

BFG was assembled during March 2016 following a Community meeting which reviewed the circumstances leading to the December 2015 flood and the recovery actions which had been put in place.

Local people voiced concerns and questioned the actions to be taken to provide enhanced flood protection measures to protect Ballater from future flooding. BFG adopted this key question as the core of its activity, and this summary report describes the categories of work undertaken during the following ten months.

The activities are described within the following categories

The December flood - causes.

The technical issues.

The legal questions and responses

The political questions and responses

The future

The work of BFG has produced some 50 documents which are available for examination by telephoning me on 013397 55625. This report is abbreviated to provide an ease of understanding and cross-refer to the various reports which in turn are evidence and/or data based.

Causes.

The flood event resulted from a combination of exceptional and unusual events which conspired to result in a volume of water within the river channel which vastly exceeded its capacity to contain it. The peak flow rate was measured at 1360 cubic meters per second. (Cu/sec). The highest recorded in the previous 40 years was 720 cu/sec during August 2014.

This 2014 value is significant as it demonstrated the point at which the river just overtopped - known as "bank full volume". The factors which influenced the December flood were:-

1. The November rainfall - the highest ever recorded, causing ground saturation
2. Storm Eva
3. Storm Frank
4. A temperature inversion at the North Pole influencing a dramatic increase in local temperatures, causing a very rapid snowmelt on surrounding higher land.

The bank full level previously described was quickly exceeded and the river began to overflow the river channel. The scenario which followed is based upon eye witness accounts, photographic evidence, flow stream evidence, and importantly, an analysis of the boulder field at the golf course which demonstrates both flow direction and flow energy.

Early during the flood event, the channel remained largely intact with flood water depths typically reported as 'a few inches'. There then followed a massive pulse with water depths rapidly rising by as much as 12 feet and with flow rates being measured at speeds exceeding 16 mph. This corresponds to the time at which the river had burst through the golf club bund wall and had flowed very quickly across the golf course before causing extensive flooding to low areas of the community as the split flow attempted to re-enter the main river channel at the Royal Bridge. The damage trail and failure directions are all completely consistent with this description.

The river channel split scenario has been analysed, based entirely on evidence. Our conclusions have been challenged, although those that have done so, have not produced evidence to support their challenge. We have described that the increasing channel flow created increasing lateral pressure at the river banks, causing rapid undercutting of the Red Braes bank resulting in the formation of a cornice-like overhang. This progression continued until the bank became unstable to the extent that a massive collapse occurred which partially blocked the main channel and deflected the channel flow towards the golf club bund.

NB. The vulnerability of the Red Braes to potential failure had been described in Professor Flemming's report published in the late 1990s.

An Aberdeenshire Council agronomist reported that trees from the Red Braes had fallen into the river channel and had been driven by the water flow with a force sufficient to destroy the golf club bund wall. It was subsequently established from boulder distribution that the primary breach points of the bund wall were directly opposite the collapsed Braes.

Once the breach points were established, the flood waters crossed the golf course in a violent manner - distributing many tons of boulders across the golf course. Some boulders weighed in excess of 100KG and had been swept 300 metres - such was the strength of the tidal stream. The path of the flood waters has been described in various reports and is not disputed.

Technical issues.

BFG has considered the question of community protection from future flooding and believes that protection against nuisance flooding must be provided without delay. The golf club bund wall had demonstrated that it offered a level of protection up to the 700 cu/sec flow levels of August 2014 flood event. BFG supported the proposal that the Council would restore the golf club bund to its original standard. This proposal was not followed through - the Council opted for a 40 metre repair section installed downstream of the breach points. This repair was challenged by BFG on the basis that the breach at this point was caused by floodwater having breached from behind i.e. the rear face of the bund (this evidenced by the boulder field).

BFG asked the Council for the evidence which supported this repair but the Council did not respond. This repair did however justify the removal of the sand bag wall - but at a later public meeting it was confirmed that the repair section had not restored the integrity of the bund wall. At a meeting in October between BFG and the Council, it was agreed that a sound technical solution would be to install a secondary containing wall behind the original bund wall. The Council were to consider this proposal and respond. To date no response has been received.

The legal position

Earlier in the year, BFG's legal representative sent an email to the Council Chief Executive requesting the Council's comments in respect of Duty of Care and Health and Safety issues resulting from flooding. After two months, a response was received from the Council's Legal Officers. It stated:-

1. Protection of property from flooding is the responsibility of the owner.
2. The Council has no obligation to protect property from flooding.
3. The Council must have arrangements in place to warn of flooding.
4. If the Council becomes aware of actions which, if taken, would reduce the risk of flooding - it must take them.

The main questions asked were not answered. A second email sent by our legal representative has not to date been responded to.

The Political issues.

A very detailed letter was sent to the First Minister explaining the extent of the devastation of Ballater, advising that the impact had caused damage far greater than to any other community within the UK. We requested that Ballater should receive a priority status within the flood study programmes.

A response was received from the Environmental Minister and Ballater does now have a higher priority with research and proposals to be provided prior to 2022. BFG had hoped to maintain a direct political dialogue with our MP, but regrettably this has not happened. Our MSP has however been very helpful by responding promptly to our questions and providing Parliamentary comment.

The future

Will it happen again? The Royal Academy has recently summarised the Climate Risk Assessment which concludes that flooding will be the greatest climatic threat for the next century - climate change is a reality. It can happen again. The highest single event rainfall recorded in Scotland in 1974 resulted in a 10 inch fall in less than 24 hours - were this area to experience such an event, flooding is inevitable.

On a positive note, preliminary findings of the SEPA channel calculations indicate that the local river channel capacity has increased following the December 2015 event. The rainfalls preceding the flood exceeded any level previously recorded and the high temperatures experienced and the rate of increase were unprecedented. The Braes collapse is unlikely to be repeated as the December 2015 collapse relieved the problem and the face angle of the bank is much reduced.

Ballater has a history of flooding, with 3 major events being recorded over a 200 year period. There have been three minor events within the last 50 years with the highest occurring in August 2014. A risk analysis based upon frequency of individual events, suggests that the risk of a major event is very low and that the risk of minor flooding is less than before the December 2015 event. However a risk is a risk - and therefore we should be aware and prepared but not intimidated by imagining that the risk is greater than it actually is.

It remains that there are actions that could and should be taken by the authorities which would reduce the risk of flooding without the risk of downstream negative impact. We must all do our best to influence them to do what can be done and do it as soon as possible.

In closing, I wish to record the sincere and very grateful thanks of BFG to Douglas Johnstone who has worked tirelessly in support of BFG's work.

This report closes the BFG, as it has served its purpose.