

## **Background and Methodology - allocation of funding for local authorities to tackle surface water flooding.**

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### **1) Overview**

- Defra announced in August 2009 how new funding of **£16m** will be allocated to local authorities across the country to take action to tackle problems from surface water flooding.
- Local authorities are generally very keen to take on this new role, recognising it builds on their existing responsibilities for highways and the planning system. This funding will help local authorities make an immediate start to manage local flood risk better in this country. This is the first step towards better management of all flooding that will be supported by and the draft Flood and Water Management Bill and the EU Floods Directive.
- The funding is for making quick wins to start reducing the effects of surface water flooding immediately and also taking preventative measures by longer term planning to try to manage the risks of surface water flooding before it actually happens.
- This funding is specifically for local authorities however other organisations also have a very important role to play in co-operating with local authorities and providing resources in line with their existing responsibilities in the built environment. This will include Water and Sewerage companies, the Highway Agency, Internal Drainage Boards, the Environment Agency and in some cases private landowners.

#### *Areas at highest risk*

- £9.7 million has been awarded to 77 local authorities for areas where the evidence shows that the risk and potential impact of surface water flooding could be highest and where surface water management plans are most needed to help understand and manage the flooding.

- Defra will be contacting the 77 Local authorities concerned to explain the details of how funding will be made available.

#### *Locally known flooding problems*

- Local authorities for all other areas will also be able to bid for a share of £5 million to help them deal with known local flooding problems.
- Details of how other local authorities can bid for the £5m and the criteria that will need to be met will be available on the Defra website by the end of September 2009.

#### *Central assistance to Local Authorities*

- Defra is also spending £1 million on making training, data and other tools available to help all local authorities manage local flood risk.
- We know local authorities have expressed concerns with the skills and capacity they have to take on a new lead role for managing surface water flooding and money is also being made available for training, upskilling and provision of support and advice to help them take on this new role over the next few years.

## **2) Background;**

### *2.1 What is surface water flooding?*

Surface water flooding happens when the ground, rivers and drains cannot absorb heavy rainfall. Typically this type of flooding is localised and happens very quickly after the rain has fallen, making it difficult to give any warning. Surface water flooding is a general term which is used to cover flooding from:

- runoff from impermeable surfaces due to very heavy rain,
- groundwater in areas where water has percolated into the soil on high ground and then emerges as springs or just rises to the surface in lower areas
- flooding from small streams or drainage ditches.
- water which has gone into drains or sewers in one place and then flooded out in another,

The first three bullets are also referred to as local flood risk in the Pitt Review of summer flooding 2007 (i.e. surface runoff, groundwater and flooding from small streams

### *2.2 Why is surface water important?*

The 2007 floods exemplified the distress and damage that surface water flooding can cause. The Environment Agency, as part of their review of the summer floods,

estimated that two-thirds of the 57,000 homes affected were flooded from surface water runoff overloading drainage systems. Combined damage from the June and July floods is estimated to be around £3 billion. Sir Michael Pitt's report ([http://archive.cabinetoffice.gov.uk/pittreview/\\_/media/assets/www.cabinetoffice.gov.uk/flooding\\_review/pitt\\_review\\_full%20pdf.pdf](http://archive.cabinetoffice.gov.uk/pittreview/_/media/assets/www.cabinetoffice.gov.uk/flooding_review/pitt_review_full%20pdf.pdf)) of the summer floods has highlighted the risks of surface water flooding and put forward recommendations to reduce the chance of such an event occurring again.

### *2.3 What is government doing about this?*

New Legislation (<http://www.defra.gov.uk/environment/water/flooding/flow/index.htm>) proposes that County and Unitary local authorities (Including Metropolitan Authorities and London Boroughs) take lead responsibility for having a strategy to manage flooding from surface runoff and groundwater together with District authorities and IDBs who retain their existing responsibility for small streams and ditches. Flooding from sewers or road drains will already be the responsibility of Highways Authorities or local Sewerage and Water companies and these responsibilities will not change. County and Unitary Authorities will be Lead Local Flood Authorities (LLFA) and will build strong partnerships with all of these organisations to understand local flood risk and work together to reduce the consequences in the short and long term. Surface water management plans (usually developed by LLFA) will help local authorities and other organisations develop their strategy and decide how surface water flooding can best be managed in their area.

Flooding from surface water is more difficult to try to predict than flooding from rivers or the sea. It usually happens very quickly after heavy rainfall in areas where there is little open ground to absorb rainfall, and where manmade drainage systems become overwhelmed. Simply increasing the size of underground pipes is not always the best solution to deal with flooding. In particular we need to find better ways of safely managing very rare and severe surface water flooding on the surface. This could result in some temporary inconvenience such as access to amenity areas or roads but this will be worthwhile if it means that people's houses and businesses are protected.

### *2.5 Why are the Government committed to funding £16m?*

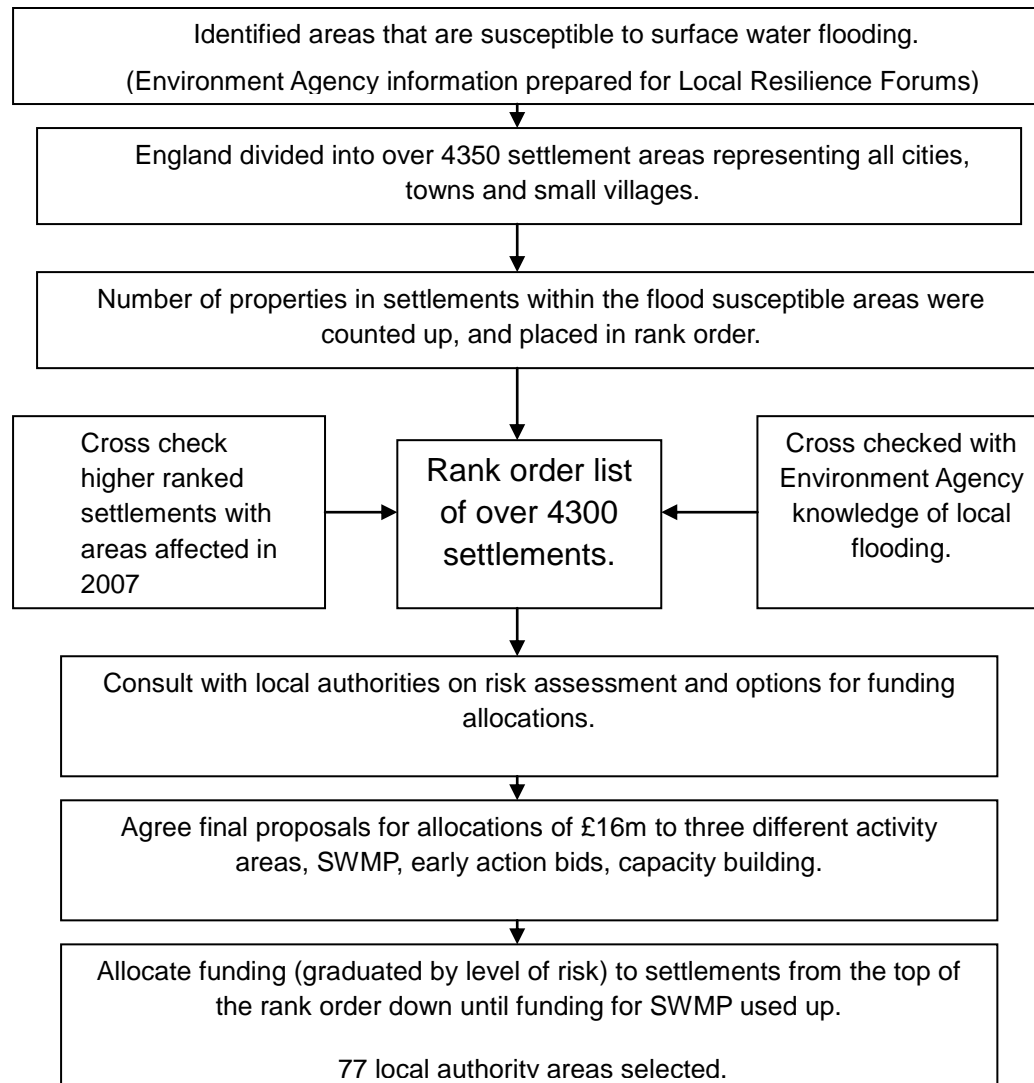
The Government agreed with the Pitt recommendations and initially made £15million available for local authority leadership on flood risk management in the 50 highest priority areas; including surface water management plans, tackling local flood risk problems, mapping of drainage assets, etc.

Since then we have consulted local authorities and in addition to the above there has been identified a clear need for provision of further training and professional development of existing staff in the new areas of local authority responsibilities,

developing datasets and support system. An additional £1m has been allocated by Defra to meet these needs.

## Methodology behind the Allocation

### 3) Summary of Methodology. (See section 4. for more detail)



### 4) More Detailed explanation of the Methodology

4.1. This section looks at how the methodology has been developed to allocate the £16m of funding. It looks at:

- How was risk calculated
- The distribution of risk across different areas.
- Allocation of the £16m for different activities
- Consultation
- Final stage in the allocation.

### ***How the risk of surface water flooding was assessed across England.***

4.2 The Environment Agency had maps produced which identify areas susceptible to surface water flooding in 2008 following Sir Michael Pitt's interim recommendations on the flooding of 2007. This resulted in information showing areas susceptible to surface water flooding following very severe rainfall. This information was provided to Local Resilience Forums in August 2008 for emergency planning purposes and more recently to Local Planning Authorities for spatial planning purposes. It is the best source of national information currently available. Further work has already begun to produce a second generation of information which will become available over the next few years.

4.3 It is assumed that all areas in the country are equally likely to suffer from very extreme rain storms and it is only a matter of chance where it falls on any occasion. The mapping represents the effect of extreme rainfall, with a 1 in 200 chance of occurring in any year, falling all over the country. The method takes account of regional variations in rainfall although the rainfall representation is simplified by modelling the effects of a single storm duration of 6.5 hours. In some areas, due to their topography, more severe effects could occur due to shorter or longer storms and new work will take this into account.

4.4 The information on the maps is based on assumptions which mean that they only show an estimate of the areas that could be susceptible to surface water flooding. It is assumed that the rainfall is so extreme that the effects of underground drainage can be discounted because all pipes would be running full and excess water would have to find pathways over the surface of the ground. The topography of an area is taken into account so flow pathways will reflect sloping ground and ponding will occur in flatter areas.

4.5 Because of the resolution and accuracy of the underlying topographic data used to produce the maps, and because this was a national model, the effects of buildings, roads, kerbs, walls etc. on flood pathways or where water will pond is not taken into account.

4.6 The assumptions made, and the method used to produce the maps, means that they should not be used to identify if individual properties in an area will be flooded. However the maps are very useful in showing where flooding is more likely, and to identify areas which have a natural vulnerability to flood first, flood deepest, and/or flood in relatively frequent, less extreme events. This will help emergency planners when considering how roads, railways, built up areas, and essential infrastructure such as hospitals could be affected.

4.7 The built up areas identified at risk for this ranking exercise did not include areas where the maps showed very shallow flooding at a national scale because

there would be great uncertainty about the accuracy of this in relation to local ground levels.

4.8 Using the Environment Agency information Defra commissioned work in spring 2009 to collate information on the areas susceptible to surface water flooding into settlements. England was divided into over 4,350 settlements including all large towns and going down to small villages. Within each of these settlements the number of properties in areas susceptible to surface water flooding were estimated and then ranked nationally to show the relative risk between settlements.

#### ***Distribution of risk to different areas***

4.9 The ranking showed that there were significant differences in potential surface water flood risk between settlements. Numbers of properties varied from in excess of 30,000 to zero. As expected the number of properties at risk was strongly correlated with more densely populated areas. However areas still had to have a high proportion of susceptibility to surface water flooding to be identified at high risk. The risks assessed are from heavy rainfall and different to those that would come from river or sea flooding although some areas could be at risk from more than one source. The key findings from the initial risk assessment work are:

- Most larger cities and towns affected in the 2007 floods are identified at higher risk in this latest assessment.
- The distribution of risk across the country shows that the majority of risk is concentrated in dense urban areas and of the 4,350 settlements in the country about 80% of the risk is in 10% (430) of these settlements and approximately 50% of the properties at risk are contained within 100 settlements. The 30 highest risk settlements all have more than 10,000 properties identified at potential risk.
- A lot of settlements in England appear to have quite a high number of properties at risk of surface water flooding if subject to very severe rainfall. Even the 300<sup>th</sup> ranked settlement in the list still had 1,000 properties at risk and the 1,000<sup>th</sup> ranked settlement had 200 properties.
- A high proportion of the settlements at potential highest risk (over 50%) are London boroughs and areas in the south east of England. This is because these areas are densely populated and include a significant proportion of paved areas which makes flooding from very heavy rain more likely.

4.10 The London boroughs represented over half of the top 50 ranked settlements and 25% of the total national properties in England at risk estimated to be around 1.7m (this figure excludes properties susceptible to very shallow flooding). The risk assessment only took account of the number of properties susceptible to flooding and did not take account of other consequences such as associated damage to transport and underground services which in London is more concentrated than

other areas. The areas identified at risk did not include very shallow flooding as the potential damage is much less certain.

4.11 Whilst London did not suffer significant damage in 2007 the potential economic risks and human consequences from a similar London or other big city wide surface water flooding event would be considerable. There is no evidence to suggest that London, Birmingham or Manchester is any less susceptible to an event of this kind – it is simply a matter of chance as to where the rain falls.

4.12 On the basis of the initial risk assessment it became obvious that the London Boroughs dominated the higher end of the ranking. In order to examine the risk in more detail outside London the London Boroughs were extracted from the national list.

4.13 Because the London Boroughs are all situated adjacent to each other and will share topographic water sheds and drainage systems it would make sense for the Boroughs to undertake a combined SWMP for the whole area and a consortium of London boroughs called Drain London Forum sponsored by the London Assembly are developing proposals for this. Efficiency savings would be expected to be achieved from a consortium approach.

4.14 Other settlements across England were ranked on the basis of the number of properties at risk of flooding and in addition further work was done to consider how risk was distributed between lead local flood authorities. This analysis showed that some of the Shire Counties have a lot of property at risk but it is distributed widely rather than concentrated in larger settlements. Unitary Authorities tend to represent single large conurbations which were at one time part of a County area.

***Allocation of the £16m funding for different activities.***

4.15 The government's response to the Pitt Review (Dec 2008) committed to funding 50 areas at highest risk of flooding. All the £16m would not be required for funding SWMPs alone as these are now estimated to cost typically £100,000-£200,000 per area with some variation for much larger or smaller areas.

4.16 £300,000 had already been allocated in Dec 2008 to undertake six first edition Surface Water Management Plans (SWMPs) at £50,000 each to test and evaluate new guidance at the following locations:

- Gloucestershire
- Hull
- Leeds
- Richmond
- Thatcham
- Warrington

These plans are due to report at the end of the summer to feed into a final version of the guidance to be published later in the year.

4.17 Since the flooding in 2007 and the Pitt review some local authorities had made it known that they were in the position to undertake works to alleviate local flooding but lacked funds to do this. To accommodate this and to distribute the initial funding more widely it was proposed to allocate part of the £16m for quick win actions outside of the highest risk areas.

### **Consultation**

4.18 Since the announcement of the £15m (now £16m) to fund local authority early actions Defra has been engaging with key stakeholders throughout the development of funding options. The Environment Agency in their Strategic Overview role for flooding has provided data and advice on the development of the methodology.

4.19 Defra in conjunction with LGA have undertaken surveys to see how well placed Local Authorities are in taking on the new local flood risk management role. This has been followed up with workshops and further surveys to ascertain more clearly what support local authorities will need to deliver better local flood risk management.

4.20 Defra held a workshop in May 2009 with over 50 local authority representatives with the aim of obtaining LA feedback on several different alternative packages for distributing the initial £15 million funding available for early works to tackle surface water flooding. The feedback from this workshop has formed the basis of the funding allocation.

At the workshop local authorities were asked to consider several different alternative packages:

**Option 1** - The top 50 highest risk locations would receive all the funding (£300k each) to progress SWMPs.

**Option 2** - A combination of actions including a proportion of money allocated to highest risk areas, a proportion inviting bids to do quick win capital works actions on the ground and a smaller package of support measures to help all local authorities including training and provision of tools and data bases.

**Option 3** - All money to be allocated to the 50 highest priority risk areas and include inviting bids for any actions that would take forward their local leadership role as well as SWMPs.

4.21 The local authorities attending preferred a variation of package 2 above, which is the combination of funding SWMPs in priority areas together with actions which enabled local authorities in lower risk areas to bid for money for SWMPs as well as capital works if they were ready and able to make a start and capacity building.

The main reasons given for the choice of package by the local authorities related to maintaining a balance between funding the highest risk areas with support to areas at less risk but where the local authorities felt that they could make a real difference with some additional funding. This would enable some LAs which covered smaller settlements where flood risk was understood, to take early actions.

Local authorities were also very supportive of some centrally organised training and capacity building and development of tools that they could all take advantage of to facilitate their new roles. Representatives from Shire Counties also asked that some account should be taken of the combination of high risk across several settlements.

### ***Final Stage in the Allocation of Funds***

4.22 Given the general support for taking forward a package comprising of three elements, allocations were assigned to these and agreed. The aim was to fund approximately 50 of the highest risk settlements outside of London to prepare SWMPs and encourage a consortium approach between London Boroughs.

4.23 The risk assessment used to rank individual settlements based on their risk of surface water flooding was cross-referenced to a rank of County and Unitary Authorities based on accumulating risk within the largest settlements in their areas to allow for more distributed risk in Shire Counties. This point had been raised at the consultation event. The ranking showed that some Shire Counties had two medium size settlements at risk which individually did not place them high in the ranking order although did in combination. Geographical proximity of these combined settlements also made the possibility of their being affected by a severe storm at the same time more likely. To take account of this the ranking was reviewed to include the cumulative risk of the largest two settlements in County and Unitary local authorities and this resulted in several Shire Counties being included in the final list.

4.24 The final stage was to allocate funding to the ranked authorities from the top down until the proportion of the allocation for SWMPs was used up. The individual allocations to the 77 local authorities were based on a combination of the estimated cost for developing a SWMP and the level of risk in the settlements and varies between £300,000 for the largest settlement outside London (Birmingham at 23,000 properties) to £75,000 for areas at lower risk (around 4,000 properties).

4.25 For London the average funding allocated is £100,000 per Borough. London boroughs are funded at a lower rate (£7 per property at risk compared to about £20 elsewhere) than other parts of the country because a consortium approach is considered the most cost effective way of addressing flood risk across London and significant efficiency savings should be possible across Borough boundaries where common systems can be used for data collection, management and modelling.

## **5.0 Links to other developments**

### *5.1 Delivery of Pitt/Floods and Water Management Bill*

The Pitt review and resulting draft Flood Management Bill are the main driving forces to close the gap in responsibilities for local flood risk management. Defra are currently reviewing the consultation responses to the draft legislation and are undertaking a 6 monthly review of the Pitt recommendations.

### *5.2 EU Floods Directive*

To fulfil the requirements of the EU Floods Directive local authorities will be required to produce a preliminary flood risk assessment in relation to surface water flood risk, including a requirement to draw up maps and management plans for those areas where risk is significant.

The timetable set for the delivery of the Directive establishes that preliminary flood risk assessments will need to be completed by December 2011, flood risk and hazard maps by December 2013 and flood risk management plans by December 2015.

The new funding for highest priority areas will aid the development of preliminary flood risk assessments, mapping and the production of relevant plans to help meet these milestones.

### *5.3 Capacity Building*

Capacity issues have been highlighted in the Pitt Review and from surveys conducted by LGA and Defra. Local Authorities have lost many of the engineering skills in recent years and generally are not in a strong position to develop surface water management plans.

Defra has announced £1m funding for 27 trainees on the existing Environment Agency Foundation Degree which is open for local authorities. Work will be undertaken to make sure that the foundation degree fits local authority requirements by adapting course content. Defra is also developing alongside Lantra (Sector Skills Council for environmental and land based industries) an appropriate NVQ qualification for school leavers and the long term unemployed in flood risk management.

The further additional £1m announced as part of the £16m will be used to develop training for existing staff in new areas of expertise to help deliver the new roles and responsibilities for local authorities to enable them to deliver better local flood risk management.