

Investigation Report into Flooding

Incident of 13th October 2018

Canal Side, Aberdulais



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

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Revision Schedule

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1. Introduction

An investigation has been undertaken by Neath Port Talbot County Borough Council (from here referred to as the Authority) as Lead Local Flood Authority in response to the flooding that occurred at Canal Side, Aberdulais on the 13th October 2018. 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 (RMAs) have relevant flood risk management functions. Appendix B provides a summary of the roles and responsibilities of the RMAs within Neath Port Talbot.

Through the investigation process it was determined that the relevant RMA's for the flooding that occurred at Canal Side are:

- NPTCBC as Lead Local Flood Authority
- NRW as Main River Authority
- DCWW as Sewerage Undertaker

The flooding of Canal Side occurred between 09:00hrs and 16:00hrs on Saturday 13th October 2018 following a period of prolonged rainfall that started on Thursday 11th October at approximately 09:00hrs and ended Sunday 14th October at 12:00hrs.

Emergency actions were undertaken by NPTCBC to help reduce the flood risk on the day, however due to the nature of the flooding NPTCBC will not be undertaking any further actions following this report.

2. Flood Incident

2.1. Location of Flooding

Canal Side is located in the electoral ward of Aberdulais which is situated at the end of the Crynant valley where it meets the Neath Valley. The affected properties are situated alongside the Neath Canal and adjacent to the confluence of the River Neath and River Dulais which is located in the centre of Neath Port Talbot County Borough. Figure 1 shows the site location.

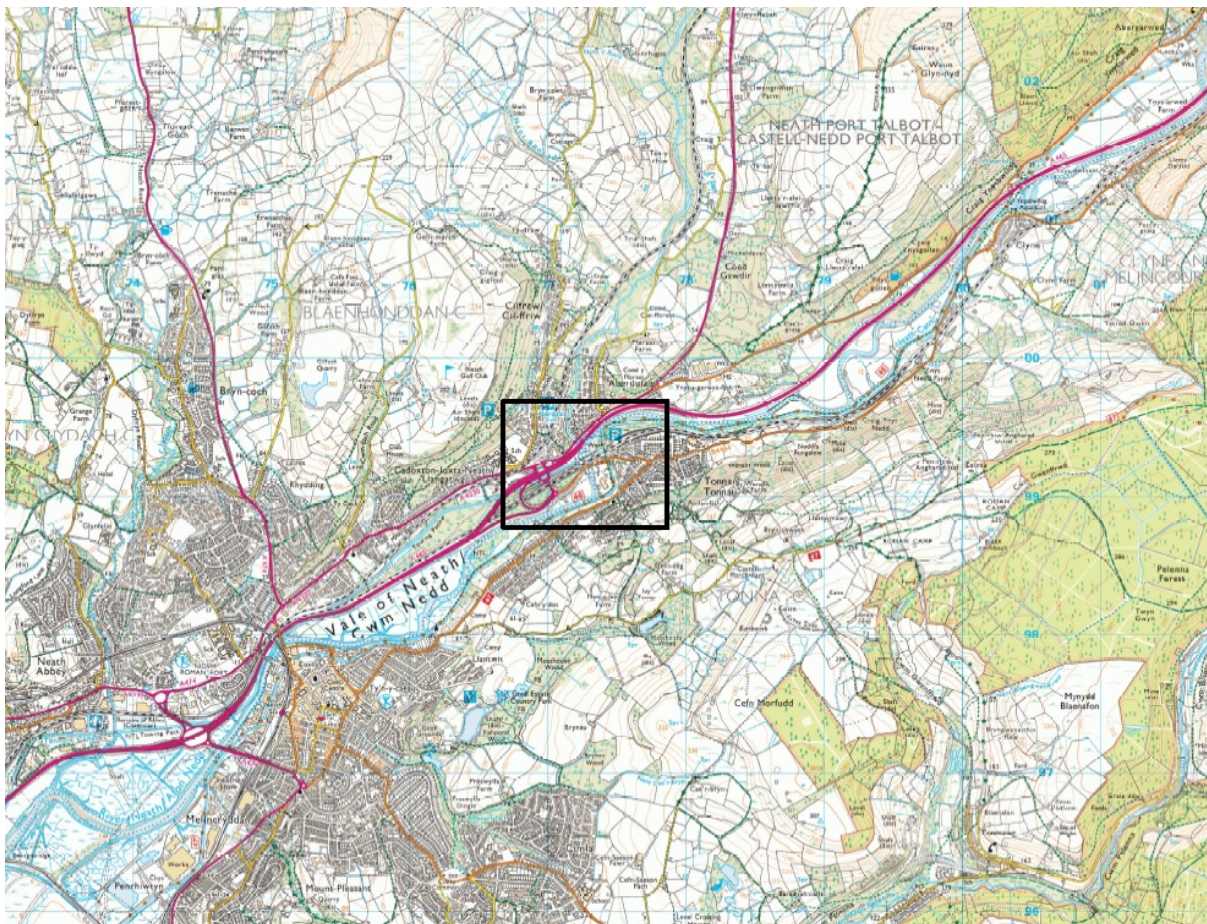


Figure 1 – Canal Side location plan.

2.2. Rainfall Event and Analysis

Between Thursday 11th and Sunday 14th October 2018 there was continuous rainfall across the County Borough which lasted approximately 78 hours peaking in intensity late Friday morning. Canal Side sits in the River Neath catchment that received the highest levels of rainfall over the 4 days. The River Neath catchment is approximately 31,652ha in size and encompasses sections of the Brecon Beacons which are drained via a number of recognised watercourses on its southern slopes before converging on the River Neath near Pontneathvaughan.

The river Neath will be discussed throughout this report as one the main contributors to the flooding. Figure 2 below shows the catchment with the location of Canal Side labelled.



Figure 2 - River Neath fluvial and pluvial catchment plan.

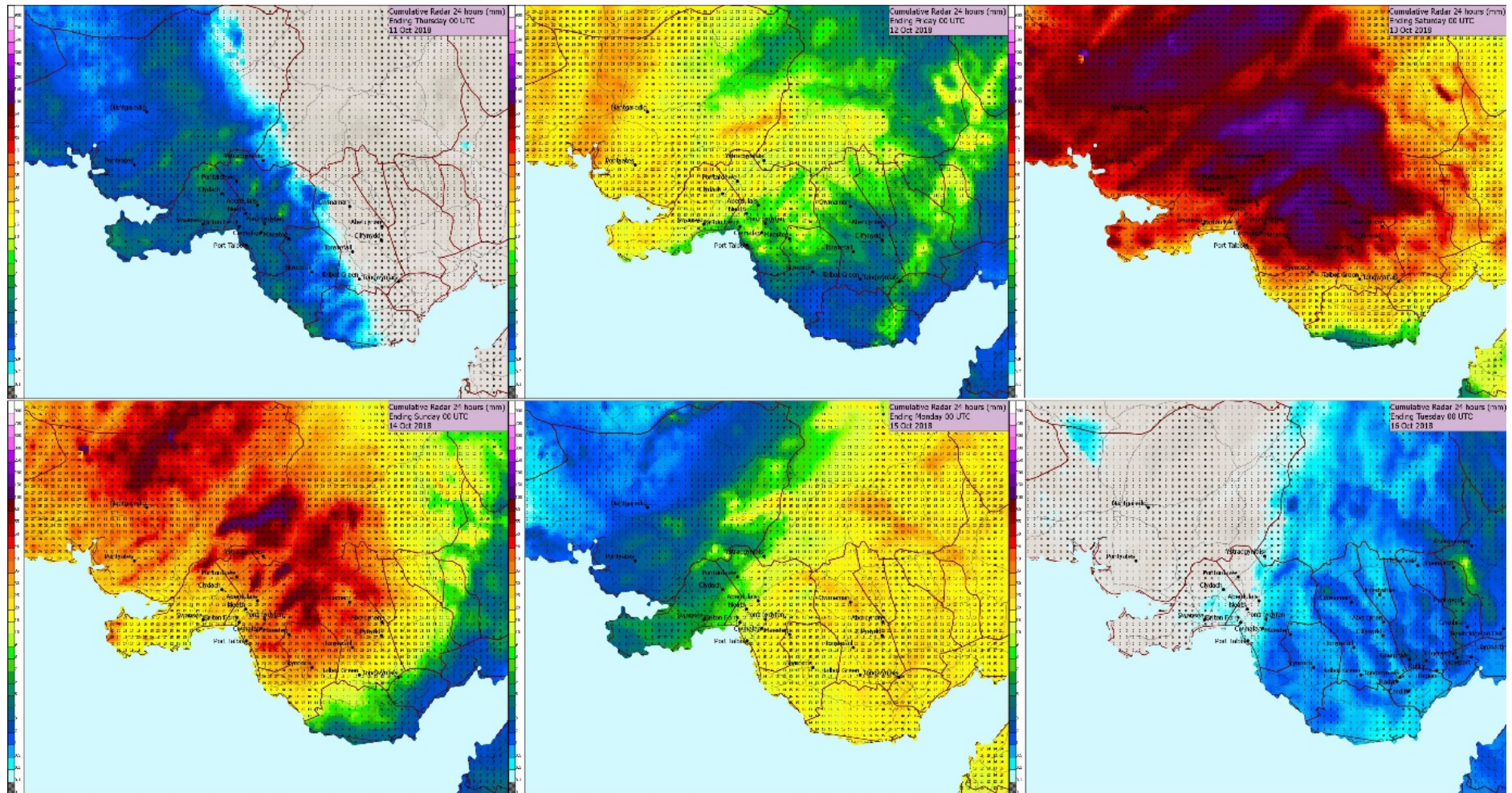
Figure 3 displays the levels of rainfall that fell on NPTCBC during the storm event and shows how it developed and receded across the 6 days. It significantly illustrates how high the average rainfall levels were, especially across Friday and Saturday.

It can be identified that, from Thursday, rainfall gradually intensified and persisted through to Sunday, peaking on Friday with the highest average rainfall across a 24 hour period measured at 142mm in an area of Rheola Forest which forms part of the River Neath catchment. Over the days of the storm it has been calculated that an average of 118mm of rainfall landed within the county boundary over a 72 hour period and an average of 142mm fell within the River Neath catchment over the same 72hr period.

WEDNESDAY

THURSDAY

FRIDAY



SATURDAY

SUNDAY

MONDAY

Figure 3 - Daily average rainfall, Wednesday 10th – Monday 15th Oct 2018, Metdesk 2018.

It is noted from the River Neath gauging station records at Resolven (6 miles upstream from Canal Side) that during the storm the river level peaked twice at very high levels. Figure 4 & 5 exemplify the magnitude of the rainfall event with the river levels falling just shy of the highest on record. The rainfall hydrograph and river level records show how the river levels reacted with a lag time from the peak of around 3-4 hours on both occasions. Rainfall peaked between 09:00-10:00 on Friday 12th October with the river levels peaking 4hrs after at 14:00. Rainfall again peaked between 01:00-02:00 on Saturday morning with river levels rising to their highest at 17:00 to approximately 2.9m just hours before Canal Side experienced flooding.

Across Friday and Saturday the Authority responded to many calls regarding flooding which both daytime and emergency ‘out of hours’ staff responded to. However at approximately 09:00 Saturday flood water entered into a number of properties on Canal Side.

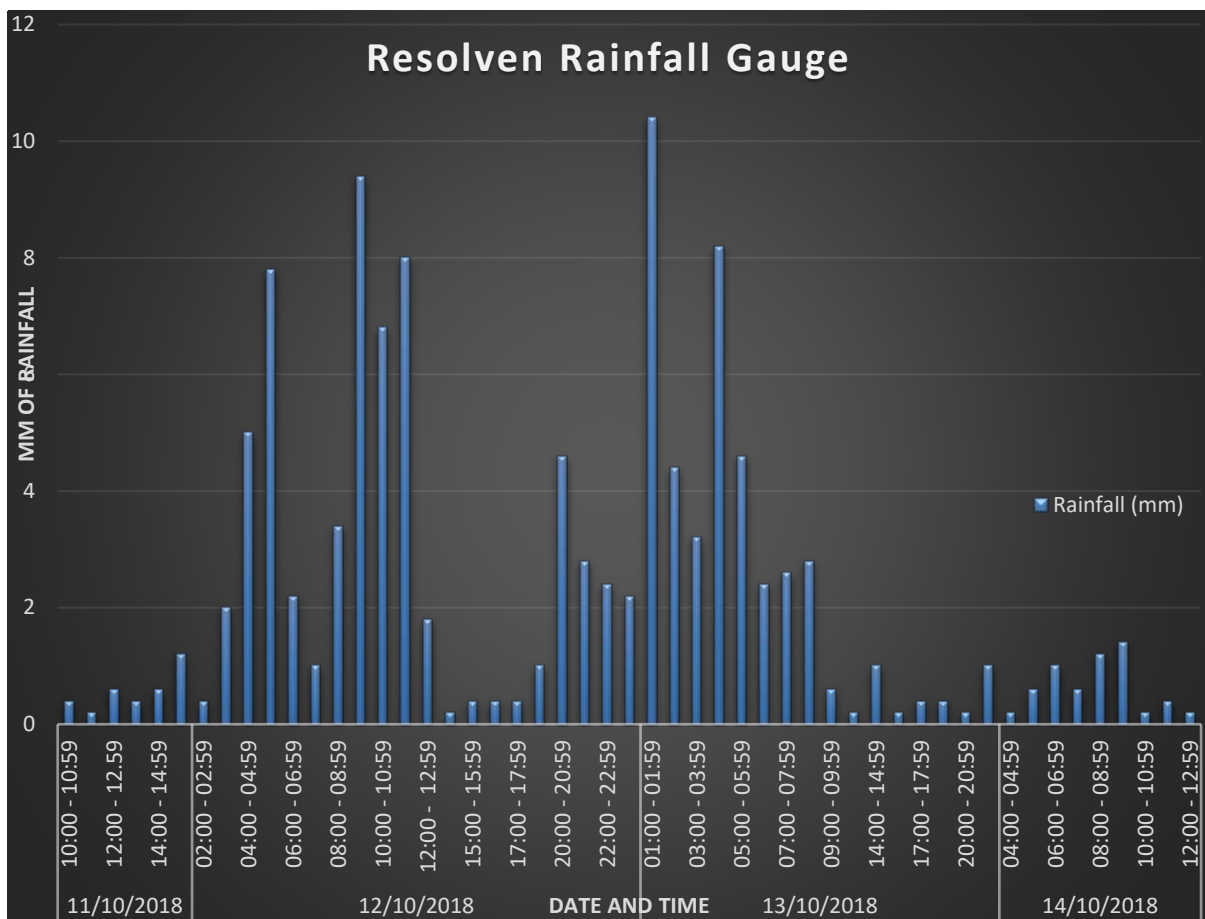


Figure 4 – Rainfall Hydrograph at Resolven, Shoothill Gauge Map 2018.

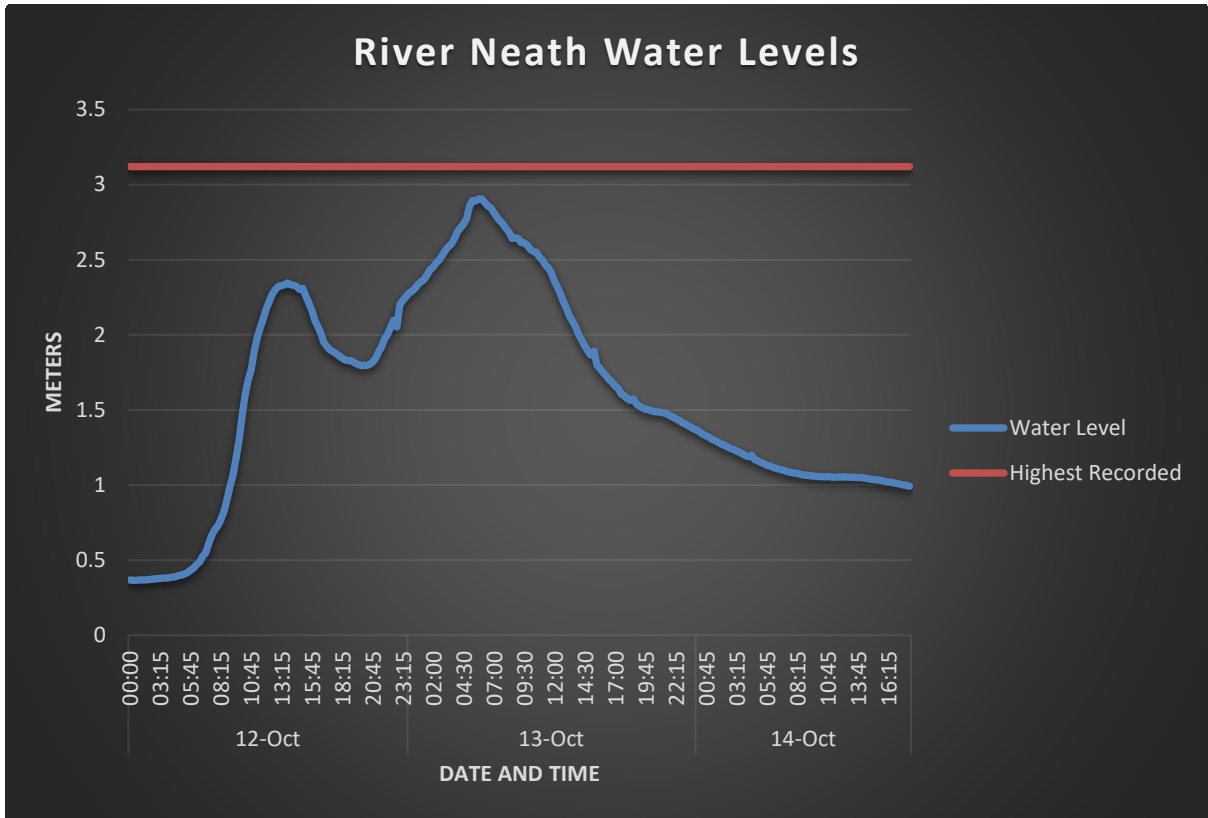


Figure 5 – River Level records at Resolven

2.3. Flood Extent

A number of properties suffered internal flooding on 13th October at Canal Side, Figure 6 illustrates the general location of the properties that were affected.

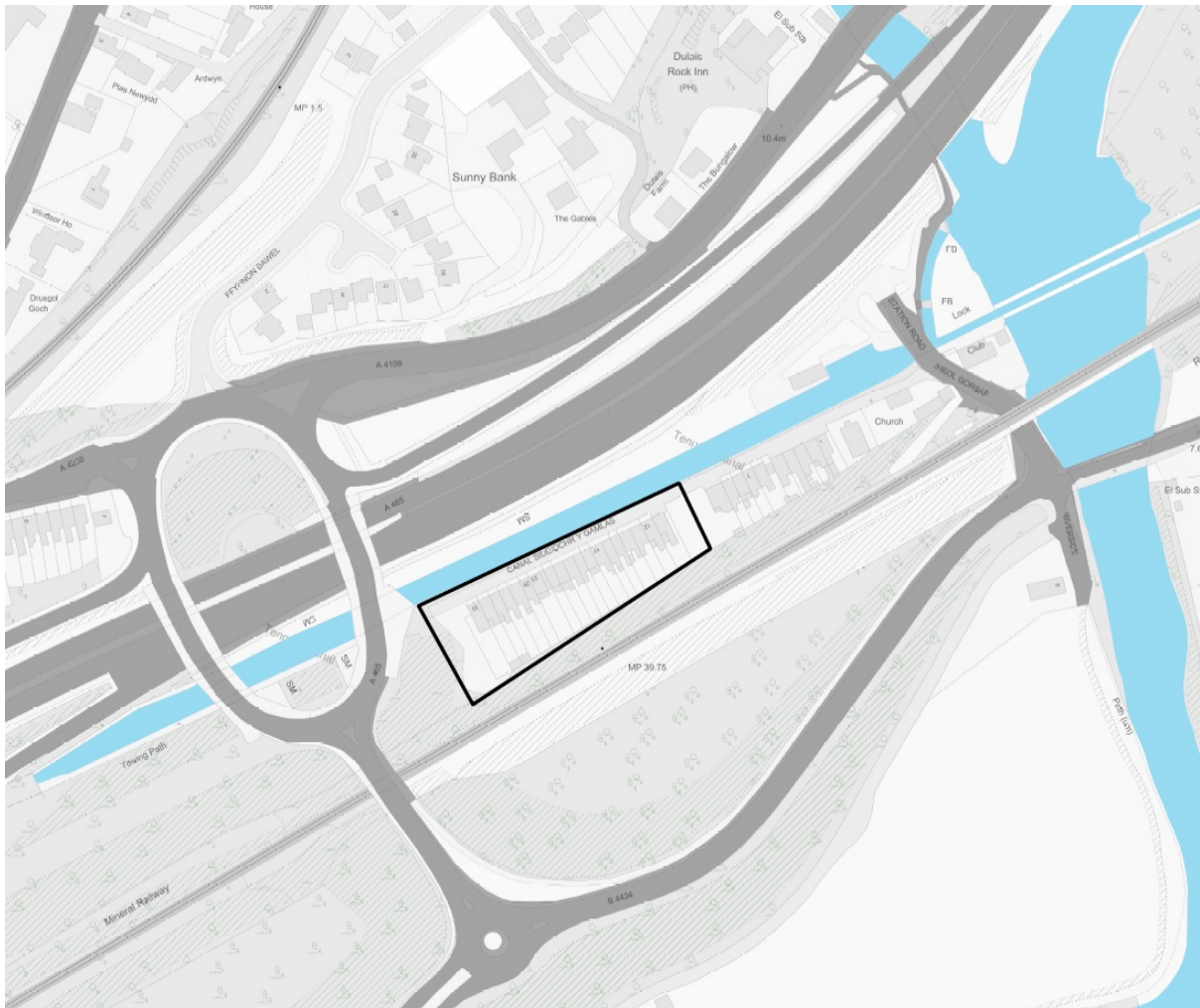


Figure 6 - Location of Properties affected by the flood event on 13th October 2018.

2.4. Site Characteristics

The properties on Canal Side are located alongside the Neath Canal in a low laying parcel of land that is sandwiched between the A465 to the north and west, the River Neath to the east and the Neath Mineral Railway line embankment to the south. The area is lower than all of the surrounding land with a difference of 2.88m between the properties that were flooded and the river level that was recorded on the day.

The area is characterised as a typical flood plain with loamy/clayey floodplain soils with a naturally high water table because of its proximity to the river. The geology is predominantly carboniferous sandstone overlaid with superficial deposits of alluvium clay, silt, sand and gravels deposited during the Quaternary period through to present day. This means that the entire area is directly affected by the water levels in the River Neath and is the key influence on flood risk in the area. It is important to note that Canal Side also marks the point of the furthest tidal influence on the River Neath as there is a weir positioned just upstream from the B4434 viaduct. This flood event was found to coincide with a high spring tide in Swansea Bay on Saturday 13th October which peaked at 09:40 hrs at a height of 9.2m which would have exacerbated the event.

2.5. Drainage Networks and Paths

There are no public or private surface water drainage networks on Canal Side, neither does the road form part of the Authority's adopted road network. Rain water that lands on houses in the area is known to drain into the Welsh Water combined sewerage network as there are also no known culverted watercourses in the area. The combined sewers were found to be located to the rear of the properties and drain out into the main trunk sewer that runs in a south westerly direction alongside the river bank, as can be seen in Figure 7.

2.6. Detailed Investigation Findings

On 13th October 2018, the hydraulic capacity of the combined sewer pipe which conveys both roof and foul waste water from the properties on Canal Side was exceeded. This resulted in the water surcharging out of inspection chambers positioned in the rear gardens of the properties, causing water in turn to flow into the ground floor of properties.

There have been a number of flooding issues in previous years at Canal Side due to its proximity to the river however it is unknown to the Authority if they have ever been flooded from the sewerage system.

The Authority's investigations have determined that flood water somehow infiltrated the trunk sewer that runs within a close proximity to the river via either through ground water infiltration, open outfalls or inspection chambers. This resulted in the adjoining sewer pipes that serves the canal side properties to become flooded.

Welsh Water, acting as the sewerage undertakers, will be undertaking their own investigation into the flooding incident and they treat internal property flooding

from sewers with the highest priority. As one of the RMAs and the owners of the apparatus that was the conduit for the flood water they will be lead on any further investigations.

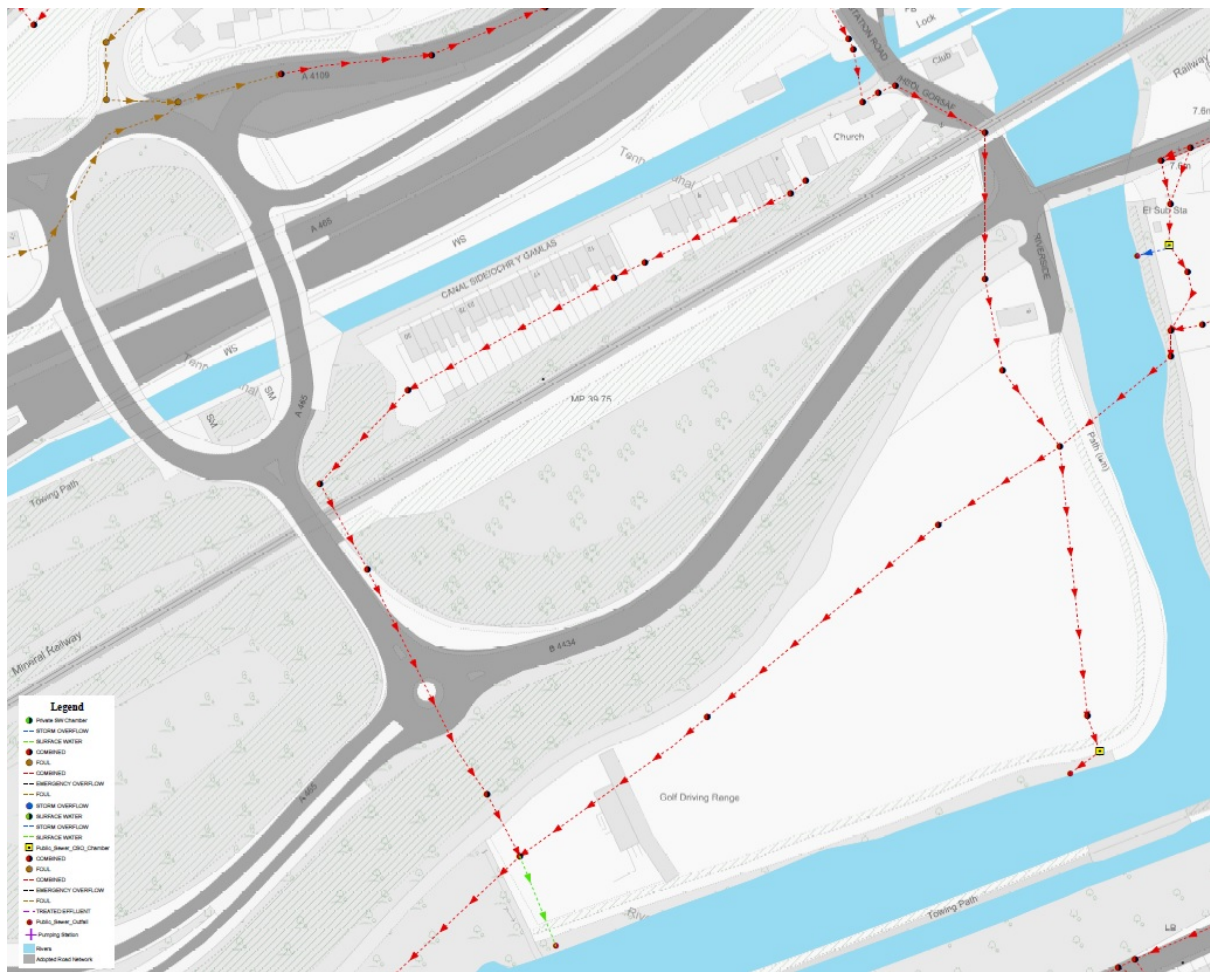


Figure 7 - Map showing the combined sewer network at Canal Side

2.7. Summary of Investigation Findings

The conclusion from the Authority's investigation is that properties along Canal Side were flooded from hydraulic over capacity of the sewerage network as a result of heavy prolonged rainfall over a 72 hour period which was concentrated around the River Neath catchment. The river levels impacted the drainage infrastructure serving Canal Side that led to the surcharging of private combined inspection chambers and internal flooding.

3. Recommended Actions

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

No.	Action by	Action	How it will be achieved
1.	Welsh Water (DCWW)	Undertake Flood Investigation	<ul style="list-style-type: none">• Combined network at Canal Side and surrounding area to be investigated to determine mechanisms that caused property flooding.
2.	NPTCBC	Review Flood Incident Response	<ul style="list-style-type: none">• Meeting to take place with Emergency Planning to review procedure and recommend/implement and changes to the incident response.

Table 1, Recommended actions

The recommended actions that have been identified to be undertaken by RMA’s 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 of 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.