

From: **Michael Hill, Cabinet Member, Community Services**
To: **Environment & Transport Cabinet Committee – 22 July 2014**
Decision No: **N/A**
Subject: **Christmas / New Year 2013-14 Storms & Floods – Final Report**
Classification: **Unrestricted**
Past Pathway of Paper: **Cabinet – 7th July 2014**
Growth, Economic Development & Communities Cabinet Committee – 8th July 2014
Future Pathway of Paper:
Electoral Division: **N/A**

Summary: This report provides the Cabinet Committee with a full review of lessons learned from the Christmas / New Year 2013-14 storms & flooding (and previous severe weather events) and makes recommendations for how the County Council, in collaboration with its partners, can be better prepared to manage such future events and flood risk.

Recommendations: The Cabinet Committee is asked to a) note and endorse the recommendations outlined in the Action Plan in **Annex 1**; and b) once approved, receive further options papers / progress reports on delivery against the Action Plan.

1. Introduction

- 1.1 Members will be aware that the extreme severe weather experienced over Christmas and New Year was unprecedented and presented an exceptionally challenging time for all concerned.
- 1.2 Indeed, in the Government's 'Flood Support Schemes Guide' sent to Local Authority Chief Executives in flood affected areas by Sir Bob Kerlake, Permanent Secretary, Department for Communities & Local Government (DCLG) and Head of the Civil Service stated:
'On 5th and 6th December 2013, the worst tidal surges in 60 years struck the east coast of England, leaving a trail of destruction and flooded properties. In addition to the December tidal surges, the country has experienced the wettest winter in over 250 years. This has resulted in many areas of the country remaining on high alert for extended periods as the emergency services, supported by local authorities, statutory agencies and local residents have battled to protect communities'
- 1.3 Notwithstanding that the initial severe storms and rainfall occurred during the Christmas Bank Holiday with many staff on leave and out of county, KCC deployed all its available staff throughout this period to support those communities across the County that were affected, not only by flooding, but by storm damage and power outages.
- 1.4 Kent was one of the most severely affected areas in the country with some 28,500 properties without power on Christmas Eve and 929 homes and business flooded over the following 8 week period. See **supporting Appendix 1 sections A1 and A2** for a detailed breakdown of properties flooded and other key facts and statistics.
- 1.5 It is recognised that these unprecedented severe weather events strained not only KCC resources but all other emergency and public services and priority decisions had to be made in order to ensure support to those communities, residents and businesses affected by these events.

1.6 This report provides:

- A summary of the storms & floods that affected Kent between December 2013 and February 2014 & the actions taken by KCC & its multi-agency partners in response;
- Good practice and lessons learned to inform how KCC and its partners can better respond to such emergencies in the future;
- A review of options for managing flood risk in the long-term; and
- Draft Action Plan for taking forward proposed recommendations – see **Annex 1**.

1.7 Whilst this report will focus on the events from 23rd December 2013 onwards, to provide further background and context, reference is also made to the preceding severe weather events on 28th October (St Jude storm) and 5th & 6th December (east coast tidal surge).

1.8 Contributions from the following have been used to inform the content of this report:

- Internal KCC and multi-agency debriefs;
- Key internal departments & partner agencies e.g. KCC Flood Risk Management, Environment Agency (EA) and Kent Police;
- Individual responses from residents, businesses and elected representatives; and
- Public consultation meetings and ‘flood fairs’ in affected communities¹.

1.9 Details of key meetings & event dates are provided in **Appendix 1 section A3**.

2. Managing Emergencies

2.1 The Civil Contingencies Act 2004 establishes a clear set of roles & responsibilities for those involved in emergency preparedness & response at the local level. The Act divides local responders into 2 categories, imposing a different set of duties on each.

2.2 ‘Category 1 Responders’ are organisations at the core of the response to most emergencies (e.g. the emergency services, local authorities, NHS bodies and the EA) and have statutory responsibilities for the ensuring plans are in place to deal with a range of emergency situations, including flooding. ‘Category 2 Responders’ (e.g. the Health & Safety Executive, transport and utility companies) are ‘co-operating bodies’. They are less likely to be involved in the heart of planning work, but are heavily involved in incidents that affect their own sector. Category 2 Responders have a lesser set of duties - co-operating and sharing relevant information with other Category 1 & 2 Responders.

2.3 Category 1 & 2 Responders come together to form ‘Local Resilience Forums’ (based on police force areas) which helps co-ordination and co-operation between responders at the local level. In Kent, this is known as the Kent Resilience Forum (KRF), which is chaired by Kent Police who adopt the lead organisation role in most emergency situations.

3. Management of the Emergency

3.1 Kent Police undertook the role of lead organisation in the ‘emergency response’ phases, with each declared emergency given an operational name - see **Appendix 1 section A4** for details.

3.2 During the ‘emergency response’ phases, a multi-agency ‘Gold’ Strategic Co-ordinating Group (SCG) and ‘Silver’ Tactical Co-ordinating Group (TCG) were hosted and chaired by Kent Police at Kent Police Headquarters and Medway Police Station respectively.

¹ Public meetings with residents / businesses were co-ordinated by the EA via the Parish / Town Councils & the Tonbridge Forum, with attendance from elected members and officers from KCC, District / Borough Councils, Kent Police and Southern Water. Flood fairs are a joint initiative between District / Borough Councils, EA, KCC, Parish / Town Councils & the National Flood Forum - a charity that raises awareness of flood risk & helps communities to protect themselves & recover from flooding.

- 3.3 Multi-agency 'Bronze' Operational teams were deployed across the County in specific affected communities (e.g. Yalding, Bridge and the Brishing Dam) and undertook work such as door-knocking, evacuations, sandbagging and public reassurance.
- 3.4 Led by the Kent Police Gold Commander, the SCG agreed upon a Gold Strategy to guide the response, with the central aim of:
- 'Saving and protecting life and property risks to people in Kent and Medway by coordinating multi-agency activity to maintain the safety and security of the public'.*
- 3.5 The core roles undertaken by KCC were as follows:
- Supporting and, at times, leading multi-agency co-ordination;
 - Responding to the effects on the highway network throughout the period dealing with fallen trees, damaged roads, surface water flooding, blocked gullies and more;
 - On-scene liaison with partners and affected communities;
 - Working with District / Borough Councils to provide temporary accommodation to those who were flooded, with transport arranged to take people from flooded areas to safety;
 - Provision of welfare support to those evacuated or in their own homes²;
 - Co-ordinating support from the voluntary sector³; and
 - Logistics management of countywide resources such as sandbags.

4. Recovery Management

- 4.1 As of 18th February, KCC has been the lead organisation in managing the long-term recovery process and has developed a Gold Recovery Strategy with the central aim of:
- 'Ensuring partnership working to support the affected individuals, communities and organisations to recover from the floods and return to a state of normality'.*
- 4.2 To manage the recovery, five task-focused teams have been established with representatives from all appropriate authorities and organisations involved
- Health, Welfare & Communities: KCC Public Health led;
 - Environment & Infrastructure: EA led;
 - Business & Economy: KCC Business Engagement & Economic Development led;
 - Finance, Insurance & Legal: KCC Finance led; and
 - Media & Communications: KCC Communications led.
- 4.3 Central Government are taking a keen interest in progress and key issues, with regular reporting to DCLG and the office of Greg Clark MP, the Flood Recovery Minister for Kent.

5. Lessons Learned

- 5.1 The following are the main points raised during the relevant debriefs, meetings & individual responses received, which have been used to inform a set of recommendations which are summarised in the Draft Action Plan in **Annex 1**.
- 5.2 For reference, the draft lessons learned from the KRF multi-agency debrief held on 21st March 2014 can be found at **Appendix 1 section A5**.

² This included vulnerable person checks and provision of food, clothing and other practical support, such as arranging electrical contractors to ensure safety within people's flooded homes and hiring dehumidifiers to support the clear up.

³ This included undertaking community liaison roles and provision of equipment, practical support (such as first aid, transportation, or provisions for responders) and psycho-social support.

Pre-Planning & Resilience

Identified Successes

- 5.3 Overall, KCC and its KRF partners, with joint planning for responding to and management of emergencies, were able to deliver support and assistance to the many communities, individuals and businesses in Kent affected by the severe weather events.
- 5.4 Staff, systems & procedures coped well when one considers the unprecedented scale, complexity and protracted nature of the events that took place
- 5.5 There were numerous examples of the commitment & resourcefulness of staff, partners, volunteers and communities to help others in need and to provide practical solutions to real problems for those affected.

Areas for Improvement

- 5.6 In the early stages of the response, staffing levels were affected by the timing of the emergencies, which occurred over the Christmas Bank Holiday period. Coupled with the sustained and complex nature of the emergency, on occasions considerable demands were placed upon a small number of individuals & teams undertaking crucial emergency response roles. Increased resilience should be established across KCC to be better prepared in the future.
- 5.7 Although there is no legal obligation on any organisation to provide sandbags and other practical support (e.g. pumps, dehumidifiers), public expectation was, understandably, to the contrary. This was exacerbated throughout the response by a general lack of awareness, mis-communications & inconsistency of approaches adopted.
- 5.8 Linked to this last point, it has been observed and reported of a general lack of flood awareness and individual / community resilience. For example, in some parts of Kent, 40-50% of the homes and businesses at risk of flooding in Kent are not signed-up to the EA's Floodline Warnings Direct (FWD) Service and so are unlikely to receive any prior warning of flooding – see **Appendix 1 section A6** for more details.

Recommendations

REC1: Undertake a fundamental review & update of key KCC and partnership plans to ensure they are fit-for-purpose for even the most complex and protracted of incidents.

REC2: Provide Cabinet with an options paper for enhancing KCC's resilience, including training a cadre of 'emergency reservists'. Once approved, implement a programme to train, equip & support relevant personnel in readiness for Winter 2014.

REC3: Develop a consistent countywide policy & plans for maintaining & providing sandbags and other practical support to individuals & communities at risk of flooding.

REC4: Implement a strategy to encourage greater flood awareness & individual / community resilience, including improving sign-up for the EA's Floodline Warnings Direct (FWD) Service and training local volunteers as Flood Wardens.

Command, Control, Co-ordination & Communications

Identified Successes

- 5.9 Actions by KCC and our partners undoubtedly saved and protected life, livestock and properties.

- 5.10 As the emergency progressed, joint plans, procedures and working arrangements matured, informed by the experiences of previous events.
- 5.11 When established, multi-agency co-ordination was effective, particularly when this was co-located. Specifically, Bronze / Operational teams deployed on the ground provided an effective and invaluable link into affected communities, particularly when communication and transport links were disrupted
- 5.12 Throughout the sequence of events, the voluntary sector provided extremely valuable support, demonstrating a high level of professionalism, dedication and capability.

Areas for Improvement

- 5.13 Feedback from debriefs, public consultations & flood fairs suggest that the EA's flood warnings were not always received or there was difficulty in receiving warnings, particularly as power supplies were disrupted. Additionally, many residents received conflicting warnings, were unsure of the level of risk & therefore the relevant actions they should take.
- 5.14 KCC and its partners responded to emergency calls throughout Christmas Eve, Christmas Day & Boxing Day. However, pressure on staffing levels due to the Bank Holiday & sheer volume / complexity of incidents that were being reported led to delays in establishing co-ordinated multi-agency support structures in key affected communities (e.g. Tonbridge, Hildenborough, East Peckham, Yalding & Maidstone) until the following weekend which, understandably, has angered many residents & businesses.
- 5.15 Additionally, partner agencies, residents & businesses alike all suffered from a lack of / poor quality engagement & support from the utilities companies, particularly the power, water & sewerage providers.
- 5.16 Information management was a continual challenge – difficulties in obtaining critical information when it was need and, vice versa, information overload at times of intense pressure.

Recommendations

REC5: Undertake a fundamental review & update of the EA's Floodline Warnings Direct (FWD) Service for communities with high / complex flood risk.

REC6: Develop enhanced arrangements for warning & informing the public in flooding / severe weather scenarios, including contingency arrangements in the event of power outages and greater usage of social media.

REC7: Develop multi-agency arrangements to provide critical 'on scene' liaison & support to affected communities e.g. via multi-agency 'Bronze' / Operational teams.

REC8: Work with DCLG and the Flood Recovery Minister for Kent to bring pressure to bear on utilities companies to improve their arrangements for engaging with & supporting partners & customers.

REC9: Streamline & enhance existing multi-agency information management protocols & systems for sharing critical data in the planning for & management of emergencies.

Escalation, De-Escalation & Recovery

Identified Successes

- 5.17 Central Government colleagues have commended KCC and our partners for our approach in a number of key areas, and are promoting these as good practice e.g. early identification & monitoring of warnings / developing situations and a flexible / proportionate approach; and recovery management arrangements developed during Operation Sunrise 4.

Areas for Improvement

- 5.18 Some partners felt that, at times, there were delays in 'standing up' the co-located multi-agency emergency response co-ordination arrangements and, conversely, that these were occasionally stood-down too soon, declaring the 'emergency' over and handing-over to the 'recovery' phase.
- 5.19 Delays in involvement / support from Central Government caused difficulties for partners and the public over Christmas / New Year period. Conversely, once Central Government command & control was put in place, requests for detailed information at very short notice placed an additional burden on local responders.
- 5.20 The financial support schemes brought in by Central Government have also been difficult to interpret and implement at the local level, and do not adequately reflect the significant burdens placed on County Councils e.g. most schemes are focussed towards the Districts / Borough Councils, with significant cost incurred by KCC currently unlikely to qualify for central support.

Recommendations

REC10: Formalise the recovery management structures developed during Operation Sunrise 4 and adopt these as good practice.

REC11: Develop protocols to support emergency responders in deciding when to escalate / de-escalate to / from the 'emergency response' & 'recovery' phases.

REC12: Influence Central Government to secure additional financial support in recognition of the severe burden that these incidents have placed on KCC.

6. Flood Risk Management

- 6.1 As well as lessons learned to improve how KCC prepares for and manages flooding emergencies in the future, consideration must also be given to roles of each organisation and the broader flood risk management options available for preventing or reducing the likelihood and / or impacts of flooding occurring.

Roles & Responsibilities

- 6.2 **EA:** Responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion. This includes, for example, setting the direction for managing the risks through strategic plans; working collaboratively to support the development of risk management and providing a framework to support local delivery including the administration of Flood Defence Grant in Aid (FDGiA). The Agency also has operational responsibility for managing the risk of flooding from main rivers, reservoirs, estuaries and the sea, as well as being a coastal erosion risk management authority.
- 6.3 **KCC:** Lead Local Flood Authority (LLFA) for Kent as defined by the Flood and Water Management Act (2010) and has a role to provide strategic overview of local flooding, which is defined as flooding from surface water, groundwater and ordinary watercourses (watercourses that are not main rivers). As part of its role as LLFA KCC has prepared and adopted the Kent Local Flood Risk Management Strategy, which sets out the objectives for managing local flood risks in Kent. All risk management authorities must act consistently with the local strategy.

Highway Authority for Kent - has a role to maintain safe conditions on the roads by taking appropriate actions that may include the provision of temporary flood warning signs, clearance of flood water, reactive cleansing of the highway drainage system and the organisation of road closures and traffic diversions when roads become flooded.

- 6.4 District / Borough Councils: Key partners in planning local flood risk management and can carry out flood risk management works on minor watercourses, working with LLFA and others, including through taking decisions on development in their area which ensure that risks are effectively managed. Districts / Boroughs and Unitary Authorities in coastal areas also act as coastal erosion risk management authorities.
- 6.5 Internal Drainage Boards: Independent public bodies responsible for water level management in low lying areas, also play an important role in the areas they cover (approximately 10% of England at present), working in partnership with other authorities to actively manage and reduce the risk of flooding.
- 6.6 Water and Sewerage Companies: Responsible for managing the risks of flooding from water and foul or combined sewer systems, providing drainage from buildings and yards.

Effectiveness of River & Flood Management Assets

- 6.7 Partners, residents & businesses alike have raised a number of queries & concerns regarding the effectiveness of river & flood management systems / assets operated by the EA and Southern Water, including:
- EA: dredging of rivers and the operation of the Leigh Barrier and sluice gates at Yalding & Allington; and
 - Southern Water: lack / effectiveness of non-return valves in preventing sewage flooding, particularly in the Tonbridge area.

Recommendations

REC13: EA / Southern Water to respond to queries / concerns regarding the perceived lack / effectiveness of their management of rivers & flood management systems / assets.

Potential Flood Defence Schemes – information supplied by the EA

- 6.8 Approximately 65,000 homes and businesses are at risk of fluvial or coastal flooding in Kent, of which 38,000 currently benefit from flood defences with 27,000 not benefitting from defences. The EA has identified a further £194m of investment which would protect an additional 17,000 properties, between now and 2021. It has also identified further schemes identified for 2021 and beyond through its pipeline development programme.
- 6.9 The EA has worked successfully in the past with KCC and the private sector to implement flood risk management schemes such as the Sandwich Town Tidal Defence Scheme. It has also attracted additional partnership funding from a range of contributors including private businesses, developers and other government departments. There is a need to continue to work together to secure funding for priority schemes.
- 6.10 The recent flooding across the County has reinforced the need to accelerate this investment to reduce the risk of flooding. The EA in Kent & South London has secured £27.4m FDGiA for 2014-15. This will allow the EA to progress schemes including:
- Broomhill Sands Sea Defences
 - Sandwich Town Tidal Defences
 - Leigh Barrier Mechanical / Electrical Improvements
 - Study into Yalding Storage on the Beult
 - East Peckham (Medway) Flood Alleviation Scheme (FAS)
 - Aylesford Property-Level Protection Scheme (£50k contribution from KCC)
 - Repairing assets damaged in the recent coastal surge and fluvial floods

- Denge shingle re-nourishment

Flood Defence Grant in Aid (FDGiA)

6.11 In order to protect areas at Kent at risk of flooding investment is required in flood defences. The government will contribute to flood defences through FDGiA. However, current rules mean that schemes are rarely fully funded through this grant. Additional contributions or partnership funding is required to make up the shortfall. Without partnership funding flood defence schemes cannot be delivered.

6.12 The Government's partnership funding mechanism means that each scheme must have a minimum cost benefit of 8 – 1 and a partnership funding score of more than 100% in order to achieve Government allocated FDGiA. The EA has identified priority locations for accelerating flood defence projects based on people at risk and economic development including Yalding and Tonbridge that do not currently meet FDGiA criteria.

6.13 Areas that require investment to deliver flood defences in Kent include:

- The Leigh Flood Storage Area (FSA) and Lower Beult;
- East Peckham;
- Five Oak Green;
- South Ashford;
- Dover;
- Whitstable & Herne Bay;
- Folkestone; and
- Canterbury.

6.14 See **Appendix 1 section A7.4** for a detailed financial breakdown of each scheme.

Recommendations

REC14: Explore all possible opportunities with partners and beneficiaries to contribute to the priority flood defence schemes required in Kent, including influencing the EA, Defra & HM Treasury to secure funding to deliver the schemes that do not currently receive sufficient FDGiA funding even with substantial partnership contributions.

6.15 Highway Drainage Improvements

The County Council is responsible for the maintenance of 5,400 miles of public highway including 250,000 roadside drains and associated drainage systems. The weather this winter highlighted numerous pinch points in the drainage network. Some of these are being addressed by the implementation of an enhanced cleansing regime however in a large number of cases work is required to improve the functionality of the system.

In response, the County Council is investing an additional £3m to enable the delivery of 120 drainage improvement schemes in 2014/15. Renewals and improvements are being prioritised on the basis of the frequency of flooding and the risk posed to highway safety, properties adjacent to the highway and network disruption.

Other Flood Risk Management Options

6.16 Work is also currently on-going in the county by the EA and KCC to improve our understanding of flood risk and investigate options to provide protection. These include:

- Spatial & land-use planning & drainage;

- Personal flood resilience;
- High / complex flood risk communities; and
- Surface water management.

In most of the above areas, existing strategies and programmes of work are maintained by the relevant authorities. However, in light of recent events and the issues / opportunities highlighted in **Appendix 1 section A8** the following recommendations are made.

Recommendations

REC15: Ensure the consequences of flood risk are fully considered before promoting development in flood risk areas by consulting all organisations with a role in flood risk management and emergency management.

REC16: Implement a strategy to encourage greater awareness & take-up of individual & community flood protection measures e.g. property-level protection, sandbags.

REC17: Support awareness & implementation of key initiatives to support communities with high / complex flood risk, particularly e.g. Surface Water Management Plans (SWMPs), Multi-Agency Flood Alleviation Technical Working Groups

7. Recommendations

Recommendations: The Cabinet Committee is asked to a) note and endorse the recommendations outlined in the Action Plan in **Annex 1**; and b) once approved, receive further options papers / progress reports on delivery against the Action Plan.

8. Supporting Information

8.1 Annex 1. Draft Action Plan

8.2 Appendix 1 – Christmas & New Year 2013-14 Storms & Floods Final Report

Sections as follows:

- A1. Numbers of Properties Flooded;
- A2. Key Facts & Statistics;
- A3. Key Meeting & Event Dates
- A4. Summary of Emergency Response Operations;
- A5. Kent Resilience Forum (KRF) Multi-Agency Debrief - Draft Lessons Learned;
- A6. Floodline Warnings Direct (FWD) Service;
- A7. Potential Future Flood Defence Schemes; and
- A8. Other Flood Risk Management Options.

8.3 Background Documents

Christmas / New Year Storms & Floods Update Report to KCC Cabinet (22nd January 2014)

<https://democracy.kent.gov.uk/mgConvert2PDF.aspx?ID=44733> (Report &
<https://democracy.kent.gov.uk/mgConvert2PDF.aspx?ID=44762> Appendices)

Kent Local Flood Risk Management Strategy

<http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/flooding-and-drainage-policies/kent-flood-risk-management-plan>

Local Surface Water Management Plans

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

Revenue & Capital Budget Monitoring Report to KCC Cabinet (28th April 2014)

<https://democracy.kent.gov.uk/mgConvert2PDF.aspx?ID=46275>

Flood Support Schemes – Funding Available from Central Government

[https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304805/Flood Recovery - Summary of Support Guide.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304805/Flood_Recovery_-_Summary_of_Support_Guide.pdf)

DfT Pothole Challenge Fund

<https://www.gov.uk/government/news/councils-urged-to-apply-for-168-million-pothole-repair-fund>

Severe Weather Impacts Monitoring System (SWIMS)

<http://www.kent.gov.uk/business/Business-and-the-environment/severe-weather-impacts-monitoring-system-swims>

9. Contact Details

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Annex 1. Draft Action Plan

No.	Recommendation	Lead / Supporting Action Owner(s)	Start Date	End Date
REC1	Undertake a fundamental review & update of key KCC and partnership plans to ensure they are fit-for-purpose for even the most complex and protracted of incidents.	KCC / KRT	Jun 2014	Nov 2014
REC2	Provide Cabinet with an options paper for enhancing KCC's resilience , including training a cadre of 'emergency reservists'. Once approved, implement a programme to train, equip & support relevant personnel in readiness for Winter 2014.	KCC	Aug 2014	Nov 2014
REC3	Develop a consistent countywide policy & plans for maintaining & providing sandbags and other practical support to individuals & communities at risk of flooding.	KRT / Districts & Boroughs / EA	July 2014	Nov 2014
REC4	Implement a strategy to encourage greater flood awareness & individual / community resilience , including improving sign-up for the EA's Floodline Warnings Direct (FWD) Service and training local volunteers as Flood Wardens.		Apr 2014	Nov 2014
REC5	Undertake a fundamental review & update of the Floodline Warnings Direct (FWD) Service for communities with high / complex flood risk.	EA / KRT	July 2014	Nov 2014
REC6	Develop enhanced arrangements for warning & informing the public in flooding / severe weather scenarios , including contingency arrangements in the event of power outages and greater usage of social media.			
REC7	Develop multi-agency arrangements to provide critical 'on scene' liaison & support to affected communities e.g. via multi-agency 'Bronze' / Operational teams.	KRT	July 2014	Nov 2014
REC8	Work with DCLG and the Flood Recovery Minister for Kent to bring pressure to bear on utilities companies to improve their arrangements for engaging & supporting partners & customers.	KRT / KCC / EA	Ongoing	
REC9	Streamline & enhance existing multi-agency information management protocols & systems for sharing critical data in the planning for & management of	KRT	July 2014	Nov 2014

No.	Recommendation	Lead / Supporting Action Owner(s)	Start Date	End Date
	emergencies.			
REC10	Formalise the recovery management structures developed during Operation Sunrise 4 and adopt these as good practice.			
REC11	Develop protocols to support emergency responders in deciding when to escalate / de-escalate to / from the 'emergency response' & 'recovery' phases.	KRT	July 2014	Nov 2014
REC12	Influence Central Government to secure additional financial support in recognition of the severe burden that these incidents have placed on KCC.	KCC	Ongoing	
REC13	EA / Southern Water to respond to queries / concerns regarding the perceived lack of / effectiveness of their rivers & flood management systems / assets	EA / Southern Water	July 2014	Sept 2014
REC14	Explore all possible opportunities with partners and beneficiaries to contribute to the priority flood defence schemes required in Kent , including influencing the EA, Defra & HM Treasury to secure funding to deliver the schemes that do not currently receive sufficient FDGiA funding even with substantial partnership contributions.	KCC & Districts & Boroughs	Ongoing	
REC15	Ensure the consequences of flood risk are fully considered before promoting development in flood risk areas by consulting all organisations with a role in flood risk management and emergency management.	Districts / Boroughs / KCC, EA & KRT	Apr 2014	Mar 2015
REC16	Implement a strategy to encourage greater awareness & take-up of individual & community flood protection measures e.g. property-level protection, sandbags.	KRT / Districts / Boroughs / EA		
REC17	Support awareness & implementation of key initiatives to support communities with high / complex flood risk, particularly e.g. Surface Water Management Plans (SWMPs), Multi-Agency Flood Alleviation Technical Working Groups	Various leads, determined by nature of flood risk	Ongoing	

* Action Owners listed here are illustrative and these lists are not exhaustive. Work will need to involve a broader range of organisations with flood risk management responsibilities.

Christmas & New Year 2013-14 Storms & Floods Final Report

Appendix 1

A1. Numbers of Properties Flooded

A1.1 As of 15th May 2014, the following are the latest figures provided by the EA and Districts / Boroughs to the Department of Communities & Local Government (DCLG).

County	Residential	Commercial	Total
Surrey	1,971	342	2,313
Thames Valley	635	295	930
Kent	731	198	929
Lincolnshire	662	106	768
Wiltshire	484	56	540
Cornwall (incl. the Isles of Scilly)	267	144	411
North Lincolnshire	339	70	409
Dorset	252	81	333
Norfolk	215	69	284
Devon	121	85	206
West Sussex	112	18	130
East Sussex	81	16	97

A1.2 Detailed breakdown of properties flooded in Kent.

Authority Area	Residential	Commercial	Total
Ashford	-	1	1
Canterbury	40	4	44
Dartford	10	3	13
Dover	30	6	36
Gravesham	2	-	2
Maidstone	207	55	262
Medway	3	2	5
Sevenoaks	30	6	36
Shepway	8	1	9
Swale	36	17	53
Thanet	-	-	0
Tonbridge & Malling	335	101	436
Tunbridge Wells	30	2	32
Total	731	198	929

Important Note: These figures presented are likely to be an underestimate as they mainly consist of properties known to have been flooded by rivers, groundwater or groundwater-fed rivers. Information on numbers of properties flooded by surface water or sewage is less certain. Additionally, many hundreds

more properties were indirectly affected by flooding (loss of utilities, access etc.) e.g. Tonbridge & Malling Borough Council (TMBC) estimate 720 businesses indirectly affected in their area.

A2. Key Facts & Statistics

A2.1 The following is a snapshot of key facts & statistics from Operation Vivaldi and Operations Sunrise 2, 3 & 4.

A2.2 A comprehensive report into the key facts & statistics, costs & demands (collated using the Severe Weather Impact Monitoring System - SWIMS) from all the severe weather events experienced over Winter 2013-14, will be tabled by KCC Sustainability & Climate Change Team later in the coming months.

- **4.7m** – peak sea levels in Dover on 5th & 6th December, the highest recorded since 1905. The Environment Agency (EA) estimates that the tidal impacts in Sandwich were equal to a 1 in 200 year event and the biggest tidal event to impact Kent since the devastating event of 1953.
- **120mm** of rainfall falling between 19th to 25th December on already saturated ground on the Upper Medway catchment. December 2013 was the wettest December for 79 years.
- **342m³ / second** – the highest ever peak flows upstream of Leigh Barrier Flood Storage Area (FSA) were recorded on Christmas Eve.
- **91** x Flood Alerts, **73** x Flood Warnings and **5** x Severe Flood Warnings issued by the EA for Kent since December.
- **28,500** properties without power in Kent on Christmas Eve.
- **929** properties flooded in Kent since Christmas Eve. In the 2000 floods, approximately 1000 properties were flooded in Kent.
- **50,000** sandbags provided by KCC, District / Borough Councils and the EA to help protect at risk communities.
- **6,400** hours worked by KCC Emergency Planning staff since 20th December in response to the storms & floods, including 1,300 out-of-hours and sustained periods where the County Emergency Centre (CEC) was operating 24 hours a day.
- **88** flood victims supported by Kent Support & Assistance Service (KSAS) with essential cash, goods and services.
- **32,000** calls received by KCC Highways & Transportation in January, a 150% increase in normal call volumes.
- **6km** of public rights of way in need of repair.
- **£8.6m** central government grant received by KCC under the 'Severe Weather Recovery Scheme' to help repair damaged highways infrastructure¹.
- **£3m** new investment by KCC Highways & Transportation into significant drainage schemes to improve existing infrastructure that was impacted by the floods.

¹ KCC Finance is exploring the potential for additional central funding being progressed by KCC Finance, under the Bellwin Scheme and the 'Pothole Challenge Fund'.

A3. Key Meeting & Event Dates

A3.1 The following is a summary of key debriefs, public consultation meetings and flood fairs, feedback from which has been used to inform this report.

Date	Details	Location
3 rd December 2013	Kent Resilience Forum (KRF) multi-agency debrief for Op. Sunrise 1	Kent Police HQ
4 th February 2014	Public consultation meeting	Hildenborough
	Public consultation meeting	Faversham
5 th February 2014	Public consultation meeting	Danvers Road, Tonbridge
12 th February 2014	Public consultation meeting	East Peckham
17 th February 2014	Public consultation meeting	Tonbridge Forum
19 th March 2014	Public consultation meeting	Collier Street
21 st March 2014	KRF multi-agency debrief for Op. Vivaldi and Ops. Sunrise 2, 3 & 4	Kent Police HQ
28 th March 2014	KCC internal debrief for Op. Vivaldi and Ops. Sunrise 2, 3 & 4	KCC
5 th April 2014	Flood fair	East Peckham
12 th April 2014	Flood fair	Hildenborough
8 th , 13 th & 19 th April 2014	Flood fair	Yalding
26 th April 2014	Flood fair	Little Venice Caravan Park & Tovil
27 th April 2014	Flood fair	Maidstone
3 rd May 2014	Flood fair	Tovil & East Farleigh
4 th May 2014	Flood fair	Clifford Way, Maidstone
10 th May 2014	Flood fair	Yalding
11 th May 2014	Flood fair	Little Venice Caravan Park

A4. Summary of Emergency Response Operations

A4.1 Important Notes

- The sequence of severe weather events, which necessitated complex & protracted multi-agency emergency operations are summarised below.
- The date ranges and operational names outlined above refer specifically to the 'emergency phase' of these events, where the situation is deemed to present a risk to life. For several days and weeks preceding and superseding each event, a significant multi-agency effort in the pre-planning for, and recovery from, each incident was put in place throughout and beyond these periods.
- Indeed, to date the recovery operations are still ongoing for the Christmas / New Year events, some 4 months later.
- A range of additional complex and challenging events also occurred during this period, including:
 - Significant operations to prevent flooding from Brishing Dam at Boughton Monchelsea;
 - Widespread surface water flooding in Eynsford (17th to 19th January);
 - A 'mini tornado' on 27th January; and
 - A number of sink-holes causing disruption, including a 15ft deep hole on the M2 central reservation (11th February).

A4.2 'Operation Sunrise 1': 28th October 2013

- St Jude Storm – Winds speeds in excess of 90mph hit the County causing widespread disruption to travel & power supplies and, tragically, one fatality.

A4.3 'Operation Vivaldi': 5th & 6th December 2013

- Spring tides combined with a tidal surge caused flooding along the East and South UK coastline impacting much of Kent coastline. The EA issued 5 x Severe Flood Warnings, 3 x Flood Warnings & 6 x Flood Alerts to homes and businesses. 41,000 properties were protected by flood walls, banks and other flood risk management assets along the Kent coast and estuaries. 58 properties were flooded.

A4.4 'Operation Sunrise 2': 23rd to 27th December 2013

- Storm force winds (60-70mph) leave 28,500 properties without power. Heavy rainfall on already saturated catchments causes river, surface water and sewage flooding across Kent, particularly in the north and west of the county. Numerous communities suffered flooding, with hundreds of homes and many businesses affected. Edenbridge, Tonbridge and Hildenborough, East Peckham, Yalding, Collier Street and surrounding communities, Maidstone, and South Darenth, amongst other locations, were all significantly affected.

A4.5 'Operation Sunrise 3': 4th to 6th January 2014

- A sudden deterioration in weather conditions threatened to bring further flooding of severity akin to that experienced over Christmas to already affected communities, and elsewhere. A significant multi-agency operation was put in place (including Military assistance) to provide thousands of sandbags for communities at risk.

A4.6 'Operation Sunrise 4': 6th to 18th February 2014

- Heavy rainfall continued into February 2014. As the rainfall soaked into the ground we experienced extremely high groundwater levels. In some locations groundwater flooding exceeded previously recorded levels by over 1 metre. The peak of the event was experienced towards the end of February and communities were subject to both groundwater flooding and flooding from groundwater fed rivers. The impacts of groundwater flooding in Kent were widespread with particular concentration along the Elham Valley. A multi-agency response to the groundwater flooding and pre-planned measures were deployed to reduce the damage to communities vulnerable to groundwater flooding, including over-pumping of sewage by Southern Water and a significant sand-bagging operation.

A5. Kent Resilience Forum (KRF) Multi-Agency Debrief – Draft Lessons Learned

A5.1 Important Note

- The following are initial draft lessons identified through the KRF multi-agency debrief process hosted by Kent Police on 21st March 2014.
- At time of writing these have yet to be agreed with partners, but Kent Police will shortly be circulating a draft debrief report to all partners for consultation.

A5.2 Pre-Planning & Resilience

- Kent Resilience Team (KRT) to develop guidance for the public in a range of situations advising them of which agencies are responsible for which issues within their areas, and who will provide what information.
- Pan-Kent flood response plans to be reviewed to ensure they are cognisant of arrangements and contingencies across all levels, including Parish, District / Borough and County.
- Review of emergency plans to ensure use of social media for warning and informing purposes is included.
- A number of respondents cited the benefit of taking part in Training & Exercising programmes at National and Regional level which left us better placed than in previous flooding events.
- It was suggested that adoption a similar programme focussed at district level would have eased some of the more local issues and built working relationships. The KRT should work with local partners to deliver a number of District / Borough based exercises focussed on civil emergency type scenarios.
- KRF to maximise training & exercising opportunities for staff attending the multi-agency Tactical Co-ordination Centre (TCC) / Strategic Co-ordination Centre (SCC), including the College of Policing's Multi-Agency Gold Incident Command (MAGIC) training course.
- Resilience in a number of partner agencies was stretched, particularly Category 2 responders and those with regional responsibilities.
- This impacted on maintaining a physical presence at the TCC and participation in the TCG process.
- Some agencies not present on the ground outside normal working hours.
- Bank holiday staffing particularly over Christmas period was lacking.
- Sustained nature of the operation presented problems for maintaining staffing at TCC / SCC.

A5.3 Command, Control, Co-ordination & Communications

- The operation was acknowledged as being tactically led, those Districts / Boroughs which involved an Operational Coordination Group at Bronze level reported a higher level of multi-agency understanding and coordination at ground level.
- Commonly Recognised Information Picture (CRIP) template to include location maps in future.
- Teleconferencing facilities in the SCC have now been upgraded to allow a greater volume of dial-in from partner agencies.
- The multi-agency room within the TCC at Medway has also been upgraded to allow hardwiring of partners IT systems, to allow a quicker transfer of information.
- It was considered that Airwave radio interoperability was not used to full effect on ground.
- Single countywide Silver control was acknowledged as being fit for purpose, non-blue light agencies would not have been able to cope with multiple TCCs.
- Decision to locate the Scientific & Technical Advice Cell (STAC) at TCC was considered sound, in view of the operation being tactically driven.
- Confusion about who the key decision maker should be for ordering evacuation.
- Clearer command protocols need to be developed between responsibilities of County / District / Parish councils e.g. evacuation, sandbag distribution.
- KRT to develop clear guidance for partner agencies to understand decision making process and responsibilities of each agency in a range of civil emergency situations.

A5.4 Escalation, De-Escalation & Recovery

- Escalation from Severe Weather Advisory Group (SWAG) with a proportionate Silver Control, set-up to flex into a functional TCC was identified as good practice.
- Need to ensure understanding of status of incident to each agency.
- Clear and distinct lines of communication are needed to ensure dissemination of escalation / de-escalation of operations. It is not sufficient to only include this in CRIP or minutes from meetings.
- KRT to develop protocols for establishing tipping points at which point an event or situation escalates into an emergency and when the 'response' phase may be safely de-escalated into the 'recovery' phase.
- The relationship between the Recovery Working Group (RWG) and the SCG during the 'emergency' phase was unclear. However, recovery structures subsequently developed during Operation Sunrise 4 to be formalised and adopted by KRT as best practice.
- Menu of capabilities of agencies / organisations to be developed by KRT for assets available for on-going deployment during 'recovery' phase.

A6. Floodline Warnings Direct Service (FWD) – information supplied by the EA

- The EA will be working with affected communities, KCC and other partners, to learn the lessons of the flooding and how it can make its FWD service even more effective. This will include providing warnings to communities that were not able to receive a warning, making warnings more focussed on particular communities, and developing Flood Warden schemes in at risk communities.

- One of the challenges during the flooding was providing consistent and trusted information to communities prompting appropriate action. Where Flood Wardens or community leaders were able to be involved in this activity it proved effective. The EA is working with Parish Councils, District / Borough Councils and KCC to establish Flood Warden Schemes in communities, especially those with a complex flood risk where the benefit can be greatest. Amongst others, the communities of central Tonbridge and Hildenborough are communities where we are supporting flood wardens.
- Registering with FWD allows customers to register multiple contact details (mobile, e-mail etc) and manage which messages they receive e.g. Flood Alerts, Flood Warning no-longer in force etc. This increases our ability to get a message through, and provide a good level of service. In areas of relatively low take-up e.g. where fewer people have registered) the EA has automatically registered properties. This is a positive step because it allows the EA to provide a service and warning to those who wouldn't otherwise have received one. However, it only uses home landline contact details (provided by BT). This therefore has a higher message failure rate, and because people haven't chosen to register, there is a lower level of engagement with the service
- The importance of receiving Flood Warnings means that a partnership effort is needed to encourage people to:
 - Sign-up:
In some parts of Kent, take-up is as low as 51% of those properties for whom the EA is able to alert via the FWD Service.
 - Keep their details up to date and provide multiple contact numbers:
The most common reason for warning messages not being received is out of date contact details. 1 in 4 people have been automatically signed-up to receive Flood Warnings, meaning that only basic contact details are available e.g. landline telephone.
 - Act: When they receive a Flood Warning: we have received some feedback that people were waiting for a Severe Flood Warning to be issued before acting, when a Flood Warning indicates immediate action required.

Take-Up of the FWD Service Across Kent²

Percentage of 'at risk' properties offered the FWD Service	91%
Percentage of Flood Zone 2 properties registered	76%
Percentage of Flood Warning Area properties registered	84%

Take-up of the FWD Service by District / Borough Council Area

Authority Area	Nos. of Properties Offered FWD Service	Take-up of FWD Service (Fully Registered)	Take-up of FWD Service (Automatically Registered)	% Take-up of Properties (Fully or Automatically Registered)
Ashford	2,360	1,459	1,012	104.70%
Canterbury	7,770	4,728	1,850	84.66%

² Data correct as of 31/03/14

Authority Area	Nos. of Properties Offered FWD Service	Take-up of FWD Service (Fully Registered)	Take-up of FWD Service (Automatically Registered)	% Take-up of Properties (Fully or Automatically Registered)
Dartford	3,198	844	1,365	69.07%
Dover	7,591	5,424	1,241	87.80%
Gravesham	2,125	554	808	64.09%
Maidstone	2,966	1,440	917	79.47%
Sevenoaks	1,738	1487	467	112.43%
Shepway	133,80	8,741	3,092	88.44%
Swale	9,981	3,686	3,788	74.88%
Thanet	671	133	215	51.86%
Tonbridge & Malling	3,715	2,200	972	85.38%
Tunbridge Wells	542	276	149	78.41%

A7. Potential Future Flood Defence Schemes in Kent – information supplied by the EA

A7.1 Leigh Flood Storage Area (FSA)

- The EA is working hard to communicate better the purpose of the Leigh FSA and its operation³. On 24th December, 5.5million cubic metres of water were stored at the Leigh FSA. By operating the Leigh FSA the EA was able to reduce the 342m³ / second of water entering the FSA reservoir down to 160m³ / second flowing downstream and continued to moderate the persistently high water levels during 25th and 26th December.

A7.2 East Peckham

- The EA will use its analysis of the event to test the proposed River Medway and Bourne East Peckham Flood Alleviation Scheme (FAS). It discussed this proposed scheme with East Peckham Parish Council in summer 2012 and, if constructed, it would protect all developed areas of East Peckham and Little Mill. The EA hopes to start the scheme design in November 2014.
- The EA's review of the event will also cover the operation of its existing assets (including the Coult Stream FSA), to see if there is anything more can be done to maximise their performance.

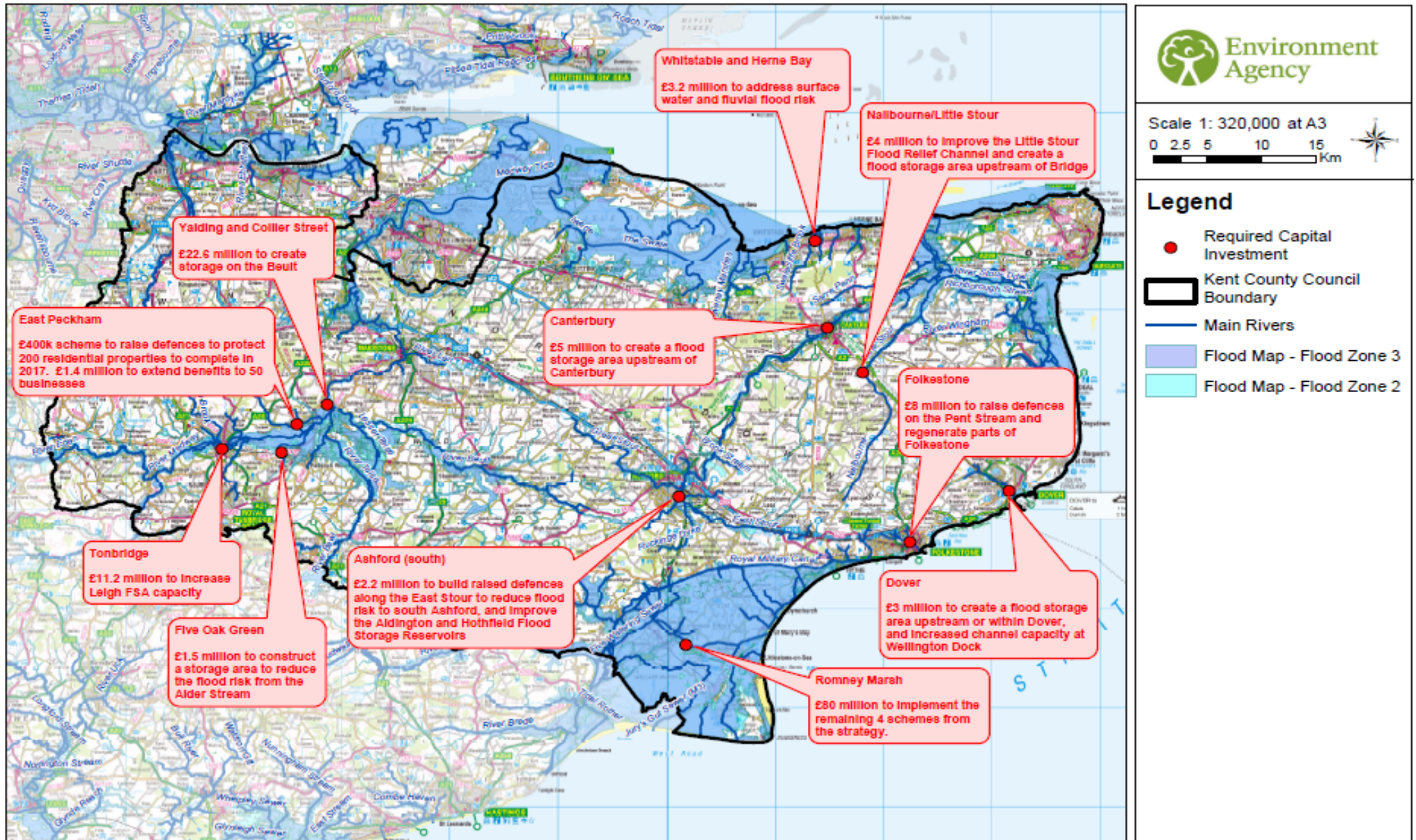
A7.3 Yalding

- Yalding is a particularly vulnerable location. 197 properties were flooded when river levels peaked on 24th December 2013. This flooding was comparable to the 1968 flood and worse than in 2000, when 119 properties flooded.

³ <http://m.youtube.com/watch?v=336-6IN-J2I>

- The EA is urgently investigating whether it can accelerate projects to reduce the risk of flooding in Yalding. There is no single solution that will benefit the whole community because of the way the homes and businesses are spread out. It is using the data it has collected from the recent flooding to review our understanding of the way floods happen in the catchment. This will help present the best case to gain funding for future schemes.
- The EA is investigating if it can further localise the current Floodline Warnings Direct (FWD) Service for Yalding. The data it is currently collecting from a project to improve the flood risk modelling for the River Medway will help the EA to improve further its forecasting and flood warning.
- Future works to reduce the risk of flooding are set out in the Middle Medway Strategy which was developed in 2005 and updated in 2010. The EA has considered a number of potential schemes to reduce flooding in Yalding.
- An option that residents are keen to progress is to find a suitable location to store water on the lower reaches of the River Beult.
- The Middle Medway Strategy also recommended that the Leigh FSA be raised by 1m giving an additional 30 per cent storage capacity.
- However, under Government funding rules, most of the schemes will need substantial contributions from external partners in order to proceed – see A6.4 and A6.5 for details.
- The EA has secured funding to progress a feasibility study into both options. It is anticipated this work will be completed by summer 2015. KCC has offered to part fund an additional FSA on the River Beult at Stile Bridge and an increase in the capacity at the Leigh FSA. The EA has submitted its funding bid to secure the additional £17.6m needed to complete both schemes. If this is successful, the earliest construction could start would be in the financial year 2017-2018.
- The EA will continue to work with KCC, Maidstone Borough Council (MBC), Tonbridge & Malling Borough Council (TMBC) and other professional partners to identify partnership funding opportunities which will increase the likelihood of the above works going ahead.

A7.4 Future Capital Investment Requirements for Potential Future Flood Defence Schemes



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A7.5 Priority Schemes Currently Not Qualifying for FDGiA Without Partnership Contributions

Scheme	Estimated cost	Nos. of properties to which flood risk would be reduced	Raw partnership funding score	Required partnership contribution	Final partnership funding score (including contribution)	Planned completion
Lower Beult Storage	£22.6m	1,151	36%	£16m	125%	2020
Increased Storage at Leigh	£11.2m	2,151	74%	£5m	130%	2019
Five Oak Green Flood Alleviation Scheme	£1.5m	266	46%	£900k	100%	2018 (only achievable with contributions)
South Ashford Flood Alleviation Scheme	£2.2m	282	24%	£1.7m	100%	2019 (only achievable with contributions)
Canterbury	£5m	1364	144%	N/A	N/A	2020 (dependant on investigations and consultations)
Romney Marsh	£80m	14,500	119%	£3m	N/A	2022
Whitstable & Herne Bay	£3.2m	Projects in early stages of development				
Dover	£3m					
Folkestone	£8m					
East Peckham	£400k					
	£1.4m	50 businesses	50%	£1m	100%	This scheme will currently only defend homes in East Peckham. Additional funding required for an extension of the protection to businesses.

A8. Other Flood Risk Management Options – information supplied by EA and KCC

A8.1 Summary of Ongoing EA Work

- The EA is keen to learn with communities, and gain a clearer understanding of the impacts of these events on people, its assets and the environment. Also to discuss how, collectively, it can improve its preparations for and response to future events.
- The EA has worked with partners to visit affected communities and attended public meetings across the County. These meetings were an opportunity for people to learn about the risks associated with flooding, to share their experiences and to find out what they can do to better prepare themselves for flooding.
- It was also an opportunity to discuss how flood protection assets, such as the Leigh Flood Storage Area (FSA), are operated to reduce the impact of flooding.
- Attending community events, including flood fairs, hosted by Parish and District / Borough Councils taking place in communities impacted by the recent flooding.
- Holding one-to-one meetings with residents.
- Planning to give residents the opportunity to visit the Leigh FSA.
- A review of the Flood Warnings issued will help the EA to understand if their warnings were timely, appropriate and relevant to those who were affected.
- Identify that new or improved warning areas are required in Hildenborough and Yalding and are investigate how the EA can localise the current Flood Warning Service.
- Work with partners to set up and support a number of Flood Warden schemes.
- Distribute questionnaires to affected communities to find out more about the extent and impact of the flooding to improve EA flood maps and Flood Warning areas.

A8.2 Spatial & Land-Use Planning & Drainage

- The EA's role as a statutory planning consultee is to provide advice to local planning authorities to manage flood and environmental risks and enable sustainable growth. We do not receive government funding to protect development built after 2012. It is therefore vital that flood risk is managed within the planning system. The EA works with partners to seek solutions to overcome these risks. Where risks cannot be overcome and development is contrary to the National Planning Policy Framework (NPPF), the EA recommends planning authorities refuse applications.
- In line with the NPPF we recommend that development is outside the flood plain. If this is not feasible the EA provides advice to Local Planning Authorities (LPAs) to ensure that people are not put at risk and that flood risk is not passed downstream.
- LPAs must ensure that Emergency Plans are fit for purpose to ensure that access and egress is still possible in flood conditions. In all circumstances where warning and emergency response is fundamental to managing flood risk, the EA advise LPAs to formally consider the emergency planning and search & rescue implications of new development in making their decisions.
- It is Local authority responsibility to ensure that flood resilience measures are incorporated into building design. The EA still advise on surface drainage at sites over 1 hectare. The future implementation of Sustainable Drainage Systems (SuDS) Approving Bodies (SABs) will mean that KCC and Local authorities will need to manage surface water risks, groundwater flooding and access and egress within the planning process.

A8.3 Personal Flood Resilience

- A 'Property-Level Protection Scheme' is already in place in Lamberhurst. In response to Flood Warnings these measures were deployed by residents, and greatly reduced the flood impact. Funding is also now in place to adopt similar measures in Aylesford.
- District / Borough Councils have been proactively promoting the Central Government 'Repair & Renew Grant'⁴ but take-up across the County has been patchy. However, as at 10th April 2014, T&MBC had received 49 requests for further information, 20% from businesses.
- The EA and KCC have also been supporting flood fairs in various locations around the County (see **section A3 of this appendix** for further details) where residents have been investigating their personal flood resilience options.

A8.4 Investigating & Improving Support to Communities with High / Complex Flood Risk Profiles

- The EA has heard from affected communities that there are often multiple sources of flooding and that the appropriate flood risk management options required are complex to determine.
 - The EA has therefore promoted the formation of Multi-Agency Flood Alleviation Technical Working Groups across the County to explore future options.
 - Groups that have already met (including existing groups):
 - Tonbridge & Malling (Hildenborough, Tonbridge & East Peckham)
 - Forest Row
 - Lamberhurst
 - Five Oak Green
 - Staplehurst
 - Aylesford
 - Headcorn
 - Edenbridge
 - Faversham
 - Yalding
 - Westerham
 - Collier Street
 - Sundridge & Brasted
 - Canterbury – Nailbourne
 - New groups still to meet:
 - Maidstone
 - Eynsford*
 - South Darent & Horton Kirby*
- Key:**
- * Still to be established if wider group needed

A8.5 Surface Water Management Plans (SWMPs)

- In order to understand the risks from local flooding KCC has undertaken a number of studies across the county to collect and map data on these floods. These studies are known as Surface Water Management Plans (SWMPs). These documents vary in their nature, some are high-level assessments of the risks, while others are in-depth studies of the causes and potential solutions to local flooding. SWMPs can be found on the KCC website.

⁴ A scheme providing up to £5,000 per flood-affected home or business to contribute to the costs of additional flood resilience or resistance measures.

- During 2014-15 KCC will continue to develop SWMPs, and will undertake studies in Marden, Staplehurst, Headcorn and Paddock Wood (all areas impacted by varying degrees of local flooding during the winter). KCC will also be exploring the opportunities to manage local flooding identified by the recently completed SWMPs in Folkestone, Margate and Dartford. SWMPs include an Action Plan of measures that can be used to manage local flooding identified by the study. However, many options require funding in order to be delivered, this funding is drawn from the same Defra fund, which is administered by the EA, as all other flood risk management investment, and each scheme must compete for funding.
- Additionally, KCC is currently co-ordinating the development of local flood risk documents that provide local communities with a simple overview of the range of flood risks in their area. KCC is working with the EA, Internal Drainage Boards (IDBs), Local authorities and water companies to prepare a pilot document. The document will show what the main flood risks are, where significant assets are, which authorities exercise risk management functions in the area, any plans or strategies they may have in hand to manage flood risks in the future and who to get in touch with for more information. Initially, the pilot will focus on the Canterbury City Council (CCC) area. If this proves successful it will be rolled out across the County, with TMBC and MBC areas likely to be considered next.

A8.6 Little Stour, Nailbourne & Petham Bourne Flood Management Group

- The EA, KCC, CCC, Shepway District Council, Southern Water, and representatives from key Parish Councils are investigating the causes and effects of the flooding experienced during the winter of 2013/14 in the Nailbourne, Little Stour and Petham Bourne valleys. These partners are working together to assess the options to manage this winter's flooding, and are seeking to reduce the potential for disruption in the future.
- The Nailbourne, Petham Bourne and parts of the Little Stour are groundwater fed watercourses. This means that they are dry for long periods of time. However, following periods of prolonged rainfall groundwater levels in the underlying aquifers rise to a point where water emerges through springs throughout the length of these valleys, and the streams begin to flow.
- The Nailbourne has been flowing since mid-January and has approached near-record levels. There has been extensive flooding of farmland, with internal property flooding reported in Bridge, Patricbourne, Bishopsbourne and Barham. The Petham Bourne, which typically flows less frequently than the Nailbourne, has also been active over the winter causing flooding and disruption. The Little Stour has burst its banks in a number of locations, also flooding farmland properties and roads.
- Owing to the high flows experienced this winter, many culverts have been overwhelmed in these valleys. At its peak, portable pumps were used to help move water over the culverts in some places, and sandbags were used extensively to protect many properties.
- The group will be undertaking three main activities:
 1. Survey the measures put in place over the course of this winter to manage and reduce flooding. This will provide a blueprint for future events, and will help enable us to mobilise and deploy necessary equipment in time if the groundwater levels rise again.
 2. Identify any opportunities that can be delivered as quickly as possible to reduce the impact of flooding should these watercourses flow again next winter.
 3. Identify opportunities to reduce the impact of flooding that can be delivered over a longer timeframe. These measures will require further investigation, more detailed design work and an application for additional funding.