

# Investigation Report into Flooding Incident of 3rd September 2016 Gough Road, Ystalyfera



**Neath Port Talbot**  
**Castell-nedd Port Talbot**  
County Borough Council Cyngor Bwrdeistref Sirol

Highways and Drainage Services  
Environment Directorate  
Neath Port Talbot County Borough Council  
The Quays  
Brunel Way  
Briton Ferry  
Neath  
SA11 2GG

## Revision Schedule

---

<b>Version</b>	<b>Prepared by</b>	<b>Reviewed by</b>	<b>Approved by</b>	<b>Date</b>
<b>Rev 1</b>	James Davies (Drainage Officer)	Steve Owen (Highways and Drainage Manager)	Mike Roberts (Head of Streetcare)	March 2017

# Contents

---

Revision Schedule .....	1
Contents.....	2
1. Introduction .....	3
2. Flood Incident .....	4
2.1. Location of Flooding.....	4
2.2. Rainfall Event .....	4
2.3. Flood Extent.....	6
2.4. Site Characteristics.....	6
2.5. Drainage Networks and Paths .....	7
2.6. Detailed Investigation Findings .....	8
2.7. Summary of Investigation Findings.....	12
3. Recommended Actions .....	13
4. Appendices.....	14
4.1. Appendix A - Duty to Investigate.....	14
4.2. Appendix B - Risk Management Authorities Responsibilities.....	16

# 1. Introduction

---

An investigation has been undertaken by Neath Port Talbot Council as Lead Local Flood Authority in response to the flooding that occurred at Gough Road, Ystalyfera on 3<sup>rd</sup> September 2016. This report is a summary of the investigation and includes relevant information required to meet the statutory requirements placed on the Authority by Section 19 of The Flood and Water Management Act 2010. Information regarding the duties and responsibilities placed on a Lead Local Flood Authority to investigate flooding can be found in Appendix A.

One of the requirements of Section 19 is that an investigation report must identify which Risk Management Authorities (RMA's) have relevant flood risk management functions. Appendix B provides a summary of the roles and responsibilities of the RMA's within Neath Port Talbot.

Through the investigation process, it was determined that the relevant RMA's are:

- NPTCBC as Lead Local Flood Authority
- Dwr Cymru Welsh Water as the water company

In addition, it was found that a number of land owners and those with riparian responsibilities are relevant in this instance.

The flooding of Gough Road occurred between 18:00hrs and 19:00hrs on Saturday 3<sup>rd</sup> September 2016 following a period of very intense localised rainfall, which fell on top of a 10 hour period of continuous rain.

Some short term measures have already been undertaken by NPTCBC to reduce the flood risk in the area, however there remain a number of recommended actions as set out in the report.

## 2. Flood Incident

---

### 2.1. Location of Flooding

Gough Road is located on the East side of Mynydd Allt-Y-Grug in the electoral ward of Ystalyfera which is situated in the upper Swansea valley. The upper Swansea valley is located in the North West of Neath Port Talbot County Borough.

### 2.2. Rainfall Event

On Saturday 3<sup>rd</sup> September 2016, there was continuous rainfall across the County Borough between the hours of 08:00 and 21:00. The communities situated in the North West of the authority received the highest levels of rainfall throughout the day.

Between the hours of 08:00 and 18:00, the Authority's emergency out of hours contact centre received very few calls, with no real issues being reported. However at approximately 18:00hrs, intense rainfall fell across the North West of the County Borough causing numerous flooding incidents. Figure 1 below illustrates the levels of rainfall that fell on Ystalyfera throughout the day on 3<sup>rd</sup> September 2016.

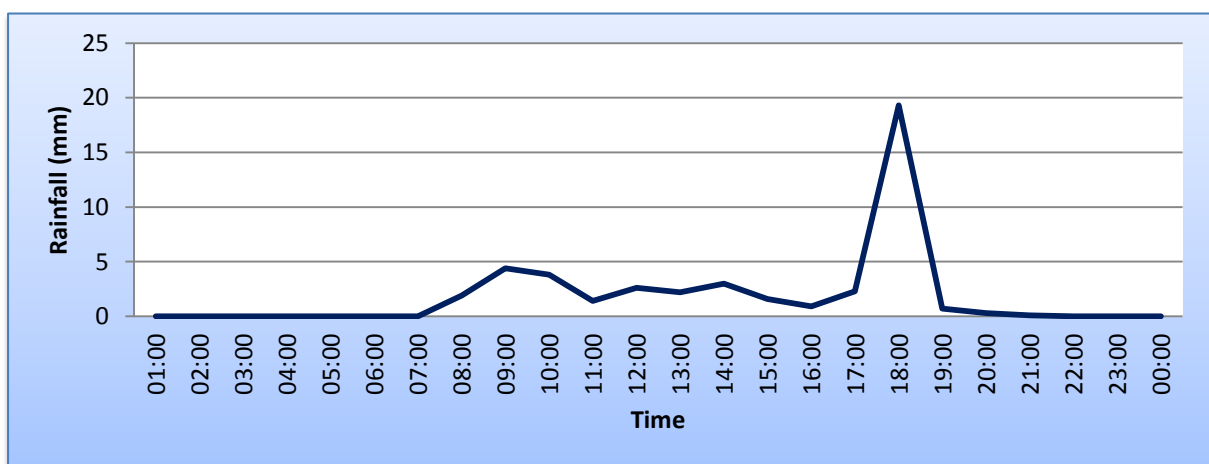


Figure 1, Rainfall in Ystalyfera on 3rd September 2016 (Rainfall data provided by MetDesk Limited)

The graph identifies that between 18:00hrs and 19:00hrs the average rate of rainfall in Ystalyfera was approximately 19.3mm/hr. However when studying the five minute rainfall radar over the same period, it was found that the peak rainfall intensity during that hour reached between 50-100mm/hr. A screenshot of the rainfall radar produced by NPTCBC's weather forecasters MetDesk

Limited can be seen in Figure 2. The period where the rainfall intensity peaked above 50mm/hr was the time that numerous communities throughout the North West of the County Borough began to suffer from surface water, ordinary watercourse and river flooding. After 19:00hrs the rainfall intensity significantly reduced until it stopped completely by 21:00hrs.

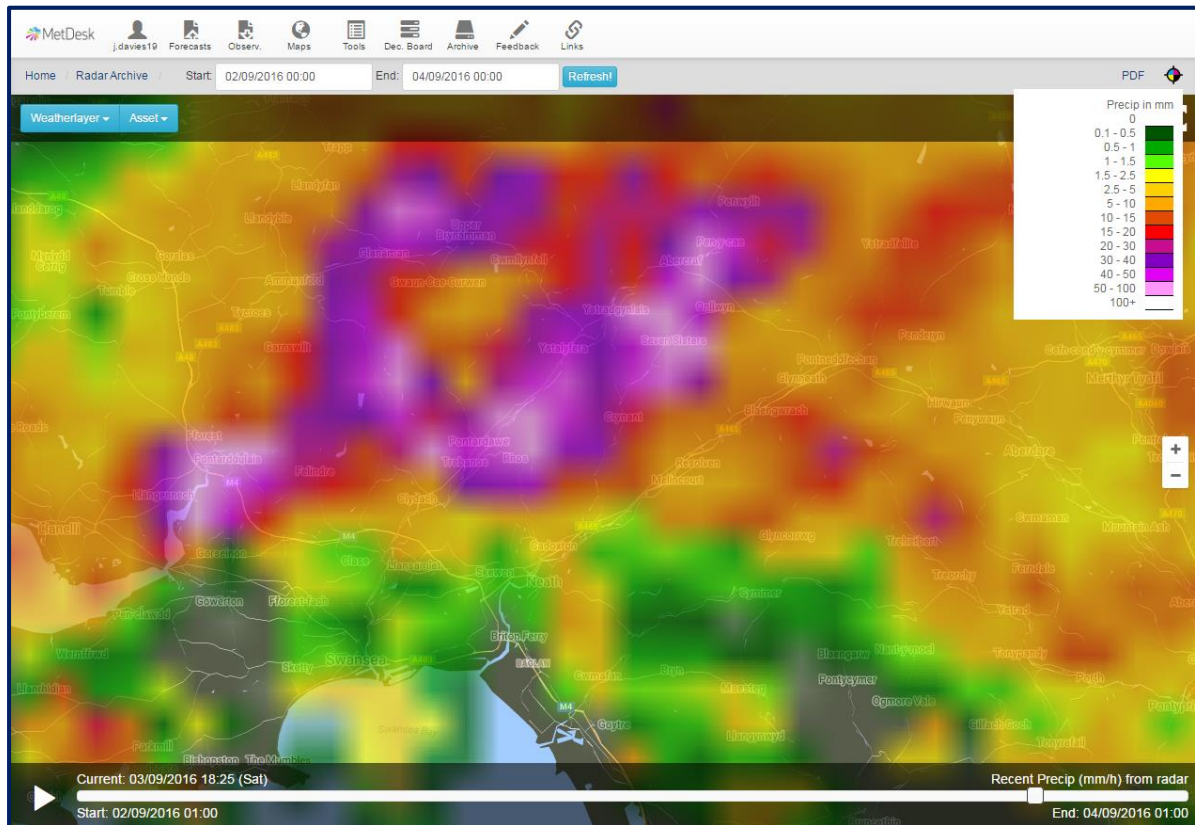


Figure 2, Screenshot of radar imagery showing precipitation levels at 18:25 on 3rd September 2016 (Provided by MetDesk Limited)

### 2.3. Flood Extent

A number of properties located at the South end of Gough Road suffered internal flooding on 3<sup>rd</sup> September. Figure 3 illustrates the general location of the properties that were affected by flooding.

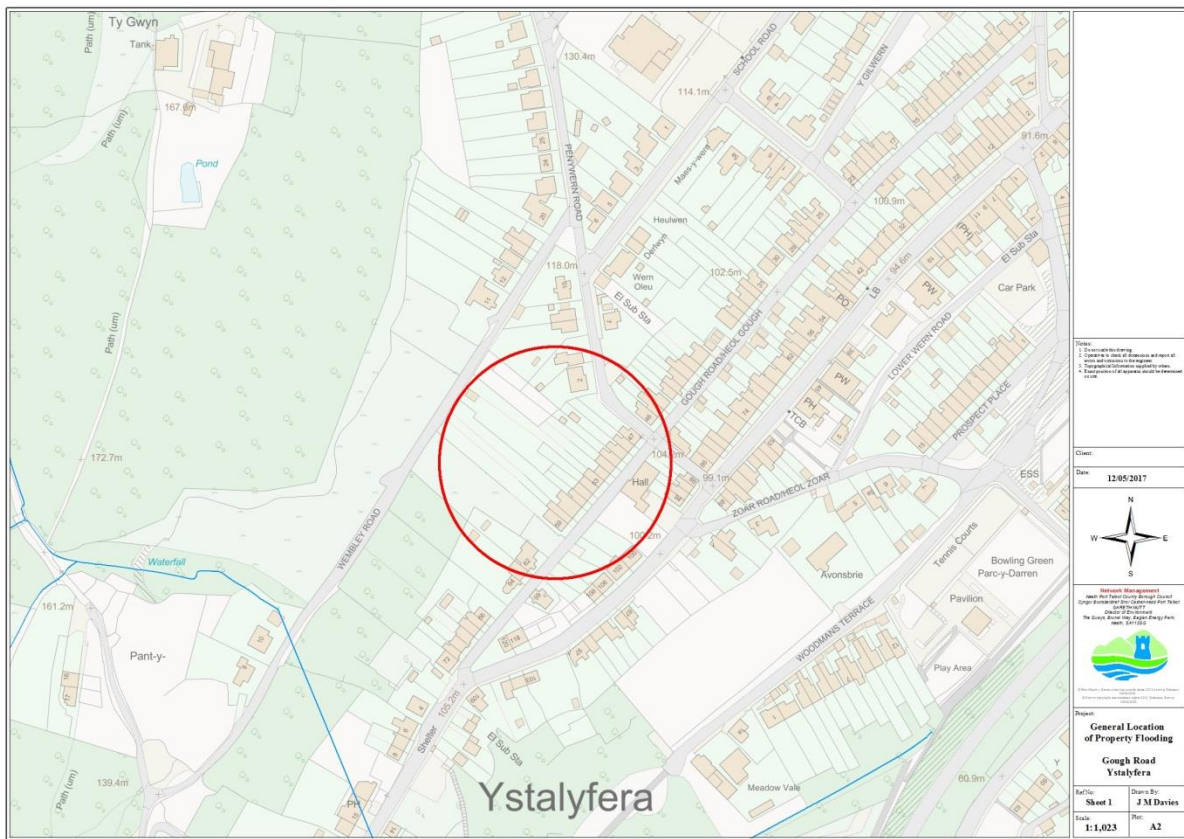


Figure 3, General location of properties affected by the flood event on 3<sup>rd</sup> September 2016

### 2.4. Site Characteristics

The terraced properties of Gough Road are located on the south east face of Mynydd Allt Y Grung which lies in the upper reaches of the Swansea Valley in Ystalyfera. The sub catchment of Ystalyfera which forms part of the large Twrch and Tawe fluvial catchment is approximately 466 ha in size and encompasses the study area.

The area has a history of mining activity due to its underlying geology and there are many springs and small un-named watercourses that originate from the hillside which can dry up in the summer months but can also quickly reappear particularly during heavy rainfall. The land above Gough Road is made up of exposed moorland that is covered in loamy/peaty soils; this then changes to

further freely draining soils covered in vegetation and trees which are situated directly on top of bed rock as you move down the mountain side.

The surface water drainage network in the area consists of two culverts, one to the east and one to the west of the study area. The culverted watercourses take a number of tributaries that drain the land above Wembley Road and Pant Y Gwanyd Row as well as highway drainage from Pen y Wern Road. It is notable that the foul sewers for the study location are positioned to the rear of the properties and drain out to Gough Road at either end of the terraced block.

Wembley Road, which is an un-adopted Road, is owned by an individual land owner across its length and forms the boundary of the rear gardens on Gough Road. The lane is made up of earth and stone which links Pen y Wern Road to Graig Y Merched and falls in a North Easterly direction. There is very little drainage related to the lane other than a small ditch and piped crossing towards the houses on Pen Y Wern which was observed to take surface water runoff and groundwater from the vegetated land immediately above the lane. Furthermore the road was above the gardens on Gough road and had no upstand that would prevent/divert water away from the gardens down towards the ditches previously mentioned.

## 2.5. Drainage Networks and Paths

The water that caused the flooding to the properties on Gough Road emanated from the steep mountainside located above Wembley Road. It is believed that the water passed over Wembley Road itself and then ran down the steep rear gardens of the properties situated on Gough Road before flooding the properties internally. Once the water had entered the properties it continued to flow through the ground floor and out of the front doors before continuing down Gough Road, Pen-y-Wern Road and Wern Road. The flow path of the flood water has been illustrated in Figure 4 below.



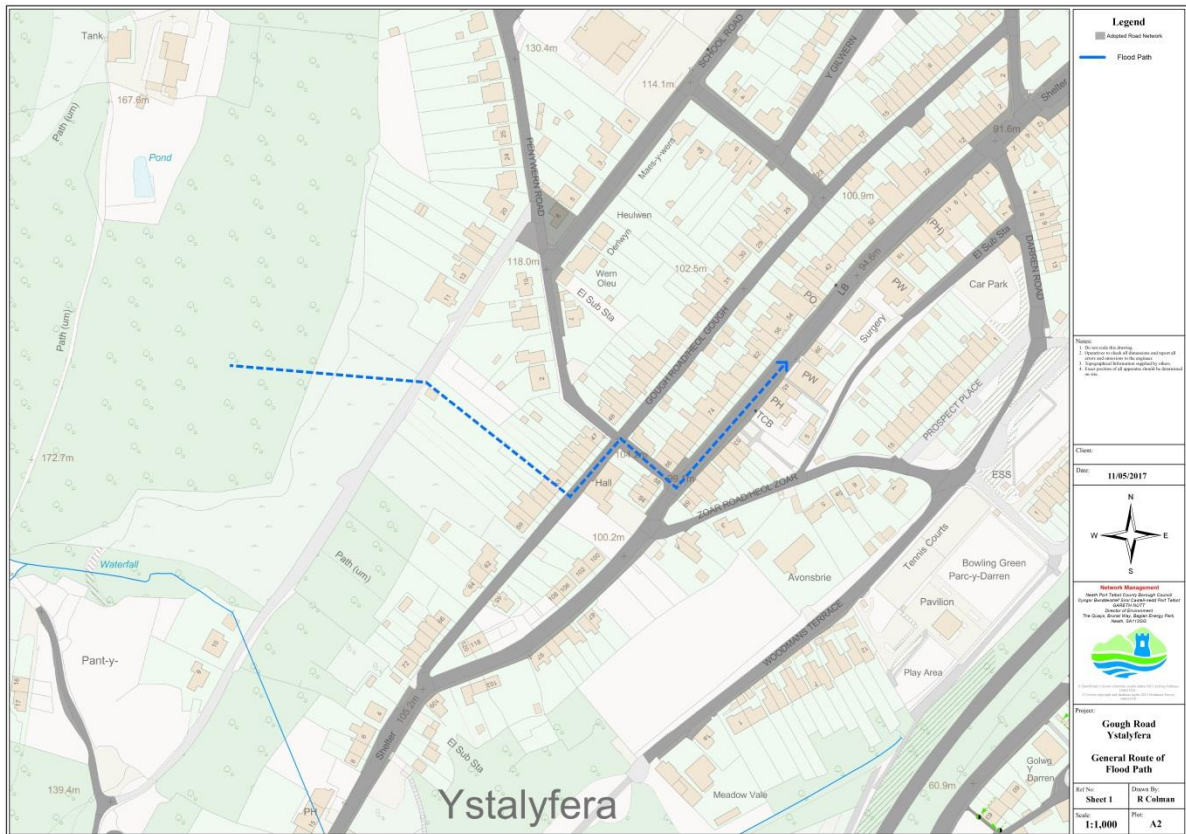


Figure 4, Map showing the flow route of surface water affecting Gough Road

## 2.6. Detailed Investigation Findings

There have been no previous flooding incidents reported to the Authority similar to that which was experienced on 3<sup>rd</sup> September 2016 to the rear of the properties located on Gough Road.

Figure 5 identifies the location of Webley Road, whilst also indicating the flood risk management assets that are located within the vicinity of the flood incident. The plan also identifies two locations where construction/clearance work has been undertaken in recent years.

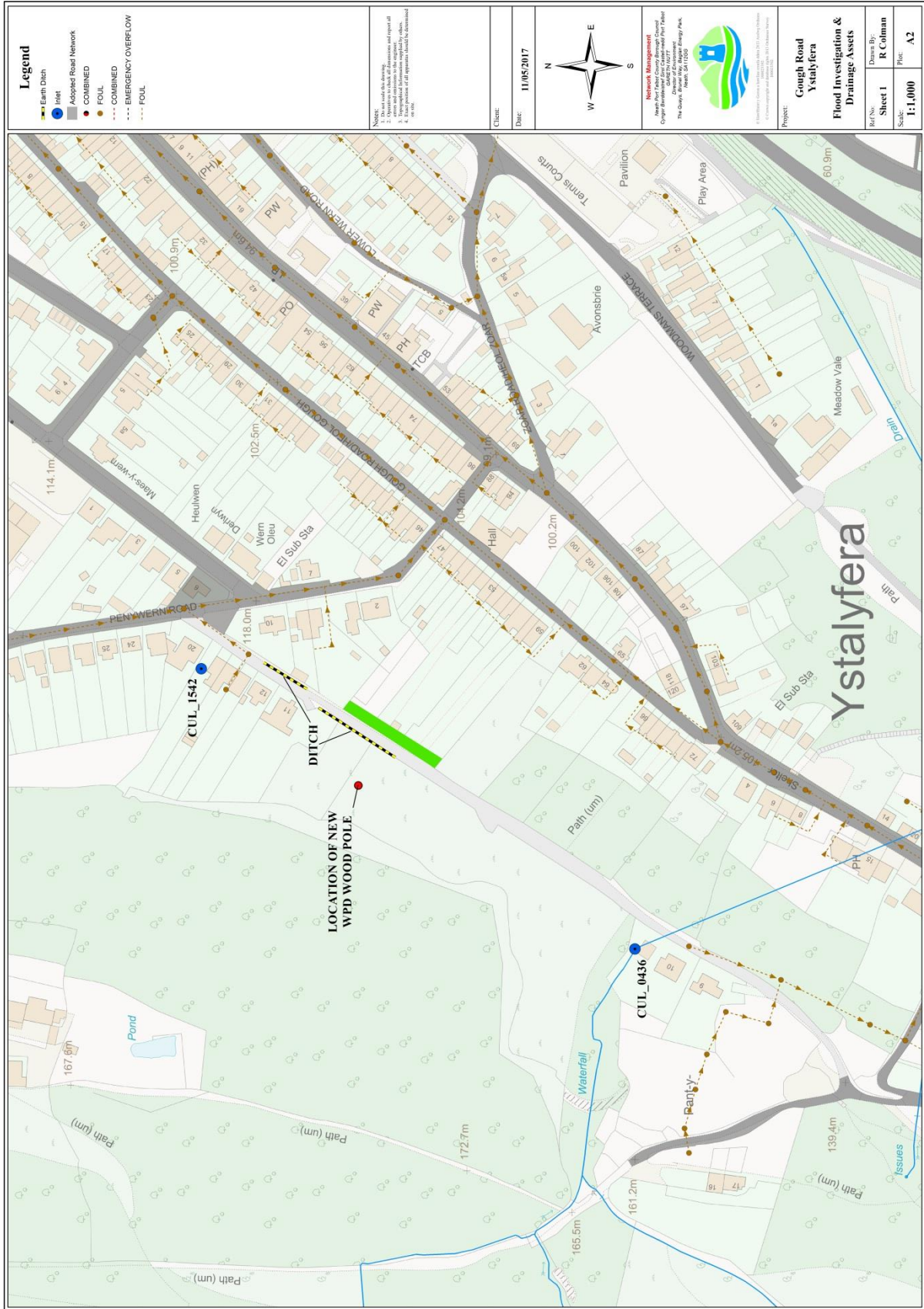


Figure 5, Key assets/issues at the rear of Gough Road

The Culvert (ID: CUL\_0436), indicated by a blue point on the left hand side of Figure 5, collects a number of small watercourses from the mountainside before conveying them underneath Wembley Road to the Swansea Canal. Investigations identified that minor works had previously been undertaken by the Authority to improve the intake structure including a new grid and dwarf wall. The works were undertaken using the Council's permissive powers under the Land Drainage Act whilst the landowner was informed at the time that maintenance liability for the system rested with them as the riparian owner. It is believed that Culvert ID: CUL\_0436 did not contribute to the flood water that affected the properties on Gough Road.

The Culvert (ID: CUL\_1542), indicated by a blue point in Figure 5, is a land drainage culvert that collects surface water from behind the properties situated at the North East end of Wembley Road before conveying it via a 225mm diameter piped watercourse down Penywern Road. As Wembley Road falls to the North East, it is believed that this culvert did not contribute to the flood water that affected the properties on Gough Road.

A ditch runs adjacent to Wembley Road for approximately 40-50m in length and collects surface/ground water that emanates from the mountainside above Wembley Road and conveys it to an intake structure/gully opposite number 12 Penywern Road. The ditch is indicated by a dashed black and yellow line on Figure 5. It is located on the private land adjacent to the un-adopted highway. The intensity and volume of rainfall that fell on 3<sup>rd</sup> September 2016 far exceeded the capacity of the ditch and intake structure, allowing surface water to flow over Wembley Road and into the rear gardens of the properties on Gough Road.

Western Power Distribution recently undertook work to install a new wooden post on the private land located on the hillside above Wembley Road, indicated by a red point on Figure 5. Vegetation was removed on the hillside to gain access to the location at which the work was undertaken. It is the belief of some residents that were affected by the flooding that the work undertaken by Western Power Distribution disturbed a culvert/spring, hence contributing to the problem. Drainage officers have been unable to confirm this assertion as there is no clear evidence of a watercourse or spring at the location. The track that was created to gain access to the works location would however have conveyed surface water that fell on the hillside.

As previously identified, there is currently no upstand at the boundary of Wembley Road and the rear gardens of the affected properties on Gough Road. This location is indicated by a green polygon on Figure 5. Figure 6 is a photograph taken two days after the flood incident showing the boundary of Wembley Road and the rear gardens of the properties situated on Gough Road.



Figure 6, Photograph of Wembley Road taken on 5th September 2016

Figure 7 is a photograph that was taken in June 2006, showing significant vegetation growth on the boundary of Wembley Road and the rear gardens of Gough Road.



Figure 7, Photograph of Wembley Road taken on 2<sup>nd</sup> June 2006

It is believed the vegetation has been cleared over the years to allow access to the rear of the properties on Gough Road, which the land currently is being used to park vehicles and caravans as shown in Figure 6. The removal of the vegetation on the boundary to allow for vehicle parking and access means that there is nothing to deter surface water from flowing over Wembley Road and down the rear gardens of Gough Road.

The residents that suffered flooding stated that there was sewage in the flood water that entered their properties. There is a Welsh Water sewer located in the rear gardens of the properties affected by the flood water, which is believed to have surcharged as a result of the flood water entering through various inlets at the rear of the properties.

## 2.7. Summary of Investigation Findings

The conclusion of the Authority's investigation is that the steep sloping hillside above Wembley Road was saturated as a result of the high levels of rainfall that fell between the hours of 08:00 and 18:00. The extraordinary intensity of rainfall that then fell between the hours of 18:00 and 19:00 travelled at a high velocity as surface water down the hillside, before crossing Wembley Road and cascading down the rear gardens of the properties on Gough Road.

The removal of vegetation as a result of the work undertaken by Western Power Distribution on the hillside, together with that which has been removed on the boundary of Wembley Road and the rear gardens of Gough Road over the years left nothing to deter the free passage of water from the hillside to the properties on Gough Road.

The capacity of the drainage ditch located at the bottom of the hillside adjacent to Wembley Road was far exceeded by the volume of surface water coming off the hillside. Any surface water that was unable to enter the ditch overflowed onto Wembley Road and down the rear gardens of Gough Road.

### 3. Recommended Actions

---

The actions contained within Table 1 are recommended actions to be taken forward by the relevant RMA or property/landowner.

Table 1, Recommended actions

No.	Action by	Action	How it will be achieved
1.	Land Owners	Remove any obstructions within a watercourse if found	<ul style="list-style-type: none"><li>• Consider the rights and responsibilities placed upon a landowner under common law in relation to riparian ownership of a watercourse.</li></ul>
2.	Land Owners	Keep the ditch adjacent to Wembley Road and associated inlet clear	<ul style="list-style-type: none"><li>• Regular inspection and removal of any debris that enters the ditch from the hillside or Wembley Road.</li></ul>
3.	Property Owners	Consider flood risk to own properties.	<ul style="list-style-type: none"><li>• To install property level protection where necessary in liaison with the appropriate RMA's.</li></ul>

The recommended actions that have been identified to be undertaken by RMA's and landowners will be monitored for progress by NPTCBC as the LLFA.

## 4. Appendices

---

### 4.1. Appendix A - Duty to Investigate

The Flood Risk Regulations 2009 and the Flood and Water Management Act 2010 identify NPTCBC as the Lead Local Flood Authority (LLFA) for the area. This has placed a number of flood risk management duties and responsibilities on the Council. In particular, Section 19 of the Flood and Water Management Act 2010 places a duty upon NPTCBC to undertake investigations into flood events to the extent that it considers necessary.

A 'Risk Management Authority' (RMA) means:

**Flood and Water Management Act: Section 19 - Local authorities: investigations**

(1) On becoming aware of a flood in its area, a lead local flood authority must, to the extent that it considers it necessary or appropriate, investigate—

(a) which risk management authorities have relevant flood risk management functions, and

(b) whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood.

(2) Where an authority carries out an investigation under subsection (1) it must—

(a) publish the results of its investigation, and

(b) notify any relevant risk management authorities.

*Flood and Water Management Act (2010), S.19, c.29, London: HMSO*

- A. Natural Resources Wales (NRW)
- B. a lead local flood authority,
- C. a district council for an area for which there is no unitary authority,
- D. an internal drainage board,
- E. a water company, and
- F. a highway authority.

When considering if it is necessary or appropriate to investigate a flood event within its area, NPTCBC will review the severity of the incident along with the

number of properties affected and the frequency of such an occurrence. The Council's Local Flood Risk Management Strategy sets out the criteria to be used when considering a Flood Investigation Report.



## 4.2. Appendix B - Risk Management Authorities Responsibilities

RMA's in Neath Port Talbot have responsibilities in relation to flood risk management. Table 2 below identifies numerous sources of flooding and the RMA that has responsibility and flood risk management functions relating to a particular source of flooding.

Table 2, Responsibilities of Risk Management Authorities

Flood Source	Natural Resources Wales	Lead Local Flood Authority	Water Company	Highway Authority
Main River	✓			
Ordinary Watercourse		✓		
Surface Water		✓		
Surface Water Originating on the Highway				✓
Sewer Flooding			✓	
The Sea	✓			
Ground Water		✓		

The general responsibilities placed upon RMA's in relation to flood risk management are outlined below.

### Natural Resources Wales

Natural Resources Wales (NRW) is responsible for managing the risk of flooding from main rivers and the sea. NPTCBC works closely with NRW, especially when managing flood risk from combined sources and in the event of a large flood incident. NRW also provide a flood warning service throughout Wales in areas at risk of flooding from rivers or the sea.

### Neath Port Talbot County Borough Council as LLFA

NPTCBC is responsible for managing the flood risk related to ordinary watercourses, groundwater and surface water. NPTCBC has produced a Flood Risk Management Plan in line with the Flood Risk Regulations 2009 which sets out how the authority proposes to undertake this function. In addition to this and as previously stated, the Authority also has a Local Flood Risk Management

Strategy which was produced to meet the requirements of the Flood and Water Management Act 2010. There are a number of duties and responsibilities placed upon the Authority as the LLFA for the area by these two legislative documents. The Authority is also responsible for consenting works on ordinary watercourses and enforcing the removal of any unlawful structure or obstruction within the watercourse.

### Neath Port Talbot County Borough Council as Highway Authority

The Authority undertakes routine maintenance on the water conveyance infrastructure contained within the highway including culvert and gully cleansing operations. These operations, together with visual inspections of the condition of such assets are undertaken to reduce the risk of flooding on the adopted highway network and adjacent land.

### Dwr Cymru Welsh Water

Dwr Cymru Welsh Water (DCWW) is responsible for the supply of drinking water and for taking away, treating and properly disposing the wastewater that is produced throughout Wales. Any flooding that occurs from the overload of public sewers or burst water mains is the responsibility of DCWW.

### South Wales Trunk Road Agency

The South Wales Trunk Roads Agency (SWTRA) is responsible for maintaining and managing the trunk road network throughout South Wales, including any associated drainage and flood risk assets.

### Land/Property Owners

Under common law, land or property owners have rights and responsibilities relating to any watercourse that passes through or adjacent to the boundaries of their land. This means that the landowner must:

- Pass on flow without obstruction, pollution or diversion affecting the rights of others.
- Accept natural flood flows through their land, even if caused by inadequate capacity downstream, as there is no common law duty to improve a watercourse.
- Maintain the bed and banks of the watercourse (including trees and shrubs growing on the banks) and clear any debris, natural or otherwise,

including litter and animal carcasses, even if it did not originate from their land.

- Not cause any obstructions to the free passage of fish.
- Keep the bed and banks clear from any matter that could cause an obstruction either on their land, or by being washed away by high flow to obstruct a structure downstream.
- Take responsibility for protecting their property from seepage through natural or constructed banks.
- Keep clear any structure that they own such as culverts, trash screens, weirs etc.

Under the FWMA 2010, a landowner needs consent from the Council if they want to construct a culvert or flood relief control structure on any ordinary watercourse.