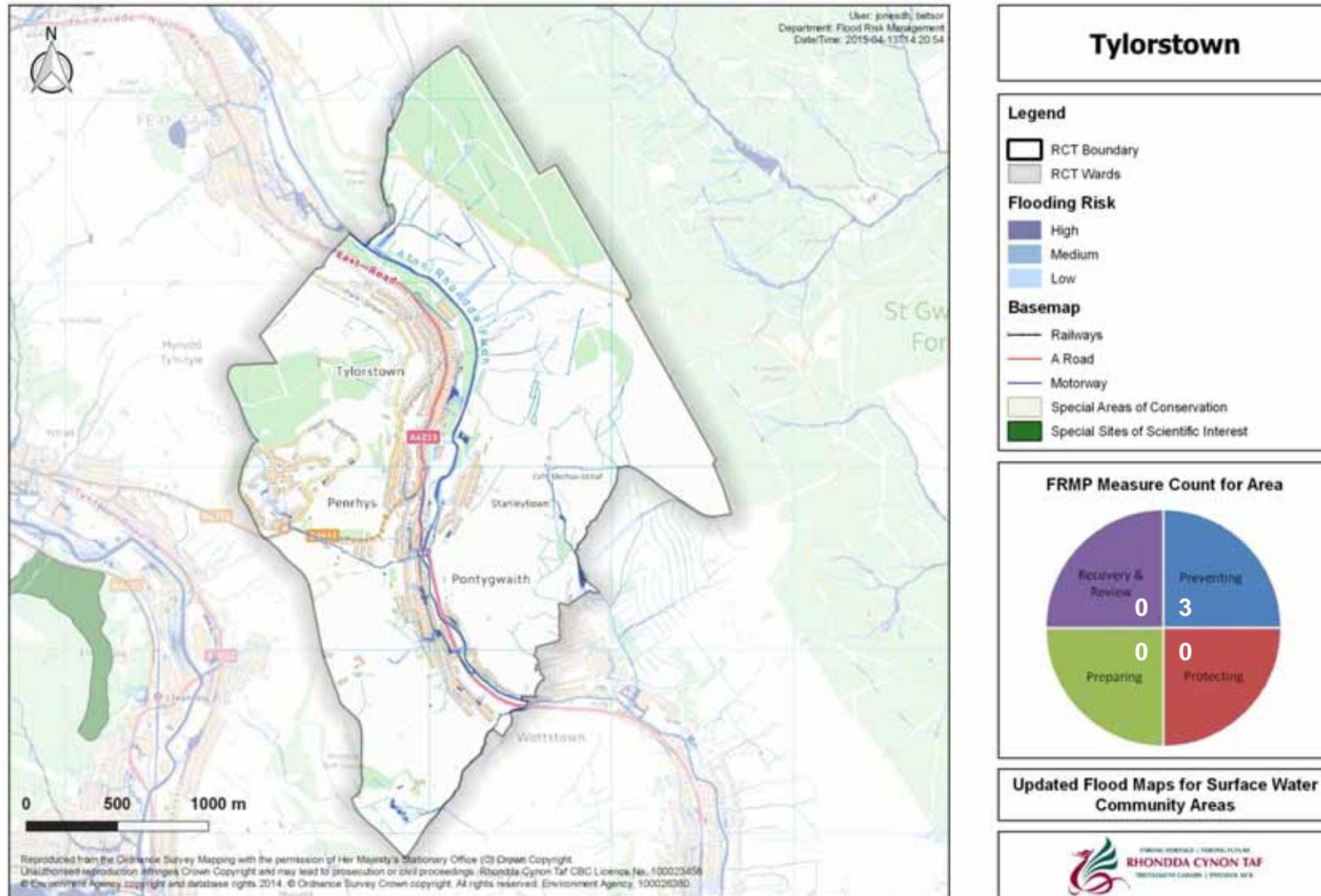
Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Tylorstown and their proposed Flood Risk Management Plan measures are presented in the table below.

Further information regarding the flood investigation area is presented in Appendix A.

**Table 114:** Summary of Flood Risk Management Plan Measures for Tylorstown

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0110	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0111	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0112	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

**Figure 66:** Tylorstown uFMfSW. Risk to people, economic activity and environmental receptors



## **9.49 Tyn-Y-Nant**

### **9.49.1 Overview**

Tyn-y-Nant is situated in the southern sector of Rhondda Cynon Taf County Borough Council, with the towns of Beddau, Tynant and Gwaun Meisgyn. The site has a maximum elevation of 102m AOD covers an area of 92Ha and is therefore the smallest community area within RCT. Tyn-y-Nant has approximately 1,474 residential properties and a population of approximately 3,646.

The majority of Tyn-y-Nant is an urban environment owing to the relatively small area the site covers, as well as the relatively shallow topography of the area. Residential development covers the majority of the site. The northern rural area is predominantly agricultural. There is a small forested area in the south-east.

Tyn-y-Nant is situated within the Afon Elai Catchment. The site is bounded to the east by the Nant Myddlyn which is partially culverted beneath Tynant. The only other watercourse within the site is an unnamed minor watercourse which discharges into the Nant Myddlyn.

The underlying geology of Tyn-y-Nant is the Grovesend Formation of the Upper Carboniferous Coal Measure comprising Mudstone, Siltstone and Sandstone. Glacial Till is present across much of the site. Alluvial Deposits are present along the Nant Myddlyn. Peat is also present in the centre of the site.

### 9.49.2 Conclusions for the UFMfSW

Tyn-y-Nant covers an area of approximately 92Ha with a total population of 3,646. Approximately 2% of the population of Tyn-y-Nant are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Tyn-y-Nant is broadly associated with the Nant Myddlyn with significant flood risk observed along the sections of the watercourse. The flooding is sourced from potential bank breaches and surface runoff.

Commonly, the flow path pattern follows the roads with a low to high risk associated along sections of Heol-Y-Beddau, Commercial Street, Mildred Street, the B4595, Fairview and Woodland Road. There is also a low risk across much of the site. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with culvert inlets.

The map also indicates a low to high flood risk in the south of Tyn-y-Nant. The flooding is largely associated with culvert inlets and is sourced from surface runoff. There is a low to high risk along sections of Caldicott Close, Caldwell Close, Calderton Road and Colbourne Road.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Tyn-Y-Nant are presented in the table below

**Table 115:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Tyn-Y-Nant

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,464	61	71	334
Services	5	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	131	2	0	5
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0.2	0.04	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	0	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	0			
External	6			
Highway	11			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Tyn-Y-Nant and their proposed Flood Risk Management Plan measures are presented in the table below.

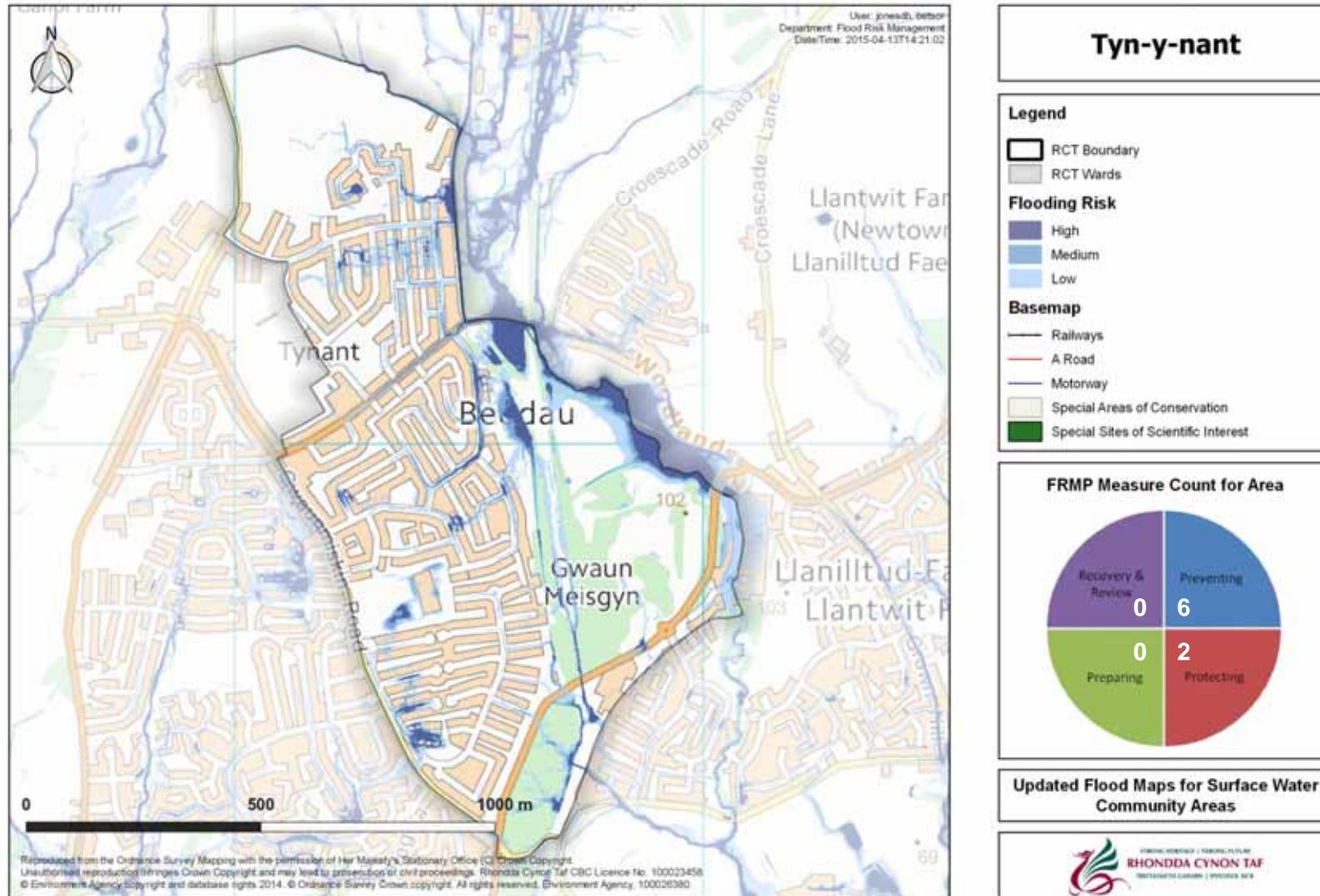
Further information regarding the flood investigation area is presented in Appendix A.

**Table 116:** Summary of Flood Risk Management Plan Measures for Tyn-Y-Nant

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0051	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0113	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0114	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0115	Local	24	Construction of Flood Defences	M33 (Protection)	2016-2021	Proposed	RCTCBC
		28	Pre-Feasibility Studies/Project Appraisal	M35 (Protection)	2016-2021	Proposed	RCTCBC
		30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
		38	Flow Monitoring	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0116	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 67:** Tyn-y-nant uFMfSW. Risk to people, economic activity and environmental receptors



## **9.50 Ynyshir**

### **9.50.1 Overview**

The community area of Ynyshir is located in the central sector of Rhondda Cynon Taf County Borough Council, with the towns of Ynyshir and Wattstown. The site covers an area of 441Ha and has a maximum elevation of 362m AOD. Ynyshir has a population of approximately 3,826 and approximately 1,628 residential properties.

The majority of Ynyshir is a rural environment owing to the steep topography of the highlands in the west and east. Residential development is confined to the base of the Afon Rhondda Fach valley. There is a small industrial estate in the northern sector of the site, adjacent to the Afon Rhondda Fach.

Ynyshir is situated primarily within the Afon Rhondda Catchment. In the east, however, there is a small section which includes the Afon Cynon Catchment. The Afon Rhondda Fach meanders from the west of the site to the south of the site. The northern highlands are drained by the Nant Llechau, which flows from north to south and discharges into the Afon Rhondda Fach.

Several minor watercourses drain the western highlands and are partially culverted beneath residential development. All watercourses discharge into the Afon Rhondda Fach.

The underlying geology of Ynyshir is the Rhondda bed of the Upper Carboniferous Coal Measure comprising Sandstone, Coal, Siltstone and Mudstone. Glacial Till is present along major watercourses. Glaciofluvial, Alluvial and River Terrace Deposits are present along the Afon Rhondda Fach.

### 9.50.2 Conclusions for the UFMfSW

Ynyshir covers an area of approximately 441Ha with a total population of 3,826. Just over 4% of the population of Ynyshir are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Ynyshir is broadly associated with the Afon Rhondda Fach with significant flood risk observed along the length of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches. Commonly, the flow path pattern follows the roads with significant risk associated along sections of the A4233, Ynyshir Road, Whitting Terrace and James Terrace. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with culvert inlets.

The map also indicates a flood risk in the north of the site, along sections of Hillside Terrace and Victoria Terrace. This flood risk extends south across the industrial estates on the northern edge of the A4233. The flood risk is largely associated with the Afon Rhondda Fach, but also the Nant Llechau. The flooding is sourced from potential bank breaches.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Ynyshir are presented in the table below

**Table 117:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Ynyshir

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	3,826	153	82	475
Services	3	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	211	7	3	29
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	6	0	0	0.007
Listed Buildings	2	0	0	0
Licensed Abstractions	0	0	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	3			
External	14			
Highway	16			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Ynyshir and their proposed Flood Risk Management Plan measures are presented in the table below.

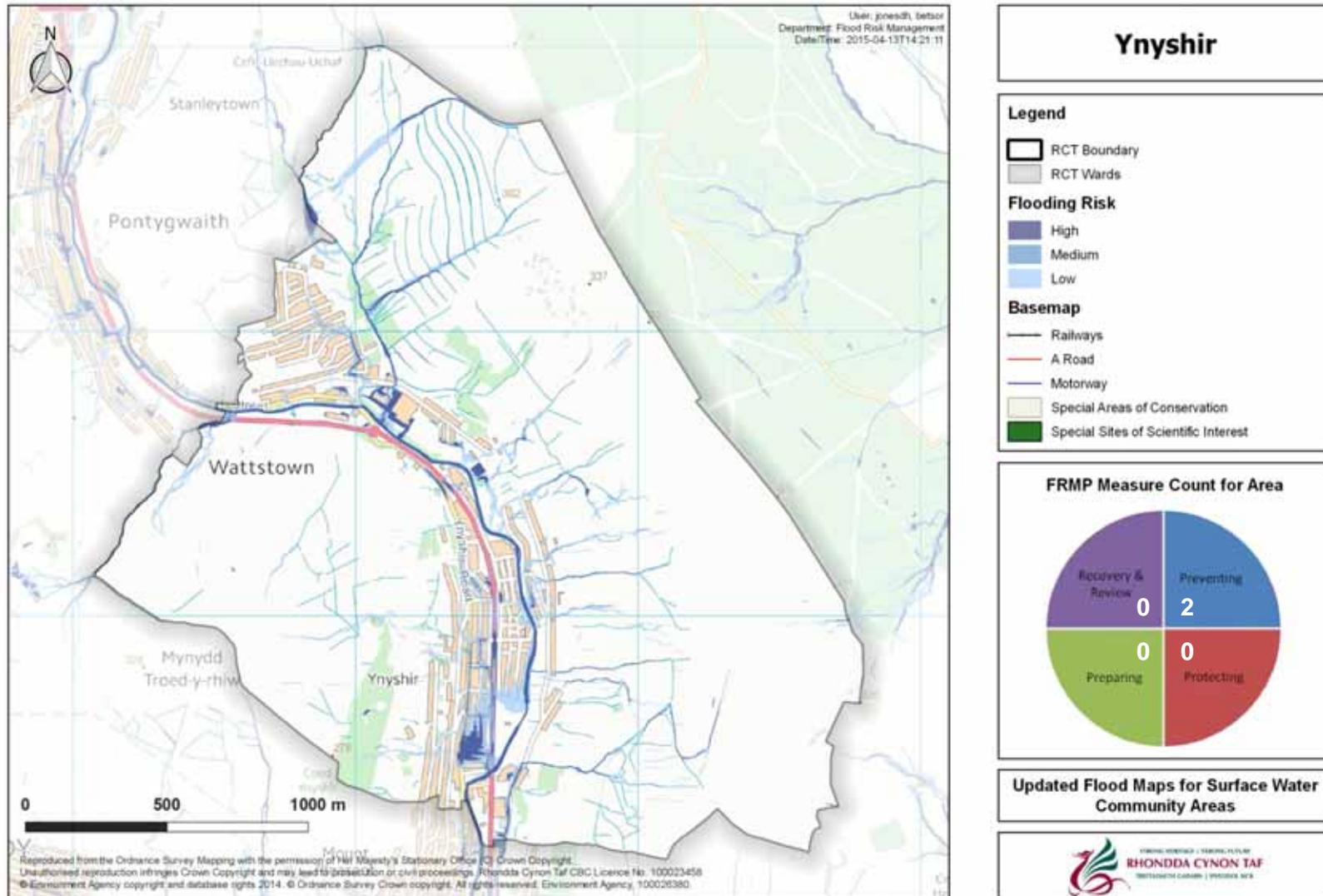
Further information regarding the flood investigation area is presented in Appendix A.

**Table 118:** Summary of Flood Risk Management Plan Measures for Ynyshir

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0071	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0117	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 68:** Ynyshir uFMfSW. Risk to people, economic activity and environmental receptors



## **9.51 Ynysybwl**

### **9.51.1 Overview**

The community area of Ynysybwl is located within the central sector of Rhondda Cynon Taf County Borough Council, to the east of Abercynon. Ynysybwl covers an area of 1,955Ha and has a maximum elevation of 402m AOD. The site has approximately 2,062 residential properties and a population of approximately 4,846.

Ynysybwl is predominantly a rural environment with the highlands in the north comprising the St Gwynno Forest. Residential development is confined to the floor of the Nant Clydach valley. The south-west of the site is comprised of agricultural land.

The majority of Ynysybwl lies within the Afon Cynon Catchment; however, a small section in the west includes the Afon Rhondda Catchment. The catchment of the Nant Clydach covers much of the site. The Nant Clydach drains the highlands in the north and flows from north to south through the entirety of the site, discharging into the Afon Taf.

The underlying geology of Ynysybwl is the Brithdir and Hughes Beds of the Upper Carboniferous Coal Measure, which are formed of Sandstone, Siltstone, Mudstone and Coal. Glacial Till is present along major watercourses. Glaciofluvial and Alluvial deposits are present along the Nant Clydach.

### 9.51.2 Conclusions for the UFMfSW

Ynysybwl covers an area of approximately 1,955Ha with a total population of 4,846. Just over 1% of the population of Ynysybwl are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Ynysybwl is broadly associated with the Nant Clydach with significant flood risk observed along sections of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

The flow path pattern generally follows the roads with a low to high risk associated along sections of Clydach Road, Robert Street and New Road. There is also a lower risk across much of the site. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with culvert inlets.

The map also indicates a significant amount of flood risk across rural areas within the community area of Ynysybwl. This flooding may also have contributions from Main River flooding. No properties, economic or environmental receptors are affected by this flooding

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

**A summary of the counts for Ynysybwl are presented in the table below**

**Table 119:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Ynysybwl

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	4,846	71	33	306
Services	6	0	0	0
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	451	4	2	25
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	0.4	0	0	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0	0	0	0
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0	0	0	0
Listed Buildings	3	0	0	0
Licensed Abstractions	10	1	1	1
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	4			
External	15			
Highway	42			

Review of the community area has highlighted additional ‘flood investigation areas’. A summary of the flood investigation areas that lie within Ynysybwl and their proposed Flood Risk Management Plan measures are presented in the table below.

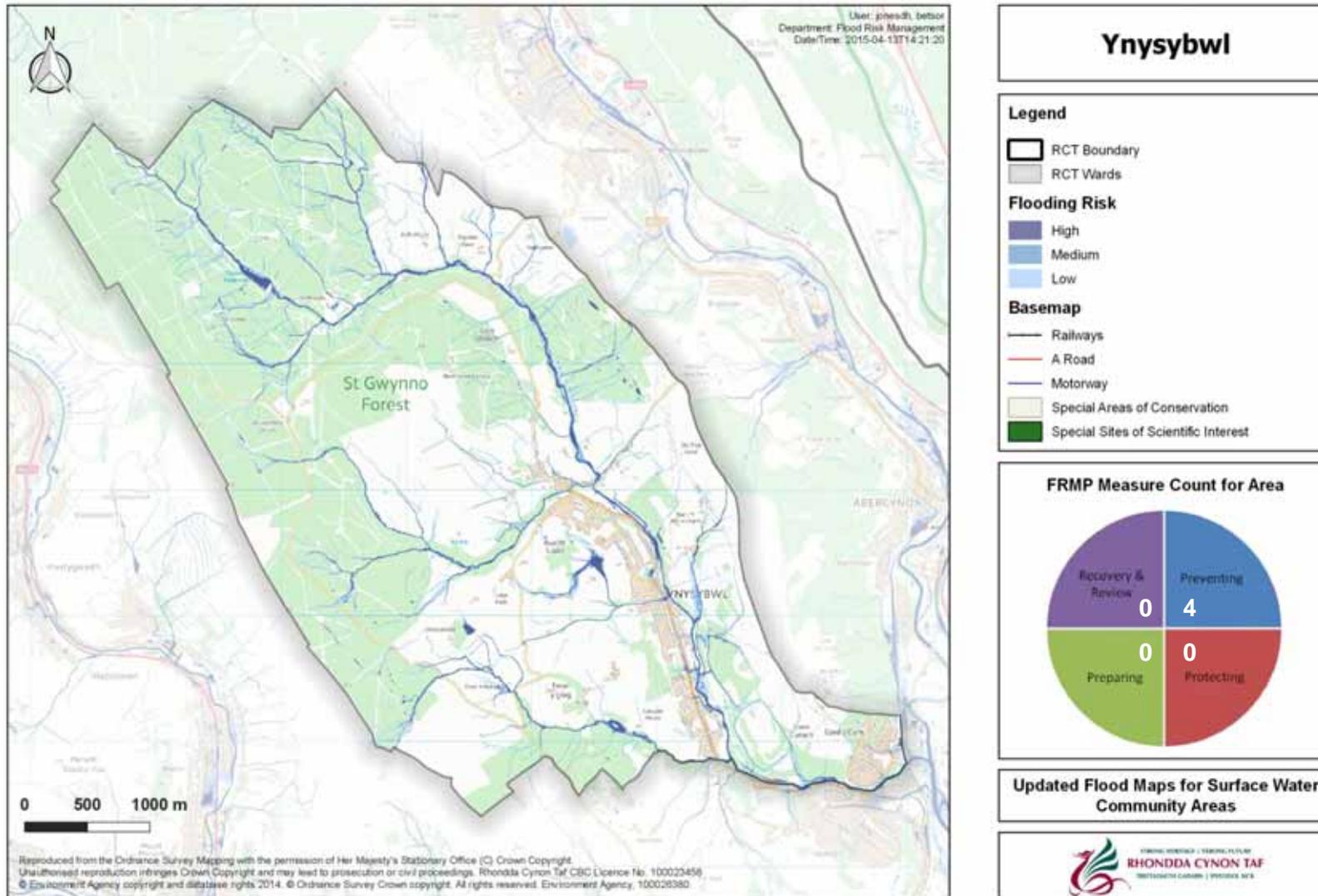
Further information regarding the flood investigation area is presented in Appendix A.

**Table 120:** Summary of Flood Risk Management Plan Measures for Ynysybwll

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0118	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0119	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0120	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0135	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 69:** Ynysybwl uFMfSW. Risk to people, economic activity and environmental receptors



## **9.52 Ystrad**

### **9.52.1 Overview**

The community area of Ystrad is located in the western sector of Rhondda Cynon Taf County Borough Council with the towns of Gelli, Ystrad Rhondda and Ystrad. The site covers an area of 717Ha and has a maximum elevation of 455m AOD. Ystrad has a population of approximately 6,399 and approximately 2,723 residential properties.

Ystrad is predominantly a rural environment with highlands in the west and east remaining largely undeveloped. Residential development is confined to the valley floor of the Afon Rhondda. There is a small industrial estate located in the centre of the site, adjacent to the Afon Rhondda.

Ystrad lies within the Afon Rhondda Catchment. The Afon Rhondda is relatively dynamic within the site, with a number of large meanders allowing for more development across the valley floor. The highlands in the east are drained by the catchment of the Nant-y-Lamb. The highlands in the west are drained by the Nant y Gelli, which also forms the border between the community areas of Ystrad and Pentre.

Several minor unnamed watercourses also drain the highlands and are partially culverted beneath residential developments. All watercourses discharge into the Afon Rhondda.

The underlying geology of Ystrad is the Llynfi and Rhondda Beds of the Upper Carboniferous Coal Measure, and the Middle Carboniferous Coal Measure. All comprise Sandstone, Siltstone, Coal and Mudstone. Glacial Till is present along major watercourses. Glaciofluvial, Alluvial and Alluvial Fan Deposits are present along the Afon Rhondda.

### 9.52.2 Conclusions for the UFMfSW

Ystrad covers an area of approximately 717Ha with a total population of 6,399. Just over 7% of the population of Ystrad are at high risk of surface water flooding.

The UFMfSW indicate that the highest risk posed to people and properties within Ystrad is broadly associated with the Afon Rhondda with significant flood risk observed along the length of the watercourse. The flooding is sourced from culvert inlets and potential bank breaches.

Commonly, the flow path pattern follows the roads with significant risk associated along sections of Gelli Road, Smith Street, Avondale Road, Rees Street, Farm Road, Oak Street, Lloyd Street, Park View, Taff Street and Union Street. There is also a lower risk across much of this area. Flood risk is posed to property where the capacity of the roads is exceeded, flowing through properties.

The flood risk presented within the UFMfSW correlates with historic flooding incidents reported to Rhondda Cynon Taf. Highways in the area have previously been flooded, commonly associated with culvert inlets.

Surface runoff is also noted along sections of Shady Road and Princess Street, William Street, River Street, Cross Street, Victoria Street, Penrhys Road, Tyntyla Road and Sherwood Street. The flood risk is sourced from culvert inlets. It is likely that it also has Main River contributions.

The map also indicates a significant amount of flood risk across within the floodplain of the Afon Rhondda, along the southern border of the site. This flooding is predominantly associated with Main River flooding. No properties or environmental receptors are affected by this flooding.

In some circumstances people may be at risk from a combination of sources including both surface runoff and ordinary watercourse. Within areas adjacent to the Main River, it is considered that people may be at risk from both surface water flooding and Main River flooding, which may result in double counting.

**Culverts are not represented within the modelling process and it is considered that the risk posed from ordinary watercourses is overstated.**

A summary of the counts for Ystrad are presented in the table below

**Table 121:** Summary flood risk from surface water to people, economic activity and the natural and historic environment within Ystrad

Risk to People and Property	Total in defined area	Risk Counts		
		defined area at high risk	defined area at medium risk	defined area at low risk
<b>RISK TO PEOPLE AND PROPERTIES</b>				
People (n) (multiplier 2.35)	6,399	449	385	1067
Services	6	0	0	1
<b>ECONOMIC ACTIVITY</b>				
Non Residential Properties	393	17	15	50
Airports	0	0	0	0
Roads (km)	0	0	0	0
Railways (km)	2	0.03	0.1	0
Agricultural Land (hectares)	0	0	0	0
<b>RISK TO ENVIRONMENTAL RECEPTORS</b>				
Bathing Waters	0	0	0	0
EPR Installations	0	0	0	0
Special Area of Conservation (SAC)	0	0	0	0
Special Areas of Protection (SPA)	0	0	0	0
Ramsar	0	0	0	0
World Heritage Sites	0	0	0	0
Sites of Special Scientific Interest (SSSI)	0.2	0.06	0.01	0.02
Parks and Gardens	0	0	0	0
Scheduled Ancient Monuments	0.2	0	0	0
Listed Buildings	2	0	0	1
Licensed Abstractions	2	1	0	0
<b>HISTORIC FLOOD INCIDENTS</b>				
Internal	6			
External	27			
Highway	57			

Review of the community area has highlighted additional 'flood investigation areas'. A summary of the flood investigation areas that lie within Ystrad and their proposed Flood Risk Management Plan measures are presented in the table below.

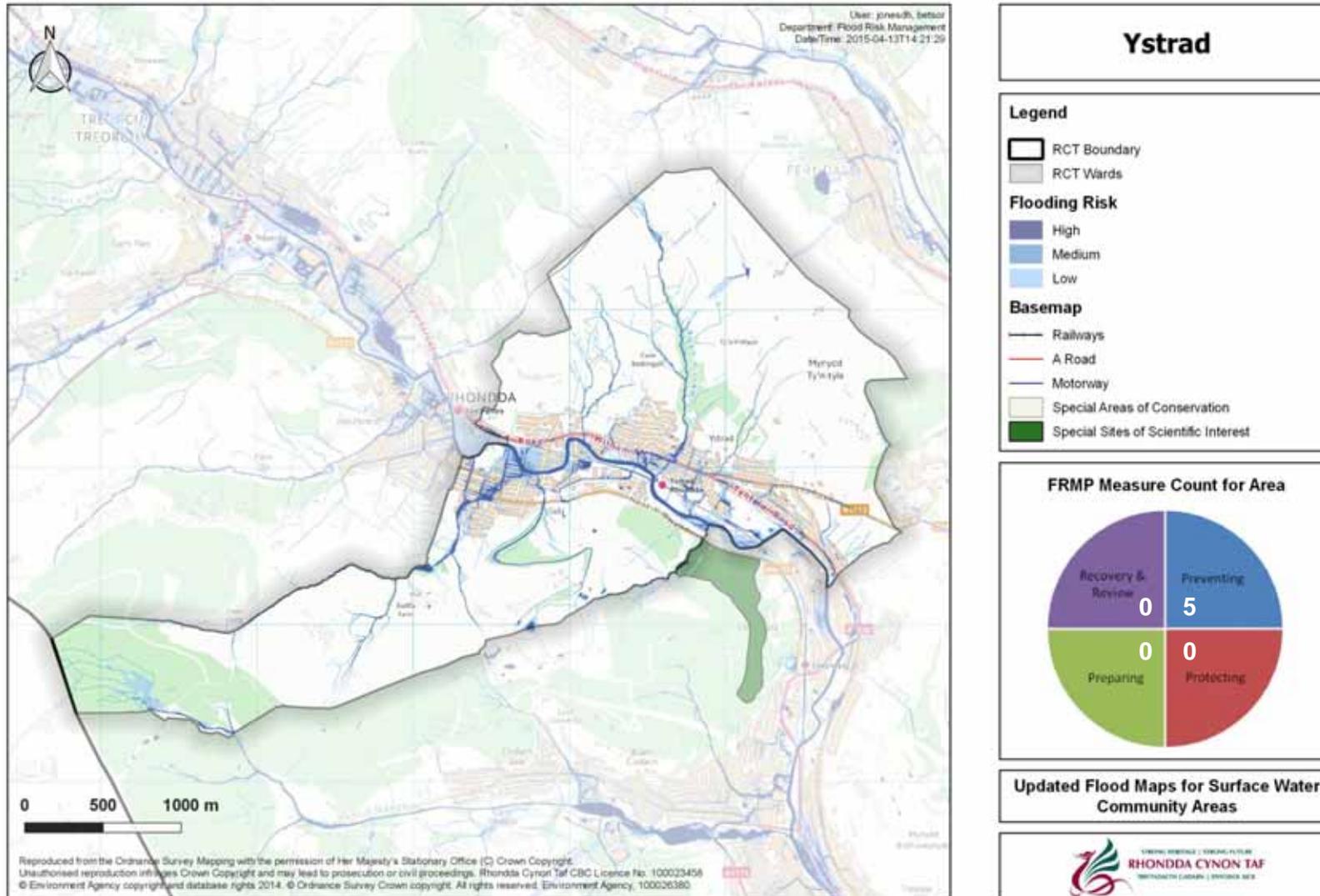
Further information regarding the flood investigation area is presented in Appendix A.

**Table 122:** Summary of Flood Risk Management Plan Measures for Ystrad

Location	Source	FRMP Measure Number	FRMP Measure Title	Measure Type	Timing	Measure Status	Responsible Authority
RCT0052	Local / Main River	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0061	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0121	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales
RCT0122	Local	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC
RCT0123	Local / Main River*	30	Surface Water Modelling	M24 (Prevention)	2016-2021	Proposed	RCTCBC / Natural Resources Wales

\*Natural Resources Wales are responsible for flooding from Main River. Further consideration of the interaction of Surface Water Flooding and Main River Flooding sources is required to understand the flood extents and sources.

**Figure 70:** Ystrad uFMfSW. Risk to people, economic activity and environmental receptors



## 10.0 COST BENEFIT OF PROPOSED MEASURES

### 10.1 Implementation of Measures

It is a requirement of the Flood Risk Regulations 2009 that a cost benefit methodology is attributed to the plan, when available. Previously, Rhondda Cynon Taf County Borough Council have benefitted from revenue grant funding from the Welsh Government in order to undertake the requirements of legislation and other flood risk management operations.

From April 2015, a new grant covering the full range of the Environment and Sustainable Development Directorate has been introduced. The work undertaken using this funding must fall within the remit of the Environment and Sustainable Development Directorate and complement the minister's priorities. It is the intention of Rhondda Cynon Taf County Borough Council to continue to bid for revenue grant funding in order to maintain the flood risk status quo, via the implementation of the measures attributed to the whole borough and Rhondda Cynon Taf County Borough Council and within the indicative flood risk area, as detailed in Section 7 and Section 8.

There is also the potential for funding to be sourced from the application for project funding from a third party to the Welsh Government. In these circumstances, Rhondda Cynon Taf County Borough Council would look to work in partnership to third party applicants.

Physical measures implemented as a result of a need highlighted within this document within Flood Investigation Areas will be screened and implemented in accordance with the requirements and with reference to Environment Agency publication 'Flood and Coastal Erosion Risk Management Appraisal Guidance (FCERM-AG), and the 'Handbook for Economical Appraisal 2014', prepared by the Flood Hazard Research Centre.

The Welsh Government is responsible for development of policy on flood and coastal erosion risk management in Wales and sets priority for funding to ensure investment is targeted in a sustainable way. Where applicable, Rhondda Cynon Taf County Borough Council will seek alternative funding from Welsh Government. These potential funding avenues are further discussed below.

### 10.2 Funding Mechanisms

The majority of funding for flood and coastal erosion risk management in Wales come from the Welsh Government. *As the level and nature of risk changes in the future, Welsh Risk Management Authorities will need to find other sources of funding to ensure that communities across Wales receive the levels of funding they need to manage the risks they face (Welsh Government, FCERM, 2011).*

Due to increasing funding constraints the Welsh Government has proposed a number of actions within its NFRMS to enable more efficient and effective spending on flood and coastal erosion risk management in Wales, namely:-

- Prioritisation of investment and the funding of projects set out in a long term investment plan;
- Joint funding for multiple benefits (particularly with regard to regeneration and transport investment) will be maximised;
- Beyond 2015, other sources of European funding will be sought;
- Contributions from the private sector will be expected to contribute to project costs where private assets are being protected;
- The levy raising powers of Flood Risk Management Wales (Natural Resources Wales' Regional Flood and Coastal Committee for Wales) may need to be exercised; and
- When setting future budgets, Local Authorities may need to factor in additional expenditure on flood risk management within their area.

The following sections outline the current and future potential funding streams which could be utilised to pay for measures contained within the LFRMS.

### **10.2.1 Flood Defence Grant in Aid (FDGiA)**

The Welsh Government is responsible for development of policy on flood and coastal erosion risk management in Wales and sets priority for funding to ensure investment is targeted in a sustainable way. The Welsh Government provides the mainstream funding for LLFAs in Wales in the form of Flood Defence Grant In Aid (FDGiA) funding. Flood Defence Grant in Aid is allocated on the basis of project appraisal outcomes where these identify the most cost beneficial solution to the problem and provide the justification for the for the most appropriate and preferred option.

### **10.2.2 Community Infrastructure Levy**

The Community Infrastructure Levy (CIL) allows Local Planning Authorities to raise funds from certain types of development to pay for the strategic infrastructure required to support the delivery of the Local Development Plan.

CIL could support infrastructure including transport, schools, libraries and flood defences (amongst others). The Council will determine in due course through the CIL process what infrastructure will be funded through CIL.

### **10.2.3 European Funding**

Funding from the European Union is designed to align the economic prosperity of the various regions of Europe. Of particular relevance to Rhondda Cynon Taf County Borough Council is the European Regional Development Fund (ERDF).

### **10.2.4 Section 106 Funding – Developer Contributions**

Local Authorities can potentially require developers to carry out works on sites (including flood and coastal erosion risk management works) under Section 106 of the Town and Country Planning Act 1990.

### **10.2.5 Local Fundraising**

Partnership funding between public and private sectors and local communities could be adopted as a means of funding projects which are mutually beneficial to all groups.

### **10.2.6 Other Possible Sources of Funding**

Partnership working/funding between Risk Management Authorities will also be considered as a way of achieving flood risk management objectives which are of mutual interest to parties

## **11.0 CONSULTATION**

To accord with the requirements of the Flood Risk Regulations 2009, Rhondda Cynon Taf County Borough Council has undertaken a period of consultation on the FRMP - between the 14<sup>th</sup> September 2015 and the 30<sup>th</sup> October 2015.

The FRMP has been advertised to the public via appropriate media streams, such as the Rhondda Cynon Taf County Borough Council website, and has also been placed in council buildings across the borough.

In addition to the public consultation, the document has been advertised on digital formats for other risk management authorities to access.

To allow contributions and opinions to be recorded, the FRMP document was accompanied by a summary document and questionnaire. A summary of the consultation responses received; and subsequent amendments to the FRMP that were deemed appropriate to address these comments, is provided in an accompanying consultation report.

## **12.0 MONITORING AND REVIEW**

Natural Resources Wales will undertake a formal review of this document prior to its publication on the 22<sup>nd</sup> December 2015. The Flood Risk Regulations 2009 require review to be undertaken on a six year cycle. Following the reviews, the document will be updated to reflect the amendments required, notably an assessment on the impact of climate change on the implemented measures.

This Flood Risk Management Plan will undergo review on an annual basis to assess the measures implemented. This will allow adequate action to be taken to address any shortcomings and ensure that the measures implemented within this document are completed.