

KENT FLOOD RISK MANAGEMENT COMMITTEE

Monday, 17th July, 2017

2.00 pm

Council Chamber, Sessions House, County Hall,
Maidstone





AGENDA

KENT FLOOD RISK MANAGEMENT COMMITTEE

Monday, 17th July, 2017, at 2.00 pm

Ask for: **Andrew Tait**

Council Chamber, Sessions House, County Hall, Maidstone Telephone **03000 416749**

Tea/Coffee will be available 15 before the start of the meeting in the meeting room

Membership (8)

Conservative (6): Mr A R Hills (Chairman), Mrs C Bell, Mr A H T Bowles,
Mr K Gregory, Mr M D Payne and Mr K Pugh

Liberal Democrat (1) Mr I S Chittenden

UNRESTRICTED ITEMS

(During these items the meeting is likely to be open to the public)

Webcasting Notice

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1. Membership and Terms of Reference (Pages 5 - 8)
2. Substitutes
3. Declarations of Members' Interest relating to items on today's agenda
4. Minutes of the meeting on 6 March 2017 and 25 May 2017 (Pages 9 - 22)

5. Introduction to the work of the Committee (Pages 23 - 26)
6. Local Flood Risk Management Strategy (Pages 27 - 70)
7. Environment Agency and Met Office Alerts and Warnings and KCC Flood response activity since the last meeting (Pages 71 - 74)
8. Kent Resilience Forum Pan Kent Flood Group (Pages 75 - 78)
9. Other items which the Chairman decides are Urgent

EXEMPT ITEMS

(At the time of preparing the agenda there were no exempt items. During any such items which may arise the meeting is likely NOT to be open to the public)

John Lynch
Head of Democratic Services
03000 410466

Friday, 7 July 2017

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To: Kent Flood Risk Management Committee – 17 July 2017

From: John Lynch, Head of Democratic Services

Subject: Terms of Reference and Membership of the Kent Flood Risk Management Committee

Classification: Unrestricted

Summary:

This report sets out the Kent Flood Risk Management Committee's Terms of Reference and Membership.

1. Introduction

1.1 The County Council agreed at its meeting on 10 December 2009 to set up a Flood Risk Management Committee with the Terms of Reference set out in the **Appendix** to this report.

2. Membership

2.1 The voting membership of this Committee is set out below:

Mr Tony Hills (Chairman – Conservative)
 Mrs Clair Bell (Conservative)
 Mr Andrew Bowles (Conservative)
 Mr Ian Chittenden (LD)
 Mr Ken Gregory (Conservative)
 Mr Michael Payne (Conservative)
 Mr Ken Pugh (Conservative)

2.2 The Committee may also include non-voting persons who are not Members of the County Council. Accordingly, invitations have been extended to each of the District Councils in Kent and the Internal Drainage Boards. The table below sets out the current non-voting Members. Each authority may substitute or amend its representatives as it wishes.

Ashford BC	Mrs Jessamy Blanford
Canterbury CC	Mrs Rosemary Doyle
Dover DC	Mr Frederick Scales
Maidstone BC	Mr Derek Mortimer
Sevenoaks DC	Mr John Scholey
Shepway DC	Mr Len Laws
Swale BC	Mr Gerry Lewin
Tonbridge and Malling BC	Mr Howard Rogers

Tunbridge Wells BC	Mrs Claire Stewart
KAPC	Mrs Geraldine Brown
	Mr David Henshaw
Lower Medway and Upper Medway IDBs	Mr Mike Dobson
River Stour IDB	Mr Martin Tapp
Romney Marshes Area IDB	Mr Larry Cooke
Kent Fire and Rescue	Mr Paul Flaherty

3 Recommendation

The Committee is invited to note its Terms of Reference and membership.

Contact:
 Andrew Tait
 Democratic Services Officer
andrew.tait@kent.gov.uk
 Ext 03000 416749

Background documents (None)

Appendix
(Paragraph 26 of the Minutes refers)

FLOOD RISK MANAGEMENT COMMITTEE

PROPOSED TERMS OF REFERENCE

7 Members

Conservative: 6; Liberal Democrat: 1.

This Committee is responsible for:-

- a) the preparation, monitoring and review (in conjunction with the Flood Risk Management Officer) of a strategic action plan for flood risk management in Kent taking into account KCC Select Committee recommendations, the Pitt Review and relevant requirements of the Flood and Water Management Act;
- b) reporting annually (and more often if necessary) to the Environment, Highways and Waste Policy Overview Committee and to the Cabinet Member for Environment, Highways and Waste;
- c) reviewing and responding to any consultation on the implementation of the Pitt Review and the future development of the Flood and Water Management Act;
- d) receiving reports from the Southern Regional Flood and Coastal Committee and responding as appropriate; and
- e) the investigation of water resource management issues in Kent.

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KENT COUNTY COUNCIL

KENT FLOOD RISK MANAGEMENT COMMITTEE

MINUTES of A meeting of the Kent Flood Risk Management Committee held at Council Chamber, Sessions House, County Hall, Maidstone on Monday, 6th March, 2017.

PRESENT: Mr R H Bird (Substitute for Mr M J Vye), Mr A H T Bowles, Dr M R Eddy, Mr L B Ridings, MBE, Mr T L Shonk (Substitute for Mr A Terry), Mrs P A V Stockell, Cllr Ms R Doyle (Canterbury CC), Mr D Mortimer (Maidstone BC), Mr A Hills (Shepway DC), Mr G Lewin (Swale BC), Mr H Rogers (Tonbridge and Malling BC), Ms C Stewart (Tunbridge Wells BC), Ms G Brown (KALC), Mr D Henshaw (KALC), Mr P Flaherty and Mr P Dowling

OFFICERS: Max Tant (Flood Risk Manager), Tony Harwood (Resilience and Emergencies Manager), Fiona Gaffney (Kent Resilience Team Supervisor) and Andrew Tait (Democratic Services Officer)

UNRESTRICTED ITEMS

1. Election of Chairman.

(Item.)

(1) The Committee extended its best wishes to Mr Mike Harrison who was recovering after a spell in hospital.

(2) Mr L B Ridings moved, seconded by Mr C Pearman that Mr A H T Bowles be elected as Chairman for the meeting.

Carried with no opposition.

(3) Mr Bowles thereupon took the Chair.

2. Minutes of the meeting on 14 November 2016.

(Item. 3)

RESOLVED that, subject to an amendment to Minute 18 (10) to indicate that the person who chaired the Recovery Group would attend the Response Group meetings from the onset, the Minutes of the meeting held on 14 November 2016 are correctly recorded and that they be signed by the Chairman.

3. Rewilding and Natural Flood Management - Presentation by Professor Alastair Driver FCIEEM, Director England and Wales Rewilding Britain.

(Item. 4)

(1) Professor Alastair Driver gave a presentation. The slides are contained within the electronic agenda papers on the KCC website.

(2) Professor Driver introduced himself. He said he had been the first conservationist in the Water Industry during the 1980s, working in the Thames catchment for 20 years. For 15 years until September 2016 he had been the Head of Conservation for the Environment Agency. Since retiring, he was working as the Director of England and Wales *Rewilding Britain*. This was a very small

organisation with only three paid personnel in the UK (a Director in England/Wales and in Scotland as well as an overall Co-ordinator).

(3) Professor Driver said that the thrust of *Rewilding Britain's* work was to bring about and enhance healthy, functioning catchments. It worked on the understanding that everyone who was involved in environmental management and restoration had a role to play in rewilding. This meant that at the most basic level, the pond at the bottom of a garden was important whilst at the top end of the scale there were very large areas (10k hectares in England and Wales and over 100k hectares in Scotland) where the landscape and its hydrology should be allowed to function naturally. This would bring both environmental and social benefits (such as flood management) whilst continuing to enable people inhabiting these areas to make a living. The best example of a large scale rewilding area in England was Ennerdale in the Lake District, Cumbria.

(4) Professor Driver then said that the first people he had approached since becoming Director had been the NFU, followed by the CLA. Their members had asked what a rewilded area would look like. His reply had been that it would vary on every occasion according to its environment and the time that needed to be spent to bring it to its optimal condition. A slide taken of a Welsh Mountainside after thirty years demonstrated the very great length of time that it took to revert an exposed, infertile landscape back to woodland.

(5) Professor Driver then gave some actual examples of natural flood management which could be undertaken "from source to sea." At Exmoor, the simple acts of blocking ditches had dramatically reduced peak flows from the ecologically restored areas and increased storm flow lag times in the space of a year. *Rewilding Britain* was able to evidence that peak flows reduced by some 30% whenever Uplands such as Exmoor were ecologically restored.

(6) Professor Driver moved on to consider the challenges and possibilities in Kent. He used the phrase "little and often" to describe the approach. Flood Management often consisted of doing a number of things on a relatively small scale. At Belford Burn in Northumberland, volunteers had built bunds out of timber, creating a number of ponds which collectively held a great deal of water back more economically than would have been the case through the creation of a very large reservoir. He added that the slow release of water that had been achieved would also have the effect of mitigating the impacts of a drought by recharging groundwater.

(7) Professor Driver said that tree planting and natural regeneration of woodland was a well proven method of flood attenuation. Its success was due to the amount of water retained below the soil. At Pont Bren in the Welsh Borders, the amount of water retained in tree planting areas was 60 times greater than in those parts which were intensively grazed by livestock and where a great deal of soil compaction had taken place as a consequence. The break-up of soil and water retention derived from tree planting occurred within two or three years of the planting, well before the trees matured.

(8) Professor Driver then said that a number of experts had questioned whether these solutions would work when the land was saturated. His response was that in most cases, the land was *not* saturated. An example of this had occurred in

Somerset where there had been high levels of surface water but the earth had been bone dry six inches down.

(9) Woody debris dams were becoming more popular. The best example was the River Stroud Enhancement Project in Gloucestershire where one Stroud DC employee with a budget of @ £150k (including his own salary) worked with local contractors to build woody debris dams to reduce flows into the Stour River. To date, some 40 structures had been built, covering some 21% of the entire drainage catchment in the area. This project was a blueprint that had been followed by other authorities such as Hebdren Bridge in Yorkshire who were now able to provide a cost effective solution to a problem which would never qualify for major Government funding. Professor Driver showed a graph which evidenced the results of a major flooding event in 2012 compared with a similar event in 2015 after the woody debris dams had been constructed. Although this graph did not paint the entire picture, the difference between the two events was so great that there had to be a connection.

(10) Professor Driver said that in the right place and with the right control mechanisms, the benefits of bringing European beavers back into England after a 500 year absence after they had been hunted to extinction, significantly outweighed the dis-benefits. Studies in Devon demonstrated that they were significantly slowing the river flows by about 30% and increasing the lag time by an hour. This was because they were creating ponds and acting as sponges on the ground. They were also contributing significantly to water quality improvement by reducing downstream levels of nitrates, phosphates and suspended solids. In addition, they were creating wildlife habitats that Wildlife Trusts would otherwise have needed to spend large amounts of money to emulate.

(11) Professor Driver moved on to discuss the benefits of river restoration. Although it was difficult to gather measured evidence, one study had proved that the creation of woody debris dams coupled with river re-meandering did generate flood reduction downstream. The restoration of the Hammer Stream in Kent had increased capacity by pulling the banks back and creating additional floodplain.

(12) Floodplain reconnection involved the reconnection of the river with the floodplain by de-culverting the river or by “daylighting” rivers which had previously run underground as a result of development. This had happened at the River Quaggy in South London, where the project had brought community benefits in tandem with flood attenuation gains. Floodplain reconnections were excellent candidates for Section 106 Agreements and Local Plan policies.

(13) Professor Driver briefly said that SuDS greatly reduced run off and should be compulsory within new development. Targeting Schools for SuDS projects was an excellent way of providing significant benefits whilst increasing young people’s knowledge and understanding of the issues involved.

(14) Professor Driver said that he had been involved in many coastal alignment schemes. Although they were resource-hungry, these schemes were able to deliver very significant benefits. There were numerous opportunities for small-scale projects in Kent which he encouraged support for.

(15) Professor Driver summarised by saying that each of the schemes he had described could be undertaken successfully on their own and would contribute to

the reduction of flood risk. Nevertheless, it was when these projects were undertaken together that a real difference was made. At Pickering Beck in East Yorkshire, the combination of Upland grip-blocking, high level timber dams, and a flood storage area had been able to significantly reduce flooding in downstream urban areas. At Holnicote Estate in Somerset, £160k of rewilding works had reduced the flood peak by 10% and had prevented housing worth £30m from flooding during a 1 in 50 year flooding event. This was important as it demonstrated that rewilding work could have a significant impact on ameliorating major as well as low level flooding events.

(16) Professor Driver described soils as “the elephant in the room”. Soil condition and quality had to be treated as a natural flood management tool. The compaction of soils through over-grazing and tillage was causing huge problems in some parts of the country. It was essential to persuade all farmers and land managers of the necessity of taking the necessary steps to reduce muddy floods. In his view this was the most important problem that needed to be tackled in terms of environmental management. Currently, huge amounts of topsoil were simply washed away into the sea.

(17) Professor Driver concluded his presentation by delivering the key messages. It had to be accepted that natural flood management needed to be delivered in close alliance with traditional civil engineering. Nevertheless, there was great potential for natural flood management which had not yet been realised. It was important to keep doing small things as often as possible. If this was achieved, rewilding would bring enormous benefits for all.

(18) Professor Driver replied to a question from Mr Hills by saying that everything had to be seen in the context of the growing number of extreme weather events. The effect of rewilding was to create greater landscape resilience to cope with climate change.

(19) Professor Driver replied to a question from Mrs Brown by saying that Kent had many small communities who lived in valleys at the bottom end of slopes where water was flowing faster than it would do naturally. Such communities rarely received funding for major projects, but it was possible for individual schemes funded partly out of the local levy or Section 106 Agreement to make a significant difference. The best way forward would be to identify the most promising area catchment for such work and then adopt the practice set by the River Stroud Enhancement Project in Gloucestershire. The effect was likely to be that more projects would be instigated once the first project had been successfully established and proved itself.

(20) Mr Tant confirmed that rewilding work was already being actively considered in Kent and that some small projects had already been undertaken at locations such as the Hammer Stream. A further scheme was being developed at Mill Farm in Marden. KCC was working in partnership with the EA and the South East Rivers Trust who had been awarded a £300k grant out of DEFRA’s new £15m Natural Flood Management Fund. The Medway was recognised as a priority catchment area by DEFRA.

(21) Dr Eddy said that some landscapes had changed their character as a result of human interference in ancient times. He asked whether this meant that natural flood management aimed to return the land to its pre-human interference condition.

Professor Driver replied that the goal was usually to return the land to the condition it had been in a couple of centuries earlier. At this point the focus was on remote Upland areas. It was unlikely that the aim would ever be to go back further.

(22) Professor Driver replied to a question from Mrs Doyle by saying that there was no climate-related reasons why European beavers could not inhabit most of lowland Britain. They were naturally shy creatures who would rather not build dams in main rivers because they could build their lodges without needing to do so. Their greatest value in this respect was in their activity in smaller side streams. There was a five year project taking place on the River Otter and, if the benefits outweighed the dis-benefits, it was very likely that the Government would approve more releases in other parts of the country.

(23) RESOLVED that Professor Driver be thanked for his informative and thought-provoking presentation.

4. Thames Estuary Asset Management 2100.

(Item. 5)

(1) Mr Victor Freeney from TEAM 2100 gave a presentation. The slides are contained within the electronic agenda papers on the KCC website.

(2) Mr Freeney began his presentation by setting out the area covered by the Team which was between Twickenham in the South West to Southend and the Isle of Grain in the East. It contained 23 policy units, 13 of which had their defence systems fully funded whilst 10 (including the 4 in Kent) still needed local funding to complement the government funding which was already in place. TEAM 2100's work programme set out how flood risk would be managed in the Thames Estuary area up to and beyond 2100. Work on developing the flood management plan had begun on 2002 and it had been published in 2012.

(3) Mr Freeney said that the effect of climate change would be an increase in storm surges and sea level rises as well as increased rainfall. More people now lived in the flood plain, increasing the consequences of any flooding that did occur. He added that the UK was tilting from top left to bottom right so that the southeast was effectively sinking. In addition, flood defences were now ageing, which also increased the flood risk.

(4) Mr Freeney then said that the Thames Estuary plan was outlined in three phases. TEAM 2100's responsibility in Phase 1 (2002 to @2015 *Maintaining confidence and planning together*) was to secure the investment programme for the first ten years of the plan.

(5) Mr Freeney went on to set out key facts in TEAM 2100's 10 year delivery programme. The contract had been signed in late 2014 with the Environment Agency as the client. It would run for 7 years with a 3 year extension at an estimated cost of £308m. The Integrated Delivery Team consisted of the Environment Agency working with CH2M, Balfour Beatty, Qualter Hall, Hunton Engineering, KGAL and engineering safety consultants. This was an innovative approach as it brought the clients and providers into the same team.

(6) Ms Rebecca Murphy (Environment Agency) set out to describe the physical work being undertaken, together with the plan going forward. The 10 year

programme was essentially split into two sections, the first of which was the major maintenance of the major barriers including the Thames Barrier and the Dartford Creek Barrier. The second was the fixed and active assets such as the walls and tidal embankments as well as the smaller pedestrian and vehicular floodgates and the tidal outfalls. The physical work generally covered major maintenance, but also included inspection, repair or refurbishment of these defences. There were no plans to carry out major replacements during the 10 year period.

(7) Ms Murphy said that the major focus of the first two years of the 10 year programme had been on the initial assessment and appraisals of the historic assets, including a general walk-over by the geological and technical experts. This work was supported by facilitation exercises such as annual vegetation clearance. This would lead to the identification of the work that was needed during the rest of the programme period. The next phase would be option identification, followed by design development and the selection of the preferred option. This would be carried out in consultation with all stakeholders involved in these defences.

(8) Ms Murphy moved on to discuss the several hundred assets currently in the programme. In Kent, these included the Dartford Creek Barrier and the defences in the Isle of Grain. These were all being appraised at this time as part of the two year assessment and appraisal phase.

(9) Ms Murphy then said that the only exceptions were the 54 floodgates in the County, where this work had been completed in a relatively short period and they were now being refurbished. Nine of these had been replaced during the current year (8 along Royal Pier Road in Gravesend and 1 at the Sealink Ferry Dock. Consideration was also being given to which of them could be de-commissioned. This would entail the full removal of the asset and its replacement by a passive defence system.

(10) Ms Murphy then informed the meeting that the 4 policy units in Kent were Dartford and Erith; Swanscombe and Northfleet; North Kent Marshes (split into Canal Basin, Denton and Shorne Marshes, and Cliffe and St Mary's); and Isle of Grain (split into Allhallows and Grain Marches,, and South). The accompanying slide set out the dates for the various stages. Generally speaking, Stage 1 would be completed in all four policy units by Quarter 2 of 2018/19. The usual expected start date for construction was Quarter 3 of 2020/21.

(11) Ms Murphy explained that much would be dependent on the achievement of full funding. The figures in the accompanying slide were based on the current figures for the work undertaken in the Thames Estuary Plan. The figures given were estimated at the highest level. The actual sums would be determined by the option selected. A funding strategy was being developed which would enable engagement with the right stakeholders. Addressing the large funding gaps was one of the main priorities for the next four years.

(12) Mr Lewin asked about the impact of "bounce back" whenever the Thames Barrier was closed. He also asked why the Study had stopped at the Isle of Grain rather than covering the entire Thames Estuary. Ms Murphy replied that when the Thames Barrier was constructed in the 1980s, it had been done as a single system so that the anticipated and known wave reflection was accounted for in the crest level of the defences. The impact of the Barrier beyond the Isle of Grain was negligible. The Strategy for the Thames Estuary only accounted for the area

around the south of Grain. An additional Study was being developed for the Medway and Swale Estuaries (including Whitstable and the Isle of Sheppey).

(13) Mr Tant confirmed that he was in contact with the producers of the Medway and Swale Estuaries Study and that he was hopeful that they would be able to attend the next meeting of the Committee.

(14) Mr Pearman informed the meeting that KCC was represented at the Strategy Group that was driving this particular delivery mechanism and that all the issues that had been or were likely to be raised were known to its two Members on the Board.

(15) Mr Bowles said that the response given in respect of the impact of the Thames Barrier east of the Isle of Grain was often given by experts. Many who lived in the area described considered that the impact was greater than the experts believed it was.

(16) RESOLVED that Victor Freeney and Rebecca Murphy be thanked for their presentation and that its contents be noted.

5. Kent Resilience Forum Exercise Surge Debrief Report.
(Item. 6)

(1) Fiona Gaffney (KCC Head of Resilience and Emergency Planning) gave a presentation. The slides are contained within the electronic agenda papers on the KCC website.

(2) Ms Gaffney briefly recapped the Exercise Surge scenario. The exercise had taken place between 25 and 27 September 2016. It had involved County-wide flooding and evacuations. It had been drawn up in such a way as to involve all the Boroughs and Districts, testing all the relevant agencies' ability to provide mutual aid.

(3) The Multi Agency Group had set itself 47 objectives, all of which had been met. Some of the key objectives were the testing of the KRF Evacuation and Shelter Plan; the Pan Kent Flood Plan; elements of the multi-agency Flood Plans, the effectiveness of the Bronze (operational) training; the Romney Marsh Diversion and Evacuation Plan; and the validation of the lessons learned in previous exercises. An entire day had been focussed on the Recovery element. This aspect of the exercise had been led by KCC. Some 250 people had participated in the Recovery Table Top exercise on the final day.

(4) Ms Gaffney said that a key element of this exercise was that it involved all the KRF partners. It had been led by the Local Authorities, involving (amongst others) the Emergency Services, the Voluntary Sector, and the Environment Agency. Overall, some 800 people had been involved in some capacity.

(5) Ms Gaffney moved on to discuss the three debriefing sessions. The first of these (October 2016) had been for the Exercise Surge Planning Team. This had identified the need for a communication plan in tandem with the exercise planning, because the wider public had not been made aware that such a large scale exercise was taking place. If information about the exercise had been made widely available, there would have been tremendous benefits in terms of community resilience.

(6) The scoping of the exercise had grown tremendously due to the large number of agencies involved, all of whom wished to test their own priorities. Although this had not led to any dilution of what needed to be tested, it had stretched resources. In future, there would be a cut-off point in the scoping process after which the focus would be purely on delivery.

(7) Ms Gaffney said that it was not intended to carry out such a resource-intensive exercise every year. The likelihood was that it would be once (perhaps twice) in a three year cycle.

(8) Ms Gaffney continued by considering the legacy of Exercise Surge. The lessons learned would be used to inform the training that was offered in the future. One of these was that an off-the-shelf training product would be developed which would be given to the Gold Commanders.

(9) Ms Gaffney said that the Recovery part of the Exercise had focussed on the immediate recovery period a day after the event itself. This aspect would be tested again in the exercise planned for 2017/18, but on this occasion there would also be an element testing recovery at a point six months later. This would draw on the “soft recovery” elements of the lessons learned in Cumbria such as the social and psychological impacts on the communities.

(10) Exercise Surge had tested the social media elements of media management. There were other elements which would be tested during the next exercise such as the use and management of real media.

(11) Ms Gaffney then said that there were different ways in which table top exercises could be undertaken. Future exercises would aim to build the scenarios as a whole so that they became more organic. This would replace the current practice which was for scenarios to be phoned in or provided in writing as the exercise progressed. It had been found that the latter approach tended to lead to interruptions to the process.

(12) Exercise Surge had tested the familiarity of the partner agencies with the national documentation that had to be completed whenever emergencies were being responded to. This would continue to be a significant objective of future exercises.

(13) Ms Gaffney explained that communication resources had been stretched because Exercise Surge had taken place in 9 different locations. The lesson derived from this experience was that it was necessary to review the way in which the various Centres had been able to talk to one another in order to identify possible ways in which the available communication technology could be more effectively utilised.

(14) Ms Gaffney said that there had been questions about the compatibility of IT technology. Responders were now being encouraged to test their laptops at the locations where they were likely to be bases and to also be prepared to do without IT altogether if the need arose. In such circumstances, the value of the incident log, pen and paper should be appreciated.

(15) The testing of the KRF Evacuation and Shelter Plan had led to amendments being made in the light of experience. Ms Gaffney said that improvements could be made to the way in which information was drawn from the public. For example, messages of advice could be pre-prepared, explaining to potential evacuees where they should go and what they should take with them. This was particularly important for those who were being re-located to very large evacuation hubs. She added that the Local Authorities debrief session in November 2016 had confirmed that they would be able to cope with the numbers at the onset but that there were areas for further consideration about the longer term questions of ensuring that they were able to support one another both within the County and with Local Authorities outside. These questions were being taken forward by the Local Authorities Emergency Planning Group.

(16) Ms Gaffney then said that the Multi-Agency Flood Plans would be reviewed following the local lessons learned during the Exercise. Work would also be undertaken by a Task and Finish Group on the experience gained during the evacuation part of Exercise Surge. It was essential to evaluate the length of time it would actually take for a full evacuation to take place. The evacuation of 120 people in the Romney Marsh had been successfully achieved within the 5 hour deadline that had been set. Nevertheless, the use of available resources and the information that was given to the public would be carefully looked at to see what improvements needed to be made. The Romney Marsh Diversion and Evacuation Plan would also be reviewed by Shepway DC in the light of the evidence gathered.

(17) Ms Gaffney said that a Training needs Analysis would be completed for Welfare Centre Managers and staff. The Local Authority Emergency Planning Group would be examining whether there had been sufficient Welfare Centre training to ensure that they continued to operate through the emergency period and that the staff had the right skills to ensure that they did so.

(18) Ms Gaffney said that work would be done on the Information Sharing Protocol to ensure that the right and appropriate information was shared, particularly in respect of vulnerable people.

(19) Ms Gaffney concluded her presentation by saying that the Exercise had underlined the importance of the Recovery phase, which was always the longest-lasting. The success of an emergency response would always be judged by the public on the basis its Recovery phase, as had been the case in the Herald of Free Enterprise disaster. It was essential to build an understanding of the social and psychological impacts into the planning and training.

(20) Mrs Brown stressed the important role that the Parishes would play as well as their Plans and experiences. She was concerned that their role had not been mentioned in the presentation. Ms Gaffney replied that Lydd TC had been involved in the Live Play evacuation. The Parish Councils would be involved more closely in future through the Community Resilience Group.

(21) Mr Bowles commented that the quality of Parish Council Emergency Plans tended to vary greatly. Some were excellent and very detailed whilst in others, they were non-existent.

(22) Mr Bird said that extreme weather events could easily bring unplanned -for problems. This had been the case in Yalding in the 2013/14 flood when there had

been no power for 4 days. When this happened, all testing of electronic communications became irrelevant. Ms Gaffney replied that plans were being developed to cater for communications during a complete power blackout. This question would also be looked at during the Recovery Exercise scheduled for 17 July.

(23) In response to a question from Mr Shonk, Ms Gaffney said that the difference between Resilience Direct (RD) Mapping and Shape Mapping was that the latter was based on the Health Authority, giving contact for GPs, Hospitals, Care Homes and Rest Centres. RD Mapping would bring about a single point of focus and would be a tool that would be useful for all agencies. There was also very little if any cost involved because of the national priority that had been accorded to it.

(24) Dr Eddy asked how long it would be possible to respond to an emergency before there would be a detrimental impact on the people available. Ms Gaffney replied that the agencies were asked to be prepared to run 2 rest centres for a 24 hour period (three 8 hour shifts). Ideally, rest centres were not intended to run for longer than this as alternative housing would be sought. Should an emergency last for longer than this, support to provide larger-scale accommodation would be requested from other Authorities that were less affected. She added that all Authorities in the County had been trained in the "One Kent" approach. The lessons had been learned from the very long hours that responders had needed to put in during the 2013/14 event. The needs of the responders were being given a high priority and mutual aid was a major consideration for Managers and Trainers.

(25) Mrs Doyle noted that Kent responders had been involved in discussions with responders in Cumbria about the after effects. Significant information could also be shared within Kent utilising the experiences in Bridge and Barham

(26) Mr Hills said that every major flooding event was unique and brought its own problems. He was pleased to note that the Romney Marsh Diversion and Evacuation Plan had been tested as there would not be any major roads passable in this area if the sea defences were breached. This would necessitate evacuating some 6,000 people. The need for better communication with the Parish Councils had been identified. Another area for more detailed consideration was how to provide the best quality information to the public. As an example, it was now possible to photograph an affected area from a drone and to make the pictures widely available. Drones had the advantage that they were not reliant on power as they contained their own power packs.

(27) Mr Bowles said that the expertise, knowledge and commitment of Local Elected Members should always be utilised. He added that they should also have some training in and resultant understanding of Emergency Planning.

(28) RESOLVED that the content of the multi-agency debrief report be noted.

6. Environment Agency and Met Office Alerts and Warnings and KCC Flood Response activity since the last meeting.

(Item. 7)

1) Mr Harwood reported that the number of flood alerts issues by the Environment Agency since the previous meeting of the Committee had now risen

to a total of 21 (4 fluvial and 17 coastal), contrasting with the overall figure of 54 flood alerts during the corresponding period in 2015/16. The Thames Barrier has been closed on 11 occasions (8 for flood defence and 3 for test purposes) during the same period.

(2) Mr Harwood added that in 2016 the month of December had seen only 17% of its average rainfall. January 2017 had seen an average amount of rainfall, but February had also been dry. As a result, Bewl Reservoir was now only ²/₃rds full.

(3) The coastal flooding alerts that had occurred were the result of spring tides and North Sea surges experienced between 11 and 17 January 2017, which had triggered a wide scale precautionary evacuation.

(4) RESOLVED that the report be noted.

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KENT COUNTY COUNCIL

KENT FLOOD RISK MANAGEMENT COMMITTEE

MINUTES of A meeting of the Kent Flood Risk Management Committee held at Council Chamber, Sessions House, County Hall, Maidstone on Thursday, 25th May, 2017.

PRESENT: Mrs C Bell, Mr A H T Bowles, Mr I S Chittenden, Mr K Gregory, Mr A R Hills, Mr M D Payne and Mr K Pugh

UNRESTRICTED ITEMS

7. Election of Chairman.
(Item. 3)

(1) It was duly proposed and seconded that Mr A R Hills be elected Chairman of the Committee.

Carried

(2) RESOLVED that Mr A R Hills be elected Chairman of the Committee.

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From: **Katie Stewart , Director of Environment Planning and Enforcement**
John Lynch, Head of Democratic Services

To: **Kent Flood Risk Management Committee – 17 July 2017**

Subject: **introduction to the work of the Kent Flood Risk Management Committee**

Classification: **Unrestricted**

Summary: This report provides the Committee with an introduction to its work, with particular reference to the period between March 2016 and March 2017. It sets out possible topics for future consideration and invites the Committee to consider how it wishes to carry out its functions.

Recommendation(s): The Committee is asked to note the contents of the report.

1. Introduction

- 1.1 The Kent Flood Risk Management Committee's terms of Reference are set out in the **Appendix to Item 1**. Its membership consists of 7 Members of the County Council (6 Conservative and 1 Liberal Democrat).
- 1.2 There is also a standing invitation to each of the District Councils, the Internal Drainage Boards in Kent, Kent Fire and Rescue Service and KALC to send representatives to the meetings. All these representatives are treated as though they are full Committee Members except for the formal items of business.
- 1.3 Officer support to the Committee is provided by Tony Harwood (Principal Resilience Officer) and Max Tant (Flood Risk Manager). Senior Officers from the Environment Agency and Kent Fire and Rescue also report and contribute to the meetings.
- 1.4 The Committee is a part of the County Council's Scrutiny suite and reports annually to the Scrutiny Committee.

2. The work of the Committee in 2016/17

- 2.1 In 2016/17, the Committee continued to monitor responses to Environment Agency and Met Office Alerts and Warnings and KCC flood response activities, receiving a standing report at each meeting throughout the year. In complete contrast to previous years, conditions were prevalingly dry. Nevertheless, damaging surface water flooding events were experienced in June 2016, which underlined the unpredictability of our weather, and the need for continued vigilance on local flood risk by Kent County Council, district councils, the wider resilience community, residents and businesses. The dry weather brought water resource planning into focus, including the need for effective emergency planning contingencies for drought and wildfire.
- 2.2 All the presentations set out are covered in detail in the Minutes which can be found, together with the accompanying slides in the "Committees and Meetings" section of the County Council's website.

3. Committee meeting of 18 July 2016.

- 3.1 The Committee received a presentation from Katie Moreton (KCC Highways and Waste) on drainage issues during the financial year 2015/16. This pointed out the significant reduction in reported incidents due to the long period of dry weather, as well as setting out the changed approach which had been adopted on April 2014.
- 3.7 The Committee also received a report from Max Tant on the Local Flood Risk Management Strategy. This topic is the subject of a report to today's Committee meeting.

4. Committee meeting on 14 November 2016

- 4.1 The Committee received a detailed presentation from Rachel Kairis of the Environment Agency on *Exercise Certus* which had been a part of its winter readiness campaign. This was a national exercise which had involved 70 players from the South East Area out of over 1,000 nationally. It had tested a number of new procedures within the *Winter Ready* plan.
- 4.2 Rachel Kairis also informed the Committee of other developments including the Environment Agency's investment in £12.5m of kit such as temporary defence barriers, pumps, instant command units, and sandbagging machines. All of this equipment was stored securely in various depots across the country. The closest depot to Kent was in Rye.
- 4.3 The Committee also received a report from Paul Flaherty (Kent Fire and Rescue) on the structure of the Kent Resilience Forum and its annual seminar.
- 4.4 Max Tant gave presentations on *Flood Re* (affordable flood insurance) and *Riparian rights and responsibilities*. Both of these topics had been identified by the Committee and the accompanying presentational materials were made more widely available after the meeting.

5. Committee meeting on 6 March 2017.

- 5.1 Professor Alastair Driver FCIEEM, the Director of England and Wales Rewilding Britain gave a presentation on Rewilding and Natural Flood Management. Professor Driver's opinions are highly valued, and there was considerable public interest in what he had to say.
- 5.2 A presentation on Thames Estuary Asset Management was given by Victor Freeney (TEAM 2100) and Rebecca Murphy (Environment Agency).
- 5.3 Fiona Gaffney (KCC Head of Resilience and Emergency Planning) gave a report on the debrief of *Exercise Surge* which was the major exercise of 2016, involving county-wide flooding and evacuations. A significant aspect of this event had been the table top Recovery exercise.

6 Future activities

- Sustainable drainage systems / SuDS
- The role and structure of the Environment Agency*
- The role of Internal Drainage Boards*
- Coastal erosion risk and management*
- Flood defence funding
- Environment Agency de-maining project Kent pilot
- Environment Agency's new framework / Project Delivery Units

*these topics will require a speaker to be invited to the committee and will depend on their availability.

7. Recommendation

7.1 The Committee is invited to note the content of this report and to identify those topics it wishes to consider in future meetings.

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Background papers
None

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To: Kent Flood Risk Management Committee

From: Tony Hills, Chairman of the Kent Flood Risk Management Committee

Subject: Local Flood Risk Management Strategy

Classification: Unrestricted

Summary: The Local Flood Risk Management Strategy sets out how local flooding (flooding from surface water, groundwater and ordinary watercourses) will be managed in the county over the next six years. It presents the progress since the previous Local Strategy and identifies challenges that remain to the effective delivery of local flood risk management, which inform the objectives and actions.

Recommendation:

That Members:

- Note the paper and draft Local Flood Risk Management Strategy and
- Provide any comments or feedback prior to it going to public consultation

1 Introduction

- 1.1 The Local Flood Risk Management Strategy (Local Strategy) is a requirement of the Flood and Water Management Act 2010 (the Act) for all Lead Local Flood Authorities to prepare. KCC must prepare a Local Strategy that sets out how local flood risks will be managed in the county, who will deliver them and how they will be funded.
- 1.2 Local flooding is flooding that is caused by surface runoff, ordinary watercourses and groundwater.
- 1.3 KCC adopted a Local Flood Risk Management Strategy in 2013, which can be found here: http://www.kent.gov.uk/_data/assets/pdf_file/0016/12076/Kent-Local-Flood-Risk-Management-Strategy-Report.pdf
- 1.4 This strategy was originally intended to last three years and it needs to be updated in this financial year.

2 Approach

- 2.1 The Act sets out the minimum that a local strategy must contain, specifically:
- 1 The risk management authorities in the relevant area.
 - 2 The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area.
 - 3 The objectives for managing local flood risk and the measures proposed to achieve those objectives.
 - 4 How and when the measures are expected to be implemented.
 - 5 The costs and benefits of those measures, and how they are to be paid for.
 - 6 The assessment of local flood risk for the purpose of the strategy.
 - 7 How and when the strategy is to be reviewed.

- 8 How the strategy contributes to the achievement of wider environmental objectives.
- 2.2 The previous Local Strategy was relatively long, at over 50 pages, not including appendices. It also focussed heavily on KCC's role as Lead Local Flood Authority, which was new at the time and set out a number of policies for us to deliver that role.
- 2.3 The intention with the next Local Strategy is for it to be a shorter, simpler document that focusses more on the strategic approach to local flood risk management.
- 2.4 The Local Strategy will be supported by the Flood Risk to Communities Document that set out the flood risks in each district council in Kent. The Flood Risk to Communities documents were presented at the meeting on 20 July 2015, the reports can be found here:
<https://democracy.kent.gov.uk/documents/g5982/Public%20reports%20pack%2020th-Jul-2015%2014.00%20Kent%20Flood%20Risk%20Management%20Committee.pdf?T=10>
- 2.5 The Flood Risk to Communities documents are now almost complete, all but Dartford and Gravesham have been drafted. They can be found here:
<https://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/flooding-and-drainage-policies/flood-risk-to-communities/>
- 2.6 Flood Risk to Communities documents provide the information on the risk management authorities and their roles, they will also set out the flood risk in the area (which is required for the Local Strategy, parts 1, 2 and 6 in paragraph 2.1). We are currently undertaking a consultation on these to gather views on how useful they are and whether there is any other information that would be useful to include in them.
- 2.7 By using the Flood Risk to Communities documents in this way, the Local Strategy can be free of a lot of the text required for these sections and this information can focus on local issues.
- 2.8 A link to the Flood Risk to Communities documents is provided in the Local Strategy.

3 Challenges and objectives

- 3.1 The first Local Strategy set out the work we would do to understand the risk of local flooding in the county and was largely focussed on fact finding. This Local Strategy will build on this work and be more balanced between understanding the risks, delivering measures to reduce risks, communicating about the risks and supporting communities at risk.
- 3.2 The work we have done over the previous three years has led to progress and improvements in local flood risk management. These include the improvement in partnership working across all risk management authorities; in fact, many of the larger risk management authorities have restructured or recruited to reflect the need to work in partnership with other bodies and this approach is helping to deliver results.

3.3 KCC has also developed a suite of surface water management plans (SWMPs), which can be found here: <http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/flooding-and-drainage-policies/surface-water-management-plans>.

These are a key source of information about local flood risks and provide evidence for the where measures are best delivered.

3.4 Further, since the flooding in 2013/14, there is now a pool of flood wardens in many of the high risk communities that will help to improve the resilience of local communities for future events.

3.5 Despite these and other successes, there remain challenges in flood risk management in Kent. The challenges that we have identified over the course of delivering the previous Local Strategy are set out the new Local Strategy and they are themes that inform the aims and actions of the Local Strategy.

3.6 The Local Strategy has four draft objectives, which are:

3.6.1 Improve understanding of flood risks

Ensure that Risk Management of Authorities in Kent have a clear understanding of local flood risk mechanisms, risks and management opportunities, and this understanding is shared with partners to create a comprehensive picture of flood risk and how it can be managed.

3.6.2 Reduce the risk of flooding:

Reduce the risk of flooding on people and businesses in Kent through the delivery of flood risk management projects and programmes.

3.6.3 Resilient planning:

Ensure that development and spatial planning in Kent takes account of flood risk issues and plans to effectively manage any impacts and emergency flood plans have a clear understanding of local flood risks and responsibilities.

3.6.4 Support resilient communities

Ensure that residents and businesses of Kent have access to appropriate data and information to understand flood risk in their area, how it is managed and by whom. Empower communities and individuals to act to protect themselves from flooding through individual efforts, partnerships and joint working.

3.7 These objectives are then broken down into aims and actions for the flood risk management community to focus on over the period of the Local Strategy.

4 Risk assessment and Preliminary Flood Risk Assessment

4.1 Under the Flood Risk Regulations, which transpose the EU Floods Directive into English Law, KCC also has to undertake a Preliminary Flood Risk Assessment (PFRA) every six years to assess the risks for local flooding and identify areas of significant flood risk.

4.2 The next PFRA is due this year. KCC has undertaken the PFRA at the same time as the Local Strategy, which is the reason the Local Strategy was not completed last year, to ensure they were based on the same assessment of risk.

4.3 If an area of significant risk is identified it will then have to go through the two further stages of the Flood Risk Regulations, which are mapping of the risks and hazards and developing a Flood Risk Management Plan.

4.4 Significant flood risk is defined by Defra for each (PFRA). The criteria for this PFRA are:

Method for determining indicative Flood Risk Areas	Definition	Indicator	Criteria
Cluster method	A cluster is formed where, within a 3x3 km square grid, at least 5 of the 1km squares meet the criteria for one or more of the indicators. Where multiple overlapping grids meet the requirement, these are unified to form a larger cluster. All of the clusters (both small and large) have been identified as indicative flood risk areas.	Number of people at risk of surface water flooding*	200 people or more per 1km grid square Number of people taken as 2.34 times the number of residential properties at risk.
		Number of key services at risk of surface water risk* eg utilities, emergency services, hospitals, schools	More than one per 1km grid square
		Number of non-residential properties at risk*	20 or more per 1km grid square
Communities at risk method	Community areas, as defined by the Office for National Statistics built-up areas (BUAs) and built-up areas sub-divisions (BUASDs), where there is a large number of properties at risk within the BUA/BUASD.	Number of reportable properties (residential and non-residential) properties at risk*	3000 or more reportable properties (residential and non-residential) within a BUA/BUASD.

4.5 .The Environment Agency undertook a preliminary assessment of the areas that met the criteria in England using national surface water mapping data and identified six in Kent. These are Dartford, Gravesend, Maidstone, Sittingbourne, Canterbury and Ramsgate.

4.6 We have reviewed this assessment using our local data and knowledge and do not consider these areas to be significant risk areas. The national mapping that the EA has used has over simplified the drainage networks and flow pathways which has exaggerated the risks in many of these areas.

4.7 There are local flood risks in most of these areas and we are already planning to manage these risks, but we do not consider that the next stages of the Flood

Risk Regulations are the appropriate way to do this. We will feed our plans into the next Flood Risk Management Plans for Kent, as we did last time, even though we did not have any areas of significant risk in Kent.

- 4.8 The PFRA is included in the Local Strategy, along with more detail about the assessment method and the submission KCC has made to the Environment Agency.
- 4.9 The Local Strategy sets out areas that we will focus on to assess and manage local flooding. These are based on the evidence we have gathered since the previous Local Strategy, including the Surface Water Management Plans we have undertaken and the work we have done with partners. The areas we are proposing to focus on are:
- 4.9.1 **Medway Catchment** - The Environment Agency has formed a Strategic Flood Partnership for the Medway Valley, which KCC is an active partner in. KCC is also a partner in the Natural Flood Management Project for the Medway Valley. As part of these projects and this Local Strategy, KCC will investigate the opportunities through NFM and other means to reduce the risk of flooding in the Medway Valley to the towns and villages there.
- 4.9.2 **Northeast Kent** (Deal, Margate, Ramsgate and Broadstairs) - Southern Water has undertaken a drainage strategy for Northeast Kent (Deal, Margate, Ramsgate and Broadstairs) that identifies sewer capacity as a potential obstacle to growth. KCC will work with Southern Water to identify opportunities where it can reduce the discharge of surface water to the sewers
- 4.9.3 **Nailbourne Valley** - KCC will work with multi-agency partners and local representatives to identify and deliver options to manage the groundwater and main river flood risks in this Valley
- 4.9.4 **Folkestone and Hythe** - KCC will work with partners to investigate opportunities to reduce the risk of flooding from the steep hills and flashy watercourses in this area.
- 4.9.5 **Sittingbourne** - KCC will investigate the causes of flooding and identify opportunities to reduce the risks
- 4.10 We will also investigate and deliver works in other areas, which are set out in the action plan in the Local Strategy. The reason these are not listed as areas to focus on is that they are relatively small pieces of work or we are at an early stage of understanding the risks and do not know if they will become an area of focus.
- 4.11 We will also continue to monitor flooding and flood risk in the county to continue to prioritise and assess the local flood risks. This may lead to works in the future and will inform the assessment of risk in the next Local Strategy review.

5 Consultation

- 5.1 The Local Strategy will be consulted on publicly this summer. Once this has been completed it will be taken to the Environment and Transportation Cabinet Committee and then Cabinet for adoption.

4 Recommendations

That Members:

- Note the paper and draft Local Flood Risk Management Strategy and
- Provide any comments or feedback prior to it going to public consultation Note the paper, and

Tony Hills, Chairman of the Kent Flood Risk Management Committee

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Kent Local Flood Risk Management Strategy 2017-2023

Draft for consultation

Summer 2017



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Kent Local Flood Risk Management Strategy

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1 Introduction

Kent County Council (KCC) is the Lead Local Flood Authority (LLFA) for Kent. As the LLFA we have an overview role for local flooding. Local flooding is flooding that arises from these sources:

- Surface runoff
- Ordinary Watercourses
- Groundwater

The flooding from these sources is generally more localised than flooding from rivers and the sea. Managing these forms of flooding often relies on several systems working effectively, especially drainage networks, sewers and ordinary watercourses, which may be managed by different authorities. Cooperation and integrated planning is required from these authorities to manage local flooding effectively.

There are many authorities involved in the management of local flooding in Kent, including Kent County Council (KCC), the Environment Agency, District and Borough Councils, Internal Drainage Boards and Water Companies.

As the LLFA, KCC must produce a Local Flood Risk Management Strategy (local strategy) that sets out how local flood risks will be managed in the county by the authorities involved.

1.1 Background

The Flood and Water Management Act 2010 (the Act) makes county and unitary authorities lead local flood authorities with a strategic overview role for local flooding in their area. A Local Flood Risk Management Strategy is a requirement for all lead local flood authorities to set out how local flood risks will be managed in the county, who will deliver them and how they will be funded.

The Act also gives the Environment Agency a national strategic overview role for flood risk management. The Environment Agency has produced a National Strategy for Flooding and Coastal Erosion Risk Management (the National Strategy) as part of their national strategic role. The National Strategy can be found [here](#).

KCC produced a local strategy in 2013 that set out the objectives for local flood risk management for 2013-16, it can be found [here](#). The main purpose of that local strategy was to improve our understanding of local flood risks in Kent as there was a lack of good evidence as the role was new. We can now build upon the knowledge and understand that we have gained in delivering that local strategy.

1.2 Aims

Kent has a large population and a dynamic economy. Due to the historic development of the county, around waterways and along the coastline, and its

geography, steep hills and areas of impermeable soils, there is a significant risk of flooding from many sources. This includes local flooding sources, which are significant in Kent and threaten the safety and well-being of Kent's residents and the sustainability of our economy.

The aims of the local strategy are:

- To support and improve the safety and wellbeing of Kent's residents and the economy of Kent through appropriate flood risk management;
- To ensure that we all work together effectively to understand and deliver appropriate flood risk management in Kent
- To contribute to sustainable development, regeneration and land management in Kent through the promotion of sustainable flood risk management practices that utilise natural processes where appropriate.

This local strategy will build upon the lessons we have learned from the first one to reduce flood risk in the areas we have identified as at risk and to continue to develop our understanding of flood risk and improve how we work together.

Through the delivery of the Local Strategy:

- Kent will be more resilient to flooding by delivering appropriate, sustainable flood risk management measures.
- Our residents will be safer from flooding and have a better understanding of flood risks and who is responsible for managing them and they will be empowered to support themselves to manage their own risks, if they feel it is appropriate.
- Our economy will be better protected from the impacts of flooding.
- Our catchments and drainage systems will be managed to account for all flood risks, employing sustainable techniques to manage runoff.
- Our residents will enjoy new developments that are planned to take account of flooding and manage it sustainably.

2 Flood risk and flood risk management

Flooding is a natural phenomenon where water inundates normally dry areas, it has the potential to cause risk to life, damage property and harm the environment.

The consequences of flooding can include:

- Damage to properties, land, infrastructure and services;
- Risk to life and health impacts (physical and mental);
- Loss of confidence or a sense of security in a community, including residential and business communities; and
- Damage to the environment, including pollution and impacts on habitats

Flooding can also be beneficial. If it is in areas where the impacts are low or acceptable it can prevent worse flooding elsewhere and provide nutrients for farmland and benefit some habitats.

2.1 Meaning of flood risk

Flood risk is a way of expressing the damage flooding can cause by combining the impact of the flooding (the damage it causes) and the likelihood of it happening (how frequently it will occur).

$$\text{risk} = \text{impact} \times \text{likelihood}$$

The impacts of flooding can be expressed in terms of the number of properties flooded or the cost of the damage of the flood.

The likelihood of flooding is generally expressed as a probability of the flood occurring in a given year (annual exceedance probability) or the average number of years between floods (annual return period).

In order to understand the risk we must therefore understand where the flooding might occur, what will be affected by the flooding and how frequently it is likely to happen. This is often very complicated, especially if it is important to be accurate. Understanding these issues is important for justifying expenditure on flood risk management measures, as it is how we demonstrate the measures will be cost-effective.

2.2 Flood Risk Management

Managing flood risk includes a range of activities to understand the risk including, where it is, assess measures that may be available to manage it and building and maintaining measures to manage it.

The storms that cause local flooding are often very small and therefore they are not always recorded by rain gauges and small streams usually do not have flow gauges. As a consequence, storms that cause local flooding are difficult to assess as the data used to assess them is not available. Similarly they cannot be forecast accurately, so local flood risk management must often rely on adaptation and preparedness in preparation for an event rather than mobilisation prior to an event.

Reducing the risk of flooding can be achieved either reducing the likelihood of the flood occurring or reducing the damage the flood will cause.

Examples of the features that can be used to reduce the likelihood of local floods include:

- landscaped features that hold or direct water away from properties, which can be green infrastructure or more conventional engineering features;
- natural features and restoring natural processes that reduce runoff and slows the flow of water;
- improved drainage including sustainable drainage systems (SuDS); and
- transferring risk to other areas where the consequences are low, for example by allowing land to flood and containing floodwater to prevent flooding elsewhere.

Examples of the steps that may be taken to reduce the damage and disruption when floods do happen include:

- controlling inappropriate development to avoid increasing risk;
- adapting buildings to minimise damage; and,
- making sure that a proper emergency response plan is in place.

A number of features may be used together to manage the risk in a particular area, working in combination within a risk management system.

It is important to understand that no organisation or body has a duty to prevent flooding or reduce the risk. Risk management authorities exercise permissive powers to undertake flood risk management works and they have access to funding to investigate and deliver flood risk management activities. However, in spending public money they have a duty to get value for money, that is the financial benefit of the works must be more than the cost of delivering and maintaining them (some funds require the benefit cost ratio to be greater than one), there are more details on the funding available in Chapter 8. In many cases flood risk cannot be managed in a cost effective way.

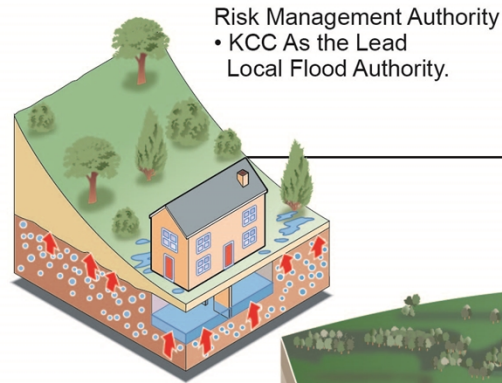
2.3 Sources of flooding

The diagram on the next page gives a general overview of the main sources of flooding and the authorities with responsibility for managing the various flood risks, if you have a query or concern about one of these risks please contact them.

Flooding sources

Groundwater

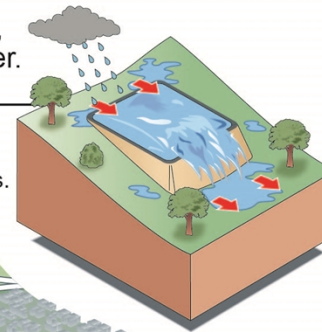
Occurs when water stored in the ground rises to the surface. This is most likely in areas with porous underlying rocks (like chalk).



Risk Management Authority
• KCC As the Lead Local Flood Authority.

Reservoirs

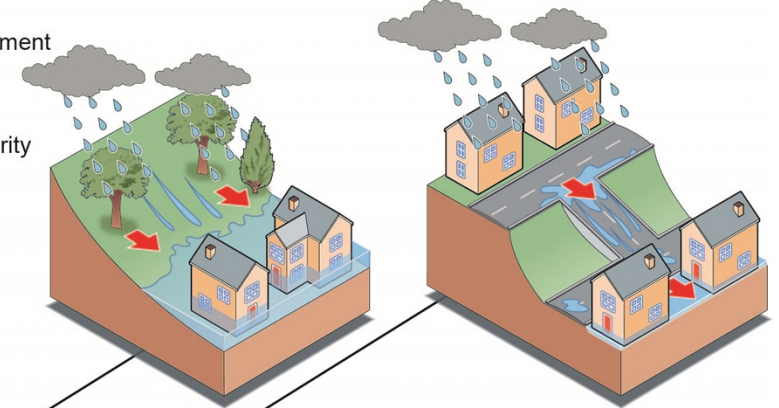
Reservoir flooding is extremely unlikely to occur. When the amount of water entering the reservoir is greater than the amount the reservoir is designed to discharge, floodwaters may overtop the crest of the reservoir and flow downstream (some reservoirs are designed to manage excess flows in this way). Occasionally, where a reservoir has been poorly designed, the structure can fail, releasing water.



Risk Management Authority
• EA - regulator.
• Reservoir owner - managing on-site risks.
• KCC/KRT - off-site emergency plan.

Surface water

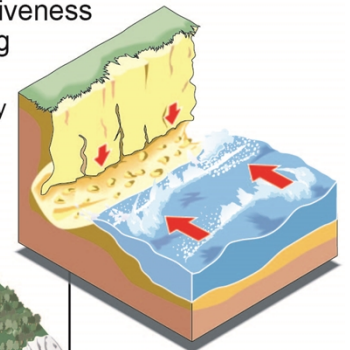
Occurs when the rate of rainfall is higher than the rate at which water can drain into the ground or enter a drainage system, creating runoff, running down hill and pooling in low points.



Risk Management Authority
• KCC as the Lead Local Flood Authority and Highway Authority.

Coastal Erosion

Occurs when the coastline is eroded by the action of the sea, leading to loss of land. Whilst coast protection works are not the same as coastal flood defences, they can contribute to the effectiveness of flood defences along a shoreline.



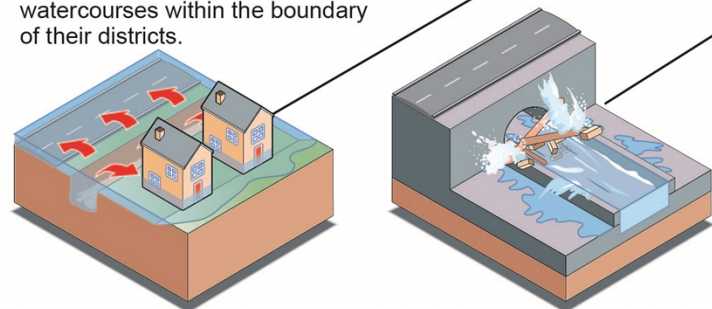
Risk Management Authority
• DB

- Authorities responsible
- KCC: Kent County Council
 - EA: Environment Agency
 - SW: Southern Water
 - TW: Thames Water
 - IDB: Internal Drainage Boards
 - o Lower Medway Internal Drainage Board
 - o Upper Medway Internal Drainage Board
 - o Romney Marshes Area Internal Drainage Board
 - o River Stour (Kent) Internal Drainage Board
 - o North Kent Marshes Internal Drainage Board
 - DB: District and Borough Councils
 - KRT: Kent Resilience Team
 - RO: Reservoir Operators

Main river and ordinary watercourses

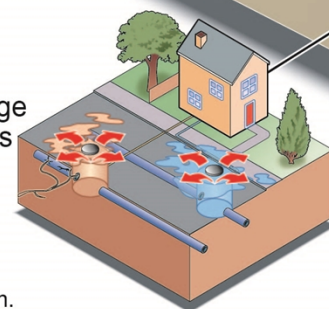
Occurs when the water flowing in a watercourse (which may be in a culvert), exceeds the capacity of the channel and goes over its banks. The capacity of the watercourse may be reduced by blockages and debris in the channel. There are two categories of watercourse: main rivers (those which present the greatest risk to life and property), and ordinary watercourses, which cover all other watercourses, including streams, drains and ditches.

Risk Management Authority
• EA - main rivers.
• KCC - ordinary watercourses, outside the boundaries of Internal Drainage Districts.
• Internal Drainage Boards – ordinary watercourses within the boundary of their districts.



Sewer flooding (including foul sewers)

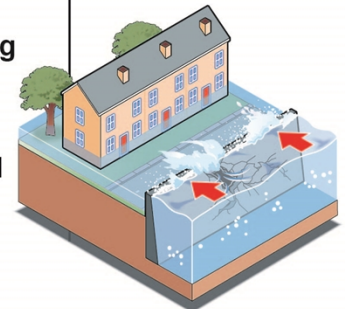
May occur when the sewerage system fails due to blockages or it is overwhelmed by surface water.



Risk Management Authority
• SW and TW for public sewers
• Sewer owner for a private system.

Coastal Flooding

Occurs when the coastline and/or coastal flood defences are either overwhelmed or breached by high tides or a storm surge.



Risk Management Authority
• EA

3 Flood Risk in Kent

Kent is at risk of all sources of flooding mentioned in Section 2 and there is generally a very high level of risk in the County compared with other areas of England.

There are approximately 64,000 properties estimated to be at risk of flooding from coastal and fluvial flooding in Kent. The coastal areas of Kent are at significant risk of flooding, in particular the Romney Marshes, Dartford and Gravesend are at high risk of coastal and tidal flooding. Flood defences are in place in many of these areas to reduce the risk. The floodplains of the Rivers Medway, Beult, Stour and Darent present a significant risk of fluvial flooding in Kent, there are some flood defences for these areas.

There are also approximately 24,000 properties estimated to be at risk of flooding from surface runoff. This is one of the highest risks of any Lead Local Flood Authority in England. All areas are at some risk of surface water flooding, but the risk is generally concentrated in urban areas. Section 7 presents more details on the areas where this risk is significant.

Ordinary watercourses are a significant source of flood risk in Kent, unfortunately there is no national estimate of the risk from this source. Ordinary watercourses can vary in size from small ditches or field drains to large streams or small rivers. There are many areas with a large number of ordinary watercourses in a concentrated area in Kent, for instance the Low Weald, North Kent Marshes or Romney Marshes, where they perform a vital role in land drainage and flood risk management in flat impermeable areas. There are also towns and villages in Kent with steeper topography, where ordinary watercourses present a significant flood risk.

Groundwater presents a significant source of flooding in parts of Kent as there are large areas of permeable aquifers, particularly the chalk aquifers of the North Downs. Groundwater flooding occurs in a number of areas across the North Downs, most notably along the Nailbourne Valley.

The specific flood risks in Kent are set out in more detail in the Flood Risks to Communities documents, which we have produced. There is a Flood Risk to Communities document for each district in Kent, which contains details of local flood risks, the appropriate risk management authorities for the flooding and waterbodies in the area, who to contact in an emergency and details of plans and strategies that are relevant to the management of flood risk in the area. The Flood Risk to Communities documents can be found here:

<https://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/flooding-and-drainage-policies/flood-risk-to-communities/>

4 Progress and developments since the previous Local Strategy

Below is a summary of some of the progress that has been made and developments that have occurred since the last Local Strategy was published.

4.1 Flooding

There has been some significant flooding since the first local strategy was published, most notably the flooding of 2013/14 as well as other more localised flood events.

The flooding of 2013/14 started in December 2013 with the high tides and storm surge that caused flooding in Sandwich and Faversham amongst other areas. Further flooding occurred on 23 December with heavy rainfall in the Medway Valley which led to widespread flooding of over 700 properties. The wet weather continued into the 2014 causing high groundwater levels in the aquifers of Kent that led to groundwater flooding and winterbournes to flow, including the Nailbourne in Canterbury, where the flood alert remained in place for 101 days. In total over 950 properties were flooded in the flooding of 2013/14, the most extensive flooding in Kent since 2000/01.

During and after this flooding the risk management authorities involved undertook reviews of how they had responded and identified areas for improvement. The review that KCC undertook can be found here:

democracy.kent.gov.uk/documents/s47250/Item%20-%20-%20Flooding.pdf

Other floods have also occurred across Kent. Tunbridge Wells flooded in August 2015 causing flooding to properties in the Pantiles and London Road areas. KCC undertook an investigation into this flood, the report of this investigation can be found here, along with reports into other flood investigations we have undertaken:

<http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/flooding-and-drainage-policies/section-19-flood-investigations>

4.2 Partnership working

Since the Flood and Water Management Act 2010 was published there has been an improvement in the cooperation and partnership working of the various risk management authorities. The Environment Agency and Southern Water have officers specifically tasked with working with local authorities and other risk management partners. This has greatly improved the relationships between the authorities and the understanding of the different objectives and funding requirements of each of the bodies. There are a number of regular meetings between the risk management authorities to discuss flood risk in the county and to identify and monitor joint working opportunities.

There are also a number of flood risk management programmes that are being delivered by a partnership of risk management authorities, including the Medway

Flood Partnership and the Nailbourne and Little Stour Flood Risk Management Group. There is still work to be done in this area to make cooperation and partnership working more common-place.

4.3 Surface Water Management Plans

As part of delivering the previous local strategy KCC has undertaken a number of Surface Water Management Plans (SWMP) in Kent. These documents set out the local flood risks (not just the surface water risks) in an area. They range from strategic level documents that cover a wide area, for example a borough, or they can be a more focussed and more detailed study of a town. The strategic type of SWMP have helped us to understand where more detailed investigations may be required. The detailed SWMPs usually involve computer modelling of the drainage and water networks to improve understanding of the flood risks and identify potential solutions.

KCC has produced 24 SWMPs or similar studies in Kent, most of the county is covered by at least one SWMP. This provides an overview of the main local flood risks in the county. The SWMPs can be found here:

<http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/flooding-and-drainage-policies/surface-water-management-plans>

4.4 Communicating flood risk

KCC has also produced Flood Risk to Communities documents for each of the districts in Kent. These documents provide a summary of all the flood risks in the district. The documents provide a summary of all the flood risks in the district, how is responsible for flood risk management and for emergency response, they include contact details for relevant parties and some further detail about the flood risks in each ward in the district.

The Flood Risk to Communities documents can be found here:

<https://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/flooding-and-drainage-policies/flood-risk-to-communities/>

4.5 Flood Wardens

Following the flooding in 2013/14 the Environment Agency, Kent County Council, the Kent Resilience Team and the districts and boroughs of Kent encouraged Flood Wardens in flood vulnerable communities in Kent. Flood Wardens help to coordinate activities in their communities during a flood, helping the emergency responders and ensuring everyone is aware of the risks and how to respond themselves. There are now over 200 Flood Wardens in Kent, though there are flood vulnerable areas that are not covered yet.

4.6 SuDS guidance

In preparation for our role as the drainage approving body, KCC worked with partners to develop guidance to promote the use of Sustainable Drainage Systems (SuDS) in new developments. The guidance Water.People.Places was developed in partnership with East Sussex County Council, West Sussex County Council, Hampshire County Council, Surrey County Council, and Portsmouth, Southampton, Brighton and Medway Councils.

Water.People.Places promotes the inclusion of SuDS in new developments at the Masterplanning stage and includes several different developments typologies as examples. Water.People.Places can be found [here](#).

4.7 Statutory consultee roles

The roles of statutory consultees for flood risk in planning applications have changed. The Environment Agency is no longer consulted on the drainage requirements of planning applications. They maintain their role for planning applications in areas of flood risk but are no longer required to comment on surface water management. LLFAs are now statutory consultees for surface water in major planning applications.

As such we provide consultations responses on the drainage proposals in major planning applications (developments of 10 homes or more, greater than 0.5 ha or more than 1000 sq m of commercial flood space), which covers more planning applications than the Environment Agency was consulted on for surface water alone. This role means that KCC can identify where drainage proposals will increase flood risk and make appropriate recommendations to the planning authority to include in the planning application decision.

Our role as a statutory consultee is instead of the role of the drainage approving body that was set out in Schedule 3 of the Flood and Water Management Act 2010. The government was not able to implement this part of the Act and does not have any plans to.

5 Challenges

Despite the progress there are many areas for further improvements. The SWMPs and Flood Risks to Communities documents provide an evidence base for the risks and issues in Kent. From these it is easy to identify a number of flood risk challenges that affect a number of areas in Kent. These challenges are outlined below and these are areas that will be addressed through the delivery of this local flood risk management strategy.

5.1 Catchment-based approach to flood risk management

There are many bodies responsible for managing many parts of a drainage or river catchment. Each body has a different way of assessing risk and prioritising work according to the corporate objectives or specific mandate that they have. This can mean that other opportunities are missed or that there may be impacts on other parts of the network in the catchment.

There have been improvements in the cooperation between bodies during the last local strategy period, especially through Public Service Cooperation Agreements (PSCAs), where authorities agree to share services. However, there remains a need for greater cooperation in the planning of flood risk management works, both capital investment and routine maintenance in order to deliver a genuinely catchment-based approach that is sympathetic to all the risks. Improving the understanding of the all of the flood risks in a catchment so that decisions can be made that incorporate all of them is a challenge.

5.2 Joint delivery of schemes

Risk management authorities are responsible for specific sources of flooding, however, flood risk to a community is often caused by a combination of sources and hence the solution involves more than one risk management authority. Each of these bodies has different funding criteria and corporate objectives, these differences can lead to complications in delivering joint solutions. There has been an improved understanding of the differences and requirements of the different bodies, however, there is still progress to be made in turning this improved understanding into integrated solutions that are co-delivered by partners.

5.3 Delivering local flood risk management works

To date only a small number of works to reduce local flood risk have been implemented in Kent. We have delivered measures to reduce flood risk, where this can be achieved by improving the understanding of asset owners or undertaking maintenance. But we have not delivered a significant number of works to reduce the local flood risk.

This is partly due to our role being new and a consequent need to understand where the risks are and what measures can be used to manage them. It is also due to the complexity of delivering works to reduce local flood risks. Local flood risk

management works often only provide small benefits and are often in urban or dense suburban areas where there are constraints on the space available to deliver a scheme. As a consequence the costs of schemes are high or there is no feasible scheme due to the lack of available, appropriate land on which to deliver it, which means that local flood risk management schemes are often not technically feasible or economically viable.

We would like this strategy to develop more feasible opportunities to deliver local flood risk reduction works, building on the risk identification work we have already undertaken and to develop our understanding of the techniques and measures available to deliver low cost local flood risk management works. We would also like to deliver more works to reduce local flood risk.

5.4 Combined sewer networks

Many areas of Kent are drained by combined sewers (as are many areas of the UK and Europe), these are sewers that carry both foul water (from toilets, bathrooms, sinks etc) and rainwater (from roads, gutters, areas of hardstanding etc) to sewage treatment works. One of the consequences of this is that if the rain fall exceeds the capacity of the sewer it will cause an overflow, where this mixture of foul water and rainwater flows out of the sewer. Overflows may be permitted discharges into watercourses or the sea (and as such are a common way manage combined sewers) or they may be unexpected and unplanned and lead to flooding.

Replacing combined sewers with separate systems is not economically feasible everywhere and in many areas combined sewers work well. However, with the pressures of climate change, housing growth and increasing density of urban areas, combined sewers in some areas are likely to face increasing constraints. We would like to work with the Water Companies to develop strategies to manage the increasing pressures on combined sewers where they are significant, ensuring new development, climate change and increasing urbanisation do not increase the risk of combined sewer overflows and that these they can be reduced where possible.

5.5 Natural flood management techniques

Natural flood management uses land management techniques to mimic natural processes in river catchments to reduce the runoff and river flows leading to lower risk of flooding downstream. Natural flood management techniques include storing water in small landscape features, slowing river and stream flows with natural dams and encouraging the infiltration of rainwater over the catchment. There have been recent developments in the use of natural land management techniques to reduce flood risk, in particular the [Belford scheme, Northumberland](#) and the [Slowing the Flow scheme in Pickering](#).

Natural flood management techniques are unlikely to be able to prevent large-scale flooding to the large watercourses in Kent on their own, but they may have benefits for smaller watercourses where the risks of flooding cannot be managed by a conventional flood defence scheme. Through this strategy we would like to work with

communities and land managers to identify opportunities to deliver natural flood management techniques and to progress with their delivery.

5.6 SuDS adoption and maintenance

Sustainable Drainage Systems (SuDS) are a way of managing runoff from developments that mimic natural drainage processes so that there is no increase in flood risk downstream and other benefits, such as amenity space and habitat, are also delivered. Unfortunately, the most beneficial forms of SuDS cannot be adopted by Water Companies (who adopt conventional drainage) and there is no other authority who has the powers necessary to adopt them and a funding mechanism to cover the costs of maintenance. This means that there is not full uptake of SuDS in developments.

Through this local strategy we hope to identify any opportunities to improve the uptake of full SuDS and promote the benefits.

5.7 Community resilience

Communities are at the forefront of flood risk, they are the ones that experience the flooding directly and often are the first to respond to it. Since the flooding in winter 2013/14 KCC, the EA and the districts and boroughs have trained flood wardens in many areas at risk of flooding to improve the local response to flooding. However, there is still a lack of widespread understanding in flood risk communities about how they can help themselves and how they can take action to feel more secure.

Improving the understanding of the causes of flood risk in the community, the assets that they have that serve a flood risk function, the triggers for flooding and how they can respond to them proactively can help communities to be more resilient. Through this strategy we will support communities to become more resilient to local flooding.

5.8 Local flood risk emergencies are properly planned for

Multi-agency flood plans set out the roles and actions for Category 1 responders, under the Civil Contingencies Act 2004, in a flooding emergency. Flooding emergencies in Kent are generally from coastal and fluvial flooding events, they do not often include local flood risks. This is appropriate in most cases, however there may be locations where local flood risk is significant and should be included in flood plans. Through this strategy we will review our understanding of local flood risks and identify any areas where they should be incorporated into flood plans.

5.9 Understanding the full economic benefits of flood risk management

Government contributions for flood defence works often do not provide the full funding needed to deliver a flood defence scheme. The government will provide funds for a portion of the costs, but only if any remaining funding required can be secured from another source, this is known as partnership funding (more details are given in Section 7). The government's contribution is largely calculated according to number of residential properties that will benefit from improved flood protection. Other economic benefits are often not fully considered nor are all of the non-

residential properties at risk of flooding, for instance businesses premises are not considered in the same way as homes. The expectation of the government is that other non-residential beneficiaries will contribute partnership funding to flood defence schemes that protect them. However, to date, partnership funding largely comes from other public sector bodies.

Changing the way that flood defences are funded is beyond the scope of this Local Strategy, as it is a matter for the government. However, there remains a challenge to get a better understanding of the full range of economic impacts of flooding, which can help to identify other opportunities for partnership funding contributions and impacts from flooding on other parts of the economy that might not ordinarily be recognised.

5.10 Flood risk management by design

Many schemes and developments are constructed that have a flood risk management impact, which is why the Environment Agency and KCC are statutory consultees for planning applications, so we can identify any issues and discuss any concerns with the developers and planning authorities. There are often opportunities in developments to reduce flood risk in the surrounding area, however there is no requirement for developers to reduce off-site risks and our interventions are often too late to modify designs to build them in at reasonable costs.

Ideally all developments and schemes would be built with the local flood risk management conditions in mind, so that they would not only be neutral from a flood risk perspective, they would actively reduce the risk. This would provide an opportunity to deliver flood risk management benefits more cost effectively and efficiently.

Through this local strategy we hope to identify some schemes and developments that can be designed to include flood risk management benefits at reasonable costs. We also hope to work with planning authorities to identify areas where proactive flood risk management policies would be of benefit and help them to build them into local planning policy.

6 Objectives and actions

6.1 Objectives

The objectives for this Local Strategy reflect the need to progress with the improvements achieved to date and to address the challenges that we face. The objectives are set out below.

Understanding flood risks

Risk Management Authorities in Kent have a clear understanding of local flood risk mechanisms, risks and management opportunities and this understanding is shared with partners to create an evidence base for flood risk and how it can be managed to ensure we target resources where they are most effective.

Monitoring, recording and investigating flooding and flood risk helps us to identify opportunities to reduce flood risk and provide information to improve the general understanding of flood risk. Our understanding of local flood risk has improved through the delivery of the first Local Strategy. However we must continue to monitor and record flooding and there remain opportunities to improve our understanding across our partners, to broaden the range of techniques available to manage flooding and identify opportunities for more parties to be involved in flood risk management.

This includes identifying the economic benefits of flood risk management so that potential new partners can be identified for flood risk management works. It will also include developing an evidence base for the use of natural flood management techniques.

Reduce the risk of flooding

Work in partnership to reduce the risk of flooding on people and businesses in Kent through the delivery of cost-effective flood risk management projects and programmes.

The delivery of flood risk management schemes for coastal and main river flooding is well supported and promoted by the Environment Agency. However the delivery of local flood risk management schemes has not enjoyed the same success. To deliver this objective we will develop a programme of local flood risk opportunities to progress through investigation, design and delivery. We will also work with partners to fund these opportunities.

We will also identify areas where surface water in combined sewers is a risk to their long-term effectiveness and potential to growth. From this we will develop a strategy to manage these sewer networks over the medium to long-term.

We will also promote the use of property level protection for areas where conventional flood risk management schemes are not viable.

Resilient planning

Ensure that development and spatial planning in Kent takes account of flood risk issues and plans to effectively manage any impacts.

The need for more housing puts pressure on infrastructure, including flood risk management infrastructure, and the natural systems that receive water and runoff. Unless new developments are managed well it can lead to an increase in flood risk. This objective will ensure that new developments do not increase the risk of flooding and where possible contribute to the reduction of flood risk.

Resilient communities

Residents and businesses of Kent have access to appropriate data and information to understand flood risk in their area, how it is managed and by whom. Emergency plans are in place for flood vulnerable communities. Communities and individuals are empowered to act to protect themselves from flooding through individual efforts, partnerships and joint working.

Communities are the hardest hit by flooding, they must be supported to understand their risks and to engage in managing it. Communities at risk of flooding need emergency flood plans as a minimum, but many communities are interested in being involved in managing the risks. There has already been a significant increase in the number of flood wardens in the county and we are keen to build upon this and empower communities to proactively engage with flood risk management in area. Through this objective we will ensure that residents and local communities are supported to understand their own flood risks and help them to identify how they can play a part in managing it.

6.2 Action plan

To deliver the objectives of this Local Strategy we have identified aims and actions these that break the objective down into discrete packages which continue to deliver flood risk management or address the challenges that we have identified in this Local Strategy. The aims and actions are set out below.

Objective 1: Understanding risk

Risk Management Authorities have a clear understand of flood risk

Our ambition	Our aims	Key outcomes
<p>Risk Management Authorities in Kent have a clear understanding of local flood risk mechanisms, risks and management opportunities and this understanding is shared with partners to create an evidence base for flood risk and how it can be managed to ensure we target resources where they are most effective.</p>	<ul style="list-style-type: none"> • Flood events in Kent are recorded and investigated as necessary • Improve the evidence base for the wider economic impacts of flooding to identify other funding opportunities • Improve the understanding and joint working opportunities between risk management authorities of the flood risks that others manage • Natural flood management techniques are better understood • Impact of climate change on flood risk assessed 	<ul style="list-style-type: none"> • Better understanding of joint flood risks and climate change across risk management authorities • Local flood risk management works are easier to plan, fund and deliver • More natural flood management techniques employed to reduce flood risk
<h3>Actions</h3>		
<ul style="list-style-type: none"> • Record flood events and share data with partners to develop a picture of flood risks in Kent • Identify opportunities for investigations or studies into flood risks • Develop Drainage Strategies for priority wastewater catchments in Kent • Explore opportunities to understand the national and local economic benefits of flood risk management schemes and identify opportunities and incentives for partners to invest in proposed schemes • Work with key partners to raise awareness of flood defence benefits who may not ordinarily be involved in funding flood defences • Develop an integrated asset record that can hold significant RMA assets to improve our understanding of flood risk management systems • Identify flood risks that have multiple risk management authorities involved and align strategic investment programmes to improve the coordinated delivery of risk management activities 		

- Undertake joint assessments of the options for flood risk management where there are shared risks, to improve efficiency of the assessment and proposed intervention
- Identify opportunities to use natural processes to manage flooding
- Investigate the economic benefits of natural processes
- Assess the areas where climate change will most increase the risk of flooding
- Ensure partners are aware of areas at risk of climate change and how this increased risk can affect them and the services they manage

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Objective 2: Reducing the risk of flooding

People and businesses in Kent are protected from flooding

Our ambition	Our aims	Key outcomes
<p>To protect the people and businesses of Kent from flooding through the delivery of flood risk management projects and programmes</p>	<ul style="list-style-type: none"> • Develop, maintain and deliver cost-effective capital investment projects to reduce local flood risk, including partnership projects • Reduce the surface water discharged to combined sewers • Promote the use of property level resistance and resilience (PLR) 	<ul style="list-style-type: none"> • Fewer properties and businesses in Kent at risk of flooding • Increased capacity in combined sewers • More jointly delivered flood risk management projects

Actions

- Develop a medium term plan of local flooding projects
- Identify funding routes and partners for the local flooding capital programme
- Identify opportunities to jointly deliver works
- Identify within Drainage Strategies, catchments where combined sewers present a risk to growth or the environment from surface water inflows
- Develop and deliver pilot schemes for surface water removal from combined sewers
- Develop a general business case for surface water separation from combined sewers
- Identify misconnections of surface water to foul sewers and ways to mitigate them
- Identify areas and/or properties that cannot benefit from conventional defences where PLR would be a benefit
- Promote PLR to appropriate communities

Objective 3: Resilient planning

Development planning in Kent contributes to effective flood risk management

Our ambition	Our aims	Key outcomes
<p>Development and spatial planning in Kent takes account of flood risk issues and plans to effectively manage any impacts.</p>	<ul style="list-style-type: none"> • Planning authorities understand the role of development in managing flood risk and promote appropriate sustainable development • Improve the uptake of SuDS as a drainage concept in new developments • Developments adopt flood risk management measures that contribute to offsite risk reduction 	<ul style="list-style-type: none"> • Developments in Kent incorporate SuDS • More developments in Kent actively contribute to flood risk management

Actions

- Continue to provide training and support to local planning authorities regarding flood risk and drainage
- Support local planning authorities to adopt SPDs for SuDS policies
- Promote the benefits of SuDS through the planning consultee role
- Support local planning authorities to adopt proactive SuDS policies
- Investigate the opportunities for SuDS to be adopted by a risk management authority
- Review new guidance for SuDS and flood risk management in new development as is becomes available and adapt policy accordingly
- Develop design guidance for SuDS in new development
- Work with local planning authorities and Southern Water to identify areas where minor development may cause a flooding issue
- Develop a protocol for providing advice to these local planning authorities for minor development in high risk areas
- Work with developers of sites in flood risk areas to identify flood risk reduction opportunities
- Support local planning authorities to develop planning policies to promote flood risk management measures that have off-site benefits in new developments

Objective 4: Resilient communities

Communities are supported to be resilient and empowered to take a proactive role in their flood risk management

Our ambition	Our aims	Key outcomes
<p>Residents and businesses of Kent have access to appropriate data and information to understand flood risk in their area, how it is managed and by whom. Emergency plans are in place for flood vulnerable communities. Communities and individuals are empowered to act to protect themselves from flooding through individual efforts, partnerships and joint working.</p>	<ul style="list-style-type: none"> • Improve the understanding of flood risk by residents and businesses of Kent • Local communities engage in developing local flood plans • Community flood wardens are supported and the benefits of flood wardens are promoted • Local communities are supported to identify manage, if appropriate, flood risks themselves 	<ul style="list-style-type: none"> • The residents of Kent understand their flood risk • More communities in Kent benefit from flood wardens and directly engage with flood risk management authorities to manage their flood risk
<h4>Actions</h4>		
<ul style="list-style-type: none"> • Identify high risk flood communities to promote the benefits of local community flood plans • Provide support to communities who want to develop community flood plans (include ones that aren't high risk) • Review local flood risks and identify any that should be referenced in Multi-Agency Flood Plans • Provide guidance to communities about local flooding so that local flood risks can be included in community flood plans • Prepare and maintain the Flood Risk to Communities documents • Provide guidance, information and support to local flood groups/forums etc • Make the register of structures and features accessible to the public to promote the identification of local flood risk significant assets • Identify new communities that can benefit from flood wardens and work with them to promote the benefits • Continue to hold flood warden training to support existing food wardens and train new ones • Identify communities that can and are willing manage flood risks locally • Provide training and support to these communities 		

6.3 Delivery and oversight of the action plan

The objectives and actions for this Local Strategy have been compiled by a strategic flood management group for Kent, where each of the risk management authorities is represented. The strategic flood management group for Kent will monitor the delivery of the Local Strategy and these actions.

These actions represent key themes that the risk management authorities see as important steps to be taken in flood risk management over the next five years. However, they also represent aspirations of the group to improve and develop the way flood risk management is assessed, understood, communicated and managed, as such we cannot guarantee that all of these actions can be delivered in this plan period. There are no specific resources allocated to the delivery of these actions, some fall within the direct function of some of the risk management authorities, though some do not and these can only be delivered if the resources are available to provide the staff and/or costs of the work. The strategic flood risk management group will work together to identify opportunities to deliver these actions through the resources the members have access to.

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7 Local flood risk assessment

There are many areas in Kent that are at risk of local flooding. This section sets out the areas we have identified as needing further investigation or intervention to assess the risk, which have been identified from the Surface Water Management Plans and flooding investigations we have undertaken.

In some areas we have a good understanding and we are aware of measures that are available to manage the risks. In other areas we may only be aware that there is a risk and further investigations are required to understand what, if any, measures can be delivered to manage these risks.

7.1 Preliminary Flood Risk Assessment

Under the Flood Risk Regulations, each LLFA has to undertake a flood risk assessment in their area called a Preliminary Flood Risk Assessment (PFRA) every six years. Kent prepared a PFRA in 2011 and the next one is due in 2017.

The purpose of the PFRA is to identify Flood Risk Areas where there is a significant risk of flooding. LLFAs have to identify Flood Risk Areas where the risks are from surface water, groundwater and ordinary watercourses. The Environment Agency are responsible for preparing the PFRA for other sources. The government sets the criteria for determining significant risk, which can be found in Appendix 2.

The government has used these criteria, based on nationally available data, to propose Flood Risk Areas. Each LLFA considers the proposed flood risk areas along with local flooding information and data they have on local flooding to determine the final Flood Risk Areas, in consultation with the Environment Agency.

In the previous round there were no Flood Risk Areas in Kent. The criteria in this review of the PFRA are different from the previous round, as a consequence, six have been proposed in this round. KCC and our partners in the county agree that none of the proposed areas presents a significant risk of local flooding and therefore warrants the level of detail and expenditure required to further assess these risk from the next round of the Flood Risk Regulations. More details about the PFRA can be found in Appendix 2, KCC's submission for the PFRA can be found in Appendix 3.

Areas that have been highlighted by the PFRA process will be included in our work as we deliver this Local Strategy, which we consider to be a more appropriate response to the risks than the requirements of the Flood Risk Regulations.

7.2 Flood risk management focus areas

Through the Surface Water Management Plans and Flood Investigations that we have undertaken, we have identified areas where there is a significant risk of local flooding or where the local flood risks need to be carefully managed in order to prevent pollution and ensure development is not hindered.

The areas we have identified to focus our flood risk management work are set out in Table 5. These areas represent areas of Kent where we are planning to deliver more than single projects or where we expect there to be more than one measure that will result from strategic investigations.

Table 1 Focus areas for local flood risk management

Priority area	Flood risk management issues	Actions	Partners
Medway Catchment (under the Medway Flood Partnership)	The Medway Valley contains many local flood risks, especially from ordinary watercourses and poor drainage	The Environment Agency has formed a Strategic Flood Partnership for the Medway Valley, which KCC is an active partner in. KCC is also a partner in the Natural Flood Management Project for the Medway Valley. As part of these projects and this Local Strategy, KCC will investigate the opportunities through NFM and other means to reduce the risk of flooding in the Medway Valley to the towns and villages there.	Environment Agency, Upper Medway Internal Drainage Board, Southern Water, Southeast Rivers Trust, Natural England
Northeast Kent (Deal, Margate, Ramsgate and Broadstairs)	Southern Water has undertaken a drainage strategy for Northeast Kent (Deal, Margate, Ramsgate and Broadstairs) that identifies sewer capacity as a potential obstacle to growth.	KCC will work with Southern Water to identify opportunities where it can reduce the discharge of surface water to the sewers	Southern Water, Thanet Council, Dover District Council
Nailbourne Valley	Groundwater and main river flooding cause long-standing disruption	KCC will work with multi-agency partners and local representatives to identify and deliver options to manage the flood risks in this Valley	Environment Agency, Southern Water, Canterbury City Council, Nailbourne and Little Stour River Group

Priority area	Flood risk management issues	Actions	Partners
Folkestone and Hythe	Steep hills in Folkestone and Hythe lead to rapid runoff which causes flooding issues from surface water, ordinary watercourses and main rivers	KCC will work with partners to investigate opportunities to reduce the risk of flooding	Southern Water, Environment Agency, Shepway District Council
Sittingbourne	Poor drainage leads to hotspots of flooding	KCC will investigate the causes of flooding and identify opportunities to reduce the risks	Southern Water, Swale Borough Council

In these areas we will need to understand the nature of the flood risks and where appropriate identify feasible, achievable opportunities to reduce the risk. The delivery of these opportunities will be dependent on funding being available (see Chapter 8). We are also likely to be working in multi-agency partnerships and will need to align our programmes across a number of organisations, which can affect the timeframes for delivery as different organisations need longer to approve and plan works.

We will also be delivering works in other areas, some of these we are aware of already (which can be seen in our action plan in Appendix 1) and others will be identified through further investigations and studies we undertake (some areas we are planning to investigate further can also be seen in). These areas and works do not

7.3 Local flood risk management in other areas

There are many other areas that experience local flooding where we are planning to undertake works to manage flood risk. However, with the information available at present we have only identified single or small projects to deliver, they do not currently require a focus over the timeframe of this Local Strategy. Where we are already aware of opportunities to reduce flooding we have built them into our programme (shown in Appendix 1). We are also aware of some areas that require further investigation (these are shown in Appendix 1, listed as scoping projects).

We will continue to monitor the information we receive and the flood investigations we undertake to identify further projects and opportunities to undertake local flood risk management in all areas of Kent. When the local strategy is reviewed in six

years' time any new information we have gathered will be used to assess the local flood risk management focus areas.

7.4 Local flood risk management projects

The projects we are preparing to undertake in first year of this strategy are presented in Appendix 1. This includes works in areas not linked to the priority areas identified in Table 5. The programme will develop and be updated over the period of this Local Strategy.

Flood risk cannot always be reduced and it can never be eliminated entirely. In delivering works to manage flood risk we have to take a pragmatic approach to ensure that the resources we have available are targeted where they can be most effective. Many flood risks are too complicated to effectively reduce or the management measures available are too expensive to be justifiable, in these cases we will have to make difficult decisions about what works to deliver. The deliverability of measures is part of the assessment we undertake before deciding to proceed to the next stage of a project or scheme.

The projects that we deliver are split into five different stages explained in Table 2:

Table 2 Project stages

Stage	Description
Scoping	Assessing whether there is a significant flood risk that needs to be further assessed for flood risk management works
Feasibility	Undertaking and assessment of whether flood risk management works could be delivered that will reduce the flood risk, this includes financial and technical considerations
Design	Detailed design of a scheme to reduce flood risk (this stage may be combined with construction)
Delivery	Construction or delivery of a scheme to reduce flood risk
Partnership Project	A project where a partner will be the primary lead and we will contribute resources as necessary

8 Funding for flood risk management projects

8.1 Flood defence grants

8.1.1 Introduction

The government has a fund for flood risk management projects called Flood and Coastal Erosion Risk Management Grant in Aid (FCERMGiA). This fund can provide funding for flood risk management schemes based on the benefits the scheme provides, primarily measured in the number of homes that are protected. Details about this fund can be found [here](#).

This fund provides grants for schemes based on the number of properties that the scheme will protect from flooding. The contribution from this fund to flood schemes is often not sufficient to deliver the scheme on its own, in these cases partnership funding contributions are required. Partnership funding can come from any source.

In order to qualify for funding from FCERMGiA, a scheme must demonstrate that it meets a minimum funding ratio compared with the cost (this level changes each year depending on the competition for FCERMGiA funding). This ratio is calculated by adding the FCERMGiA contribution to any partnership funding and dividing by the cost of the scheme. The qualifying ratio is often above 100%.

FCERMGiA can be used to fund the assessment of schemes, their design and construction. Once a stage is complete more information is available to apply for the next stage, if it is appropriate (development of the scheme may have identified that the scheme is not feasible for some reason). Each stage of application requires more evidence to demonstrate that the funding that is allocated is being put to effective use.

There is no specific benefit-cost ratio that has to be achieved to qualify for FCERMGiA, but due to way the funding is allocated according to properties that benefit there is a high level of cost effectiveness achieved by FCERMGiA, typically 1:8 or more.

8.1.2 Partnership funding

Most flood risk management schemes require partnership funding either to support schemes that have FCERMGiA or to deliver ones that do not have FCERMGiA. Partnership funding sources could include other funds, for instance Local Enterprise Partnership funds, Lottery funds, or it could be other beneficiaries of the scheme choosing to make a contribution, for instance land or property owners and infrastructure operators. The contribution can also be in kind donations of time, land or materials needed to deliver the project.

Finding partnership contributions is a challenge. Through this local strategy we hope to develop a better understanding of how to identify other funding opportunities and

beneficiaries and what is needed in order for them to be able to contribute to local flood risk management works.

8.1.3 Medium term plan

The Environment Agency administers FCERMGiA on behalf of Defra. The fund is allocated over a rolling six year period with new bids submitted annually to be included in the following year's plan. The plan is known as the Medium Term Plan (MTP). The MTP contains the allocation made to each project in each year.

When a project is identified it can make an outline application to be included on the MTP. This can include the expected costs for each stage up to the construction. This can be allocated on a provisional basis on the MTP. At each stage evidence will have to be provided that the project still qualifies for the subsequent allocation and that the benefits it will deliver are the same.

Often schemes change as they develop from investigations to construction and they cannot deliver the same benefits that were originally identified or, in some cases, they are not feasible at all. As a consequence they are not entitled to the FCERMGiA that was originally allocated to the project. This means that FCERMGiA can become available in a year even though the MTP covers six years.

8.2 Other funding

Flood risk management schemes may be eligible for other sources of funding if they deliver other benefits that are supported by another fund. For instance, schemes that deliver habitat enhancement or creation can already get some funding through FCERMGiA and there are other funds that also support this.

Flood defence schemes that support growth may be eligible for funding from the South East Local Enterprise Partnership (SELEP). KCC has already been successful in applying for SELEP funding for the Leigh and Hildenborough and the East Peckham Flood Alleviation Schemes. However, these are large schemes that will deliver large scale growth in Kent and there was a lot of competition for this funding. It is unlikely that local flood risk management schemes would be eligible for this fund because they are generally small and unlikely to unlock significant growth.

We will look for other funds that do not directly support flood risk management projects, which we may be able to use if our projects if we are able to deliver these benefits as well as the flood risk management benefits. We will also look for opportunities to build in flood risk management benefits to other projects and schemes.

Appendix 1 Local flood risk management works programme

Number	Project name	Strategy or plan	Description	Project phase
1	Folkestone flood strategy	Folkestone and Hythe	Develop a combined flood strategy for all sources of flooding and drainage to accommodate climate change and growth	Scoping
2	Ightham	Medway Catchment	Assessment of options for conventional and NFM measures on the Busty Stream to protect Ightham village.	Scoping
3	Ightham Mote	Medway Catchment	Working with the National Trust to deliver NFM features within their land holding	Scoping
4	Marden Road tank, Staplehurst	Medway Catchment	Survey of attenuation tank to understand the connectivity and discharge of the system	Scoping
5	Snipeshill, Sittingbourne	Sittingbourne	Survey of existing tanks/soakaways to understand drainage connectivity.	Scoping
6	Canterbury	Misc	Investigation of local flood risks in Canterbury urban areas	Scoping
7	Steeds Close	Misc	Investigation of the ditch system and land management practices and potential for natural flood management	Scoping
8	East Studdal/Ashley	Misc	Investigation of options for soakaways and NFM features which can reduce flood risk within East Studdal.	Scoping
9	Stour Wetland Project	Misc	Supporting design work for wetland creation on the River Stour.	Partnership project
10	All Saints Avenue, Margate	Northeast Kent Drainage Strategy	Investigate solution for highway flooding on All Saints in coordination with Highways.	Feasibility and design
11	Dane Park, Margate	Northeast Kent Drainage	Investigate opportunities to utilise Dane Park to manage highway runoff.	Feasibility

Number	Project name	Strategy or plan	Description	Project phase
		Strategy		
12	Neville Street, Tunbridge Wells	Medway Catchment	Detailed design to reduce highway runoff to combined sewer	Design and delivery
13	Church Street, Deal	Northeast Kent Drainage Strategy	Neville Gardens soakaway	Design and delivery
14	Bell Road, Sittingbourne	Sittingbourne	Detailed design and construction of soakaway in Glovers Crescent	Design
15	Whitenbrook Wood culvert, Hythe	Folkestone and Hythe	Replacing the culvert which is located on OWC, Whitenbrook Wood watercourse culvert	Design and delivery
16	Northdown Park, Margate	Northeast Kent Drainage Strategy	Detailed design of attenuation system and highway drain in Queen Elizabeth Avenue, Margate	Design
17	Pocket Park, High Street, Sittingbourne	Sittingbourne	Additional rain garden	Design
18	Mill Farm Wetland	Medway Catchment	Completion of the Mill Farm Wetland project. Engagement with landowners within the Medway catchment using Mill Farm as a demonstration site.	Delivery
19	Ayleswade Farm, Hammer Stream	Medway Catchment	Continuation of the Hammer Stream river restoration project. Work will improve the quality of the river and re-meander the channel will help to slow the flow of flood events.	Delivery

Number	Project name	Strategy or plan	Description	Project phase
20	Hawden Stream, Hildenborough	Medway Catchment	Creation of NFM features upstream of Hildenborough. Project will reduce the risk of flood risk to properties and infrastructure. Hildenborough suffers from flooding from the River Medway which prevents the Hawden from discharging. NFM will capture the runoff from the upper parts of catchment and slow/store water.	Delivery
21	Paddock Wood	Medway Catchment	Natural flood management on Tudely Brook to reduce the risk of flooding to the western side of Paddock Wood.	Delivery
22	Rodmell Road, Tunbridge Wells	Medway Catchment	Replacement of existing culvert trash screen which is difficult to maintain safely to prevent flooding from blocked screen to Warwick Park area.	Delivery
23	Downs Road, Folkestone	Folkestone and Hythe	Completion of construction of raingardens on Dolphins Road to reduce flood risk to Downs Road.	Delivery
24	Westerham	Misc	Improvement to runoff management in Westerham to prevent flooding to Goodley Stock Road properties.	Delivery
25	Cheveney	Misc	Creation of a swale to channel surface water flooding off the main High Street and into Cheveney lake. Reducing flood risk to properties on the High Street	Delivery

Scoping – assessing whether there is a significant flood risk that needs to be further assessed

Feasibility – undertaking and assessment of whether a scheme could be delivered that will reduce the flood risk, this includes financial and technical considerations

Design – this the design of a scheme to reduce flood risk

Delivery – the delivery of a scheme to reduce flood risk

Partnership Project – this is a project where a partner will be the primary delivery body and we will contribute resources as necessary

Appendix 2 Preliminary Flood Risk Assessment

A2.1 Flood Risk Regulations

The Flood Risk Regulations (the regulations) are a transposition into English and Welsh law of the EU Floods Directive 2009. Under the Flood Risk Regulation 2010, England and Wales must make a preliminary assessment of flood risk from all sources, except sewers, and then to identify areas at significant potential risk of flooding. For these 'significant risk' areas maps must be plotted to show the potential flood extent and the adverse consequences arising from such a flood. Objectives and measures must then be developed to reduce this flood risk in flood risk management plans.

In England, the Environment Agency is responsible for assessing the risks from rivers, the sea and reservoirs, whilst LLFAs are responsible for assessing the risks from surface water, groundwater and ordinary watercourses. This assessment is known as the Preliminary Flood Risk Assessment (PFRA). The PFRA forms the basis for determining areas of potential significant flood risk which will subsequently be mapped and for which flood risk management plans will be then prepared.

The regulations set in train a six yearly assessment, mapping and planning cycle that began with the first preliminary flood risk assessment in December 2011. The assessment, mapping and planning cycle continues on a six-yearly basis with the first review of the preliminary flood risk assessment due by 22 December 2017. Flood maps must be reviewed by 22 December 2019 and flood risk management plans by 22 December 2021.

LLFA contributions to this process must be assessed by the Environment Agency prior to being submitted to the EU. Therefore the deadlines for completing these stages are prior to these dates.

KCC's submission for the PFRA can be found in Appendix 3.

A2.2 Preliminary Flood Risk Assessment criteria

LLFAs must assess the risk of flooding from surface water, groundwater and ordinary watercourses. The government sets out guidelines to determine if an area is at significant risk of surface water flooding. Ordinary watercourses pose a form of risk from rivers, but rivers with significant flood risks are main rivers, so these are regarded as low risk for the purposes of the regulations. Groundwater does pose a potential significant risk, but the government allows for local determination based on historic events, as groundwater is unlikely to pose a significant risk in areas which have not experienced groundwater flooding previously.

The criteria set by the government for significant risk from surface water is based on the concentration of properties at risk of surface water flooding in an area. There are two criteria used to assess this concentration of properties, set out in Table 3.

Table A2.1 PFRA flood risk area criteria

Method for determining indicative Flood Risk Areas	Definition	Indicator	Criteria
Cluster method	A cluster is formed where, within a 3x3 km square grid, at least 5 of the 1km squares meet the criteria for one or more of the indicators. Where multiple overlapping grids meet the requirement, these are unified to form a larger cluster. All of the clusters (both small and large) have been identified as indicative flood risk areas.	Number of people at risk of surface water flooding*	200 people or more per 1km grid square Number of people taken as 2.34 times the number of residential properties at risk.
		Number of key services at risk of surface water risk* eg utilities, emergency services, hospitals, schools	More than one per 1km grid square
		Number of non-residential properties at risk*	20 or more per 1km grid square
Communities at risk method	Community areas, as defined by the Office for National Statistics built-up areas (BUAs) and built-up areas subdivisions (BUASDs), where there is a large number of properties at risk within the BUA/BUASD.	Number of reportable properties (residential and non-residential) properties at risk*	3000 or more reportable properties (residential and non-residential) within a BUA/BUASD.

The Environment Agency has undertaken an initial assessment of Flood Risk Areas for surface water using national surface water flood risk maps. These maps use national topographical and rainfall data, to determine flood risk from surface water. These maps are then used to identify the number of properties are risk using the above criteria. This assessment does not include local information or flood history.

This methodology gives indicative areas for flood risk. This assessment is used by KCC along with other information about local flood risk to determine the Flood Risk Areas. In many of the indicative flood risk areas, more local information is available, which has not been used in the national assessment. Once flood risk areas are defined they will be subject to further rounds of planning in the six-year period defined by the Flood Risk Regulations.

Once the Flood Risk Areas have been determined in the Preliminary Flood Risk Assessment stage, there are two further stages to the Flood Risk Regulations, mapping and flood risk management plans. Given the additional work it is important that we identify the appropriate flood risk areas.

A2.3 Flood Risk Areas in Kent

The indicative Flood Risk Areas in Kent given by this initial assessment are set out in Table 4 along with a summary of the decision on whether to accept these as Flood Risk Areas in Kent.

Table A2.2 PFRA flood risk areas

Proposed Flood Risk Area	Local evidence available	Confirmed Flood Risk Area	Comments
Dartford	Dartford SWMP, Dartford and Gravesham SWMP	No	The Dartford SWMP identifies local flood risk in Dartford, but this are largely confined to highways risk. Where properties are identified as at risk the likelihood is low. KCC does not consider the surface water flood risks in Dartford to constitute a nationally significant flood risk
Gravesend	Dartford and Gravesham SWMP	No	The Dartford and Gravesham SWMP identified a small number of flood risks to properties in Gravesend predominately associated with sewers. KCC does not consider the surface water flood risks in Gravesend to constitute a nationally significant flood risk
Sittingbourne	Swale SWMP	No	There are areas of risk in Sittingbourne where we are already planning works or investigate further to scope the opportunities. However, KCC does not consider the surface water flood risks in Sittingbourne to constitute a nationally significant flood risk
Maidstone	Maidstone and Malling SWMP	No	The Maidstone and Malling SWMP identified a small number of flood risks to properties in Maidstone predominately associated with the highway. KCC does not consider the surface water flood risks in Maidstone to constitute a nationally significant flood risk

Proposed Flood Risk Area	Local evidence available	Confirmed Flood Risk Area	Comments
Canterbury	Canterbury SWMP	No	The Canterbury SWMP has shown some areas of risk that we will investigate further to scope the options for further work. However, KCC does not consider the surface water flood risks in Canterbury to constitute a nationally significant flood risk
Ramsgate	Ramsgate SWMP	No	The Ramsgate SWMP has shown some areas of risk that we are intending to investigate further to scope the options for further work. However, KCC does not consider the surface water flood risks in Ramsgate to constitute a nationally significant flood risk

DRAFT

Appendix 3 Preliminary Flood Risk Assessment submission

DRAFT

To: Kent Flood Risk Management Committee – 17th July 2017

From: Tony Hills, Chair of Kent Flood Risk Management Committee

Subject: Environment Agency and Met Office Alerts and Warnings and KCC flood response activity since last meeting.

Classification: Unrestricted

Summary: To update Kent Flood Risk Management Committee on the water resources situation, Environment Agency and Met Office Alerts and Warnings, and flood response activity since the last meeting of the Committee on 6th March 2017. Members are requested to note this report.

1. Background

1.1 KCC Resilience and Emergency Planning Service and Contact Point receive Environment Agency and Met Office alerts and warnings by e-mail on a 24 hour basis. Potential impacts upon communities, infrastructure and the wider environment are then assessed and a response mobilised as required.

1.2 Some 70,000 properties in Kent are located within areas identified as potentially at risk from fluvial (river) or tidal flooding. Where practically possible, these properties are offered a Flood Warning Service by the Environment Agency. However, other parts of the County are also vulnerable to surface and ground water flooding. Early warning of flood risk to communities (including areas outside of floodplains) is delivered through flood guidance statements, severe weather warnings and mobilisation of Kent Resilience Forum Severe Weather Advisory Group (SWAG).

2. Latest situation

2.1 A drier than average autumn and winter has extended into spring and early summer 2017. The Environment Agency has recently issued a Prolonged Dry Weather Update outlining the current situation¹.

2.2 Prevailing dry conditions are reflected in the paucity of flood alerts issued since the last meeting of Kent Flood Risk Management Committee on the 6th March 2017. A total of just 5 flood alerts (4 fluvial and 1 coastal) have been issued by the Environment Agency². This contrasts with 32 flood alerts during the corresponding period in 2016.

2.3 A total of 6 yellow Met Office severe weather alerts and warnings have been issued since the last meeting (5 for heavy rain and 1 for high winds)³. This is far lower than the 12 yellow alerts and warnings issued during the same period last year.

2.4 The Thames Barrier has been closed by the Environment Agency on 4 occasions (all for test purposes) since the last meeting of the Committee. The figure for the same period in 2016 was 10 (8 for flood defence and 2 for test purposes).

¹ Please see appendix 1

² Please see appendix 2

³ Please see appendix 3

3. Next Steps

3.1 The dry conditions will continue to be closely monitored by KCC and the wider resilience community in Kent, informing water resource planning and effective emergency planning contingencies for drought, pollution and wildfire planning and response. Indeed, the Kent Resilience Forum Drought Plan has been reviewed and updated and is currently out to consultation with local resilience partners.

3.2 Elected Members will continue to be regularly updated on the water resources situation, flood alerts, severe weather warnings, operational response and any significant flooding events affecting Kent.

4. Recommendations

4.1 That Members:

- Note the current water resources situation and the level of alerts and warnings received since the last meeting of the Committee; and
- Contribute any additional matters arising from debate by the Committee.

Tony Harwood, Principal Resilience Officer, Growth Environment and Transport
tel. 03000 413 386 e-mail tony.harwood@kent.gov.uk

Background documents: None

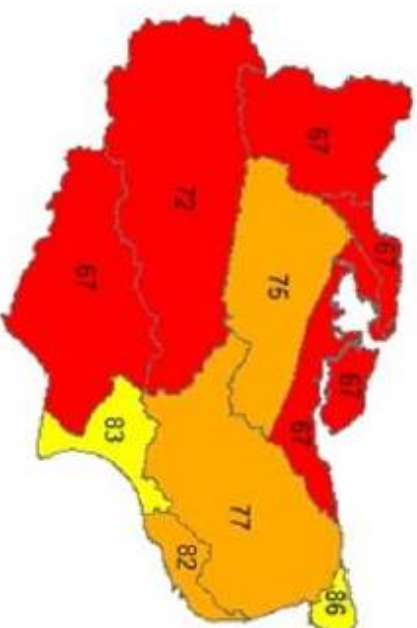
Prolonged dry weather update - Kent

The situation

- We are currently in a period of prolonged dry weather. The 11 month period from July 2016 to May 2017 was the driest on record for many parts of Kent.
- The dry winter and spring means river flows and groundwater levels are much lower than they would usually be at this time of year and some reservoirs are also below average.
- Rivers that are predominantly fed by rainfall are notably or exceptionally low (Medway, Upper Stour, Rother). Rivers supported by chalk groundwater are also below normal or notably low (Darent, Great Stour, Dour).
- Groundwater levels in some areas are exceptionally low for this time of year and are declining sharply.

- The intermittent periods of rainfall over the last month have temporarily eased pressure on the environment, but have not changed the overall water resources situation.
- The period of hot, dry weather in June put the environment and farmers under increased pressure.
- We are now seeing some environmental impacts exacerbated by the prolonged dry weather.
- Water companies have not put any customer restrictions in place, but always advise people to use water efficiently, especially during prolonged dry weather when everyone can help preserve water supplies and protect the environment.

Kent rainfall map - last 12 months



Total rainfall for hydrological areas across Kent for the last 12 months (to May 2017), classed relative to an analysis of respective historic totals.
 Data source: Rainfall from South East Soil Moisture Model.
 Some features of this map are based on digital spatial data licensed from the Centre for Ecology and Hydrology. © CEH. Includes material based on Ordnance Survey 1:50 000 maps with the permission of the controller of Her Majesty's Stationery Office © Crown copyright. All rights reserved. Environment Agency, 100026390, 2017.

Environmental impacts

- Low river flows cause problems for fish and wildlife and increase the impact of pollution.
- We have recently attended several incidents where fish have died, which have been exacerbated by the hot and dry weather.

June 2017



What are we doing?

- We are monitoring river flows and groundwater levels.
- We use this information to manage the many water abstractions by farmers, businesses and water companies.
- We are attending significant environmental incidents and taking appropriate action to minimise any potential impacts on the environment and wildlife.
- We are working with water companies, who are also taking appropriate actions to manage the prolonged dry weather.
- We are working with all our partners to balance the needs of people, business and the environment.

Outlook

- Continued dry weather will add pressure on water resources and further impact on the water environment and farmers.
- Any further rainfall will be welcome, although we do not anticipate that reservoir or groundwater levels will recover until this winter, at the earliest.

How can I help?

- We always advise that everyone uses water wisely, especially during a period of dry weather. Please follow the advice of your water company on using water efficiently.
- Please report any environmental incidents to our 24 hour hotline: 0800 80 70 60.

Appendix 2: Environment Agency Flood Alerts issued since 6th March 2017

Flood Zone	Date issued	Status
Pent Stream (Folkestone)	28/05/2017	Alert
Rivers Shuttle and Cray	28/05/2017	Alert
Rivers Shuttle and Cray	21/06/2017	Alert
Isle of Sheppey and Coast from Kemsley to Seasalter	25/06/2017	Alert
Rivers Shuttle and Cray	05/07/2017	Alert

Appendix 3: Met Office Severe Weather Warnings issued since 6th March 2017

Met Office Warnings	Date issued	Status
Yellow Warning of Rain for London & South East England	26/05/2017	Warning
Yellow Warning for Rain for London & South East England	01/06/2017	Warning
Yellow Warning of Wind for London & South East England	06/06/2017	Warning
Yellow Warning of Rain for London and South East England	21/06/2017	Warning
Yellow Warning of Rain for London and South East England	30/06/2017	Warning
Yellow Warning of Rain for London and South East England	04/07/2017	Warning

To: Kent Flood Risk Management Committee – 17th July 2017

From: Tony Hills, Chair of Kent Flood Risk Management Committee

Subject: Kent Resilience Forum Pan Kent Flood Group

Classification: Unrestricted

Summary: To update Kent Flood Risk Management Committee on current activity by Kent Resilience Forum Pan Kent Flood Group

1. Background

1.1 The Kent Resilience Forum was established in April 2005 to deliver upon legal duties enshrined within the Civil Contingencies Act 2004. The Forum ensures enhanced co-operation across resilience partners, including the emergency services, Government agencies, local authorities and utilities. A number of working groups are operated by the Forum. The Pan Kent Flood Group was launched in October 2014, delivering upon debrief recommendations arising from the winter 2013/14 floods.

1.2 Terms of reference for the Kent Resilience Forum Pan Kent Flood Group are set out at appendix 1 of this report. The Group is chaired by the Environment Agency, with Kent County Council filling the vice chair role.

1.3 At its meeting on 10th March 2015 the Committee requested periodic updates upon the Group's activities and work programme.

2. Work Programme

2.1 The Group meets on a quarterly basis and recently agreed their work plan for 2017/18. The following five key themes are identified as priorities for the coming year:

- Pan Kent and Local Multi Agency Flood Plans;
- Community road closures during flooding events;
- Off-site reservoir inundation planning;
- Better use of Resilience Direct (the Government's secure resilience IT platform); and
- East Coast surge preparedness.

2.2 Training and exercising is another focus of activity, including an innovative programme of flood warden training. A flood warden seminar and equipment demonstration is scheduled for 7th October at East Malling Research Centre. Exercise Tethys is scheduled for 29th November encompassing a reservoir dam failure scenario.

3. Next Steps

3.1 A further report will be tabled at 13th November Flood Risk Management Committee addressing specifically the updated Pan Kent and Local Multi Agency Flood Plans, ahead of winter and its increased risk of flooding.

3.2 Elected Members will continue to be periodically updated on the wider activities of this Group.

4. Recommendations

4.1 That Members:

- Note the work programme for the Kent Resilience Forum Pan Kent Flood Group; and
- Contribute any additional matters arising from debate by the Committee.

Tony Harwood, Principal Resilience Officer, Growth Environment and Transport
07850 907286 / tony.harwood@kent.gov.uk

Background documents: None

Purpose of the Group:

To ensure that Kent has appropriate emergency plans in place to deal with the range of flood emergencies set out in the Kent Community Risk Register and to ensure that there are the requisite multi-agency capabilities to respond to and recover from any such emergency. To identify and act upon lessons learned from recent tidal, fluvial, pluvial, ground and surface water flooding events in Kent and agree a structured prevention, response and recovery action plan.

Aim of the group:

Through effective partnership working between Category 1 and 2 responder agencies to ensure common understanding and execution of Emergency Planning, training and exercising responsibilities in order to achieve an integrated response and recovery process to any flooding emergency in Kent.

Objectives:

1. Ensure connectivity between the multi agencies within the group by supporting and assisting in the development of a bespoke Flood action plan to ensure gaps in capabilities are identified and mitigated against.
2. To collate, disseminate and understand recommendations from all agency flood reports and debriefs.
3. Produce an overarching action plan that seeks to resolve the recommendations and identifies any gaps / risks that may need further work.
4. Review / update the KRF Pan Kent Flood plan and District flood plans to incorporate recommendations as appropriate and highlight any risks through the KRF Executive Group.
5. To formulate Task and Finish groups as appropriate with a fixed end date to deliver a defined outcome to the group and make recommendations to the Executive Group as required.
6. Engage the KRF membership on key resource provision to assist in the delivery of the action plan.
7. To ensure timely highlight reports are presented to the Executive Group.
8. To ensure, once approved, the action plan and updated plans are entered and monitored on the KRF Register of Plans and Capabilities.

Priorities:

1. Delivery of debrief recommendations
2. Ongoing work from gap analysis

Membership: Chair: Environment Agency – Luke Thompson
Vice Chair: Kent County Council – Tony Harwood
Appropriate representatives from Category 1 and 2 responders and DCLG (RED)

Frequency: As required (at least quarterly)

Links with: Kent Resilience Forum Risk Assessment Group
Kent Resilience Forum Training and Exercise Group
Kent Resilience Forum Public Warning and Informing group

Reports to: Kent Resilience Forum Executive Group

Secretariat: KRT

Date agreed: 07 January 2015

