Cockermouth Flood Risk Management

Questions and Answers

June 2011

What is this work all about and what are you doing?
The Environment Agency has investigated whether improvements can be made to the existing standard of protection against flooding in Cockermouth. Results of this feasibility study show that improvements can be made and are justified on economic, technical and environmental grounds.

As part of our study we investigated different options to reduce flood risk to the town and discussed these with local residents during February and March 2011. Working with the community has enabled us to address concerns and come up with our preferred option to reduce flood risk to homes and businesses in Cockermouth which is to raise sections of the flood walls and embankments along the River Cocker and River Derwent.

Where are you now?
We are starting to prepare the detailed design for our preferred option and will continue to work with the community on our designs especially those directly impacted – such as those living next to the flood walls and embankments. We will consider all views on how the finished walls should look.

What are the next steps?
We hope to have completed the detailed design and have all the necessary planning permissions in place by April 2012. This will allow us to start construction, providing funding for the scheme is granted by the Government.

Many schemes in areas at high risk will receive full funding from Government, whilst others receive large contributions that will go a long way towards meeting the amount needed for a flood risk management scheme to be built.

Where additional contributions are needed, the Environment Agency works in partnership with local communities to find ways of securing private investment such as from businesses or developers who will benefit from the added protection a flood defence will bring.

Will a flood risk management scheme protecting Cockermouth, just push the problem downstream and make the flood risk worse for people on the right bank of the Derwent?
All designs we produce for flood risk management schemes need to ensure that we don't transfer the flood risk to other areas. In our plans for Cockermouth, we have checked that all the raised defences don't push more water onto Derwentside Gardens or onto Gote Road. We know this because the standard of protection we are proposing along the River Cocker and downstream of the River Derwent confluence, is less than, or equal to, the standard of protection currently provided to the Gote and Derwentside Gardens.

Does the Environment Agency remove gravel from rivers?
We regularly monitor the river bed levels in urban areas where gravel accumulation occurs, however, we only remove gravel where we need to maintain the required level of flood protection. In Cockermouth, controlling river bed levels through gravel removal is essential to maintain the standard of protection against flooding that is provided to the town.

If you want to reduce flood risk further, why can't you just remove more gravel from the rivers?
In order to reduce the flood risk from the River Derwent, modelling has indicated that a 2.3km stretch of

the river bed would need to be dredged to between a one and two metre depth. This is not the best option to reduce flood risk as rivers are mobile and gravel within a channel is transported and deposited down the river during high flows. The river bed levels in Cockermouth have also reached a natural equilibrium and if dredging were to be adopted as the only means of managing flood risk, it may be needed to be done annually and after every flood, which is not the most appropriate or cost-effective method for reducing flood risk.

Dredging on the River Cocker is not feasible as this would undermine the foundations of bridge structures fronting the river and again, because this river bed level has reached a natural equilibrium, it would need to be done on a very regular basis. Therefore the risk of flooding from the River Cocker could not be reduced by using this method.

However, some gravel removal from the rivers, particularly the River Derwent, will be included as part of our solution to reduce flood risk to homes and businesses in the town. This will be presented in a maintenance management plan.

Did gravel build up in the channels cause or contribute to the flooding of Cockermouth town?
The extent of rainfall that contributed to the high flows in the Rivers Cocker and Derwent would have caused flooding regardless of the amount of gravel in the river channels. With any high river flow, gravel is transported down through the river system, settling in areas where the channel gradient changes and becomes less steep.

During the November 2009 flood, gravel was deposited in both rivers. This was subsequently removed from the River Derwent by the Environment Agency in order to maintain the level of flood protection that existed before the floods. Cumbria County Council also removed some gravel from some sections of the River Cocker.

Did blockages of bridges in Cockermouth make the 2009 floods worse?
The flooding in November 2009 resulted because of record levels of rainfall. The flooding was going to occur regardless of bridge blockages or build up of gravel within the channel. Blockages of bridges in Cockermouth can, however, make flooding worse. As we cannot guarantee that bridges will never block, we have included some blockage at several of the bridges in the river models being used to design the flood risk management scheme.

Will any future works cause major disruption to the town?
Any amount of construction work causes some disruption due to construction vehicles travelling to and from the site. However, we always work hard to ensure that disruption from construction work is kept to a minimum. It is important to remember that this is still early stages and construction of a flood risk management scheme is not guaranteed at this stage. We will however, keep you informed as to how our proposals are progressing.

What would the impact be if both the South Street footbridge and the Waterloo bridge were removed or raised?
We have carried out a study to show the impact of the river flows if the two bridges were removed - both individually and together. The results show that the height of the maximum river levels would drop, particularly at the Waterloo Bridge area, where the peak level dropped by 537mm. Maximum river levels dropped by 410mm at South Street footbridge and 165mm at the old railway bridge.

Removal of the bridges was not considered a viable option to help reduce flood risk to the town because they currently provide connectivity between communities, are permissive rights of ways and have historic connotations for the area. South Street footbridge also is part of the Coast-to-Coast Sustrans cycle route. The option of raising the bridges out of the floodplain during a flood event was considered, but decided not viable. This was due to the high cost and the extensive structural works

needed to protect the bridge against upstream debris impact during high flows when the bridge deck would need to be raised.

If the flood defences are raised, higher flows will be carried down the river - does this mean there a greater risk of defences failing?
The flood defences will be designed to take the additional loading from the increased flow and structural assessments will be completed on all defences providing flood alleviation. Where existing defences are likely to be weakened by the increased flows, strengthening works will be completed. Inspections of existing defences have already been completed and where strengthening works are needed, have been included in our proposals.

The emergency works to repair flood defences following the 2009 floods, included works to the foundations of the existing defences. This allows us to carry out future works to raise the height of defences, without impacting on the structural integrity.

Why do the results from the modelling show that the standard of protection is low when flooding from the River Cocker has only occurred once?
In determining standards of flood protection, the most up to date records of recent flooding need to be used. The 2009 flood provided new rainfall data which had significant implications on the hydrology and the flood levels.

Return period flows are estimated using a flood frequency curve which uses existing data to forecast higher return periods where data from flooding may not exist or is limited. Where data is available, particularly for high levels of flooding (such as that Cumbria experienced in 2009), the information provides a valuable opportunity for checking that forecast return periods developed from using low flood return period data, are accurate.

In the case of Cockermouth, the 2009 data influenced the flood frequency curve by recording higher flows for the 100 year return period, thereby reducing the standard of protection that was originally determined from earlier data.

Is surface water flooding a big concern in Cockermouth town?
Flooding can also occur from surface water when the drainage systems are overwhelmed and are unable to outfall into the river due to high river levels. We continue to work with Cockermouth Flood Action Group, United Utilities, Cumbria Highways and other partners to reduce the risk of surface water flooding.

What caused the November 2009 floods?
The amount of rainfall that fell over two days on top of the saturated catchment caused rivers to swell, many to record levels, overwhelming the floodplains in Cumbria. In Cockermouth, approximately one month's worth of rainfall fell in the space of 24 hours and the impacts were worsened by flows peaking in both the River Cocker and the River Derwent at similar times.

No requests were made to United Utilities to release water from Thirlmere Reservoir or Crummock Water. Both reservoirs were already full as a result of so much rainfall. Thirlmere Reservoir does not have a control structure that is able to release controlled amounts of water into the river. Any additional water entering the river would have been due to the reservoir overtopping once full. Gravel removal alone would not have prevented the flooding that occurred.