

FLOODING IN BOURNEMOUTH
23rd June 2016
Section 19 Report (Floods and Water Management Act 2010)
for
Flooding Advisory Group

Final 16/12/2016

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P.Ambrose

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1.0 Executive Summary

- 1.1 On the night of the 23rd June 2016 a small part of the Bournemouth conurbation experienced an intense rainfall event. A number of business properties in the Winton Area were affected and it is known that six commercial properties in Wimborne Road flooded internally. There was also more wide spread flooding of roads and gardens but this has been based on observed debris / tide marks.
- 1.2 The recorded rainfall did not show a statistically significant event with return periods of at most 1 in 2 years and more typically less than a 1 in 1 year event. However, it is worth noting that worst reported or observed flooding occurred in an area that is just outside 2km from any rain gauge. It may well have been more intense very locally although it is difficult to believe that something would have not been recorded on the nearest rain gauges. The rainfall radar does not show any particular intense area of rainfall during this time. The heaviest rainfall occurred at around 3.00 a.m. (BST) in the morning so it is not surprising there are few eye witness reports. The extent of flooding has been determined by interviewing affected properties. Many of them had not even been aware they had flooded until they opened for business on that morning.
- 1.3 No flood warnings had been issued.
- 1.4 None of the six properties internally flooded appears to have had more than about 50mm deep water inside based on "tide marks" but this was sufficient to ruin some stock on the floor, and damage floor coverings and electrics. Most shops had to close for at least a day to clear up and then spend some time and effort (cost) "drying out".
- 1.5 All these business premises have suffered flooding on several previous occasions.
- 1.6 The purpose of this report is to satisfy the requirements of Clause 19 of the Floods and Water Management Act. To satisfy the Act it only needs to be a simple factual report but for future reference, where possible some further information is included and some recommendations will be made.

2.0 Introduction

2.1 The purpose of this report is to comply with the requirement of Clause 19 of the Floods and Water Management Act 2010 which states: -

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.

2.2 It is up to the Lead Local Authority to decide if it is “necessary or appropriate” to investigate and the Act does not give much guidance on this. However, all the Lead Local Flood Authorities in the South West region agreed on a common threshold of an event being significant to allow common reporting across the SW. Subsequently this seems to have been adopted widely across the Country. The agreed thresholds are.

Flood which: -

(a) caused internal flooding to five or more residential properties, or

(b) flooded two or more business premises, or

(c) flooded one or more items of critical infrastructure, or

(d) caused a transport link to be totally impassable for a significant period.
(transport links are further defined but are not relevant in this case anyway)

Item (b) of the above criteria have been reached in this event triggering the need for this report.

2.3 We have interviewed businesses and local residents to try and determine the extent of flooding but we do not have the resources to embark on wide scale “door knocking” We have not issued any questionnaires or wider consultation to collect any additional data. It is known that under reporting is a major issue but this report is solely based on data available at the time of writing.

2.4 All data has been recorded in the Council’s Flooding GIS database. As we also record details of names, addresses, phone numbers etc this will not be available to anybody except professional partners. This data can have a considerable impact on things like property values, insurance etc so the data in this report will, unless unavoidable, not identify individual properties. However, to be of any practical relevance it may need to identify areas down to individual roads.

3.0 Rainfall data

- 3.1 There are now 4 No “tipping bucket” rain gauges operated by Bournemouth Borough Council across the borough and Poole Council have recently installed 3. These record the time of each 0.2mm of rain and allow not just the total quantity of rain to be measured but also the intensity.

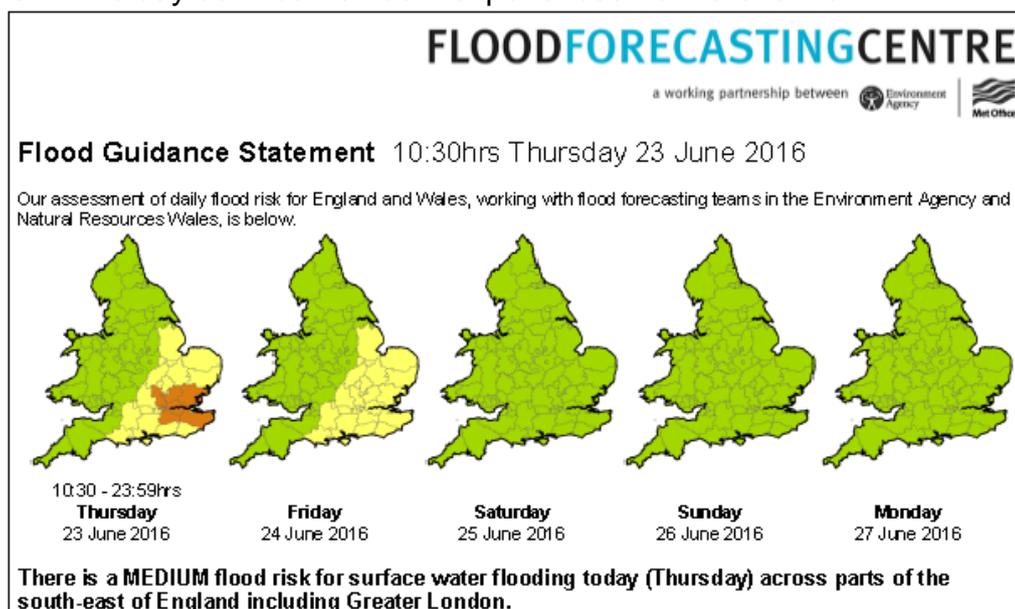
Publically accessible data can be found at <http://www.timeview2.net/>
Bournemouth Username and Password “Bournemouth Data”
Poole Username: “BoP” Password: “Transportation”)

The Environment Agency and Wessex Water also have a number of tipping bucket gauges locally. Further there are now a number of private weather stations locally that upload their data to the Web. Finally, there is the official Meteorological Stations at Hurn and Kings Park (although Kings Park is only daily totals). This now gives us access to reasonably good rainfall data and is a vast improvement in the last decade. Further rainfall radar data is now much more easily accessible in almost real time via Hazard Manager although experience has shown the radar intensities are not always very reliable.

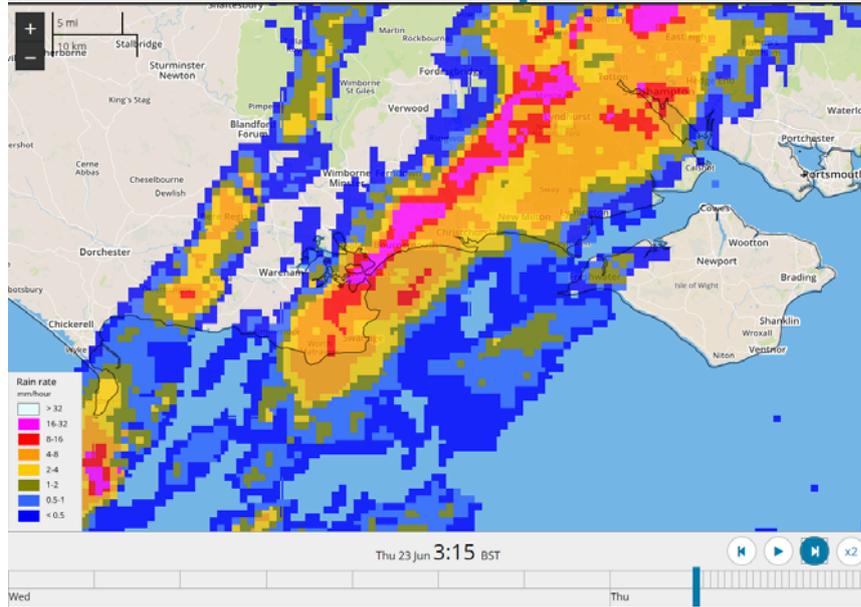
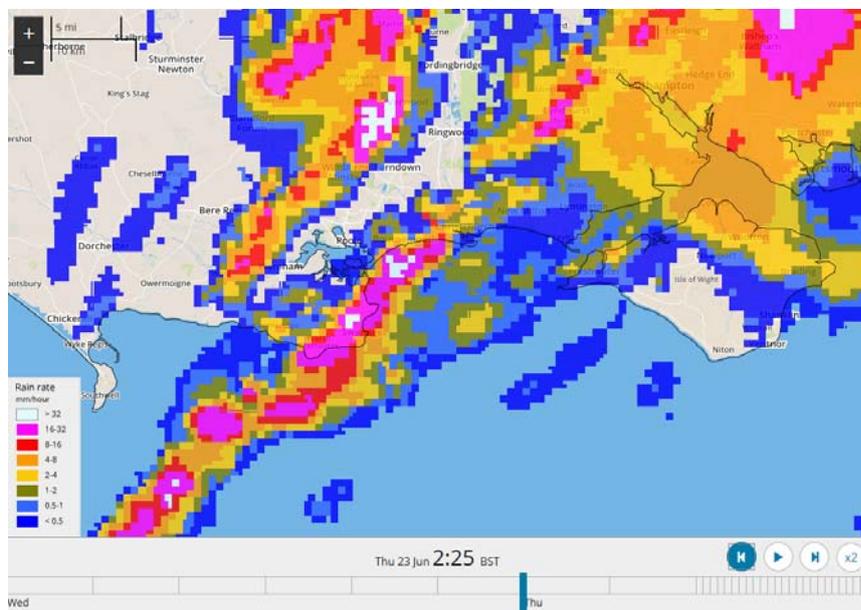
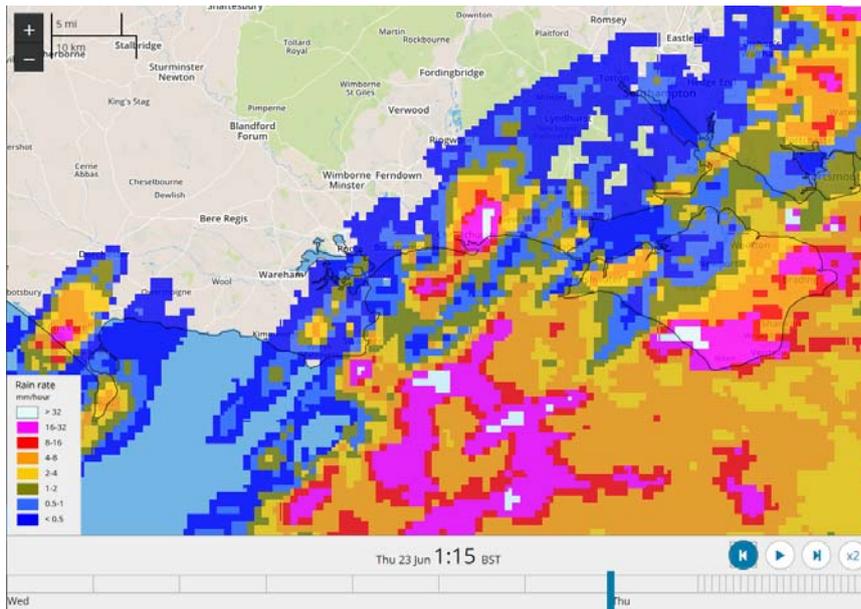
- 3.2 The weather had been particularly unsettled in the run up to this event with thunderstorms throughout the southern part of Britain however for the 22nd / 23rd of June there was no specific Flood warning covering the Dorset area. (NB Dorset is for Flood forecasting purposes considered to be in the South West). The only information issued was a more general warning from Natural Hazards Partnership (at 2.00 p.m. on the 22nd) of FLOOD: The Flood Guidance statement (FGS) from the Flood Forecasting Centre (FFC) stated:

“Torrential, thundery downpours are likely to affect some parts of south-east England at times from Wednesday night, and on Thursday and into the early part of Friday. This brings a MEDIUM likelihood of significant surface water flooding impacts in the far south-east of England from Wednesday evening into Thursday morning”

The Flood Forecasting Centre did on the 23rd June release a flood forecast for later in the day but Bournemouth experienced no more rainfall.

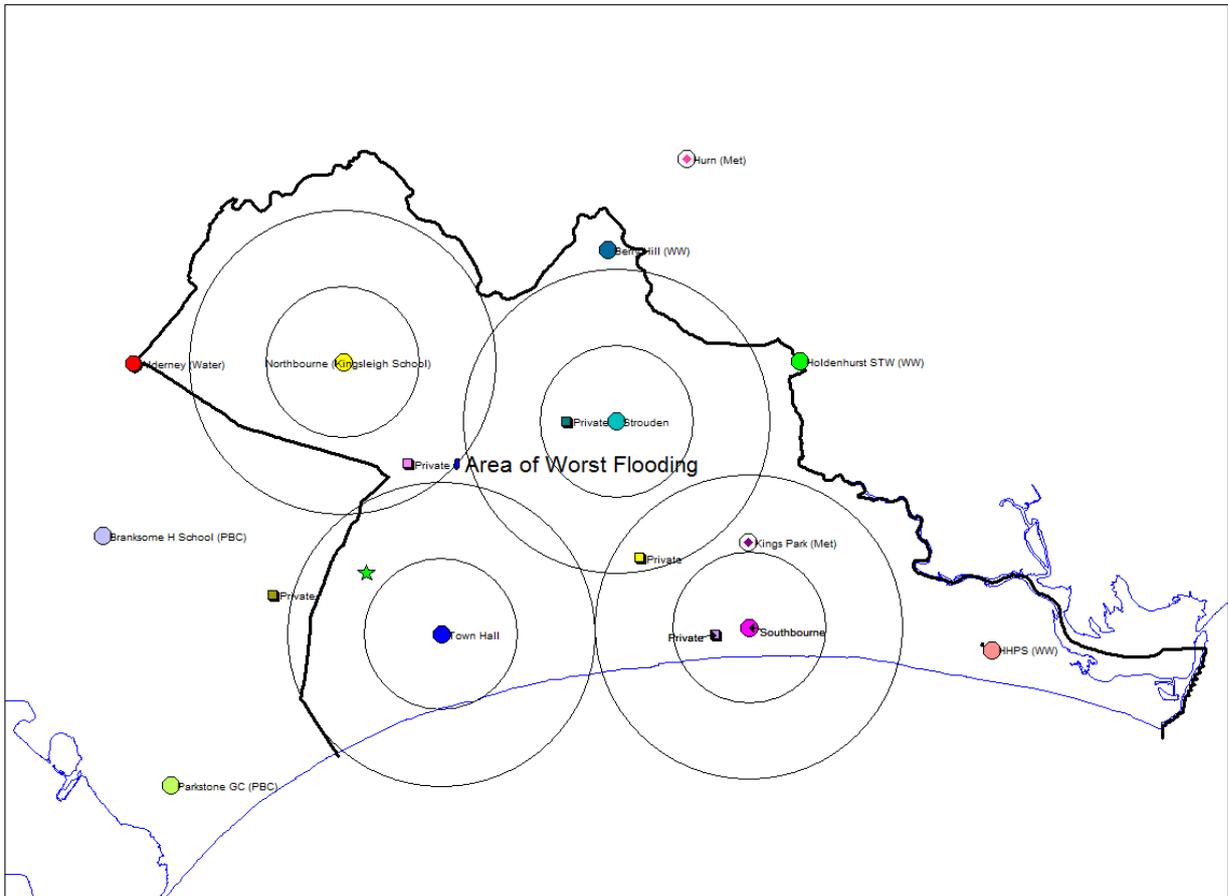


3.3 The following shows “snap shots of the actual rainfall radar which shows that the vast bulk of the rainfall was mainly out to sea but just for a while “drifted” in land. The rain gauges suggest that the heaviest rainfall was actually in Southbourne and the Strouden areas of Bournemouth (confirmed by the Wessex Water rain gauge at Berry Hill). THERE WAS NO REPORTED FLOODING IN THESE AREAS.

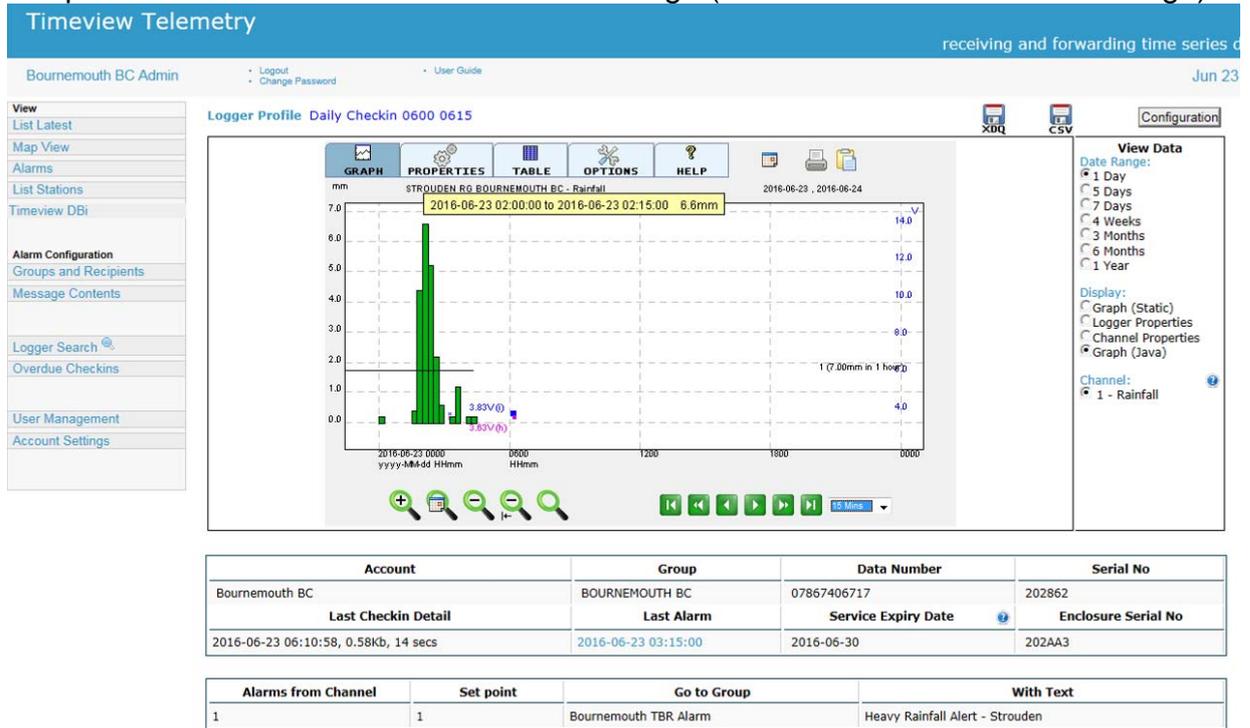


Existing Rain Gauges in and around Bournemouth (not to scale)

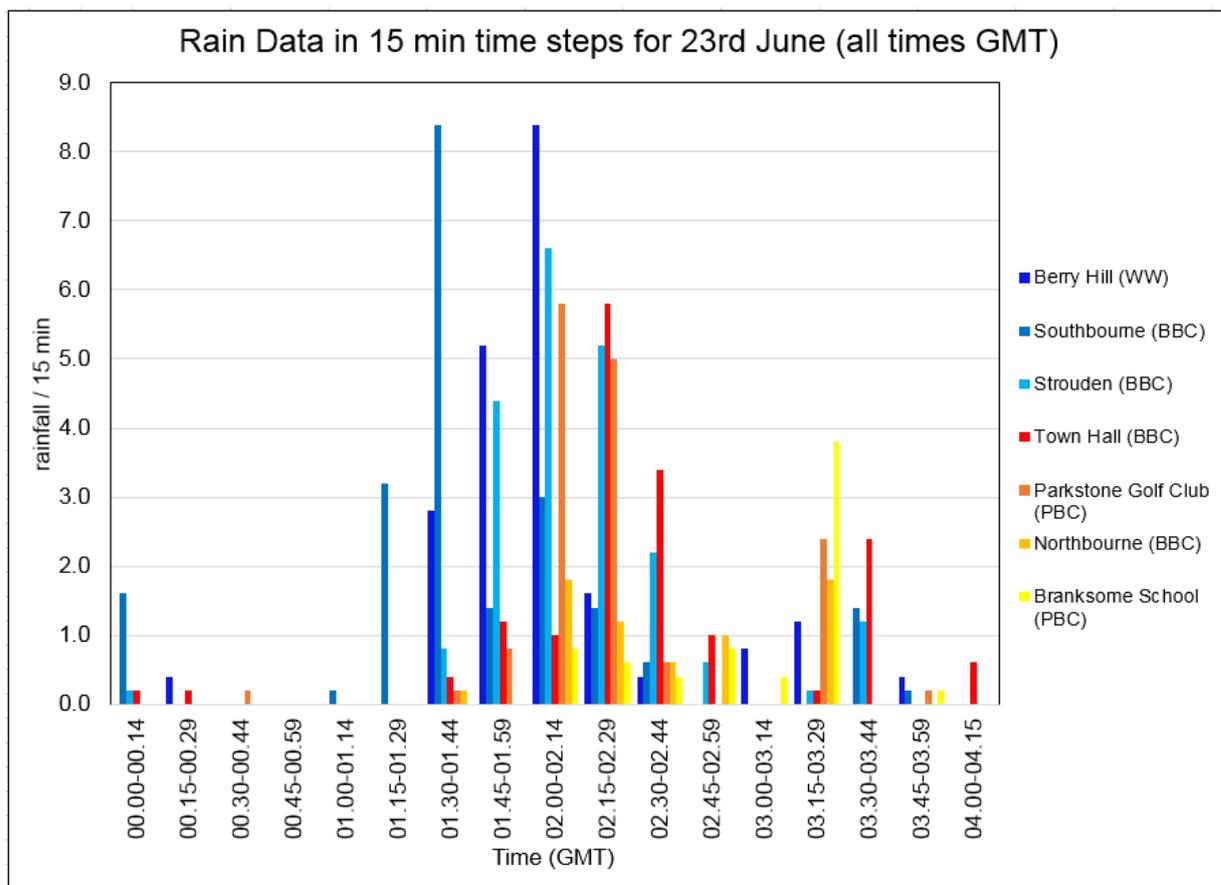
(Rings are 1km and 2km respectively from the Bournemouth Raing Guages. The private rain gauge which was near by does not seem to be currently reporting)



Snap shot of Bournemouth Strouden Rain Gauge (heaviest rainfall for a BBC Gauge)



Rainfall from available gauges plotted in 15 min time steps



	00.00-00.14	00.15-00.29	00.30-00.44	00.45-00.59	01.00-01.14	01.15-01.29	01.30-01.44	01.45-01.59	02.00-02.14	02.15-02.29	02.30-02.44	02.45-02.59	03.00-03.14	03.15-03.29	03.30-03.44	03.45-03.59	04.00-04.15	Total
Berry Hill (WW)	0.0	0.4	0.0	0.0	0.0	0.0	2.8	5.2	8.4	1.6	0.4	0.0	0.8	1.2	0.0	0.4	0.0	21.2
Southbourne (BBC)	1.6	0.0	0.0	0.0	0.2	3.2	8.4	1.4	3.0	1.4	0.6	0.0	0.0	0.0	1.4	0.2	0.0	19.8
Strouden (BBC)	0.2	0.0	0.0	0.0	0.0	0.0	0.8	4.4	6.6	5.2	2.2	0.6	0.0	0.2	1.2	0.0	0.0	21.2
Town Hall (BBC)	0.2	0.2	0.0	0.0	0.0	0.0	0.4	1.2	1.0	5.8	3.4	1.0	0.0	0.2	2.4	0.0	0.6	16.2
Parkstone Golf Club (PBC)	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.8	5.8	5.0	0.6	0.0	0.0	2.4	0.0	0.2	0.0	15.2
Northbourne (BBC)	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.8	1.2	0.6	1.0	0.0	1.8	0.0	0.0	0.0	6.6
Branksome School (PBC)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.6	0.4	0.8	0.4	3.8	0.0	0.2	0.0	7.0

3.4 The Bournemouth Rain Gauges are set up to send an alarm to the Duty Officer if rainfall exceeds 7mm in any one hour. The following alarms were sent: -

Timeview Telemetry receiving and forwarding time series data and alarms

Bournemouth BC Admin

[Logout](#)
[Change Password](#)

[User Guide](#)
Aug 17 2016 13:28 GMT

Alarms - Bournemouth BC
Bournemouth BC
Items per page: 20
[Back](#)

Page 1 of 4, showing 20 records out of 63 total, starting on 1, ending on 20

Group	Serial No	Tag	Alarm Detail	Alarm Date	Actions
BOURNEMOUTH BC	202862	STROUDEN RG	Heavy Rainfall Alert - Strouden	2016-06-23 03:15:00	View
BOURNEMOUTH BC	103187	TOWN HALL ANNEX	Heavy Rainfall Alert - Town Hall Annex	2016-06-23 02:30:00	View
BOURNEMOUTH BC	202862	STROUDEN RG	Heavy Rainfall Alert - Strouden	2016-06-23 02:15:00	View
BOURNEMOUTH BC	201A74	SB RAINGAUGE	Heavy Rainfall Alert - Southbourne Raingauge	2016-06-23 01:45:00	View

NB these times are GMT.

3.5 To put this in context the Bournemouth typically gets on average 2.7 times a year when rainfall exceeds 25mm in 24 hours but this has varied between 0 and 7 times a year (based on Kings Park Met data 1981-2015).

4.0 Consequences

- 4.1 The only report BBC had of any flooding was a call to our Customer team on the morning of the 23rd June about flooding in Wimborne Road (Winton High street in an area informally known as St Peters Hill) from one of the shops. (Case ID: 101000644185) and even then they initially said it was a blocked gully. The Gully crew dully attended about 4.00 p.m. that afternoon but no blockages were found apart from a drinks can in one piece of pipe that links two gullies. However, there are at least 10 gullies in this immediate area as it has a history of flooding.
- 4.2 Works were ongoing at the time for a flood reduction scheme in East Avenue and from the evidence of tide marks around the site it was obvious that there must have been considerable highway flooding at this location but it probably did not actually enter any properties. Again debris indicated that the Central and Lower Gardens as well as Bradley Road flooded. These are all regular locations but fortunately no properties are affected. Further the public sewers surcharged in the Lower Gardens which again is not a rare event.
- 4.3 According to local media the Police closed roads at the Cooper Dean Roundabout around about 4.00 a.m. but it had all gone by 6.15 a.m. before there was any significant volumes of traffic.
- 4.4 Wessex Water had a small number of calls about this event but the only relevant was probably flooding in Charminster Road near Heron Court Road.
- 4.5 On the 24th of June the Flooding Manger visited site and interviewed a number of shop owners at which point it became obvious that this area flooded extensively. 8 proprietors were interviewed and 6 reported that they had flooded internally (a 7th may have also have had flooding but they thought it was water entering through faulty roof guttering). None of the six properties appears to have flooded internally to more than about 50mm deep based on "tide marks" but this was sufficient to ruin some stock on the floor, and damage floor coverings and electrics. Most shops had to close for at least a day to clear up.

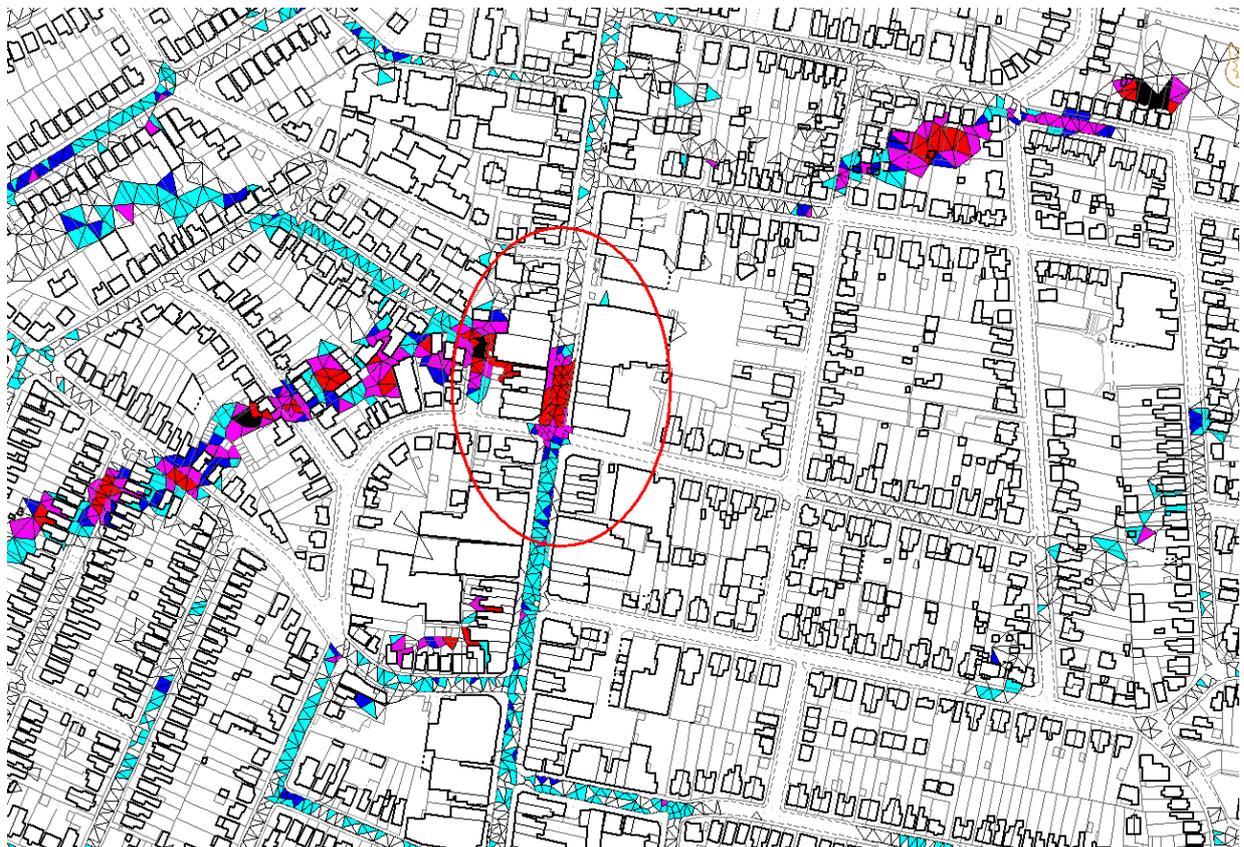
On previous occasions these properties have flooded from both the public highway at the front and private car parking areas at the back but this time it was not really possible to tell where the flood water had come from although the most likely was from the public highway at the front.

BBC has records of these properties flooding on: -

7th Oct 2001
28th June 2005 (Unconfirmed)
12th Sept 2008
18th August 2011
3rd July 2015
And 23rd June 2016

Again speaking to some of the owners there are other occasions when they have flooded but not reported it. (One owner said "what's the point, nobody does anything about it!"). However, many of these shops are on relatively short term leases. For example, two of the 10 often affected have changed hands in less than a year.

- 4.6 It is worth noting all of these events are relatively short duration flash flood type events and none occur in the winter months.
- 4.7 It is also worth noting that there are 10 gullies in this immediate vicinity which suggest it has been a flooding hot spot for many years. However, it is also known that many of the gullies are simply linked together and there are only 4 actual gully connections to the public sewerage system. There is no dedicated highway piped network or any water courses in this area and the area is totally drained by the public sewerage system. Hydraulic analysis has shown that there is a lack of capacity in this area but the system should have been capable of conveying this magnitude of rainfall.
- 4.8 All the currently available surface water flood models show this is a high risk area. Below are the results for a 1 in 100 year storm using the latest available full Infoworks Model developed jointly with Wessex Water (The pale blue is depth 50-100mm, dark blue 100-150mm, purple 150-300mm, red 300-500mm and black exceeding 500mm).



5.0 Conclusion

- 5.1 As far as can be determined the rainfall for this event, while heavy, was not a very extreme event but the worst flooding was in a very small zone over 2km from all the existing rain gauges. For information the epicentre of the now infamous Air Show event of 18th August 2011 was only 3km across and far more extreme than this event
- 5.2 One of the reasons for carrying out a Section 19 report is to “*whether each of those risk management authorities has exercised, or is proposing to exercise, those functions in response to the flood*”. Investigation has shown that there were no blockages to the gullies or the gullies connections to the sewer. Wessex Water have not been able to determine if there were any blockages in the public sewerage system. There is a distinct lack of any hard facts as to what happened because of the time of the flood (3.00 a.m. in the morning) with no eye witness reports and the only evidence being subsequent damage or “tide lines”. The only conclusion that can be drawn was that the rainfall was very intense and the local drainage capacity was exceed. It is accepted that this is unsatisfactory but there is not much else than can be determined at this stage.
- 5.3 Bournemouth Borough Council are now working with Wessex Water to see if there is a more long-term solution but there is not an obvious answer. A piped solution could involve very large diameter pipes over considerable distance. There is no room for attenuation storage of flood water either above or below ground. Changing the existing Highway drainage to more sustainable system would have to be very extensive and probably involve loosing so much on street parking (which is already in very short supply) as to be unacceptable. Long term, as the area is redeveloped insistence on more Sustainable Urban Drainage systems (SuDs) will improve the situation but this could take decades or even centuries. The only realistic short term solution to prevent internal flooding is possibly Property Level Protection (PLP) but the available grants are largely targeted at residential properties.

6.0 Recommendation

- 6.1 That work progresses to look at possible long term solutions and costs as well as exploring potential sources of funding.