



TORBAY COUNCIL
Flood Investigation Report
1st – 3rd March 2018

Introduction

Under the Flood and Water Management Act 2010 (FWMA) Torbay Council as a Unitary Authority were designated as the Lead Local Flood Authority (LLFA) for Torbay. This has placed a number of statutory responsibilities on the Council in relation to flood risk management. One of these new responsibilities is identified under Section 19 of the Act which states:

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 investigations, and
 - b) Notify any relevant Risk Management Authorities

Under the Act a Risk Management Authority is identified as:

- 1) The Environment Agency
- 2) A Lead Local Flood Authority
- 3) A district council for an area for which there is no unitary authority
- 4) An internal drainage board
- 5) A water company
- 6) A highway authority

When considering whether it is necessary or appropriate to investigate a flooding event Torbay Council will assess the severity of the event and the number of properties affected. The Local Flood Risk Management Strategy which is currently being prepared by Torbay Council will identify the criteria to be used when considering whether a Flood Investigation Report is required. Until this Strategy is published, Torbay Council will undertake a Section 19 flood investigation following a flooding event where 5 properties or more suffer internal flooding.

In partnership with the other Risk Management Authorities in Torbay this report has been produced to comply with the legislation and to determine the main causes of the flooding. In addition within this report Torbay Council have identified a number of actions the relevant Risk Management Authorities need to consider. Torbay Council as the LLFA will continue to monitor the list of actions with all the relevant Risk Management Authorities and will assist in the delivery where practical to do so.

Risk Management Authority Responsibilities

Recording Flooding Incidents and Key Responsibilities

As part of the new statutory duties identified within the FWMA 2010 all LLFA's must record flooding incidents within its area.

The roles and responsibilities for the various types of flooding is spread across all of the Risk Management Authorities identified within the FWMA 2010 with the LLFA having an overriding duty to investigate, where appropriate, the flooding from all sources. The following table identifies the relevant flood risk management functions for each of the Risk Management Authorities and the different sources of flood risk that Torbay Council as LLFA need to investigate.

Flood Source	Lead Local Flood Authority	Environment Agency	Water Company	Highway Authority
Rivers:				
Main Rivers		Responsible		
Ordinary watercourses	Responsible			
Surface Run Off:				
Surface water	Responsible			
Surface water on the highway				Responsible
Other:				
Sewer Flooding			Responsible	
Coastal Flooding		Responsible		
Groundwater	Responsible			
Reservoirs		Responsible		

It should be noted that a main river in the above table refers to a river that has been designated as such by the Environment Agency. These tend to be the larger arterial watercourses that are considered to pose a significant flood risk. Ordinary watercourses include all rivers and streams that have not been designated as main rivers and all ditches, drains, culverts, dikes, sluices, sewers (other than public sewers) and passages through which water flows.

The general Risk Management Authority responsibilities in relation to flood risk and surface water management are outlined below:

The Environment Agency is responsible for managing the risk from the sea, main rivers and reservoirs and they have a strategic overview role for all flood risk management. The Environment Agency also provides a flood warning service throughout England and Wales in areas at risk of flooding from rivers or the sea.

Torbay Council as Lead Local Flood Authority is responsible for overseeing the flood risk from ordinary watercourses, groundwater and surface water run-off. They are also responsible for consenting works on ordinary watercourses and enforcing the removal of any unlawful structures or obstructions within the watercourse. As previously identified they must ensure that following a flooding event a flood investigation is carried out and the flood investigation report is published.

Torbay Council as Highway Authority is responsible for surface water on the highway and maintaining gullies and culverts to ensure effective highway drainage.

In addition to the Risk Management Authority responsibilities identified above land/property owners that have a main river or ordinary watercourse in or adjacent to their land have riparian responsibilities on that main river or ordinary watercourse. This means that the landowner must:

- Let water flow through their land without any obstruction, pollution or diversion which affects the rights of others.
- Accept flood flows through their land, even if these are caused by inadequate capacity downstream.
- Keep the banks clear of anything that could cause an obstruction and increase flood risk, either on their land or downstream if it is washed away.
- Maintain the bed and banks of the watercourse and the trees and shrubs growing on the banks and should also clear any litter or debris from the channel and banks, even if it did not come from their land.
- Keeps any structures, such as culverts, trash screens, weirs and mill gates, clear of debris.

Background

The South West of England experienced a spell of severe winter weather from late February to early March 2018. High pressure over Scandinavia resulted in unusually low temperatures, strong easterly winds and heavy snowfall. The situation was then compounded with the arrival of Storm Emma, again causing strong winds and snowfall. This coincided with high tides. It has been calculated that Storm Emma had a return period of 1:75 years.

Rain gauges owned by Torbay Council and the Environment Agency have been downloaded in Brixham (Laywell Reservoir, EA and TC gauges), Torquay (Torquay Town Hall and St Cuthbert Mayne School) and Paignton (Templer Road). The total precipitation recorded from 28th February until 4th March 2018 at these raingauges is shown below. It must be noted, however, that as most of this fell in the form of snow the data could be unreliable. The totals are not excessive.

Date	Torquay		Paignton	Brixham	
	Town Hall	St Cuthbert Mayne School	Templer Road	Laywell (EA)	Laywell (TC)
28/2/18	0.6	0.2	0.4	0.3	0
01/03/18	0.2	0.6	0	8.8	12.8
02/03/18	16.2	16.6	32.6	10	5.4
03/03/18	8.8	10	10.6	9	6.8
04/03/18	3.2	3.2	5.2	3.2	2.4
Total Rainfall	29	30.6	48.8	31.3	27.4

In Torbay the sea defences were overtopped due to a combination of easterly winds, heavy seas and high tides.

Date	Time	Predicted height (m)
28/02/18	04:54	4.5
	17:26	4.6
01/03/18	5:46	4.9
	18:14	4.8
02/03/18	06:32	5.1
	18:56	5.0
03/03/18	07:12	5.2
	19:34	5.1
04/03/18	07:50	5.3
	20:10	5.1

Prior to the storm event and during the storm event a number of severe weather warnings and flood warnings were issued by the Met Office and the Environment Agency. Details of these warnings are identified below:

Severe Weather Warnings

Date	Time Issued	Warning
Sun 25/02	14:29	Yellow Warning for Snow on Tues 27 th Feb
Sun 25/02	14:29	Yellow Warning for Snow on Weds 28 th Feb
Sun 25/02	14:29	Yellow Warning for Snow on Thurs 1 st March
Tues 27/02	12:15	Amber Warning from Thurs 14:00 – Fri 08:00 Updated due to the risk of freezing rain
Weds 28/02	12:00	Yellow Warning for Wind + Snow on Thurs 1 st March
Weds 28/02	12:00	Amber Warning of Snow and Ice from Thurs 12:00 to Fri 08:00
Weds 28/02	12:31	Yellow Warning of Snow + Ice for Fri 2 nd
Weds 28/02	12:31	Yellow Warning of Ice for Sat 3 rd 00:00 – 9:00
Thurs 01/03	08:05	Amber Warning for Wind + Snow on Thurs 1 st
Thurs 01/03	08:15	Red Warning for Wind + Snow on Thurs 1 st
Fri 02/03	09:00	Yellow Warning of Snow and Ice for Friday 2 nd March
Fri 02/03	09:00	Yellow Warning of Snow and Ice for Saturday Morning

Flood Alerts / Warnings

Date	Time Issued	Warning
Weds 28/02	12:41	Flood Alert for the South Devon Coast from Start point to Dawlish Warren (Wed to Sun) Wind: Force 7 ENE High Tide: 4.7m HT @ 17:45 / 5.0m HT @ 06:00 Offshore Wave Heights 2.7m + 3.3m Flood of Low Lying Areas (Not Property)
Thurs 01/03		Flood Alert Update for the South Devon Coast from Start point to Dawlish Warren Wind: Force 8 ENE High Tide: 4.9m @ 18:30 / 5.2m @ 07:00 Surge? Offshore Wave Heights 3.9m
Fri 02/03		Flood Alert Update for the South Devon Coast from Start point to Dawlish Warren Wind: Force 7 ENE + Force 5 SE High Tide: 5.0m @ 19:30 / 5.3m @ 07:45 + 300mm surge Offshore Wave Heights 2.2m + 1.6m Flood of Low Lying Areas (Not Property) Damage to Coastal Structures
Fri 02/03	16:18	Flood Warning for the South Devon Coast at Beesands, Torcross, Slapton and Dawlish (Not issued for Torbay!) Wind: F7 ENE + Force 5 SE High Tide: on 2 nd = 19:30 / on 3 rd = 07:45 + 300mm surge Offshore Wave Heights 2.2m + 1.6m Property Flooding Expected
Sat 03/03	15:22	Flood Alert for the South Devon Coast Wind: Force 2 SW + Force 5 SSE + 320mm surge High Tide: 5.1m @ 20:00 / 5.3m @ 08:15 Offshore Wave Heights 1.1m + 1.5m Flood of Low Lying Areas (Not Property)
Sun 04/04	12:11	Flood Alert No Longer in Force

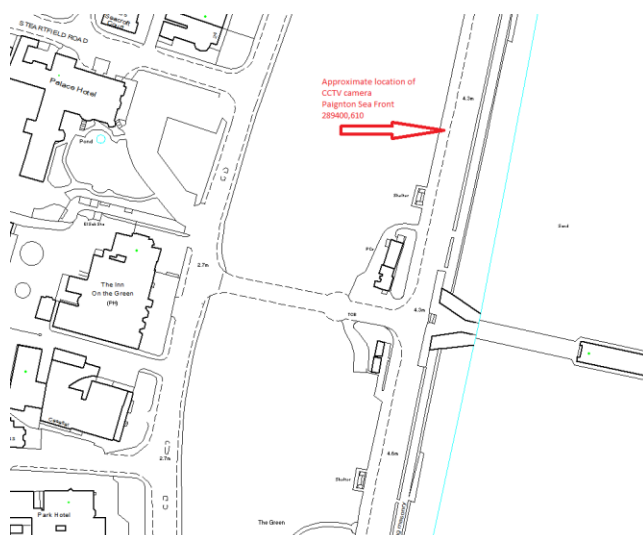
Following the initial warnings of snow and sea defence overtopping TOR2 were notified. They arranged for staff to be on standby and also checked the stock of sand bags for emergency use should flooding occur.

Heavy snow fell across the Bay during 1st March, such that by 4pm the majority of roads were impassable. A large number of vehicles were abandoned, including on Torbay Road in Torquay near Torre Abbey. Heavy snow continued to fall throughout 2nd March.

At approximately 04:45 hrs on 2nd March Torbay Council's 24 hour control room received their first calls reporting flooding of Torquay Road at Livermead and Meadfoot Beach Road. TOR2 were unable to attend as the roads were impassable due to the snow. By 08:00 reports had been received of flooding in Paignton around The Esplanade, Kernou Road, Adelphi Road and Berry Square. Further calls were received throughout the storm event. Drainage staff monitored the situation, while Highways and TOR2 staff were mobilised as roads became safe for travel. Their work involved putting in place diversion arrangements for flooded roads, installing warning signs, sandbagging locations to prevent flooding from the highway, replacing blown manhole covers, clearing blocked road gullies, clearing trash screens and generally cleaning up after the flooding had subsided.

CCTV for incident management and post-incident analysis

CCTV footage for contemporaneous incident management, and post-incident analysis is not available. The Torbay Council CCTV camera on Paignton Sea Front was destroyed at the beginning of the storm.



Incident Reports

A detailed analysis of the reported incidents to Torbay Council's control room, Devon and Somerset Fire & Rescue control room, and those received directly by Torbay Council's Engineering and Highways sections has been undertaken. It should be noted that additional properties are likely to have been flooded, however property owners have not reported them.

During the storm event there were reports of 18 properties suffering internal flooding and 4 properties reporting external flooding. Tourism infrastructure at Goodrington,

Broadsands and Preston was flooded and damaged. In addition reports were received identifying locations where highways had been flooded.

The flooding was caused by overtopping of the sea defences around the bay at Oddicombe/Babbacombe, Meadfoot, Torre Abbey, Livermead, Preston, Paignton, Goodrington and Brixham.

Key Problem Areas

Oddicombe / Babbacombe

One property at Oddicombe Beach was flooded internally and damaged.

Meadfoot, Torquay

Meadfoot Beach Road was closed due to flooding from overtopping of the sea wall.

Torre Abbey, Torquay

Torbay Road was closed between Belgrave Road and the Grand Hotel due to flooding, Torre Abbey Meadows was also flooded.

Livermead

Torbay Road was closed at Livermead due to flooding and extensive damage to the sea wall.

Preston

Overtopping of the sea wall caused extensive displacement of and damage to the beach huts. One public house and the Beach Kiosk were flooded internally.

Paignton

Ten properties were reported as flooding internally. Retail units on the Pier were also flooded.

External and highway flooding was reported in

- Esplanade Road
- Kernou Road
- Adelphi Road
- Sands Road

Flooding also occurred at Berry Square, Torbay Park and Paignton Green.

Goodrington

Much of the tourist infrastructure at Goodrington was flooded internally, including

- One café
- One public house
- South Sands Public conveniences
- South Sands Beach Manager's Office
- North Sands ice cream kiosk
- Torbay Surf Lifesaving School
- Boating Lake Office and Store
- Crazy Golf Office and Store

Young's Park was flooded to the extent that sea water contaminated the fresh water lake causing damage to the wildlife and ecology of the area.

Broadsands

At Broadsands internal flooding occurred in

- Broadsands ice cream kiosk
- Broadsands kayak hire storeroom

Brixham

Flooding occurred in

- Breakwater Bistro
- Breakwater Lighthouse
- Water's Edge Kiosk, Shoalstone Pool

The Water's Edge Kiosk was destroyed and Shoalstone Pool suffered extensive damage.

Actions

Esplanade Road/Sands Road/Kernou Road, Paignton

This area of Paignton has a history of flooding incidents from a number of sources including the combined sewer system, surface water sewer system, Victoria watercourse, surface water run-off, highway flooding and coastal flooding. In the past flooding from the surface water sewers and the Victoria watercourse occurred when a storm event coincided with a high tide however, following the construction of the Paignton Green pumping station the risk of flooding from the surface water system has been significantly reduced even when a large storm event coincides with a high tide.

In March 2018 10 properties in Paignton were reported to have been flooded internally. The cause of the flooding was overtopping of the sea wall due to high tide combined with strong on-shore winds. The flooding was of short duration with the exception of the low lying Berry Square and Torbay Park.

Actions

Environment Agency / Torbay Council	Investigate possible solutions to overtopping of the sea wall.
Property Owners	Consider flood risk to own properties and investigate possibility of installing property level protection where necessary.

Oddicombe / Brixham

The properties flooded are all commercial and are situated in front of the sea wall.

Paignton / Preston / Goodrington / Broadsands

Actions

Environment Agency / Torbay Council	Investigate possible solutions to overtopping of the sea wall
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Properties Flooded

Brixham

Address	Type of flooding	Risk Management Authority
Breakwater Bistro	Internal coastal	

Broadsands

Location	Type of Flooding	Risk Management Authority
Broadsands Car Park	Public open space	Torbay Council

Goodrington

Location	Type of Flooding	Risk Management Authority
Goodrington South Sands café	Internal coastal	
Inn on the Quay	Internal coastal	
Youngs Park	Public open space	Torbay Council

Preston

Location	Type of Flooding	Risk Management Authority
Public House, Preston	Internal	

Paignton

Location	Type of Flooding	Risk Management Authority
Paignton Pier	Internal coastal	
2 properties, Adelphi Road	Internal coastal	
Hotel, Berry Square	Internal coastal	
Hotel, Esplanade Road	Internal coastal	

5 properties in Kernou Road	Internal coastal	
Public House, Esplanade Road	Internal coastal	
Restaurant, Torbay Road	Internal coastal (from Torbay Park)	
1 property Adelphi Road	External	
Hotel, Esplanade Road	External	
Torbay Park	Public open space	Torbay Council

Torquay

Location	Type of Flooding	Risk Management Authority
Oddicombe Beach Café	Internal coastal	
Torquay Road	Highway	Torbay Council
Torre Abbey Meadows	Public open space	Torbay Council
Meadfoot Beach Road	Highway	Torbay Council

In addition, a number of tourism facilities were flooded:

Location		Type of Flooding	Risk Management Authority
Breakwater Lighthouse	Brixham	Internal coastal	
Shoalstone Pool Kiosk	Brixham	Internal coastal	
Broadsands Kiosk	Broadsands	Internal coastal	Torbay Council
Broadsands kayak hire storeroom	Broadsands	Internal coastal	Torbay Council
Goodrington South Sands temporary toilet block	Goodrington	Internal coastal	Torbay Council
Goodrington South Sands Beach Manager's Office	Goodrington	Internal coastal	Torbay Council
Goodrington North Sands Ice Cream Kiosk	Goodrington	Internal coastal	Torbay Council
Torbay Surf Life Saving School	Goodrington	Internal coastal	Torbay Council
Boating Lake Store	Goodrington	Internal coastal	Torbay Council
Boating Lake Office	Goodrington	Internal coastal	Torbay Council
Crazy golf store	Goodrington	Internal coastal	Torbay Council
Crazy golf office	Goodrington	Internal coastal	Torbay Council
Beach kiosk	Preston	Internal coastal	Torbay Council

Next Steps

The next steps, following publication of this report into the flooding event within Torbay between 1st and 3rd March 2018, will be for Torbay Council as the Lead Local Flood Authority to ensure that the recommended actions identified at each flooding location are actioned by the relevant Risk Management Authority. Torbay Council will prioritise the actions and monitor delivery through regular review meetings whilst working in partnership with the Environment Agency, South West Water and the local affected community.

There is an expectation from Torbay Council of itself and its partners that all authorities involved will cooperate and work together to improve the flood risk in the vulnerable areas identified in this report by completing the actions. As the Lead Local Flood Authority Torbay Council has a responsibility to oversee the delivery of these actions.

Where minor works and quick win schemes have been identified, these will be prioritised and subject to available funding and resources work will be undertaken as soon as possible. Any major works requiring capital investment will be considered through the Environment Agency's Medium Term Financial Plan process for grant in aid funding.

A review of the actions will be undertaken by Torbay Council as Lead Local Flood Authority in order to maintain progress and encourage delivery of the recommended actions.