Kent County Council Flood Response Plan

IN THE EVENT OF AN EMERGENCY GO TO SECTION 1 Page 7

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All enquiries or amendments relating to this document should be sent to:

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Issue & Review Register

Summary of changes	Issue number & date	Approved by
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Minor updates	Issue 1.1 February 2013	Steven Terry Emergency Planning Manager
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NOTE: The latest version of this plan can always be found at on Resilience Direct and Kent.gov.uk

Next review scheduled: September 2024

Compiled by: **Date: October 2023**

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Distribution List (electronic):

Title	Role/Organisation
Borough and District Councils – Resilience and Emergency Planning	Borough and District Councils
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Duty Emergency Planning Officers	KCC
Environment Agency Incident Room (Kent Office)	Environment Agency
Environment Agency Emergency Planning Advisor	Environment Agency
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KCC Sustainable Business and Communities	KCC
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Kent.gov.uk – Emergency Planning Page	KCC

1. Response Summary

1.1 Flood Alert Response

- On receiving a Flood Alert, the Duty Emergency Planning Officer (DEPO) will consult with Environment Agency, Met Office and/or the KCC Highways Senior Duty Officer on the forecast and likely impacts.

- A decision will be made as to whether a multi-agency Severe Weather Advisory Group (SWAG) is required.

- If no SWAG is required, this decision will be communicated to multi-agency partners by the lead agency for the response, and the DEPO will maintain a watching brief. KCC Highways Senior Duty Officer will consider whether an Operational Impact Warning will be issued.

- If a SWAG is called, it will be chaired by the Environment Agency in the event of fluvial or coastal flooding, or KCC for surface water flooding, and will utilise the standing agenda and circulation list available on Resilience Direct*. The situation will be monitored and further action by individual agencies may be initiated through the SWAG.

1.2 Flood Warning Response

- On receiving a Flood Warning, the DEPO will contact and brief the KCC Duty Director.

- A SWAG will be called which will be chaired by the Environment Agency in the event of fluvial or coastal flooding, or KCC for surface water flooding, and will utilise the standing agenda and circulation list available on Resilience Direct*. The situation will be monitored and further action by individual agencies may be initiated through the SWAG. The SWAG will also determine if there is a need to stand up formal multi-agency Command and Control procedures.

- The DEPO, in consultation with the KCC Duty Director, will determine whether it is necessary to activate the KCC Flood Response Emergency Plan and any internal Command and Control procedures.

- The corporate KCC response, in the event of the activation of the KCC Flood Response Emergency Plan, will be co-ordinated by the DEPO and/or the County Emergency Centre (CEC), with specialist services mobilised as required.

1.3 Severe Flood Warning Response

- On receiving a Severe Flood Warning, the DEPO will contact and brief the KCC Duty Director, who dependent upon the forecast threat and risk may be asked to attend the SWAG.

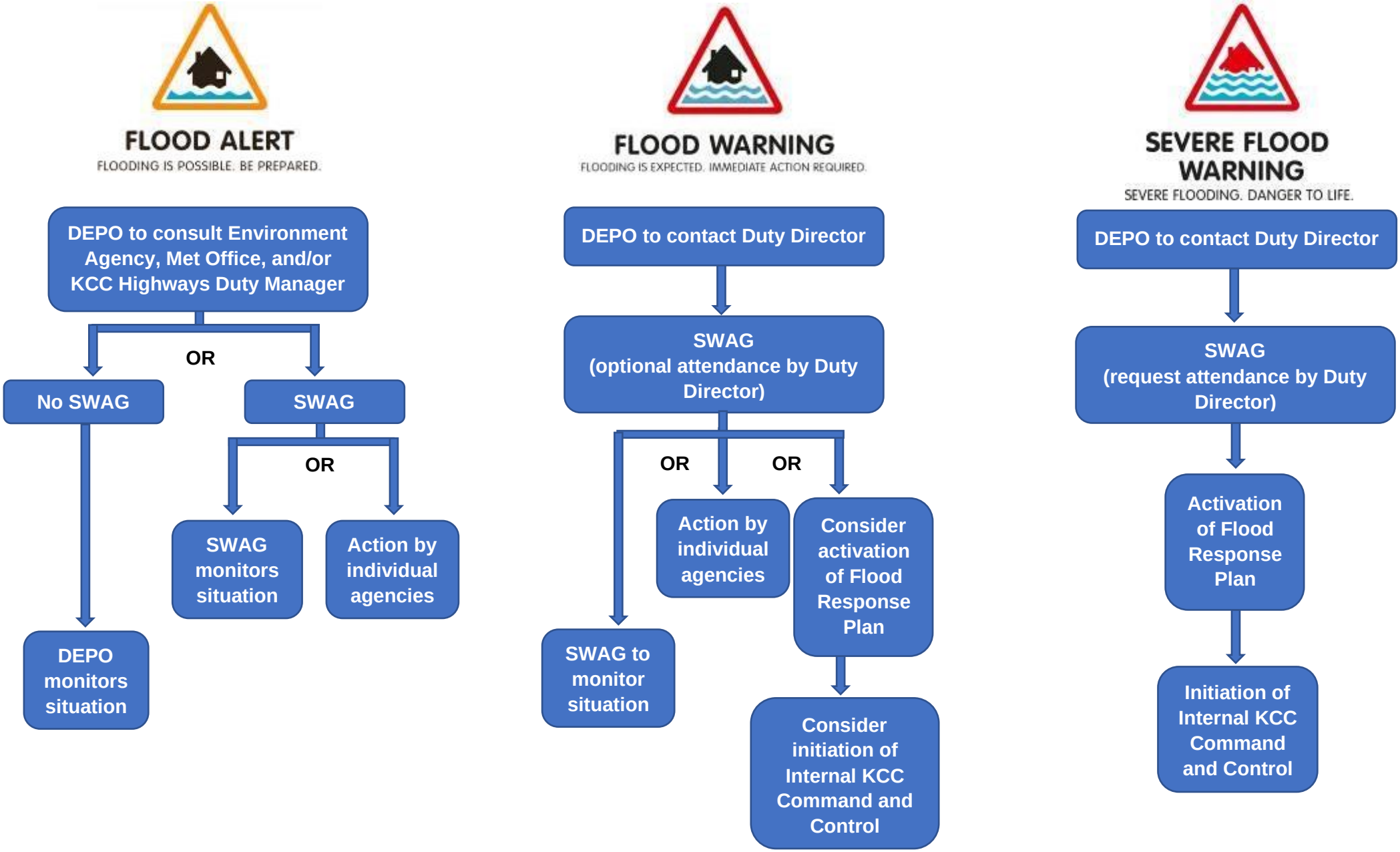
- The SWAG will be chaired by the Environment Agency in the event of fluvial or coastal flooding, or KCC for surface water flooding, and will utilise the standing agenda and circulation list available on Resilience Direct*. The situation will be monitored and further action by individual agencies may be initiated through the SWAG. It is likely that a TCG and/or SCG will be called following the initial SWAG.

- The DEPO in consultation with the KCC Duty Director will activate the KCC Flood Response Emergency Plan and any internal Command and Control procedures.

- The corporate KCC response, in the event of the activation of the KCC Flood Response Emergency Plan, will be co-ordinated by the DEPO and/or the County Emergency Centre (CEC), with specialist services mobilised as required.

*To access SWAG resources on Resilience Direct go to; Kent Resilience Forum, Kent Responses, Severe Weather Advisory Group Resources.

Figure 1.4 – Plan Activation Summary



2. Introduction

2.1 The purpose of this plan is to set out the principles that govern KCC's response to a flooding event within their local authority administrative area.

2.2 This Plan is produced and maintained by KCC Resilience and Emergency Planning Service to meet the requirements of the Civil Contingencies Act 2004 and other relevant legislation and guidance.

2.3 Emergency Response and Recovery Guidance (accompanying the Civil Contingencies Act 2004) states: **"County and Unitary Local Authorities should be lead responders for multi-agency severe weather events"**.

3. Scope

3.1 The aim of this Plan is to ensure an informed and co-ordinated response by KCC to a flooding incident, with a primary focus on the welfare of those individuals and communities affected. The mitigation of environmental, economic and property damage are strong supporting aims.

3.2 The focus of this plan is coastal, fluvial (river), surface water and ground-water flooding. The document incorporates guidance arising from the Pitt Review, recognising the impacts of climate change and associated extreme climatic events.

3.4 The Plan provides information on actions, roles and responsibilities in response to a flooding affecting the KCC administrative area. It is a sub-plan of the KCC Major Emergency Plan. A range of Kent-wide plans/frameworks have been published by the Kent Resilience Forum (KRF) which compliment this plan on Resilience Direct, including:

- KRF Pan Kent Strategic Emergency Response Framework;
- KRF Pan Kent Multi-Agency Flood Plan;
- KCC Recovery Framework;
- Kent and Medway Reservoir Inundation Emergency Plan;
- Borough and District Council Local Multi-Agency Flood Plans;
- KRF Welfare Centre Guidelines;
- KRF Psychological Care Guidelines; and
- KRF Identifying Vulnerable People in an Emergency Plan.

The following are not covered by this plan:

- **Foul Sewage** - the impact is likely to be local, resulting from blockage or surcharging of the sewerage network leading to overflow through manholes etc. The responsibility for response lies with the relevant water utility company. However, flood water contaminated by foul water sewage may require additional actions by responders and effective alerting

of and liaison with the relevant water utility company and other partners. This type of flooding often occurs in conjunction with, or as a result of, other forms of flooding and the source may be difficult to determine. This means that it may be dealt with as part of the wider response to other forms of flooding.

- **Water Main Burst** - the impact is likely to be local; responsibility lies with the relevant water utility company, however, KCC and wider partner support may be required to manage consequences.
- **Contained Water** - this includes statutory and other reservoirs, private lakes and canals. In respect of reservoirs covered by The Reservoirs Act 1975, this planning is specifically addressed through the Kent and Medway Reservoir Inundation Emergency Plan, available from Resilience Direct.

The Environment Agency will co-ordinate with the affected water utility company in the event of a wastewater or sewage pollution incident affecting the aquatic or marine environment.

In the circumstances of mechanical or electrical failures at wastewater pumping stations (WwPSs) and/or wastewater treatment works (WwTWs), where discharges of sewage may not be screened and will not have the benefit of storm rainfall to dilute flows. The water utility company, the Environment Agency and the Local Authorities must then co-ordinate and communicate to ensure the correct public information is made available in a timely fashion and is maintained throughout the duration of the incident.

Early notification from the affected water utility company is key. The Environment Agency has a 24/7 Hotline for the reporting of incident. These calls will be referred to the Environment Management Duty Officer for assessment. The impacted local authorities (at both District and County tiers), who will be alerted by the Environment Agency and/or relevant water utility company, are encouraged to log and maintain their own notification procedures and these should be shared with the water utility company and the Environment Agency so that they and the Environment Agency are informed simultaneously.

The water utility company will have the responsibility to share technical and asset condition information with partners, how precisely this information will be shared with partners will need to be established early in the incident. In the event of more significant waste water pollution impacts, a multi-agency Tactical Co-ordination Centre will be established. The Environment Agency will provide water quality information to partners as part of the incident response process. The affected Local Authorities will use the information from the water utility company and the Environment Agency to produce suitable public information displays for beaches and bathing waters and any wider warning and informing interventions which may be required. In the event of large or prolonged spills, or those that could impact upon a protected site or shellfish beds the information should also be shared with other key partners such as Natural England, Cefas, IFCAs, etc.

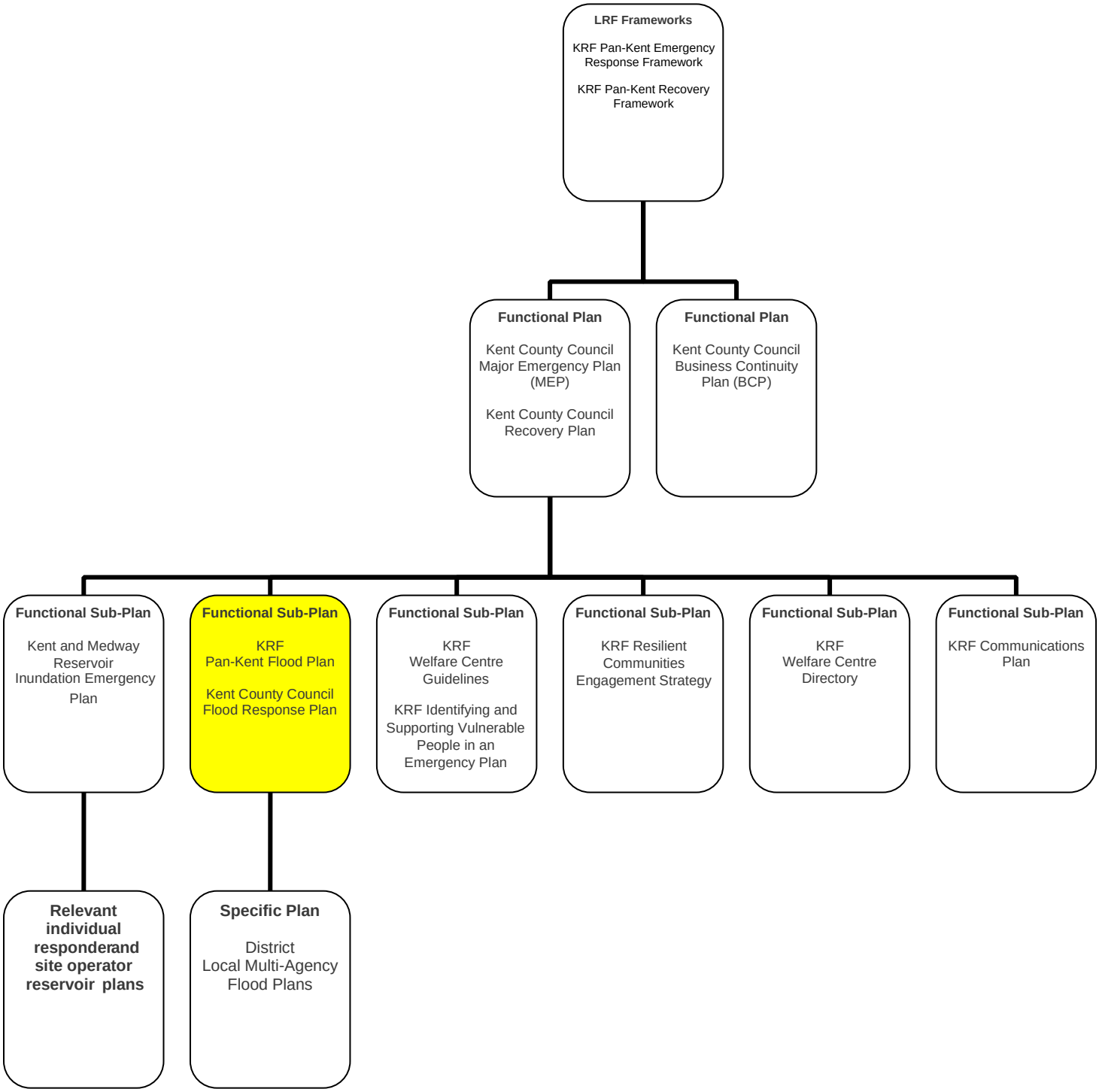
4. Audience

4.1 This document is intended for use by all KCC Directorates, duty officers, duty directors and command and control personnel, to inform and support their planning for and response to flooding events affecting the County.

5. Related and Interdependent Plans

The relationships between response plans are indicated in the diagram below.

Figure 5.1 - Related and Interdependent Plans



6. Actions, Roles and Responsibilities

Figure 6.1 – KCC Flood Specific Roles and Responsibilities

Directorate	Planning roles & responsibilities	Response roles & responsibilities	Recovery roles & responsibilities
Growth, Environment and Transportation	• Identify critical transport infrastructure that is vulnerable to flooding (Highways & Transportation Division) • Maintain registration with Environment Agency Flood Warning alert system • Provide expert analysis role, particularly in identifying particularly flood impact vulnerable areas and horizon-scanning of emerging risks and patterns (Environment & Waste and Growth & Community)	• Ensure that critical infrastructure is maintained during flooding incidents (Highways & Transportation Division) • Deploy personnel and internal and external contractor resources and assets to assist the practical emergency response to flooding (Highways & Transportation, Environment & Circular Economy and Growth & Communities) • Provide intelligence on condition and viability of transport infrastructure, including GIS and flood depth. Seek to protect highways infrastructure from flooding, using sandbags and other physical barriers (Highways & Transportation) • Provide intelligence on condition and viability of waste disposal infrastructure during flood event (Highways & Transportation) • Community Wardens can deliver: a uniformed presence at scene, assistance to police with cordon control, assist the police with evacuation, provide local knowledge, supply public information to communities, provide on-the-ground intelligence, including shoreline clean-up assessment technique surveys, and aid in operation and security of rest centres (Growth and Communities).	• Ensure that key data is maintained, and relevant data is entered into SWIMS to assist debrief, recovery and any subsequent inquiry (all Heads of Service) • Accommodate and manage increased demand for services following flooding event (all Heads of Service) • Provide expert analysis role, particularly in identifying flood disadvantage areas and horizon-scanning of emerging risks and patterns (Environment & Circular Economy and Growth & Communities) it should be noted that removal and disposal of sandbags is the responsibility of the agency which deploys them. • Libraries and other cultural outlets to host publicity events and display material to assist community recovery from flood event (Growth & Communities) • Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry (all Heads of Service)

Directorate	Planning roles & responsibilities	Response roles & responsibilities	Recovery roles & responsibilities
		• Communicate with partner agencies to ensure that care is provided to vulnerable individuals and communities affected by flooding (Growth & Community) • Communicate with APHA, Defra, RSPCA, local animal rescue charities and District Councils on welfare of livestock, domestic, exotic and wild animals threatened or affected by flooding (Growth & Community) • Communicate with partner agencies to mitigate adverse impacts upon critical infrastructure and the wider environment during flooding (all relevant teams) • Provide intelligence on impacts upon the built and natural environment during flood event (all relevant teams) Mobilise senior management representation to Command and Control and liaison personnel to Severe Weather Advisory Groups and partner agency emergency centres as required (all Heads of Service)	
Adult Social Care and Health	• Work with strategic partners to ensure flood risk is appropriately reflected in commissioning decisions, including the location of critical health and social care infrastructure	• Identify vulnerable groups and people • Provide intelligence on impacts upon the built and natural environment during flood event (all relevant teams) Mobilise senior management representation to County Emergency Centre and liaison personnel to Severe Weather Advisory Groups and partner agency emergency centres as required (all Heads of Service)	• Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry (all Heads of Service)

Directorate	Planning roles & responsibilities	Response roles & responsibilities	Recovery roles & responsibilities
Children, Young People and Education		• Provide senior manager participation in Command and Control and liaison personnel to attend Severe Weather Advisory Groups and partner agency emergency centres as required (all Heads of Service)	• Ensure appropriate protection, cleaning and repair of education premises affected by flooding or used as emergency rest centres • Facilitate psycho-social support for schools and pupils who are affected by flood events • Accommodate and manage increased demand for services following flooding event ensure that key data is maintained, and relevant data is entered into SWIMS to assist debrief, recovery and any subsequent inquiry (all Heads of Service) • Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry (all Heads of Service)
Strategic and Corporate Services	• Maintain registration with Environment Agency Flood Warning alert system (Resilience & Emergency Planning)	• Receive flood alerts / warnings and cascade to internal and external partners (Resilience and Emergency Planning Service) • Attend and/or facilitate relevant KCC officer attendance of Severe Weather Advisory Group (Resilience and Emergency Planning Service) • Ensure that critical built and information communication technology infrastructure is protected and maintained during flooding incidents • Mobilise senior management representation for Command and Control, and liaison personnel for Severe Weather Advisory Groups and partner agency emergency centres as required (all Heads of Service)	• Contribute to the cost of recovery for all but the most exceptional flooding events using General Funds and submit appropriate bids to Government under the Bellwin scheme for any qualifying impacts (Finance) • Ensure that key data is maintained, and relevant data is entered into SWIMS to assist debrief, recovery and any subsequent inquiry (all Heads of Service) • Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent public inquiry (all Heads of Service)

Directorate	Planning roles & responsibilities	Response roles & responsibilities	Recovery roles & responsibilities
		• Ensure that KCC buildings are protected and maintained during flooding incidents (Property) • Deploy appropriately skilled and equipped personnel, internal and external contractor resources and assets to assist the wider emergency response to flooding (all Heads of Service) • Contact Point personnel relay key flood related information from public and partner agencies to relevant teams and individuals (Contact Point) • Communicate with Defra, RSPCA, animal welfare charities and District Councils on welfare of livestock, domestic, exotic and wild animals threatened or affected by flooding (Resilience and Emergency Planning Service) • Mobilise senior management representation for Command and Control and liaison personnel for Severe Weather Advisory Groups and partner agency emergency centres as required (all Heads of Service) • Mobilise Director of Public Health support and advice as required for KCC and multiagency response (Director of Public Health)	

Figure 6.2 – Partner Agency Flood Specific Roles and Responsibilities

Organisation	Planning roles & responsibilities	Response roles & responsibilities	Recovery roles & responsibilities
District & Borough Council	• Share data as required on vulnerable persons and communities • Riparian/Coastal Districts to issue directions to and maintain contact details of flood gate owners/land occupiers (Section 30 County of Kent Act 1981) • EA, riparian district councils and flood gate owners to ensure closure mechanisms function properly • Identification of social landlord / council properties at risk from flooding • Incorporate flood risk into the Business Continuity planning process • Ensure flood risk is appropriately considered when processing development proposals (at spatial and planning management stages), commission flood risk assessments and where appropriate maintain flood management structures	• Flood warning and gate closure notification dissemination, warning and informing the public (in conjunction with EA) • Riparian / Coastal Districts to ensure Thames Tidal flood gates are closed in accordance with closure notifications (Section 30 County of Kent Act 1981) • Flood mitigation measures, advice on clearance of blocked watercourses and mitigating measures. *It should be noted that not all local authorities provide sandbags, (each council should be contact for further information)* • Where resources allow, assist the EA in repairing river and coastal defences (between high tides) NB It should be noted that removal and disposal of sandbags is the responsibility of the agency which deploys them.	• Provision of temporary or longer-term accommodation or rehousing for residents made homeless by flooding • Structural and condition surveying of council properties damaged by flooding; and remedial action to repair properties • Invoking the council's business recovery plan if council premises are affected • Consultation with health authorities on hygiene and environmental health issues in affected areas • Assisting residents in removal of damaged furniture and household goods • Removal of mud/debris from council owned land as required • Ensure that key data is maintained, and relevant data is entered into SWIMS to assist debrief, recovery and any subsequent inquiry
Environment Agency	• Prepare and maintain Kent Local Flood Warning Plan • Advise on relevant development proposals • Update flood risk maps • Support flood risk assessments; • Maintain watercourse capacity • Maintain flood management structures	• Issue warnings • Monitor catchment • Operate defences • Support LAs and emergency services	• Support LAs and community as resources allow • Repair any damaged defences • Ensure that key data is kept, and relevant data is entered into SWIMS to assist debrief, recovery and any subsequent inquiry

Organisation	Planning roles & responsibilities	Response roles & responsibilities	Recovery roles & responsibilities
Kent Police	• Engage with KRF Severe Weather Group Partners particularly around risk assessment, planning and public warning and informing • Identifying, with Cat 1 and 2 partners, areas of critical infrastructure at risk	• Save and prevent loss, or further loss, of life in conjunction with the other emergency services and any other relevant organisation • Support Co-ordination of the overall response through Command and Control	• Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry
Kent Fire & Rescue Service	• Identify KFRS premises at risk to flooding • KFRS holds copies of EA Flood Maps • Participation in flood exercises with other agencies	• Assisting with evacuation in the event of wide-scale flooding • Participate in Command and Control and provide liaison officers to other Control rooms as appropriate i.e. Environment Agency • Activate Station BC Plans where KFRS premises are at risk to flooding • Assist with pumping water	• Assist with other agencies to minimise impact on community
South East Coast Ambulance Service (SECAmb)	• Met. Office Weather Warning system in place • Contingency Plan for Extreme Weather • Identify SECAmb premises at risk of flooding	• Attendance as required upon assessment	• Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry
National Highways (and their contractors)	Identify critical transport infrastructure that is vulnerable to flooding	• Ensure that critical infrastructure is maintained during flooding incidents • Deploy personnel and internal and external contractor resources and assets to assist the practical emergency response to flooding • Provide intelligence on condition and viability of infrastructure, including GIS and flood depth • Seek to protect highways infrastructure from flooding, using sandbags and other physical barriers	

Organisation	Planning roles & responsibilities	Response roles & responsibilities	Recovery roles & responsibilities
NHS	• Distribute flood warnings	• Participate in Command and Control as required • Ensure NHS infrastructure and services are protected and maintained • Support patients and service users as required • Support psycho-social care assessments and interventions as required	• Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry
Port of London Authority	• Sharing of Flood Response Plans	• Issue appropriate warnings to river users • Supply detailed local tidal & hydrographic information on request	• Promote restoration of navigation and shipping activity
National Grid Gas and electricity distribution/ transmission	• Identify plant and assets in predicted flood zone e.g. substations, cable tunnels, joint bays, regulators – medium to low pressure, high pressure gas installations COMAH sites – storage • Vulnerable Persons Database – use system to identify all addresses in a predicted area by post code	• Protect and maintain critical infrastructure	• Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry
Southern Gas Networks	• Receive detailed flood assessment information for all at-risk major sites (supplying >50,000 consumers) from EA / SEPA. Review annually • Receive 48 hours warning from EA / SEPA for MAJOR sites • Identify other plant and assets in predicted flood zone using EA flood data and Flood Outlook Statements	• Protect and maintain critical infrastructure • Extract and copy asset records and plans for on-site use identifying siphons, low points etc.	• Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry
EDF Energy Networks	• EDF Energy Networks Flood Plan • Environment Agency indicative flood plains mapped into Company GIS system	• Protect substations by temporary works if practical • Disconnect electricity supplies if the public are at risk or if substations or plant and equipment cannot be protected from inundation	• Ensure that key data is maintained, and relevant data entered into SWIMS to assist debrief, recovery and any subsequent inquiry

6.3 Operational Response Activities

6.3.1 Response – Supplementary Information

6.3.1.1 Voluntary Sector

Voluntary organisations can play a part in the response to flooding incidents affecting Kent. They meet as part of the KRF Kent Voluntary Sector Emergency Group (KVSEG) and can be activated via the KCC DEPO. Details of their capabilities, including those relevant to a flooding incident, can be found in the ***KVSEG Capabilities Directory***, available from Resilience Direct.

6.3.1.2 Mutual Aid

KCC has a mutual aid arrangement with all local authorities in Kent, and with the other top tier authorities in the 'South East 7' group of top tier local authorities.

6.3.1.3 Military Assistance

Military assistance can also be requested, although all other mutual aid and commercial options must be exhausted or discounted first. It can be mobilised through Kent Resilience Forum channels. Details of how to activate all of these arrangements can be obtained from the Resilience & Emergency Planning Service.

6.3.1.4 Public Health

Floodwater Public Health Risks
The following section deals with public health risks arising from floodwater inundation:

Chemical Contamination
Flooding can result in disruption and overload of water purification and sewage disposal systems, inundation of waste disposal sites, and contamination from chemicals stored in commercial, industrial, agricultural, horticultural and domestic settings. This can be hazardous to human health and the wider environment. Contact with flood water should therefore be avoided, and where unavoidable; minimised, with protective clothing worn. While different chemicals cause different health effects, the signs and symptoms most frequently associated with chemical poisoning are headaches, skin rashes, dizziness, nausea, excitability, weakness, and fatigue.

Sewage/ Wastewater/ Animal Waste Contamination
Flooding can cause the disruption of water purification and sewage and other wastewater disposal systems. Slurry stores, landfills and other accumulations of domestic, industrial and animal waste can also contaminate floodwater. A key risk arising from contamination of floodwater with sewage, animal and other waste for human and animal health are potentially harmful microbes. Water-borne infections associated with flood events can include Gastroenteritis, Escherichia Coli (E. Coli), Enterococci, Botulism, Salmonella, Campylobacter, Giardia Cryptosporidiosis, Leptospirosis, Hepatitis and Tetanus.

It may be assumed that any floodwater affecting property and land will contain sewage, animal waste and other contaminants. Contact with flood water should therefore be avoided and where this is unavoidable protective clothing should be worn.

Contamination of the aquatic environment with sewage , animal waste and other organic pollutants, including milk and other foodstuffs, may lead to de-oxygenation through microbial blooms and resultant potentially harmful impacts upon human health and aquatic wildlife.

Most of the risk from contaminating micro-organisms is removed when water recedes and surfaces are cleaned. However, pathogen survival on dry surfaces can vary significantly with Campylobacter able to survive for up to six days, E. Coli up to 16 months, Enterococcus up to four months and Gastrointestinal viruses up to two months.

Electrical / Fire Hazards

Areas affected by floodwater inundation may contain electrical or fire hazards connected with power lines, sub-stations and other electrical infra-structure. The following precautions should be taken where electricity infra-structure is affected by floodwater:

- Never enter flooded areas containing electrical equipment unless you are certain that the power supply is off.
- If water has been present anywhere near electrical circuits and electrical equipment, turn off the power at the mains.
- Do not assume that any part of a flooded electrical installation or appliance is safe, do not turn on their power supply.

Entrapments

These include any hazard that can snag or hold an individual underwater, bringing the risk of direct injury or subsequent exposure to hypothermia or drowning. Even the shallowest of floodwater can conceal such hazards.

6.3.1.5 Kent Fire and Rescue Services Water Safety Aide Memoir

Hazards	Risks	Control Measures
Water		**Pre-planning!** Equipment, training, procedures, command arrangements and site familiarisation
Current, flow, under-tow, whirlpools, eddies- hydraulic features + force of water	Entrapment, drowning	**KEEP OUT!** Correct PPE= Lifejackets/PFDs, defensive swimming, early rescue- downstream throw lines, never work alone, never put feet down in flowing water if swept away.
Depth of water/ mud	Entrapment, drowning	**KEEP OUT!** Probe ground, correct PPE=Lifejackets
Water temperature	Cold water shock causing drowning, hypothermia	**KEEP OUT!** Early rescue, never work alone, PPE=Life-jackets/boots/waders/dry suit + thermal suit etc
Water clarity	Entrapment, drowning	**KEEP OUT!** Probe ground ahead
Pollution	Infection/health	**KEEP OUT!** PPE=boots/waders/dry suit (barrier protection), hand and face washing, discipline (no smoking, eating, drinking in risk area)

Debris	Impact injuries	**KEEP OUT!** Upstream spotters, agreed warning signals-whistles

Hazards	Risks	Control Measures
Weather/ Environment / Specialised Operations		Pre-planning! Equipment, training, procedures, command arrangements and site familiarisation
Weather	Fatigue/ hypothermia or hyperthermia	Relief crews, welfare, rest & recuperation (R&R) arrangements
Riverside/ shoreline conditions- cluttered/ slippery/ silt traps, onlookers	Slipping, tripping and falling, silt traps and additional casualties	Enforced 3 metre risk zone, lighting, safety brief, minimum level of PPE (Lifejackets, boots, gloves etc.), never work alone, site familiarisation
Inadequate lighting	Disorientation, getting lost	Personal torches, scene lighting, personal issue light sticks, tight command & control over personnel
Background noise	Warnings not heard, failure of communication	Whistles and hand signals.
Overhead power lines	Electrocution	Risk assess, safety brief
Specialised operations	Fatigue of specialised personnel/unsafe personnel in risk area	Relief crews, adequate resources, R&R, 3 metre risk zone
Work equipment Falling into water	Cessation of work/delays/impact injuries	Adequate resources, safety observers, safety brief

Surface vessel movements	Impact/unguarded props	Safety brief, command and control, safety observers (upstream and downstream spotters-throw line operators)

6.3.1.6 Welfare of Livestock and Other Animals

Kent Fire and Rescue Service has a dedicated animal rescue unit based at Faversham Fire Station. The unit has specially trained personnel and dedicated equipment such as a crane and cradle with lifting capacity to move trapped livestock.

The KCC DEPO will liaise with the APHA, Defra, RSPCA and local animal welfare charities on the welfare of livestock, domestic and other animals that may require rescue or feeding on site.

The Kent Resilience Forum has published an Animal Evacuation and Shelter Plan which can be accessed on Resilience Direct.

The RSPCA also offer advice on preparedness and looking after pets in an emergency; this can be found from the following RSPCA link:

http://www.rspca.org.uk/in-action/issuesindepth/floods

6.3.1.7 Water Rescue

In addition to its wider statutory duties, Kent Fire and Rescue Services provides strategic leadership for water rescue and pumping operations and acts as specialist operations adviser during the flood response stage.

Kent Fire and Rescue Services use High Volume Pumps (HVPs), which are 150mm in diameter and can pump water up to 3km in distance, assuming there is a suitable discharge point.

6.3.1.8 Guidance for Working Near to Flood Water

The following is offered as a supplement to normal practice, it is not necessarily exhaustive, and individuals must make their own risk assessments on the situation facing them.

Dangers:

- Shallow ponded water can cover ditches, manholes, access to hatches to basements etc. Covers to manholes and access hatches are frequently lifted off by the power of the water, leaving a deep hole into which the unsuspecting can fall or drive into;
- Flowing water can exert strong, lateral forces and will typically build up on the upper stream side to a height half as high again as the flow depth;
- Flood water may be contaminated. There may be overflows from Sewage Treatment Plants, or the water may have been contaminated with chemicals from industrial or agricultural premises; and
- Water will conduct electricity. If the power has not been turned off there is a possibility of electric shock. One indication of the presence of live electricity in flood water is the sense of vibration. If you experience this, you should withdraw.

Considerations:

- Pre-determined organisational rules/protocols and qualifications;
- Having the necessary equipment available to enter water;
- Other alternatives to entering water and what purpose is served by entry;

- Whether entry could wait until the flood water recedes further;
- Depth of the water, whether the tide is rising, speed of flow;
- Whether you should inform someone of your actions or be accompanied;
- Proceeding with caution, to avoid ditches, manholes and access hatches as well as electricity; and
- Avoiding driving into flood water without a suitable vehicle (and proceed with caution, ensuring the vehicle is not submerged and minimise bow waves flooding properties or submerging other vehicles).

7. The Risk of Flooding

7.1 Risk Assessment

Risk is a product of the likelihood and impact of a given hazard or threat. The impact will depend upon the exposure of people and property to the hazard and their respective vulnerability to harm. In Kent, the risks from flooding vary according to the source of the flooding and the characteristics of the people and property exposed to flooding.

Assessed risk details, including critical infrastructure, are contained in the Kent Community Risk Register (available from https://www.kentprepared.org.uk/), which is derived from the National Risk Register, and also at a local responder level.

7.1.1 Community Risk Register

The Kent Community Risk Register assesses risks based on likelihood and impact. The risk of flooding is divided into 5 main risks:

- **R81 –** Coastal Flooding (very high)
- **R82 –** Fluvial Flooding (very high)
- **R83 –** Surface water flooding (high)
- **R74 –** Reservoir/dam collapse (medium)
- **HI20 –** Localised, extremely hazardous flash flooding (medium)

7.2 Flood Risk

Fluvial floods are predominantly natural events, though they can be exacerbated by climate change impacts, that result from excessive rainfall which may exceed the absorption capacity of the river catchment, which can cause rivers to burst their banks.

Tidal storm surges on the coast or the tidal stretches of rivers cause the sea level to rise temporarily, which combined with the height of the waves may lead to overtopping and damage to flood defences.

Some areas are protected by flood defence measures, which may include flood storage reservoirs, flood walls and bypass channels. These reduce, but do not eliminate the risk of flooding occurring. However, they can lead to a false sense of security for those living or working in the defended areas, who may then be unprepared for flooding. The consequences of flooding are therefore best controlled by precautionary measures, such as avoiding inappropriate new or more intensive development in flood risk areas.

In total, around 88,000 properties in Kent are estimated to be at risk of fluvial or coastal flooding. There is significant population growth and development pressure across the County which will inevitably cause this figure to increase in future years. In addition, many more people work in, visit or travel through potentially flood vulnerable areas and may be unaware of the risk.

As a result of man-made climate change, both the risk and impact of flooding are increasing. According to the UK Climate Change Risk Assessment 2022, sea levels will rise, there will be more frequent and higher storm surges, increased winter rainfall and more intense summer precipitation. Given these changes, it may not always be possible to improve fixed defences sufficiently to maintain or raise protection standards. As such, adaptation is becoming increasingly important to seek to decrease the impact of flooding and other severe weather events by building-in greater resilience to infrastructure and other built development, landscape and natural environment, communities and the local economy.

7.3 Climate Change Impacts & Uncertainty

Projected climate change impacts in the South East include, but are not limited to, shifts in seasonal and rainfall patterns; increases in the frequency and magnitude of extreme weather events such as an increasing frequency and intensity of rainfall and storm events, resulting in escalating coastal storm surges and an elevated risk of tidal/coastal flooding events; glacier and ice sheet melting; thawing of permafrost; sea-level rise (which, in relative terms, is predicted to be greater in the South East compared to in other parts of England); acidification of the oceans and average temperature increase, causing drier summers and more frequent drought conditions as well as wetter and milder winters.

The scale and magnitude of impact will depend on the pattern of future greenhouse gas emissions and superimposed over this is the fact that the British Isles are subject to significant background weather variability. However, this needs to be balanced with the fact that the planet is locked-in to climate change impacts as a consequence of cumulative historic and current emissions, regardless of future levels.

The consequences of the direct impacts of heat and extreme weather events include: a deterioration of access to essentials such as clean water, food and shelter; forced migration, conflict and societal disruption; and loss of biodiversity' as well as, increasing physical and mental stress from flooding; cold and heat related mortality and increased prevalence of vector-borne diseases.

In Kent, there are currently approximately 88,000 properties at risk of coastal and fluvial flooding, and 24,000 at risk of surface water flooding (2019). As a result of climate change, the frequency, distribution and severity of flooding may change, and areas that have not been affected by flooding previously may be at risk in the future, for example, the risk of severe flooding of coastal areas is likely to increase as a result of rising sea levels and an increased frequency and magnitude of storm surges.

7.4 Flooding Sources

7.4.1 Coastal Flood Risk

7.4.1.1 Coastal Flood Risk General Information

Coastal flooding occurs due to the combination of storm surges (where a low-pressure weather system allows the level of the sea to rise) and wave height, leading to overtopping of flood defences. Flood defences may also be breached as the result of an accident e.g. failure to close a flood gate or damage to a flood defence.

There are defended and undefended stretches of coastline in Kent. The coastal flood defences for the Kent coastline, which includes private defences, give varied levels of protection against a storm surge.

Furthermore, some areas do not benefit from any defences and are therefore at greater risk of flooding, while other defences only deliver a low-level of protection e.g. 1 in 5-year events.

A breach in the defences is likely to be a 'no-notice' event. The risk of a breach increases with the severity of a storm, and responding agencies must be alert to the possibility of a breach when a Flood Warning or Severe Flood Warning has been issued. If a breach occurs, floodwater will be trapped behind the defences and may be present for several weeks. It poses a risk to life, buildings, and infrastructure, and will also be brackish (salty), unlike fluvial flooding. Other hazards may include submerged vehicles and other large objects, and mud / sand / shingle washed in through the breach. Floodwater may drain away as the tide recedes, but many areas may remain inundated.

7.4.1.2 Coastal Flood Risk in Kent

The Kent coastline is some 326 miles long (524.6 km) and poses a potential tidal flooding risk to 369 square miles of land (593.8 km) within the county (excluding Medway's administrative area). A map showing areas within Kent potentially vulnerable to coastal (or tidal) flooding can be found at Figure 6.5. With a predicted cumulative sea level rise of 1.2m in the South East by 2115 (source: Environment Agency) and an increasing likelihood and severity of stormy conditions the threat from a North Sea storm surge is a key and growing risk to Kent.

7.4.2 Fluvial Flood Risk

7.4.2.1 Fluvial Flood Risk General Information

Fluvial flooding will occur when freshwater flows within a watercourse exceeding the capacity of the channel, or overtop flood defences, or escape through a breach in flood defences. High freshwater flows may result from intense or prolonged rainfall, snowmelt, reservoir dam failure or blockage of a channel.

Larger fluvial flooding events in Kent are most likely to occur from the autumn through to the spring and there will generally be a warning issued in advance by the Environment Agency when there is the likelihood of flooding.

The standard of the protection held by defences varies from river to river and, in many cases, along the watercourse itself. Fluvial flood defences take many different forms, in contrast to tidal defences. Many significant fluvial flood defences are provided by flood storage areas, which are designated as reservoirs. A breach of these defences is addressed by the Kent and Medway Reservoir Inundation Emergency Plan. Flood alerts and warnings can be issued in areas that have telemetry when triggers are expected to be met or exceed top of bank levels when rivers or reservoirs reach capacity.
(see Figure 6.8 for reservoir inundation risk map).

7.4.2.2 Fluvial Flood Risk in Kent

The landscape of Kent is defined by its river systems. The largest, the catchment of the **River Medway**, covers 930 square miles (2,409 km^2) comprising some 25% of the area of the County. The River Medway flows for 70 miles (113 km) from just inside the West Sussex border to the point where it enters the Thames Estuary in north Kent. The River Medway is tidal downstream of Allington Lock, Maidstone.

Tributaries of the River Medway include:

- **The River Eden** - flows through the Weald of Kent from the border with Surrey, rising from the source in Titsey, and flowing eastward through the Wealden clay to join the River Medway near Penshurst.
- **The River Bourne** - begins its course west of Oldbury Hill on the Greensand Ridge in the parish of Ightham and enters the River Medway upstream of East Peckham.
- **The Hilden Brook** - rises near Underriver and flows approximately 8km south east to join the River Medway at Tonbridge.
- **The River Teise** - begins in Dunorlan Park in Tunbridge Wells and flows eastwards through Lamberhurst, passing Bayham Abbey. Here the small River Bewl, on which is located Bewl Water, joins the Teise. The Teise bifurcates 1.2 miles (2km) South West of Marden, the minor stream flows directly to Twyford Bridge in Yalding, while the major stream joins the River Beult at Hunton, 0.9 miles (1.5km) downstream from Yalding.
- **The River Beult** - has its several sources on the Weald west of Ashford, and then flows through Headcorn, where it is joined by the major stream of the Teise. The river enters the Medway at Yalding.
- **The Shaw and Loose Streams** - The Shaw Stream rises near Langley, South East of Maidstone, and runs towards Boughton Monchelsea where it goes underground and re-emerges at Loose as the Loose Stream before joining the River Medway at Tovil. The Shaw Stream is heavily modified, with a dam structure at Parkwood Farm (TQ 78205 51438) as well as numerous culverts at points where it flows under the local road network. Loose Stream is now a largely urban watercourse with significant modification along most of its length.
- **The River Sherway** - flows generally south west from Grafton Green near Egerton to the River Beult just south of Headcorn.
- **The River Len** - has its source at a small watershed south of Lenham. This heavily modified small river flows in a westerly direction and joins the Medway at the Archbishop's Palace Gardens in Maidstone town centre. The Len has been dammed at various points along its course, including Chegworth Mill, Leeds Castle, Mote Park, Turkey Mill and Palace Avenue Mill Pond. Several tributaries of the River Len rise at the spring-lines at the foot of the Kent Downs AONB to the north and Greensand Ridge to the south. Some of these tributaries, such as the Hollingbourne Stream at Hollingbourne, Fair Bourne at Fairbourne Heath and Lilk Stream at Bearsted are seasonally swollen by increased surface and groundwater flows.

The second largest catchment in Kent is that of the **River Stour**. The River Stour is the generic name for a group of rivers. The towns at Ashford and Canterbury have grown up on the banks of the River Stour. The river is tidal downstream of Fordwich.

Its catchment area covers the eastern part of Kent and tributaries include:

- **River Upper Great Stour** - flowing from near Lenham to Ashford.
- **River East Stour** - rising near Hythe to Ashford.
- **River Great Stour** – flowing from Ashford to east of Canterbury.
- **River Little Stour** – from Postling to join the Great Stour at Plucks Gutter, north west of Canterbury.

- **River Wantsum** – a relic of the old Wantsum Channel that separated the Isle of Thanet from mainland Kent.
- **Whitewater Dyke** - running from Shadoxhurst to Ashford
- **Ruckinge Dyke** - from north of Hamstreet to Ashford
- **Aylesford Stream** - its source is north of Sevington to Willesborough

Other Kent rivers include the **River Darent** which rises at Westerham and Limpsfield Chart and joins the **River Cray** at Dartford Marshes before flowing into the tidal Thames at **Dartford Creek**, the **River Fleet** which rises at Springhead Nursery and joins the River Thames at Northfleet, the **River Dour** which flows from Temple Ewell to the sea at Dover, by which point its course is heavily modified, and the **River Rother** which forms part of the geographical boundary between the administrative counties of Kent and East Sussex.

In addition, many smaller watercourses persist within the county which can contribute to localised flooding. Significantly, these include the **Brockhill, Mill Lease, Saltwood and Seabrook Streams** all rising at the foot of the scarp of the Kent Downs and flowing into the **Royal Military Canal**. The **Enbrook Stream** and (now heavily modified) **Pent Stream A, B, C and D,** which have the same origin but flow into the English Channel and Folkestone Harbour respectively. The heavily modified courses of the **Gorrell Stream** at Whitstable, **The Brook** and **Swalecliffe Brook** at Swalecliffe, **West Brook** at Hampton and **Plenty Brook** at Herne Bay have all contributed to historic flooding events as they flow (or are pumped) to the sea. A map showing areas within Kent vulnerable to fluvial flooding can be found at figure 6.5 at the end of Section 6.

7.4.3 Surface Water/Overland Flow and Sewer Flood Risk

Surface water flooding results from rainfall that exceeds the capacity of the land or drainage infrastructure to receive it. Areas vulnerable to this form of flooding include urban conurbations

Sewer flooding occurs when drains and sewers are overwhelmed by rainfall and discharge away from where the rainwater entered them. Where the sewers are combined (that is they convey foul and surface water), contaminated water may be released.

Surface water and sewer flooding generally occur as the result of intense rainfall, which is relatively unpredictable and so may result in flooding without any warning. Flooding may also result from high river and tide levels preventing the discharge of sewers and drains.

Water depths from surface water and sewer flooding are rarely significant, other than in topographical depressions or manmade features and structures, such as cuttings, underpasses, and basements, unless associated with river or tidal flooding. Local circumstances such as steep gradients and constrictions may give rise to higher water velocities. Surface water flooding, when unaccompanied by fluvial or tidal flooding, is likely to trigger a major incident only when widespread occurrence causes significant property inundation, traffic disruption or strains the wider response capability. An Environment Agency map showing areas within Kent vulnerable to surface-water flooding can be found at figure 6.6 at the end of Section 6.

7.4.4 Groundwater Flood Risk

Groundwater flooding occurs when the water table exceeds the level of the ground and groundwater emerges. Due to the nature of groundwater, areas may be waterlogged or flooded for several months.

Borehole levels are monitored by Environment Agency, and due to the slow onset of groundwater flooding can be prepared for, but not stopped.

Groundwater flood risk in Kent is most notably associated with chalk catchments in the east of the county (**Little Stour, Nailbourne and Petham Bourne**) and west of the county (**Darent catchment. Including former chalk quarries in northwest Kent**). Historic records of groundwater flooding also exist for parts of the Lower Greensand within the County, but these are less well understood than on the chalk. An Environment Agency groundwater emergence map can be found at figure 6.7.

Figure 7.5 - Map of Kent showing coastal and fluvial (river) flood risk (source: Environment Agency)

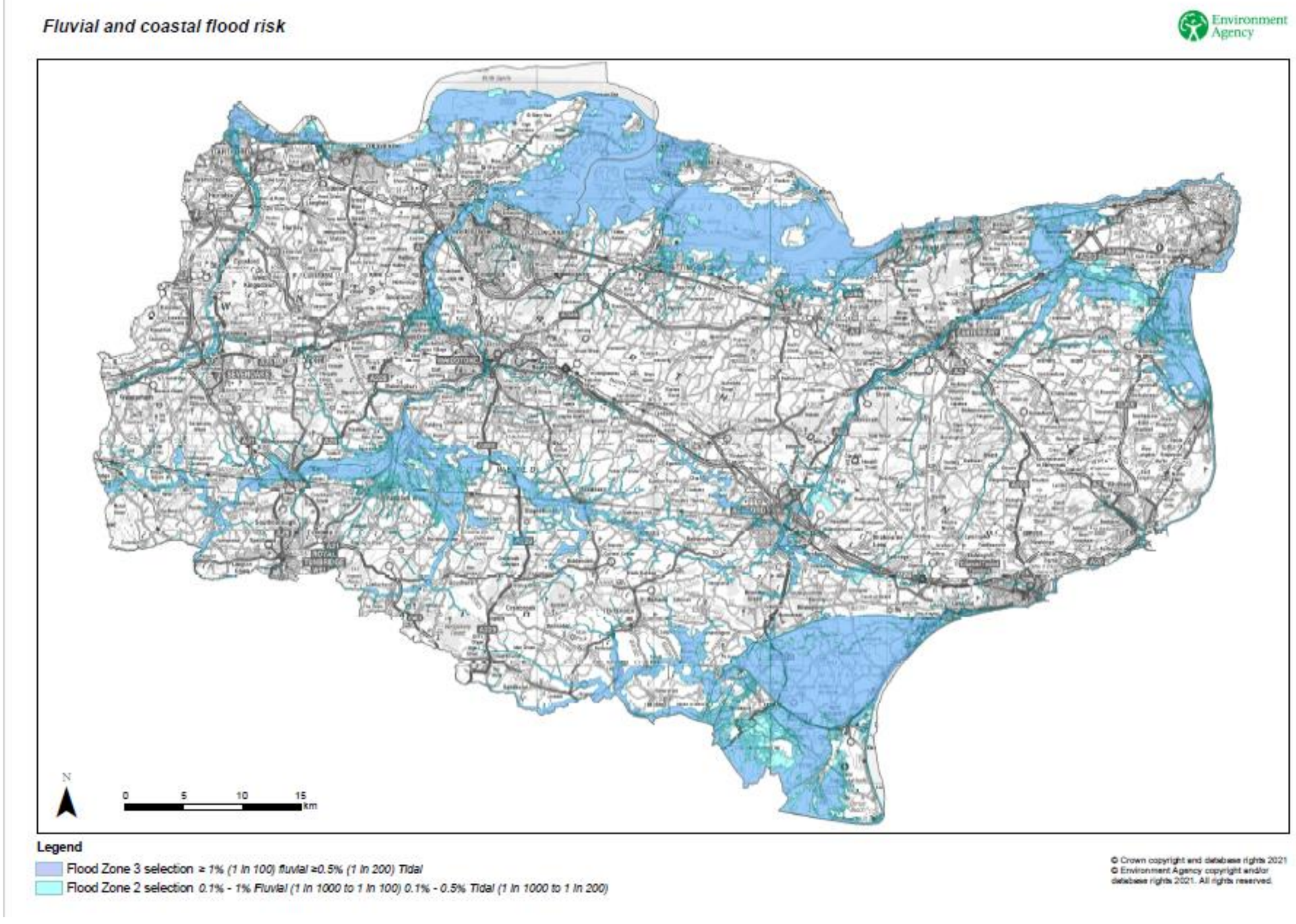


Figure 7.6 - Map of Kent showing surface water flood risk (source: Environment Agency)

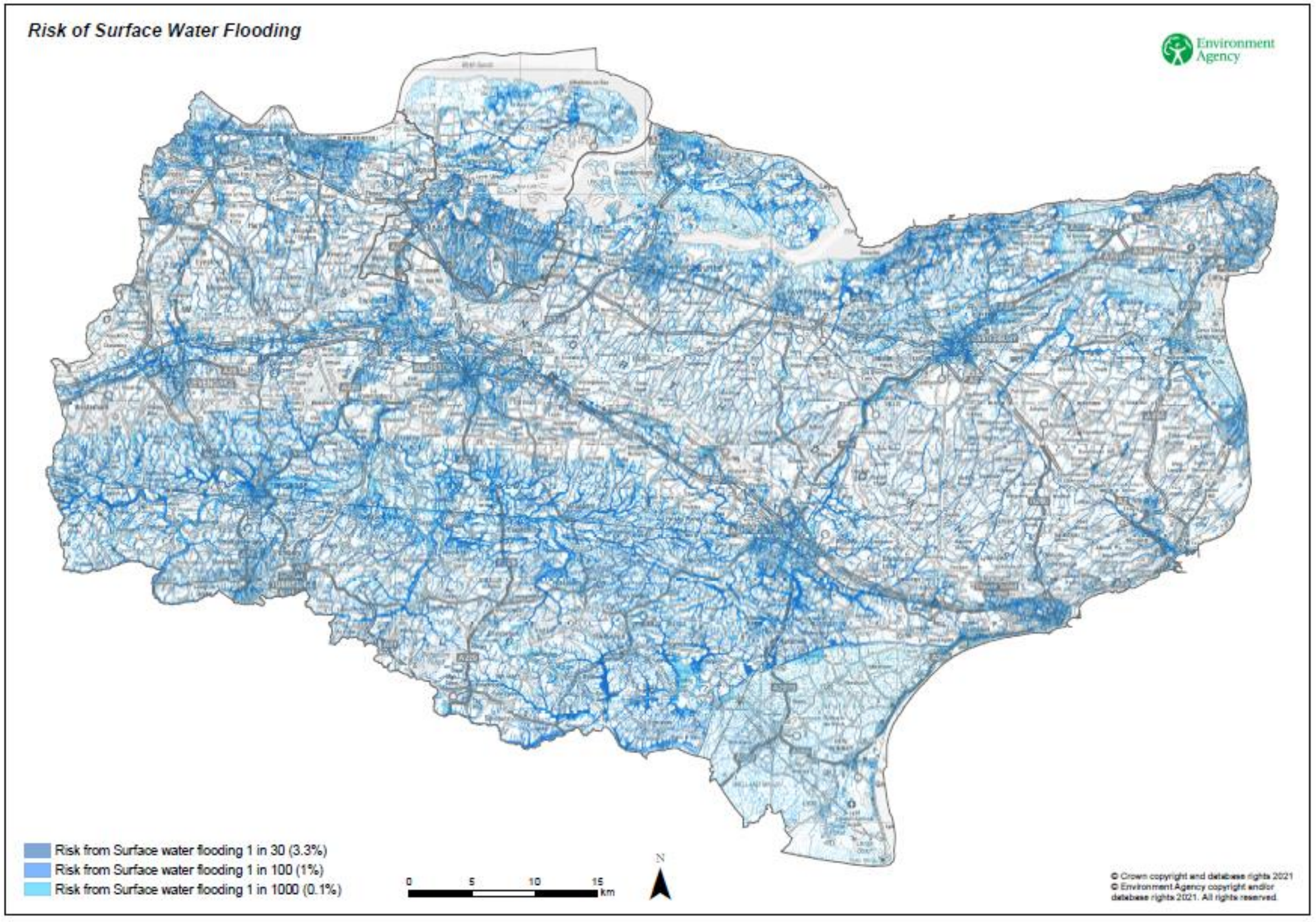
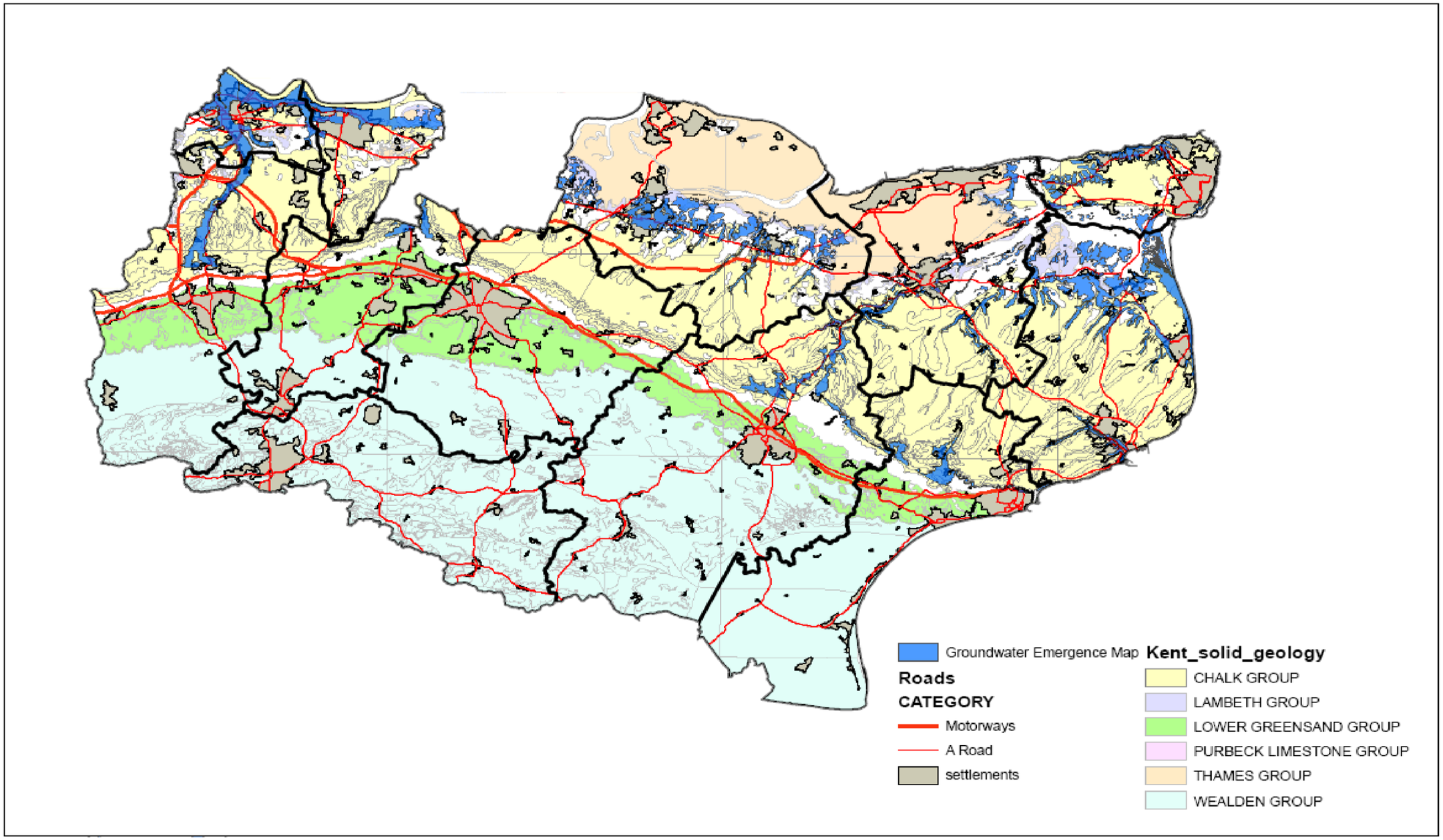


Figure 7.7 - Map of Kent showing ground water flood risk (source: Environment Agency)



Produced by the KCC Research & IntelligenceTeam

Ref: H/Flood Map/Groundwater Emergency Map 3

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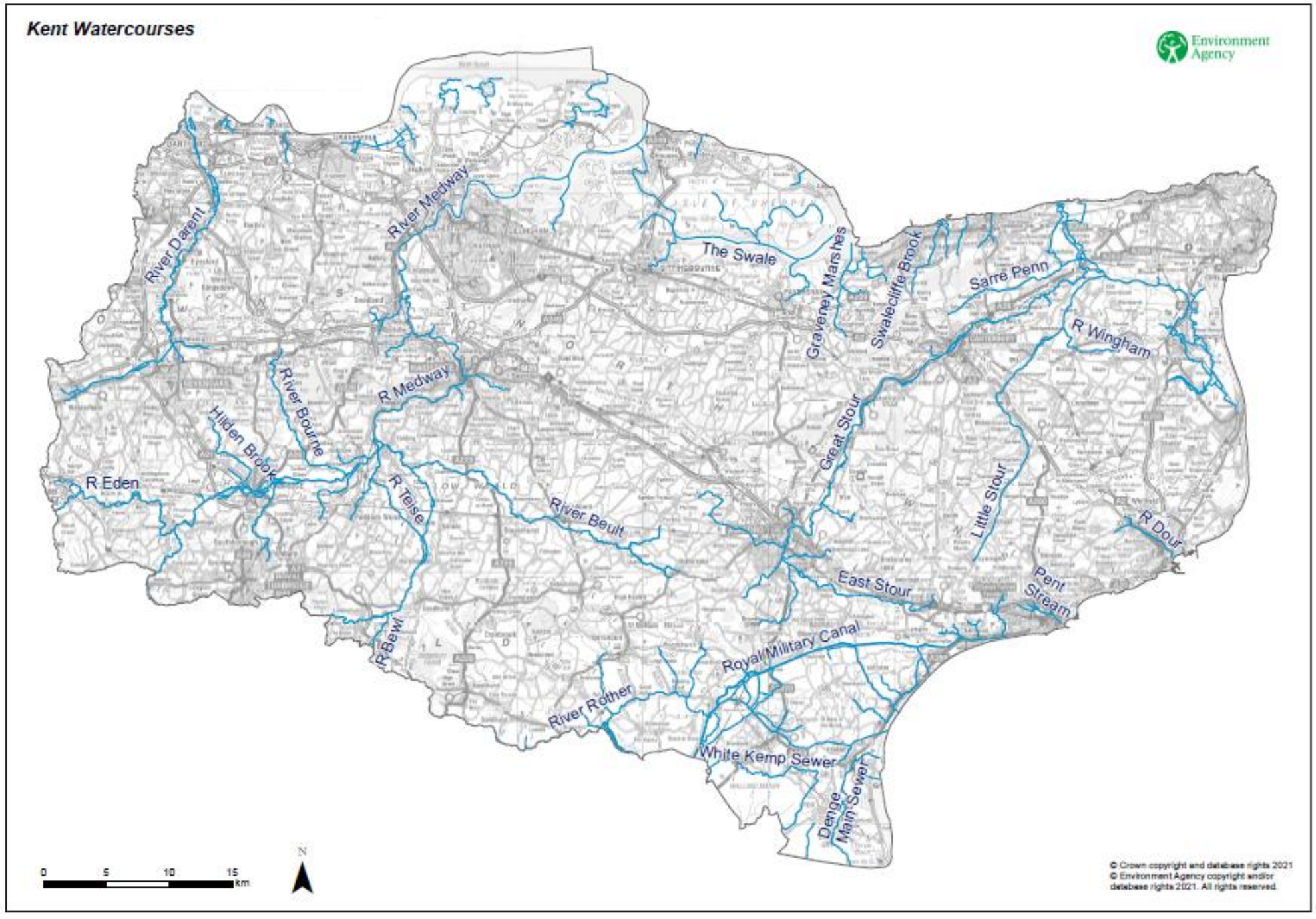
1:436479

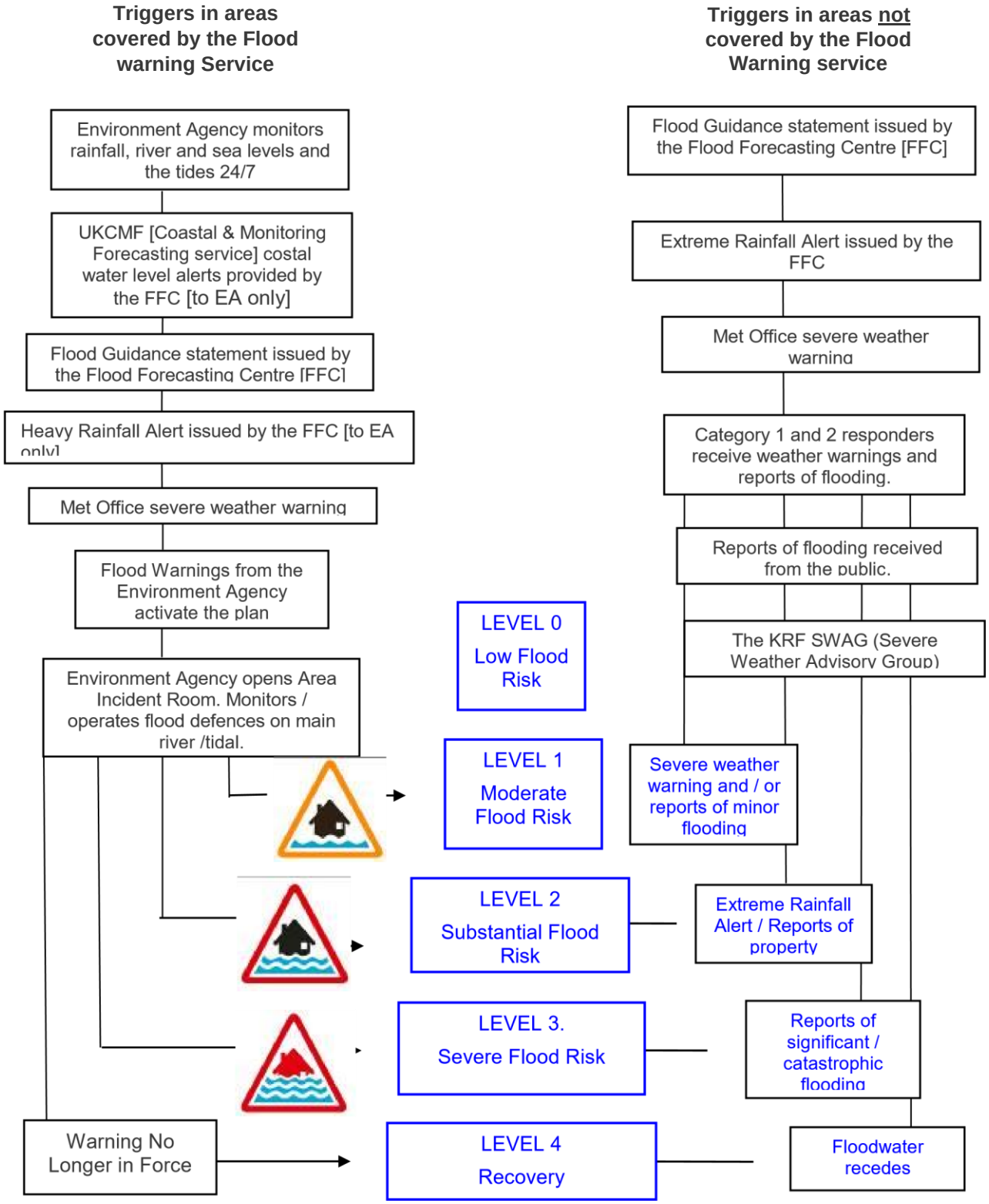
Figure 7.8 - Map of Kent showing reservoir inundation risk

Figure 7.9 - Map Showing Significant Kent Watercourses (source: Environment Agency)



8. Plan Activation

Figure 8.1 - Plan Activation Flow Diagram



***** please refer to Figure 6.2 on next page “Common Triggers and Thresholds” and to the specific actions contained in Part 2 of this plan.

Figure 8.2 - Common Triggers and Thresholds

Warning Level	Action
	EA will lead Severe Weather Advisory Group (SWAG) for coastal and fluvial flood events and consider opening their area incident room and monitor the situation closely. **EA** teams will be clearing grills and monitoring or operating their defence assets as necessary.
Flood Alert  Severe weather warning and / or reports of minor flooding	Emergency response unlikely **EA** will keep partners informed either via SWAG, Strategic or Tactical command, and provide info where requested. **EA** will lead Severe Weather Advisory Group (SWAG) if it is still required and consider opening their area incident room. **EA** teams will be clearing grills and monitoring or operating their defence assets as necessary. **EA** will possibly be issuing alerts and monitoring the situation closely.
Flood Warning  Extreme Rainfall Alert / Reports of property flooding	Emergency response likely but limited **EA** will keep partners informed either via SWAG, Strategic or Tactical command, and provide info where requested. **EA** will lead Severe Weather Advisory Group (SWAG) if it is still required. Incident Room is likely to be operational. **EA** teams will be clearing grills and monitoring or operating their defence assets as necessary. **EA** will possibly be issuing alerts or warnings dependant on the situation and monitoring the situation closely.
Severe Flood Warning	

 Reports of significant / catastrophic flooding	Emergency response probable **EA** will keep partners informed either via Strategic or Tactical command and provide info where requested. **EA** will lead Severe Weather Advisory Group (SWAG) if it is still required. Incident Room is likely to be operational. **EA** teams will be clearing grills and monitoring or operating their defence assets as necessary. **EA** will possibly be issuing severe flood warnings and monitoring the situation closely.
Warning No Longer in Force Floodwater recedes	Consider recovery **EA** will keep partners informed either via Strategic or Tactical command and provide info where requested. **EA** Incident Room is likely to be stood down. **EA** teams will be clearing grills and monitoring or operating their defence assets as necessary and begin necessary repair works. **EA** will continue to monitor the situation closely.

The procedures in this response plan will be activated when any of the following criteria are met:

- Met Office Severe Weather Warning received for Rain or Thunderstorm;
- Flood Alert / Flood Warning / Severe Flood Warning issued;
- Flood Guidance Statement Issued
- Intelligence received from KCC colleagues, partners or public indicating flooding may occur;
- Properties are threatened by flooding;
- Properties are affected by flooding; and
- Intelligence indicates that human or animal welfare is threatened by flooding or risk of flooding.

8.3 Flood Alerts and Warnings

8.3.1 Environment Agency Flood Alerts and Warnings

1. **Flood Alert**

Flood Alerts are issued earlier than a Flood Warning, to give customers advance notice of the possibility of flooding.

Rivers will be running bank full and further rainfall is expected. Flooding of property is possible, particularly in low lying and riverside areas. There may be minor flooding of low-lying land, roads and gardens. The alert is issued in order that the public at risk, the emergency services, local authorities and other bodies are aware of increasing chance of flooding and take appropriate preparatory action.

People should: STAY ALERT, STAY VIGILANT, MAKE EARLY LOW-LEVEL PREPARATIONS FOR FLOODING.

2. **Flood Warning**

Flood Warnings are used to warn customers that flooding of property is expected, and they should take immediate action to protect themselves and/or their property.

When flooding of homes and businesses is expected, those issued will be property owners, the public at risk, the emergency services, local authorities and other bodies who should act to protect life and property.

People should: TAKE ACTION TO PROTECT THEMSELVES AND THEIR PROPERTY

3. Severe Flood Warning

Severe Flood Warnings are used to warn of a significant risk to life or significant disruption to the community caused by widespread or prolonged flooding. Customers may have already received a Flood Warning, or they may receive a Severe Flood Warning as their first warning of expected flooding depending on the situation.

Significant risk to life may be caused by:

- deep and fast flowing water (e.g. caused by significant overtopping of defences or sudden onset flooding from dam/defence failure);
- rapid onset of flooding;
- presence of debris in the water that could cause death or injury;
- potential/observed collapse of buildings/structures; and
- the vulnerability of the population or their surroundings (e.g. deep/fast flowing water through a caravan park).

Significant disruption to communities may mean:

- it is likely to affect whole community;
- community isolated by floodwaters with no obvious means of escape;
- critical resources/infrastructure for communities disabled (e.g. no access to food, water, electricity);
- emergency services and authorities unable to cope with large volumes of evacuees and rest centres at full capacity; and
- mutual aid/military support necessary or called upon.

Property owners, the public at risk, the emergency services and local aurhorities should act to protect life and property. This is likely to involve an enhanced response and the commitment of significant resource.

People should: TAKE ACTION TO PROTECT THEMSELVES AND FOLLOW THE ADVICE OF THE EMERGENCY SERVICES.

4. No Longer in Force

To signal stand down and to close communications with people.

5. Extended Floodline Service (EFS)

The aim of EFS is to improve the experience for callers whose query is outside Floodline's usual remit, and who would otherwise have to be redirect - specifically callers who EA may advise to contact their Local Authority (see Appendix F). The EFS is able to provide the answers to common and frequently asked questions regarding those things that may fall under the Local Authority remit while educating callers in who to contact in the future, such as on:

- Sandbags or property level protection;

- Drains, culverts, sewers or water mains**;
- Surface water flooding, flooded properties or flooded roads;
- Evacuation, rest centres, helping vulnerable people or longer-term assistance;
- Recovery following flooding; and
- Contacting the LA or community assistance.

**Signposting to third party organisations can be added to EFS, where it is locally specific, and provides only publicly available details – e.g. the name and number of the local water utility company.

8.3.2 Flood Warnings Received by Kent County Council

KCC Resilience and Emergency Planning Service, KCC Adult Social Care and Health (via their emergency planning lead) and Kent Highways, Transportation and Waste are registered to receive these warnings:

8.3.3 Flood Warning Lead Time

Expected Environment Agency flood warning lead in times:

Fluvial	**2 hours** (in general) to people living in designated flood risk areas where a flood forecasting facility exists, and where lead times are sufficient to enable to do so.
Tidal	**9 hours** approximate warning of flooding (this does not consider breaches in existing defences where there is likely to be **no** warning at all). Note that on the North Kent coast normal flood defence closures of the Thames Barrier are accompanied by Flood Alerts issued to riparian authorities downstream of the Barrier at Woolwich.

The Environment Agency will endeavour to provide the respective lead times above, but this is not always possible, and this fact should not be relied upon.

8.3.4 Flood Warning Dissemination Methods

- Flood Warning Service, by registering to this free service, Flood Warnings can be received directly by either phone, text or email.
- Floodline - 0345 988 1188 (24 hours).
- Flood Warning service website - https://flood-warning-information.service.gov.uk/warnings
- Floodline Warnings Direct - can be signed up for and automatically sends advance warning of area specific flooding by telephone, mobile, fax, pager, SMS text message or email. The system was designed to replace the Automated Voice Messaging System (AVMS) and gives information on the type of warning, the location, the situation and advice.
- The Environment Agency website – www.environment-agency.gov.uk/flood
- The Media - broadcasting on radio stations across Kent and national and local television news stations.
- Social media.

9. Communication

9.1 Kent County Council Alerting Responsibilities

The Pan Kent Strategic Emergency Response Framework document setting out the agreed major incident alerting principles operated within Kent are set out at figure 8.5.

Kent County Council operate a 24 hour, 7 days a week Duty Emergency Planning Officer (DEPO) rota and in the event of a flooding incident, they will alert relevant KCC personnel (e.g. the Duty Director and relevant services) as well as external partner agencies (e.g. Borough / District Councils, voluntary agencies, the military). If necessary, in consultation with the Duty Director, they will activate the KCC County Emergency Centre to facilitate the KCC response.

9.2 Kent County Council Elected Member Alerting and Engagement

Floods can assume a high media profile and generate significant public concern and interest. Community leadership by the Leader, Cabinet and wider Elected Membership can therefore be particularly important during the response and recovery phases of flooding events.

It is a role of the On-call Duty Director to alert and brief Leader and Cabinet and the wider Elected Membership in the event of a major incident such as significant flooding.

The County Council's Resilience Guidance for Elected Members sets out County Councillor roles and can be found on Knet.

9.2.1 Executive Members

The Leader of the Council carries a political responsibility for emergencies affecting the County, and as such, will be the principal political spokesperson for the County Council in the event of a major flood event.

The Cabinet Member for Community and Regulatory Services has a particular understanding and knowledge of the resilience agenda and is responsible for ensuring that suitable emergency and business continuity plans and arrangements are in place for the Local Authority – both before, during and after flooding incidents.

For highway flooding the Cabinet Member for Highways and Transport carries particular responsibilities, while the Cabinet Member for Environment oversees flood risk (surface water), climate change and natural environment portfolios.

9.2.2 All Elected Members

All Elected Members have a role in preparing for and responding to a major flooding incident, given their role in representing local communities. Both prior to and in response and recovery to an incident, the role of a County Councillor will be significant in championing resilience and supporting the local community and KCC officers in preparation and response to a flood event. Where an individual Division is affected, this community leadership and advocacy role may be amplified for the local Elected Member.

9.3 Door Knocking High Risk Properties

The Pitt Review arising from the 2007 floods recommended the door knocking in affected areas to reinforce the distribution of flood alerts / warnings. Multiagency partners, including KCC Social Care and the NHS, will identify vulnerable people in those areas. If a door-knocking response if appropriate, then efforts should be made to contact these people. Door-knocking may be carried out by Kent Police, KCC Community Wardens, Borough and District Council uniformed officers, Environment Agency, or the voluntary sector.

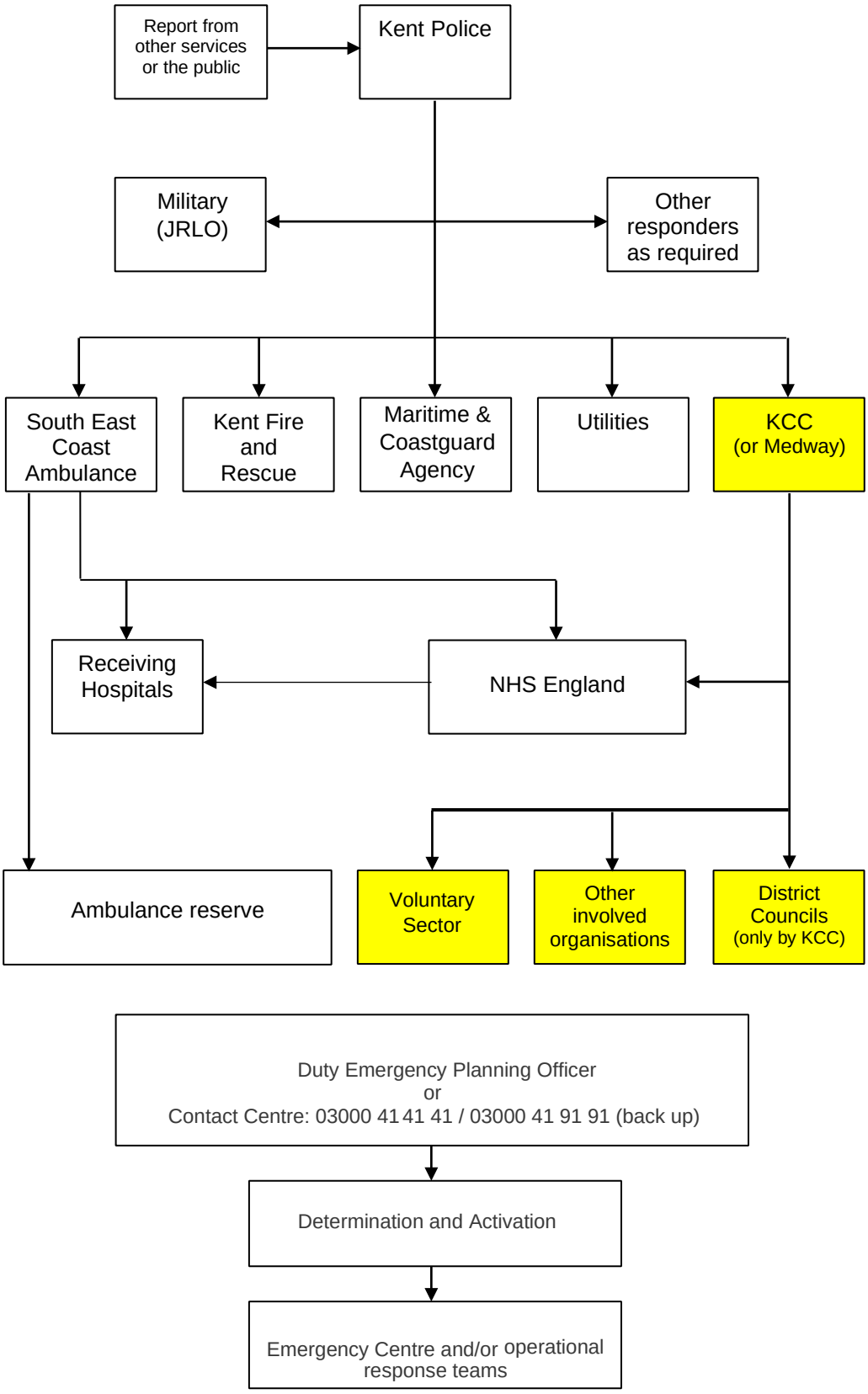
KCC Community Wardens can support door-knocking of high-risk properties both on the ground (using the Community Warden Support Team to reach outlying areas) and by working with community leaders to identify vulnerable members of the community. They can be activated by the KCC DEPO.

It is important to state that KCC staff **must not** enter flood water due to the risk from submerged hazards, being swept away by fast flowing water and contamination.

9.4 Communicating with the Public

Information on communicating with the community can be found in the ***KRF Media & Communications Plan***, available from Resilience Direct. The plan includes specific information on communicating during a flood incident and the way in which this information will be shared between partners.

Figure 9.5 - The Pan Kent Strategic Emergency Response Framework Document: Major Incident Alerting Principles:



10. Vulnerable People & Communities

10.1. Identification

Identifying, planning for and providing for the needs of vulnerable individuals and groups involves a large number of partners and an everchanging data resource. For this reason, it is unrealistic to expect a central list of potentially vulnerable individuals to be maintained. Rather the approach is to maintain a list of partners and contact telephone numbers that can be used to gather up-to-date and relevant information in the event of an emergency.

Records of vulnerable people are held and kept up to date by KCC Adult Social Care & Health, Children, Young People and Education, NHS and utilities providers, each organisation will hold records of its own clients. During a flood incident this information will be supplied to the Strategic Co-ordinating Group (SCG) or Tactical Co-ordinating Group (TCG) and other partner organisations as required.

Due to the nature of the changing situation during a flooding event the status of any persons' vulnerability can change at any time, this is a fact to be aware of in all situations.

Those who may be considered potentially vulnerable include: -

- Children
- Older people
- Mobility impaired
- Mental/cognitive impaired
- Sensory impaired
- Individuals supported by Health or local authorities
- Temporarily or permanently ill
- Individuals cared for by relatives
- Homeless
- Pregnant women
- Minority language speakers
- Refugee bridging hotel residents and those in asylum seeker and migrant accommodation
- Tourists
- Gypsy and Traveller communities
- Static and holiday caravan parks (including seasonal farm workers)

Please see Kent Resilience Forum Identifying Vulnerable People in an Emergency Plan via Resilience Direct.

10.2. Background, Analysis and Horizon Scanning

The County Council's recognition of the UK Environment and Climate Emergency has helped highlight the increasing risk and severity of flooding resulting from climate change. It poses a significant health risk to the population in flood prone areas and may lead to increased deaths, injuries and mental health issues.

Vulnerability to flooding includes more than just the physical risk; political, social and economic factors constrain the ability of the population to respond and their ability to adapt. These factors can have implications on people's health and wellbeing, and therefore extends to the wider health and social care sectors.
Within Kent, such socially vulnerable communities are often located in or near areas of high flood risk, including low-lying coastal areas. Kent & Medway are some of the most at-risk local authorities in the UK in respect of surface water flooding, as are many low-lying coastal areas, which are at risk of fluvial & coastal flooding. Two of Kent's districts (Swale and Folkestone & Hythe) are in the top 10 most flood vulnerable districts in the UK, this issue is compounded in those areas where the population is generally older and/or have lower incomes as well as in flood-risk areas with many social care facilities such as care homes and GP surgeries, which may negatively impact social care provision during the response and recovery phases of a flood event, see figures 9.3, 9.4 and 9.5.

Flooding is a threat to several urban settlements across Kent, including Tonbridge, Tunbridge Wells, Sheerness, Deal, Folkestone, Gravesend, Dartford, Maidstone, Ashford Canterbury and Whitstable, alongside many villages and rural hamlets. This is because settlements have historically grown-up alongside the sea and rivers, these conurbations now possess significant areas of impermeable hard surfacing, which inhibit natural infiltration of water to the ground, alongside heavily modified watercourses and extensive drainage infrastructure that can become overwhelmed under certain circumstances.

Analysis has indicated that flood disadvantage is greater from surface water flooding than from fluvial & coastal flooding in most areas, and that the areas of highest social & flood vulnerability are concentrated around Kent's coast. Data analysis also suggests that climate change will not increase the geographic area of Kent that is disadvantaged from flooding but will increase the severity where it is already present, particularly in areas such as Romney Marsh and the Isle of Sheppey.

Social vulnerability to the impacts of flooding involves a combination of factors including:

- **Susceptibility to flooding** – how likely someone is to experience a loss of wellbeing due to a flood;
- **Ability to prepare** – personal actions someone can take to reduce the harm suffered if a flood occurs;
- **Ability to respond** – why some people may act more effectively during a flood event;
- **Ability to recover** – how much someone can aid their own recovery from a flood; and
- **Community support** – the availability and quality of emergency and healthcare systems (Sayers *et al*, 2017).

For example, anecdotal evidence from past flood events has highlighted that; 'some sections of the older population [...] were reportedly bewildered and frightened by people banging on their front doors to alert them to imminent flooding'; families with young children were more vulnerable, as children became distressed, or because of 'adults being unable to take necessary action with youngsters in tow'; and disabilities were also 'said to impede effective response, deaf people were [at] risk of not receiving telephone warnings'. Those with greater wealth are able to protect themselves, which has important implications when discussing the impacts of flooding on communities and for identifying vulnerable geographic hotspots (Defra/Environment Agency, 2005).

Other factors such as social isolation, language barriers and cultural background may also make people more vulnerable and less able to cope in an emergency (England & Knox, 2016; Defra, 2014). Those who are less able to adapt are more likely to rely on services provided by local authorities, the health and social care sector, and health services, especially in the case of an illnesses exacerbated by the incident.

Gypsy, Traveller and itinerant agricultural worker communities on the Low Weald and in other flood-vulnerable areas are geographically disproportionately vulnerable to flooding. Caravans and amenity blocks are often uninsured and flooding frequently results in irreparable damages, making the caravan a ‘total loss’. Such problems can be exacerbated because such communities are often on the margins of society, separated from mainstream communities and subsequent relief services. In some areas of Kent, there are other communities which may be more affected by flooding due to language barriers or as they are new to the area or to the country and are therefore unaware of the local flood risk. These residents may not have any experience of flooding and therefore not know how to prepare or respond appropriately.

Holiday parks, comprising caravans and mobile homes, can also be vulnerable to all forms of flooding and it can be challenging to ascertain levels of occupation at any given time to inform effective alerting, evacuation and shelter interventions.

Figure 10.3 - Kent and Medway Flood Vulnerability Map

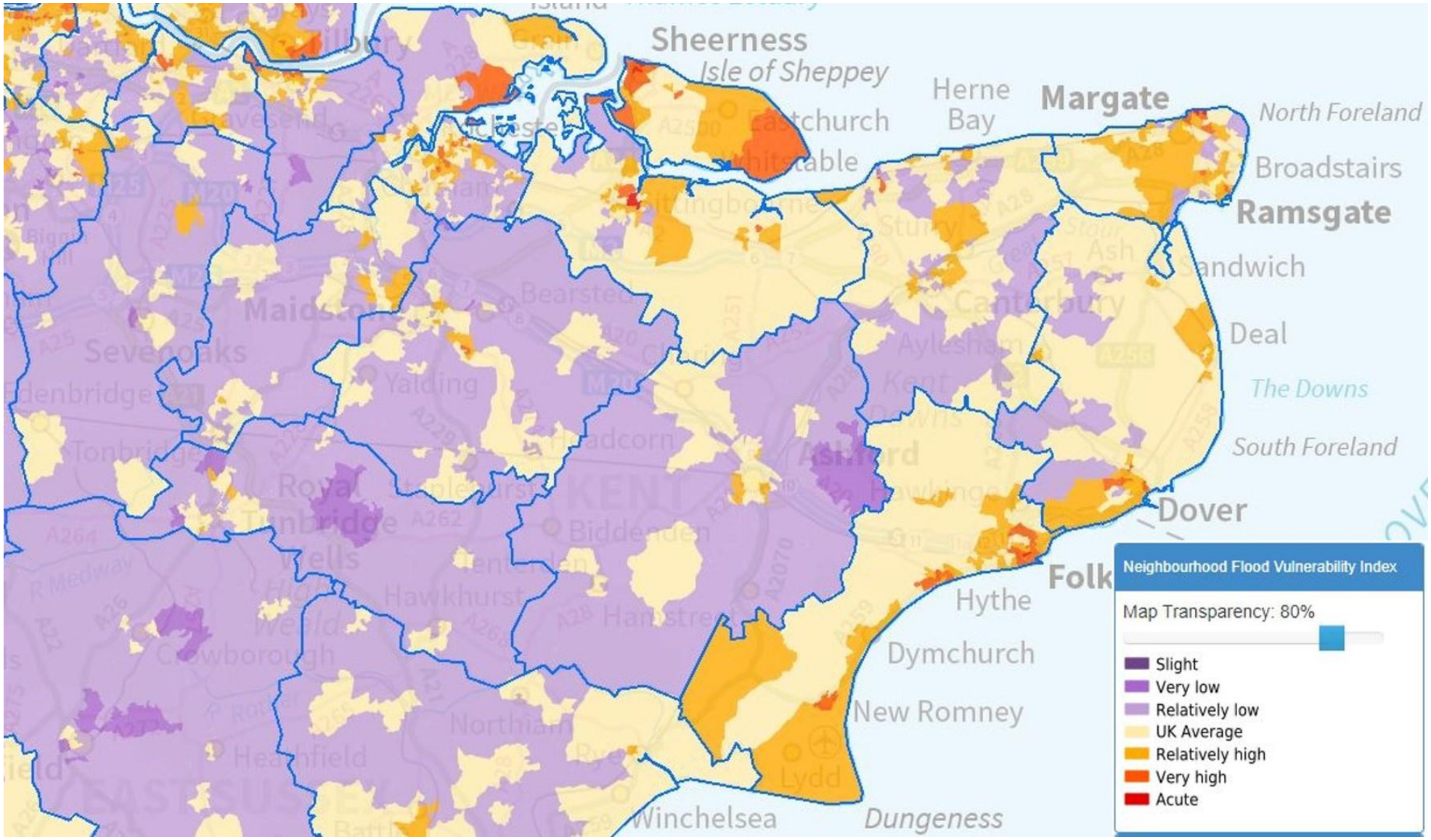
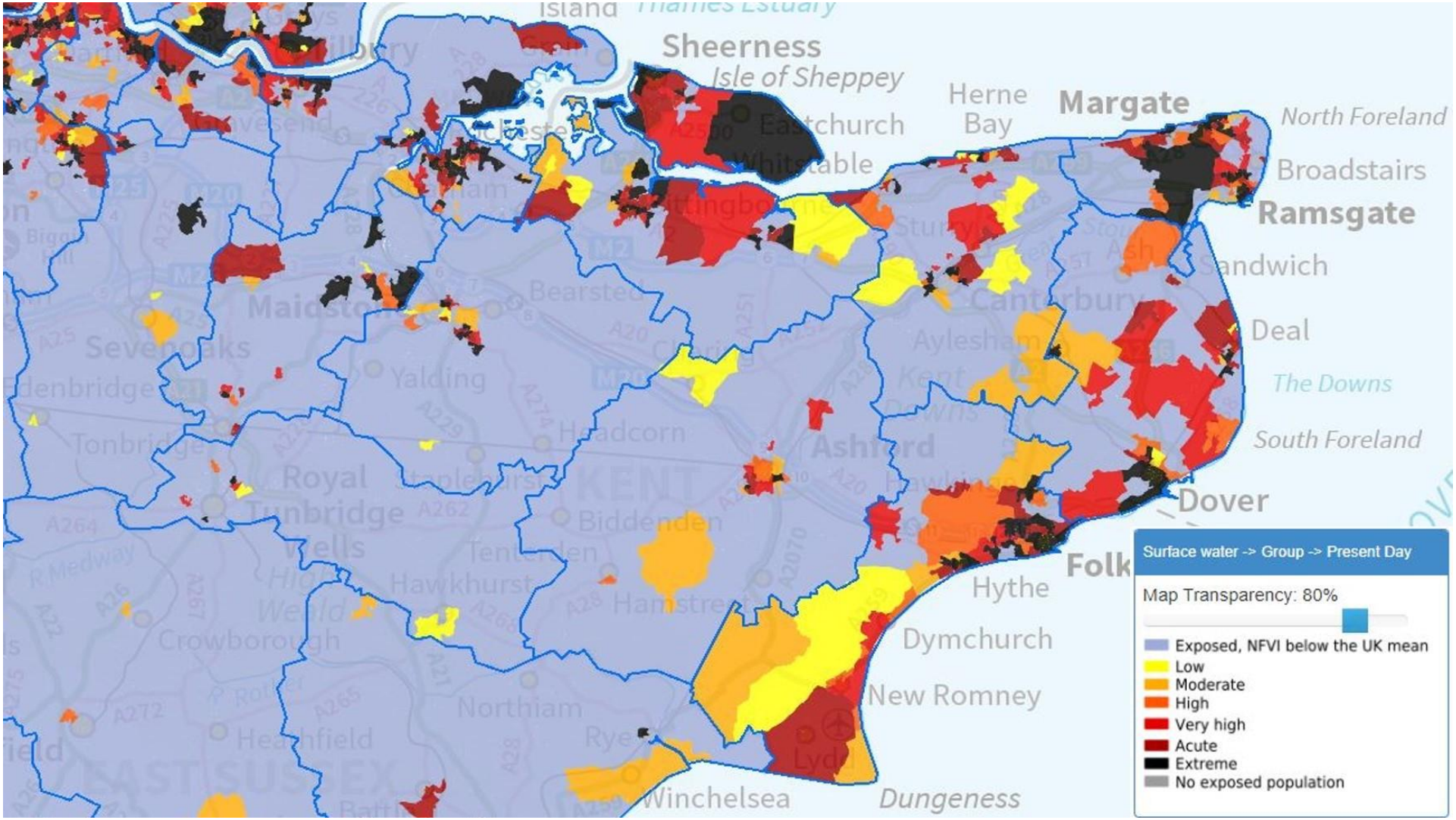


Figure 10.4 - Kent and Medway Disadvantage Map



11. Critical Infrastructure

Information regarding critical infrastructure can sometimes be sensitive information, this information can be obtained from the utility provider or the Police for use by the multi-agency SCG (Strategic Coordinating Group) – which will set overall policy for the response to a major flooding event.

Locations for critical infrastructure within flood vulnerable areas are listed within District Local Multi-Agency Flood Plans, Pan Kent and Medway Flood Plan and identified on the GIS system.

12. Evacuation and Shelter

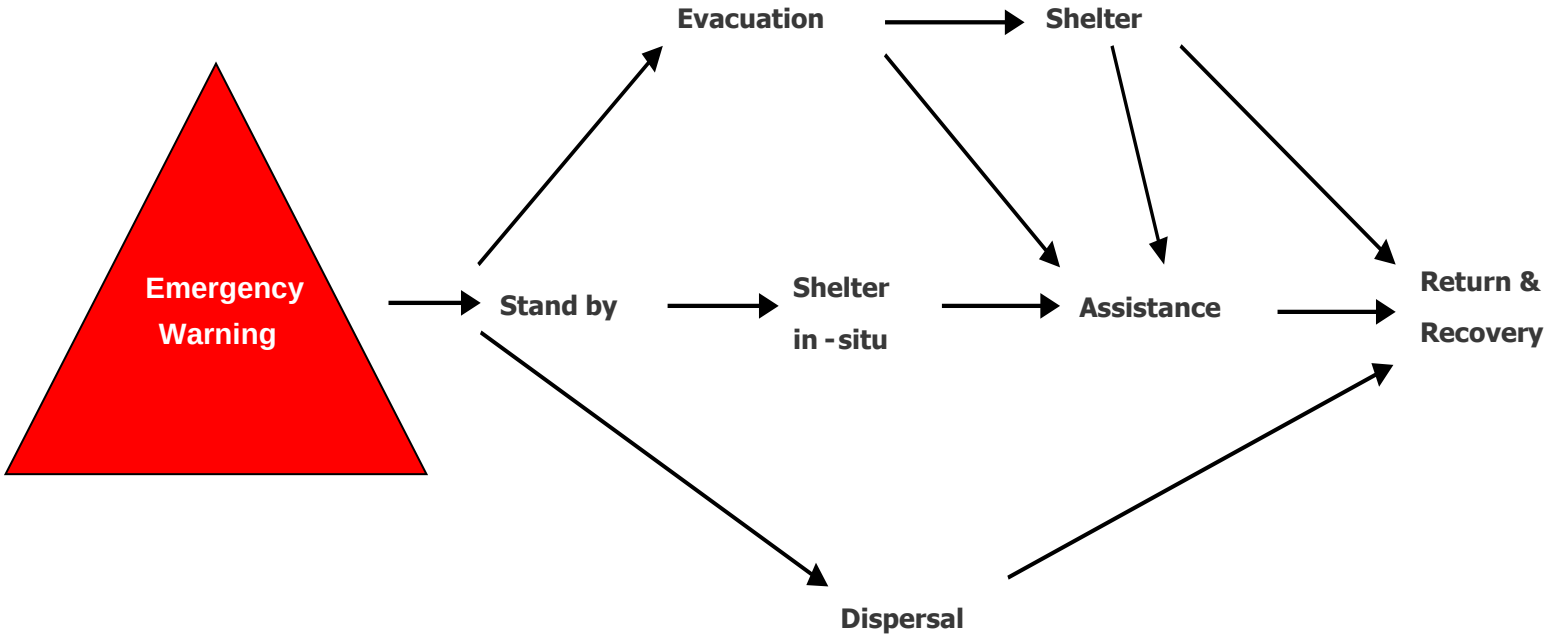
Information on the evacuation and shelter of residents can be found in the following plans:

- KRF Evacuation & Shelter Plan
- KRF Welfare Centre Guidelines
- District Welfare Centre Plans and Directories

- Statutory legislation informs roles and responsibilities in relation to evacuation, shelter and homelessness. It must further be remembered that legislation and regulation covering day-to-day operation of residential and public premises also applies to survivor reception and rest centres - including health and safety, food hygiene and licensing.

- Non statutory Evacuation and Shelter Guidance has also been produced by the Civil Contingencies Secretariat of the Cabinet Office. This guidance states at paragraph 1.5. "The Purpose of Evacuation and Shelter" that: "The purpose of evacuation is to move people, and where appropriate other living creatures, away from an actual or potential danger to a safer place. For this to happen safely there need to be plans not just for alerting people and moving them, but also plans to shelter and support them through to their eventual return and recovery. "The need to provide humanitarian and other assistance, particularly to those with special requirements, requires careful consideration and planning. The diagram below shows the stages of evacuation and includes "dispersal - a form of evacuation in which people are simply directed to move away from a particular location without the need for temporary accommodation. The activity of warning and informing the public should also run throughout the process."

Figure 12.1 - Evacuation and Shelter Methodology



13. Rescue

No agency currently has a statutory duty for rescue during a flooding incident. However, a number of agencies have the capability to rescue people trapped by flooding, including Kent Fire & Rescue, Kent Search & Rescue, HM Coastguard, and the RNLI. These organisations should be engaged during an incident to determine the best way of rescuing residents, and this will be coordinated by the multiagency Tactical Co-ordinating Group (TCG).

14. Recovery

- Kent County Council is likely to lead the Recovery phase of a major flooding event affecting the administrative county of Kent and maintains a detailed KCC Recovery Plan (a public version of this plan can be found on the Emergency Planning page of Kent.gov and the full plan can be found on the KCC page of Resilience Direct). Further, the Kent Resilience Team maintains the Pan Kent Emergency Recovery Framework, on behalf of the Kent Resilience Forum, which will inform recovery and clean-up interventions by relevant agencies following a major flooding event.

- Recommendation 83 of the Pitt Review states that "Local Authorities should continue to make arrangements to bear the cost of recovery for all but the most exceptional emergencies". KCC maintains General Funds for such unforeseeable eventualities. It is vital that excellent records are maintained for response and associated expenditure. Please see The Bellwin Scheme of Emergency Financial Assistance to Local Authorities guidance notes on Gov.uk

- In line with the KRF Severe Weather Framework, if there are significant impacts from flooding, the KCC Resilience and Emergency Planning Service, will log an event of the Severe Weather Impacts Monitoring System (SWIMS). The SWIMS system should be used by all members of the KRF (including specific services within KRF member organisations) to record how they are affected by severe weather events. This will help to inform future resilience planning and form part of the evidence for risk analysis undertaken by the Risk Assessment Group (RAG). More information on SWIMS can be found www.kent.gov.uk/SWIMS

- A model recovery agenda for a flooding event can be found at **Appendix E** of this plan.

15. Training and Exercising

- The Civil Contingencies Act 2004 Regulations require Kent County Council as a “Category 1 Responder” to include provision for training and exercises in their emergency plans.

- The corporate nature of the council’s emergency response requires that all personnel should have an understanding of emergency planning and business continuity principles. Regular training and exercise events will raise staff awareness of potential risks and provide an understanding and confidence in the council and their partners’ emergency response procedures.

15.1 Training

Emergency planning and business continuity training events are invaluable tools to raise awareness, pass on best practice and instil confidence in emergency response plans and procedures. Major emergency response can be very different from day-to-day activity in terms of management principles, pressures upon the organisation (and individual members of staff) and levels of public and media interest. It is therefore vital that all staff with a potential role in the emergency response have an understanding of emergency planning and business continuity principles. A rolling training program will be needed to account for staff turn-over, and also to ensure all staff are regularly refreshed and practiced in emergency response.

15.2 Exercising

Exercises perform a distinct training role and enhance emergency preparedness. Exercises have three main purposes: to validate plans; to develop staff competencies and provide practice in carrying out roles in emergency plans. It is important that personnel taking part in exercises should be trained beforehand. Participants should have an awareness of the council's emergency response and that of their key partners their own role within it, before they are subject to the stresses of an exercise.

There are three main exercise types comprising: seminar, table-top and live exercises.

Figure 15.3 - Training and Exercising Programme

Organiser	Title of training / exercise	Type	Date
KCC Emergency Planning / EA / Tonbridge and Malling Borough Council	Exercise Sigrun	Training exercise	30th January 2012
KCC Emergency Planning / EA / Maidstone Borough Council	Exercise Skuld	Training exercise	14th March 2012
KCC Emergency Planning / EA / Shepway District Council	Exercise Valkyrie	Training exercise	4th April 2012
KCC Emergency Planning / EA / Shepway District Council	Exercise Friia	Training exercise	26th April 2012
KCC Emergency Planning / EA / Canterbury City Council	Exercise Idun	Training exercise	9th May 2012
KCC Emergency Planning / EA / Ashford Borough Council	Exercise Ran	Training exercise	17th May 2012
KCC Emergency Planning / EA / Dartford Borough Council / Gravesham Borough Council	Exercise Sunna	Training exercise	22nd May 2012

KCC Emergency Planning / EA / Swale Borough Council	Exercise Skadi	Training exercise	23rd May 2012
KCC Emergency Planning / EA / Thanet District Council	Exercise Kara	Training exercise	30th May 2012
KCC EP / EA / Sevenoaks District Council	Exercise Atla	Training exercise	6th June 2012
KCC Emergency Planning / EA / Swale Borough Council	Exercise Sol	Training exercise	8th June 2012
KCC / EA	Kent Flood Summit	Conference	26th June 2012
KCC Emergency Planning / EA / Defra	East Coast Flooding Exercise	Table-top exercise	April 2013
KCC Resilience and Emergencies Unit	KCC Flood Response Plan Validation Training Exercise	County Emergency Centre	October 2014
Defra / EA / Kent Resilience Forum	East Coast flooding exercise	Multi-agency exercise	February 2015
Kent Resilience Forum	Exercise Ragnarok (Coastal flooding)	Multi-agency exercise	March 2015
KCC	Exercise Thor (Surface Water Flooding)	County Emergency Centre	X3 December 2015
KCC	Exercise Eastre (Surface Water Flooding)	Training exercise	(x12) April 2016 – March 2017
Kent Resilience Forum	Exercise Surge (Coastal Flooding)	Multi-agency Exercise	September 2016
Kent Resilience Forum	Exercise Surge Recovery Exercise	Multi-agency Exercise	November 2017
KCC	Exercise Tethys (Reservoir Inundation)	Table-top	November 2017
KCC / Kent Resilience Forum	Met Office Emergency Responders	Training	28th September 2018
KCC	Exercise Persephone (Flood Plan Validation)	Table-top	13th September 2019
KCC	Exercise Willow Emerald (Reservoir Inundation)	Virtual Table-top	3rd December 2020
KCC	Exercise Scarce Emerald (Reservoir Inundation)	Virtual Table-top	28th October 2021

KCC Emergency Planning	Exercise Basilea (Flood Plan Validation)	Virtual Table-top	6th December 2021
KCC Emergency Planning	Exercise Marsh Harrier (COMAH with Tidal Flooding Scenario)	Virtual Table-top	10th December 2021
KCC	'Future Flooding'	All Member Briefing	4th March 2022
KCC Emergency Planning	KCC Flood Response Plan Validation Exercise	Table-top	4th November 2022
KCC Emergency Planning	Exercise Southern Emerald (Reservoir Inundation)	Virtual Table-top	23rd May 2023
Kent Fire and Rescue Service	Flood Awareness Training Event – Road Safety Experience, Rochester	Briefings	10th October 2023

Appendix A - Resources [Assets]

The Kent Resilience Forum compiles a list each autumn of resources available to respond to severe weather, including sandbags, vehicles, pumps and welfare resources etc. The KRF Winter Capabilities spreadsheet is available on Resilience Direct Kent Resilience Forum > Kent Responses > Severe Weather Advisory Group Resources.

Appendix B - Business Continuity Management

Under the Civil Contingencies Act 2004, Kent County Council, as a Category 1 Responder, has a duty to put in place Business Continuity Management arrangements.

Business Continuity Management (BCM) provides a framework for building in resilience to an organisation and delivering a capability for an effective response to events that might threaten its business operations.

Kent County Council Directorate Business Continuity Plans include the following documents (an overview of Business Continuity Management in Kent can be found at Section 9 of the KCC Major Emergency Plan):

- Business Continuity Management Policy;
- Business Continuity Programme Management;
- Business Impact Analysis (BIA);
- Plan Scope;
- Activation Plan;
- Response Plan or Action Plan;
- Alternative Response Strategies; and
- Recovery Requirements for critical services.

Appendix C - Health and Safety

It is crucial that managers and staff prioritise health and safety when mobilised as part of an emergency response and do not place themselves or colleagues in potentially dangerous situations. Indeed, the Health and Safety at Work Act 1974 applies to all elements of the local authority response to a major incident and covers:

- safety of staff and contractors;
- safe systems of work;
- safe equipment;
- manual handling; and
- electricity at work.

Managers should ensure that a risk assessment, in compliance with current Health and Safety Executive guidance (Five Steps to Risk Assessment), is undertaken for the various elements of the Council's emergency response and that findings and actions are recorded and acted upon. Expert advice from the Council's Professional Health and Safety Officer should be sought as a matter of urgency. Health and Safety Executive Risk Assessment Guidance is held by all KCC Health and Safety Officers.

At an Operational level responding personnel should considered risks and undertake dynamic risk assessments. Potential hazards arising from major incidents could include:

- slips, trips, falls;
- debris on roads and footways and severe weather implications on all travel modes;
- extremes of temperature arising from weather emergencies;
- floodwaters and concealed risks;
- risk from fumes and noxious substances;
- explosion risk and / or unstable structures;
- acts of violence, working or travelling alone; and
- injury from traffic.

Access to safety equipment

A range of professional officers routinely carry generic protective equipment on day-to-day business including hard hats, steel toe cap boots, high visibility clothing, throw-lines, rigid and self-inflating lifejackets.

Stocks of water safety equipment, comprising throwlines, rigid and self-inflating life-jackets, are held at Borough and District Council offices for issue to personnel working on or close to water or mud. Lone working is discouraged when working close to water and mud and all personnel likely to be involved in the operational response to flooding or aquatic pollution incidents should have attended Kent County Council / Kent Fire and Rescue water safety awareness training session.

Appendix D - Risk Assessments

Kent Resilience Forum – Individual Risk Assessment (IRA)

Hazard / Threat Category	Kent Risk Ref	LRMG Risk Number(s)
SEVERE WEATHER **Local fluvial flooding**	**R82**	
Date of Revision	Next review date	
16/11/2018	18/10/2019	
Overview of hazard or threat:		
Fluvial flooding - Fluvial flooding happens when a river cannot cope with the amount of water draining into it from the surrounding land. The result is often water overtopping or breaching of a river bank or defence. Fluvial flooding can also occur from a blockage in the channel. Rivers respond to rainfall at different rates according to several factors such as land use, catchment size and topography. In some areas of London, fluvial flooding can occur within 30 minutes following the onset of rain. Some other larger rivers can take several days to reach their highest level following a rainfall event. The Environment Agency aims to provide a two hour warning of property flooding (flood warning). However, there are some rivers in Kent that can react very quickly to heavy rainfall; particularly smaller tributaries, and therefore a 2 hour lead time of property flooding occurring can sometimes be difficult to achieve.		
Key historical evidence (last 5 years or of particular note):		

• October - November 2000 - Many communities throughout Kent affected by the severe rainfall which fell on areas of Kent during the winter and spring of 2000/2001
• December 2002 / January 2003 – Over 100mm of rain fell over Southern Region resulting in flooding to around 126 properties in the Kent area.
• Summer 2007 – Exceptionally heavy rain in June and July 2007 resulted in fluvial and surface water flooding. The worst affected areas were Thames Valley, Gloucestershire, Humberside and South Yorkshire.
• Winter 2013-14 Between 17 December 2013 and 17 January 2014 more than 320mm of rain fell across the upper reaches of the Medway. The ground was saturated and rivers were high when a further 65 - 70 mm of rain fell during the severe weather on 23 and 24 December, leading to flooding in many areas. The flows in the Upper Medway were the highest ever recorded resulting in more than 700 flooded homes and businesses being flooded throughout the River Medway catchment. The worst affected locations included Tonbridge, Hildenborough and Yalding in the River Medway catchment.
• Winter of 2015 saw storms Desmond, Eva and Frank cause flooding across the north of England. December 2015 was the wettest month ever recorded in the UK, with exceptional amounts of rainfall (341mm in 24 hours in Cumbria) and record river flows flooding around 17,000 homes and businesses. Between the 5 December 2015 and 6 January 2016 the Environment Agency issued 92 severe flood warnings.

Likelihood	
Hazard	Likelihood
SEVERE WEATHER - Local fluvial flooding	**Medium (3)**
Impact:	
Summary:	
Hazard	Impact
SEVERE WEATHER - Local fluvial flooding	**Significant (4)**
Details:	
Impact associated with risk	
Primary:	

• Drowning of people, pets and livestock.
• Evacuation and temporary/long-term accommodation needs for large numbers of people.
• Major damage to property and surrounding land.
• Closure or washing away of roads, bridges, railway lines. Disruption to infrastructure – road and rail travel and community services.
• Disruption to infrastructure – road and rail travel, community and key services for a prolonged period.

• Pollution/health risks from sewerage systems, chemical stores, fuel storage tanks. Loss of (and possible damage to) telephone, electricity, gas and water supplies.
• Communities unable to function without significant support. Care required for vulnerable people.
• Long term physical and mental health effects.

Secondary

• Need for recovery strategy in aftermath of major flood. Extensive clean up and recovery costs.
• Disruption of economic life and major costs of rebuilding infrastructure.
• Public need for information, advice, benefits/emergency payments.
• Insurance implications, including help for the uninsured.
• Safety assessments/possible demolition of damaged buildings and structures.
• Shortage/overstretch of key resources (equipment and personnel) and agencies.
• Overstretch of normal communication links, including mobile phones.
• Long-term displacement of people post flooding, accommodation problems

Overall assessment:

Category:

SEVERE WEATHER

Likelihood	Impact		Risk Rating
Significant (4)	Overall		**Very High**
	Fatalities	4	
	Casualties	5	
	Economic	5	
	Social Disruption		
	Psychological	4	

Controls in place

Individual contingency plan or wider information can be obtained from the KRF capability requirements matrix's.

Local plans:
EA
NHS
LA Flood plans

KRF Plans:
KRF Evacuation and Shelter and Transport plan

KRF Identifying Vulnerable People plan
KRF Media and Communications Plan
KRF Multi Agency Flood Plan
KRF Pan Kent Strategic Emergency Response Framework
KRF Pan Kent Emergency Recovery Framework
KRF Severe weather framework

Kent Resilience Forum – Individual Risk Assessment (IRA)

Hazard / Threat Category	Kent Risk Ref	LRMG Risk Number(s)
Coastal Flooding	**R81**	
Date of Revision	Next review date	
08/02/2019	01/11/2019	

Overview of hazard or threat:

Assumes:
- *Up to 4 days of advanced severe weather alerts from the Met Office*
- *Severe Flood Warnings issued up to 24 hours in advance by the Environment Agency*
- *Storm tide forecasting service shows risk of over-topping (up to 8hrs lead time).*
- *Rescue can only be by boat, helicopter or high-clearance vehicles.*
- *Emergency services affected if located in the flood zone.*
- *Evacuation warnings given to emergency services (as little as 1 hour)*
- *Multiple failure (breaches) of flood defence systems and significant overtopping.*
- *Damage or failure at: several sites of telecommunications, electrical sub-stations, water and sewage treatment works, road bridges and rail embankments, rendering these essential services inoperable for up to 14 days.*
- *Closure of key and essential transport routes for up to 5 days leading to national disruption to commuters and supplies of goods and services.*
- *There are hospitals, schools, shops and industrial/ commercial premises in the flooded area (& possibly rest centres).*
- *'Properties' includes occupied mobile homes and caravans sites in low-lying coastal zones (summer tourists).*

Key historical evidence (last 5 years or of particular note):

• January 1953 - Severe flooding caused by a massive surge tide devastated North and North East coastal areas of Kent ,having taken the lives of 300 people in East Anglia and then continued onto Holland and took a further 1,800 lives.
• December 2013 - The storm that hit the UK, on Thursday 5th and Friday 6th December 2013 resulted in the most serious tidal surge in over 60 years.
• Record sea levels were recorded in a number of locations. In some places levels were higher than the destructive floods of 1953. 58 properties (42 residential, 16 commercial) were flooded during the tidal surge in the Kent and South London Area.
• At Dover the tide was the highest seen since 1905 and flooding was experienced in Strood, Conyer, Faversham and Sandwich.

Likelihood	
Hazard	Likelihood
	Medium (3)
Impact:	
Summary:	
Hazard	Impact
	Significant (4)
Details:	
Impact associated with risk	
Primary:	
• Drowning of people, pets and livestock • Major damage to property and surrounding land • Closure, or washing away, of roads, bridges, railway lines • Loss of (and possible damage to) telephone, electricity, gas and water supplies	

Secondary
• Pollution/health risks from sewerage systems, chemical stores, fuel storage tanks • Evacuation and temporary / long-term accommodation needs • Disruption of economic life and major costs of rebuilding infrastructure

Overall assessment:			
Category:			
SEVERE WEATHER			
Likelihood	Impact		Risk Rating
Significant (4)	Overall	4	**Very High**
	Fatalities	4	
	Casualties	4	
	Economic	4	
	Social Disruption		
	Psychological	4	

Controls in place

Individual contingency plan or wider information can be obtained from the KRF capability requirements matrix's.

Local plans:
EA
NHS
LA Flood plans

KRF Plans:
KRF Evacuation and Shelter and Transport plan
KRF Identifying Vulnerable People plan
KRF Media and Communications Plan
KRF Multi Agency Flood Plan
KRF Pan Kent Strategic Emergency Response Framework
KRF Pan Kent Emergency Recovery Framework
KRF Severe Weather Framework

Kent Resilience Forum – Individual Risk Assessment (IRA)

Hazard / Threat Category	Kent Risk Ref	LRMG Risk Number(s)
Surface Water Flooding	**R83**	

Date of Revision	Next review date
08/02/2019	23/11/2020

Overview of hazard or threat:

Surface water flooding caused by a warm unstable atmosphere, most likely to occur in summer due to the warmer atmosphere having a greater water holding capacity, causing a pattern of consecutive convective rainfall events. These events result in a pockets of high intensity rainfall in the south east of England and includes rain gauges recording exceptional levels of rainfall over a short duration.

The following description is based on the risk in London, where the most severe impacts may occur, although other neighbouring LRF's Hertfordshire and Thames Valley are named. Given the proximity of Kent to the capital and the density of urban developments in North Kent and other locations in the county, this should be considered;

Flooding of up to 87,000 properties and 21,000 businesses (108,000 properties in total). Just over 40 fatalities and thousands of casualties. Evacuation of up to 314,000 people (25,000 of which may require additional assistance). Short to medium term shelter requirements for 117,000 residents, people leaving the area create the possibility of disruption and extra policing needed. Closure of schools in affected area for over 1 month.

Surface water flooding is caused when the volume of rainwater falling does not drain away through the existing drainage systems or soak into the ground, but lies on or flows over the ground instead. This type of flooding is usually short lived and associated with heavy downpours of rain and thunder storms (convective rainfall events).

Convective rainfall events are challenging to predict, often due to the short timescales upon which they occur. Although models are able to predict total amounts of consecutive rainfall, it is more difficult to predict exactly where rainfall may occur, due to its localised nature, particularly across shorter timescales of a few hours. These types of event are likely to increase in the future due to the warming climate.

The Environment Agency report on 'Managing flood and costal erosion risks in England: April 2014 to March 2015' states that some 2.4m homes and 600,000 businesses are at risk of flooding in England and Wales from surface water.

Key historical evidence (last 5 years or of particular note):

• Folkestone August 1996 – Pent Stream and the immediate catchment caused significant surface water flooding at the bottom of Blackbull Road trapping people in their homes

• October - November 2000 - Many communities throughout Kent affected by the severe rainfall which fell on areas of Kent during the winter and spring of 2000/2001

• December 2002 / January 2003 – Over 100mm of rain fell over Southern Region resulting in flooding to around 126 properties in the Kent area.

• Summer 2007 – Exceptionally heavy rain in June and July 2007 resulted in fluvial and surface water flooding. The worst affected areas were Thames Valley, Gloucestershire, Humberside and South Yorkshire.

• Winter 2013-14 - Between 17 December 2013 and 17 January 2014 more than 320mm of rain fell across the upper reaches of the Medway catchment, the ground was saturated and rivers were high when a further 65 - 70 mm of rain fell during the severe weather on 23 and 24 December, leading to flooding in many areas. With these amounts of rainfall, flooding from all sources, surface water, groundwater, drainage systems and river systems is inevitable.

• The winter of 2015 saw storms Desmond, Eva and Frank cause flooding across the north of England. December 2015 was the wettest month ever recorded in the UK, with exceptional amounts of rainfall (341mm in 24 hours in Cumbria) and record river flows flooding around 17,000 homes and businesses. Between the 5 December 2015 and 6 January 2016 the Environment Agency issued 92 severe flood warnings.

Likelihood	
Hazard	Likelihood
	Medium (3)

Impact:	
Summary:	
Hazard	Impact
	Moderate (3)

Details:

Impact associated with risk

Primary:

Economic and Political

• Loss of assets

• Loss of business (denial of access to premises and lost working hours)

• Cost of temporary accommodation

Health

• Just over 40 fatalities and thousands of casualties (around 80% less severe or from indirect trauma)

Social

• Disruption to transport (potentially severe and widespread)

• Potential for impact to drinking water supplies and sewerage systems

• Some disruption to power supply

• Disruption to road deliveries driving the fuel score

• Disruption to the distribution of essential food stuffs and medical supplies where these relied on regular delivery
• Closure of businesses
• Flooding of major hazard sites (e.g. chemical installations) and waste treatment works
• Possible failure of telecommunication systems regionally
• Just over 40 fatalities and thousands of casualties
• Evacuation of up to people (some of whom may require additional assistance). Short to medium term shelter requirements for residents, people leaving the area create the possibility of disruption and extra policing needed
• Closure of schools in affected area for over 1 month

Environment
• Potential for environmental damage/contamination of habitat and heritage sites

Secondary

• Need for recovery strategy in aftermath of major flood
• Disruption of economic life and major costs of rebuilding infrastructure
• Public need for information, advice, benefits/emergency payments
• Insurance implications, including help for the uninsured
• Safety assessments/possible demolition of damaged buildings and structures
• Shortage/overstretch of key resources (equipment and personnel) and agencies
• Overstretch of normal communication links, including mobile phones.

Overall assessment:

Category:

SEVERE WEATHER

Likelihood	Impact		Risk Rating
	Overall	3	High
	Fatalities	2	
	Casualties	4	
	Economic	4	
	Social Disruption		
	Psychological	3	

Controls in place
• Flood and Water Management Act 2010
• The Flood Risk Regulations 2009
• Land Drainage Act 1991
• Water Resources Act 1991
• Civil Contingencies Act

Local plans:
Local Authority Multi Agency Flood plans

KRF Plans:
KRF Evacuation and Shelter and Transport plan

KRF Humanitarian Assistance
KRF Identifying Vulnerable People plan
KRF Media and Communications Plan
KRF Multi Agency Flood Plan
KRF Pan Kent Strategic Emergency Response Framework
KRF Pan Kent Emergency Recovery Framework
KRF Severe weather framework
KRF STAC

Kent Resilience Forum – Individual Risk Assessment (IRA)

Hazard / Threat Category	Kent Risk Ref	LRMG Risk Number(s)
Reservoir/dam collapse	**R74**	

Date of Revision	Next review date
2015	2018

Overview of hazard or threat:

Assumes:

- No time to evacuate.
- Flooding lasts less than 24 hours.
- Emergency services not pre-warned
- Extent of downstream effect could reach 50-60km.

Significant damage to gas, electricity supplies, telecommunications, road and rail links.

Key historical evidence (last 5 years or of particular note):

National events

Major flood events (e.g. summer 2007, autumn 2000, Easter 1998) are likely to have resulted in localised flooding downstream of reservoirs.

The following events are well documented due to the occurrence of fatalities:

Bilberry 1852: 81lives lost

Dale Dyke 1864: 250 lives lost 798 houses destroyed

Eigiau and Coedty 1925: 16 lives lost

Skelmorie 1925: 5 lives lost

Ulley 2007. Led to the closure of the M1 between junction 32 and 36, and over 700 local residents being evacuated from their homes

The introduction of the 1930 and subsequently the 1975 Reservoirs Act has led to a reduced likelihood of reservoir failure. However a significant amount of development in the flood plain of reservoirs over the last century has increased the impact of any failure.

Likelihood

Hazard	Likelihood
	Low (1)

Impact:

Summary:

Hazard	Impact
	Moderate (3)

Details:

Impact associated with risk

Primary:

- Drowning of people, pets and livestock
- Major damage to property and surrounding land
- Closure, or washing away, of roads, bridges, railway lines
- Loss of (and possible damage to) telephone, electricity, gas and water supplies
- Pollution/health risks from sewerage systems, chemical stores, fuel storage tanks
- Evacuation and temporary/long-term accommodation needs
- Potential damage to EU environmental designations

Secondary

- Need for recovery strategy in aftermath of major flood
- Disruption of economic life and major costs of rebuilding infrastructure
- Public need for information, advice, benefits/emergency payments
- Insurance implications, including help for the uninsured
- Safety assessments/possible demolition of damaged buildings and structures
- Shortage/overstretch of key resources (equipment and personnel) and agencies
- Overstretch of normal communication links, including mobile phones

Overall assessment:

Category:

SEVERE WEATHER

Likelihood	Impact		Risk Rating
	Overall	1	**Medium**
	Fatalities	4	
	Casualties	3	
	Economic	3	

	Social Disruption	3	
	Psychological		

Controls in place

Individual contingency plan or wider information can be obtained from the KRF capability requirements matrix's.

Local plans:
KCC Reservoir Plan
Individual Reservoir Plan

KRF Plans:
KRF Media and Communications Plan
KRF Multi Agency Flood Plan
KRF Pan Kent Strategic Emergency Response Framework
KRF Pan Kent Emergency Recovery Framework
KRF Evacuation and Shelter Plan
KRF Identifying Vulnerable People Plan

Appendix E - Kent County Council Flooding Event Model Debrief Agenda

Incident:

Date of Debrief:

Chair:

Secretary:

Present:

1. Introductions and apologies (Chair / All)

2. Background (Chair)

3. Effectiveness of alerting and mobilisation (by Team)

4. Command and control
   - what went well (by Team)
   - what went badly (by Team)

5. Recovery
   - what went well (by Team)
   - what went badly (by Team)

6. Recovery
   - what went well (by Team)
   - what went badly (by Team)

7. Did any best practice emerge during response and/or recovery (Chair / All)?

8. Are changes required to KCC Flood Response Emergency Plan (Chair / All)

9. Implications for future training and exercising (Chair / All)

10. Run through and refinement of recommendations arising from Debrief (Chair/All)

11. Outline next steps and close meeting (Chair)

Appendix F - Extended Floodline Service

Extended Floodline Service: Background

July 2018

What is Floodline?

Floodline is a 24/7 telephone service providing up to date flood warning information and answering general flood related enquiries on behalf of the Environment Agency (EA), Natural Resources Wales (NRW) and the Scottish Environment Protection Agency (SEPA).

When calling Floodline, customers are given six options. From here, the majority of callers tend to use two main routes:

Floodline
0345 988 1188

- Option 1 - to listen to recorded information on the current flood warnings and alerts in force
- Options 3 and 4 - to the call centre, to set up or amend a flood warning registration, find out about their long term flood risk or to get general flood related advice and information (e.g. how to prepare for flooding).

Options 2 and 6 give pre-recorded advice on what to do before, during and after a flood, as well where to go to find road and travel information. Option 5 provides access to the Welsh language service.

The majority of calls are handled by a dedicated team of agents who only deal with Floodline calls. They are supported by a wider pool of agents who are fully trained in taking Floodline calls and also flood event trained agents, who are trained to answer the most common flood event enquiries such as how to prepare for flooding, how to find out the latest situation and directing reports of flooding.

The Floodline call centre experiences varying call volumes handling between 10,000 - 80,000 calls per year (plus an additional 4 times this number accessing the recording situation information), and a peak recorded number of 9,000 calls in one day.

Customer satisfaction scores are consistently extremely high and it is this dedication to continued excellent customer service which makes EFS important to us.

"I just wanted to say the adviser was brilliant - knowledgeable, patient, listened to me and explained things to me. Wonderful, wonderful, wonderful" (June 2017).

"It is very reassuring to have somebody personal at the end of the line, extremely important when people are stressed and in quite a lot of worry about flooding and I feel much more secure that I've got that back up. Thank you" (Oct 2017)

customer service line	incident hotline	floodline
03708 506 506	0800 80 70 60	03459 88 11 88

www.gov.uk/environment-agency

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What can the Floodline call agents do for callers?

The call agents can provide the following information to callers:

- Confirm and explain the long term flood risk at the location of the caller's property or a property/location they are interested in
- Confirm which flood warnings and alerts are currently in force which may affect the caller, and provide the latest available information on the situation
- Provide advice on where the caller can obtain further information online about flood warnings in force
- Register a caller to receive flood warnings (by telephone, text and email) or make amendments to existing customer's accounts.
- Provide advice on how callers should prepare for flooding and what actions they should take during and after a flood
- Provide general advice on surface water flooding (e.g. who is responsible and how the surface water maps are produced), and other sources of flooding
- Pass reports of flooding from rivers or the sea to our Incident Hotline so that these can be logged and passed to the relevant local Area team if further action is required
- Pass reports of blockages in rivers which may result in or exacerbate flooding to our Incident Hotline so that action can be taken (where possible)
- Arrange for further information to be provided to the caller by the relevant Area office (e.g. to obtain a report for home insurance or regarding a planning application)
- Provide advice on who the caller needs to speak to if they are unsure of the responsibilities of responding organisations

Callers should not be advised to call Floodline simply if your organisation is unable to help them any further. They should only be told to call Floodline if they require any of the information listed above that falls under the EA/NRW's remit.

Why do we need EFS?

Feedback from previous flood events tells us that many people are passed from one organisation to the other when they are trying to obtain information. The public often do not know the different responsibilities of organisations who respond to flooding, and as Floodline is often the most visible number, they are asked a lot of questions for which they do not have the answers.

What the Floodline call agents cannot do for callers

Members of the public should not be advised to contact Floodline for the following:

- To arrange for water to be pumped out of flooded homes and businesses
- To report flooding when the source is known to be from surface water, the sewer system, a burst water main or any other source except rivers or the sea
- To arrange for blockages in drains, non-main rivers and other structures not maintained by the EA/NRW to be cleared
- To arrange for assistance with evacuations to rest centres

What we would like the call agents to be able to do for callers through EFS

The aim of EFS is to improve the experience for callers whose query is outside Floodline's remit, and who we would otherwise have to redirect - specifically those who we may advise to contact their Local Council. Through EFS, we would like to be able to provide the answers to common and frequently asked questions regarding those things that may fall under the Local Council remit while educating them in who to contact in the future, such as:

- Sandbags or property level protection
- Drains, culverts, sewers or water mains**
- Surface water flooding, flooded properties or flooded roads
- Evacuation, rest centres, helping vulnerable people or longer term assistance
- Recovery following flooding
- Contacting the council or community assistance

These are the questions most frequently asked where we have to ask the caller to contact their council or other third party. **Signposting to third party organisations can be added to EFS, where it is locally specific, and provides only publically available details - for example the name and number of the local water company.

How does the service work?

The Floodline agents have an existing knowledgebase of frequently asked questions provided by the EA, NRW and SEPA.

EFS uses a series of topics for Local Councils to add local information to supplement the general information already available to the Floodline agents. This is then added into the knowledge base of information used by the agents to handle calls.

When a customer calls the Floodline call centre, they are asked to provide a postcode so that agent can provide location specific flood related information. It will also tell them who their Local Council is and whether they have provided information via EFS.

The agent can then use the EFS section to provide the information as required. If the information is not available or the caller requires further help, the call can be transferred to the local council. If a transfer is not possible the agent can email you on behalf of the caller. Transfers or emails can only take place if the local council has allowed us to do so by providing contact details and opening times.

For further information on the Topics that Local Councils can add via EFS, please read the document '**Knowledgebase Content - guidance on what information to provide for EFS**'.

What are the benefits of EFS?

- Enables the public to obtain locally specific information alongside general advice in the same call
- Saves callers time and reduces possible frustration and anxiety
- Helps educate callers as to where to obtain this information in the future
- Free for Local Councils to join
- No training or log in details needed

How to join EFS

Local Councils, including County Councils have two options to join the service. Using the template provided, you can choose to complete the FAQs section only, or you can additionally complete the Transfers section with contact details (telephone and email) for the Floodline agents to use to transfer callers. The agents cannot see the contact details you supply so these details will not be given to the public (unless you also include them in the answers to your FAQs).

In two-tier areas, information for County Councils and District Council can either be collated under the county council, or separately. However, councils must liaise with each other to avoid significant duplication or contradicting pieces of information. The Floodline agents are trained on the different roles of single and two-tier councils but there should be a clear distinction in your FAQ content. Transfer details must be associated to the relevant individual council.

How much of your time will EFS take up?

To join the EFS you will need to do the following:

- Read the background information and guidance materials provided.
- Write the FAQs for your council using complete the template provided (with or without contact details for transfers). Review the Terms of Service included on the template.
- Send your information to the local EA/NRW rep who will pass it to the National Flood Risk Services team, NFRS, (fwisteam@environment-agency.gov.uk) for checking and uploading.
- Incorporate EFS into your incident management arrangements - should the need arise, you can request urgent information to be briefed out to the Floodline agents as a temporary bulletin (eg major evacuations required) via the template provided.
- Review your FAQs when requested (every 12 months), or whenever changes are required.

Need further help?

If you have any further questions about the purpose of EFS and how it works, please contact your Environment Agency/NRW Area Primary User, or email fwisteam@environment-agency.gov.uk

Kent County Council Flood Response Plan

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Plan owner: Director of Infrastructure, Strategic and Corporate Services