Kent and Medway Offsite Reservoir Inundation Emergency Plan

Version 4.3
December 2024

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

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Next scheduled review: December 2025

KCC Resilience and Emergency Planning Service are accredited under ISO14001

(Environmental Management)

Issue & Review Register

Summary of changes	Issue number & date	Approved by
V. 2 Complete overhaul and re-draft **Lead officer**: T. Harwood	September 2016	Group Head Public Protection
V. 3 Comprehensive update and reservoir specific appendices added **Lead officer**: T. Harwood	October 2017	Head of Resilience and Emergency Planning Service/KCC and KRT Manager
V. 4 Major review against existing KRF plans and updates to reservoir specific appendices **Lead officer**: L. Newman	April 2018	Head of Resilience and Emergency Planning Service/ KCC and KRT Manager
V. 4.1 Minor review and update to whole document including contact details **Lead officer**: A. Butfoy	August 2019	
V 4.2 Full review and update to plan, including incorporation of new EA reservoir maps **Lead officer:** L. Newman	November 2021	
V 4.3 review and update to plan, including site specific appendix amendments due to update onsite plans	December 2024	

NOTE: The latest version of this full plan can be found on Resilience Direct with a public version on Kent.gov.

Resilience Direct>>Planning>>Organisations>>England>>South East>>Kent County Council>>Secure Page>>Emergency Plans

Next review scheduled: December 2025

Compiled by: **Date: 15TH December 2024**

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Contents

1. Generic Triggers Actions and Information

1.1 Introduction

This Plan addresses planning for, response to and recovery from, offsite reservoir inundation emergencies occurring within (or impacting upon) the administrative boundaries of Kent and Medway.

1.2 Legislation & Guidance

A range of legislation and regulation informs reservoir inundation planning and response including:

Civil Contingencies Act 2004

The Civil Contingencies Act 2004 places a duty on responding organisations to have robust arrangements in place for risk assessment, planning, response, recovery, training and exercising (including command and control). This Plan is written in accordance with the requirements of the Act.

The Reservoirs Act 1975 (as amended by the Water Act 2003)

The Reservoirs Act provides for Ministers to direct undertakers of large raised reservoirs (i.e. retained waters with volumes exceeding 25,000 cubic metres) to draw up On-Site Flood Plans setting out what actions the undertaker should take in the event of a potential or actual uncontrolled release of water; this includes maintaining contacts with Category 1 responders as defined within the Civil Contingencies Act 2004. Under the provisions of this Act reservoirs are categorised using the alphabetical notation outlined in Table 1.1 below.

Table 1.1 Reservoirs Act Categories

Dam Category	Potential Effect of Dam Breach
A	Where a breach could endanger lives in a community. We consider a community to be not less than 10 people.
B	Where a breach: • Could endanger lives not in a community (usually inhabitants of isolated houses and operatives in treatment works immediately below the dam and in other places of work in the flood path) • Could result in extensive damage including erosion of agricultural soils and the severing of main road or rail communications.
C	Where a breach would pose negligible risk to life and cause limited damage. Therefore, this includes flood-threatened areas that are 'inhabited' only spasmodically. For example, footpaths across the flood plain and playing fields. In addition, this category covers loss of livestock and crops.
D	Special cases where no loss of life can be foreseen as a result of a breach and very limited additional flood damage would be caused. Many small reservoirs with low earth dams may cause no real problem, except that of replacement, if they wash out.

	The point of assessment for whether the damage is significant or not can be taken as the first site below the dam at which some feature of value exists (for example, a mill or road bridge).

The Flood and Water Management Act 2010

This Act incorporates references to planning for reservoir inundation emergencies. Key provisions within the Act include:

- All undertakers with reservoirs over 25,000m³ must register their reservoirs with the Environment Agency;
- Inspecting engineers will have to provide a report on their inspection within 6 months of registration;
- Where directed, undertakers will need to prepare a reservoir flood plan (the 'on-site' plan); and
- All incidents at reservoirs must be reported to the Environment Agency.

Framework for Reservoir Inundation Preparedness Planning (Cabinet Office: October 2009)

This guidance confirms upper tier / single tier local authority responsibility for maintenance of offsite reservoir inundation plans and co-ordination of offsite planning within their administrative boundaries.

In summary, upper tier / single tier local authorities have a legal duty to maintain a generic off- site reservoir plan, with *Category A* reservoirs subject to site specific planning.

1.3 Scope

This plan covers pre-planning, activation, alerting, management, co-ordination and recovery aspects of reservoir planning and response. It also provides a brief description of the mechanics and process involved within the multi-agency response (alerting, evacuation, rescue, welfare etc.). Full details of multi-agency response are described in the KMRF Pan-Kent Emergency Response framework.

The plan is sufficiently flexible to cover a range of eventualities and details statutory duties and response obligations. The plan details the procedures to facilitate a co-ordinated multi-agency response to the off- site consequences of a potential or actual dam breach at a reservoir either:

- Within the Kent County Council and/or Medway Council administrative area; or
- Whose water course may inundate areas within the Kent County Council and/or Medway Council administrative area.

Site specific information for all such 'large raised reservoirs' is held in an accompanying spreadsheet satisfying the Cabinet Office guidance.

1.4 Aim & Objectives

The aim of this plan is to provide clear definitions of the roles, responsibilities and actions for responding agencies at the pre-planning, response and recovery stages of a reservoir emergency. To achieve this, it will:

- Outline key principles of pre-planning for a reservoir inundation emergency;
- Describe the actions of the first responders on the scene and/or to receive the incident notification;
- Provide a response escalation procedure to cover actions from the initial alert through to stand-down and post-incident recovery;
- Set-out the multi-agency co-ordination and control arrangements at each level of response;
- Specify the manner in which warnings may be communicated to the public and partner agencies in an accessible and consistent fashion;
- Provide contact details to facilitate an efficient call-out of resources; and
- Outline key principles of recovery for a reservoir inundation emergency.

1.5 Audience

This document is intended for those Kent County Council and Medway Council personnel and multi-agency partners' partners that would participate in and support pre-planning, response and recovery to a reservoir emergency.

1.6 Scenarios

1.6.1 Types of Dam Breach

The Reservoir Supervisor will inform the Supervising Engineer when a dam breach is believed to be likely to occur.

- **A complete collapse of a dam wall and a sudden inundation of water:** If a complete collapse occurs without warning or is forecast, available inundation velocity details and maps (potentially combined with the predicted period of time until collapse) will indicate how much time is available to evacuate downstream properties.

- **A slow onset reservoir emergency**: In a slow onset emergency, i.e. where water is escaping as the result of an uncontrolled or emergency draw-down. The dam will continue to be monitored to assess the risk of a major failure.

1.6.2 Dam Break Analysis

Maps have been informed by the findings of a formal dam break analysis undertaken on behalf of the Environment Agency and informed by the following planning principles:

- An assessment of the effects of two dam breach scenarios

  'Dry day' breach – This would occur in dry weather conditions, suggesting the breach is not a result of increased flows into the reservoir. Downstream conditions are normal.

  'Wet day' breach – This describes a dam failure during a flood event, suggesting the breach may be the result of the increased flows entering the reservoir. Downstream conditions could already be experiencing high flows and flooding.
- Routes of the likely water flow, through inundation maps, identifying potential hazard areas, assets at risk and total (and partial) structural destruction;

- Estimates the size of the population potentially affected, thus enabling assessment of risk to life for the 'worst case' scenario;
- Features likely to affect mobility and evacuation during and after the event.

1.6.3 Multiple Dam Breach Locations

In some cases, reservoirs may have multiple possible breach locations. This will be indicated on the maps, which should model several potential breach sites. In the event of a breach, the panel engineer will interpret the maps to assess water flow in the immediate vicinity of the reservoir. Beyond the immediate locality the inundation will follow the course indicated on the maps.

1.7 Consequences of Reservoir Inundation Emergency

1.7.1 Specific Downstream Impacts

All the listed reservoirs, in **section 1.11 (page 10)**, retain a volume of water greater than 25,000m^3 and are classified as 'large raised' reservoirs under the Reservoirs Act 1975. Reservoir inundation may impact on downstream areas in a range of ways:

- Deaths and/or injuries amongst population caught in flood wave;
- Flooding, structural damage or total destruction of a number of properties;
- The severing and/or inundation of key parts of the local transport infrastructure, including arterial roads, bridges and railway lines. Closures of key parts of the transport network, such as major arterial roads and bridges linking different areas could compromise the ability of key agencies to respond and deploy their resources where these are needed; and
- The severing and/or inundation of key parts of the local utility infrastructure (electricity, gas, water and telecommunications). Even where no infrastructure assets are identified above ground within the inundated area, underground assets may still be susceptible. A dam breach may result in the severing of power cables or inundation of electricity sub-stations supplying large numbers of the population. This has the potential to cause discomfort to a wider population and complicate the response. A loss of telecommunications would complicate this further.

1.7.2 Different Characteristics of Reservoir Inundation from Fluvial and Coastal Flooding

The impact of flooding caused by a dam breach is likely to differ from conventional fluvial and coastal floods and is comparable to rapid response catchment flooding events. Key differences include:

- The difference in the speed of development of the emergency, the potentially sudden rise of water and the time available for evacuation;
- The increased force of the water being likely to lead to the total destruction of buildings near the dam, reducing to partial structural damage and inundation damage with distance downstream; and
- The increased impact on infrastructure, such as roads, railways, electricity, gas, (waste) water, sewerage, telecommunications and other essential services.

1.8 Planning Assumptions

1.8.1 Flood Warnings

There could be a collapse without warning. Although there are some scenarios where there may be some warning, **see 1.6.** Currently reservoirs are not on the Environment Agency Flood Warnings Direct services. So, the public would not currently receive warnings for reservoir inundation. Therefore, alternative means for warning and informing the public will have to be considered in the event of a breach.

1.8.2 Flood Rescue

Assumes the use of only flood rescue teams (whether from the Fire & Rescue Service or voluntary sector) that are on the forthcoming Flood Rescue National Asset Register and meet the relevant team typing standard (not self-presenting operators whose standard of training and equipment will be unknown).

The National Asset Register will contain the details of all flood rescue responder teams that have met the required national standards for the relevant team type. The team types include a water rescue boat team (Type B) and a water rescue technician team (Type C).

In the event of major or wide area flooding, where flood rescue mutual aid is needed to support local resources, the relevant **incident commander should contact the Fire & Rescue Service National Co-ordination Centre (FRSNCC) in line with the Guidance for Accessing Specialist Flood Rescue Mutual Aid**. The FRSNCC will evaluate the request and consider assembling typed teams listed in the National Asset Register.

The number of typed teams available to respond to a particular flood incident will depend on the number of other impacted authorities and the number of types teams available on the Register at any one time (teams which are not available for a period exceeding four hours are removed from the ‘live’ Register).

1.8.3 Infrastructure

This plan does not take into account damage or failure at sites of telecommunications, power stations, and road or rail links. It is expected that this will be dealt with by the relevant utility/agency or responding organisation. Information, as far as it is available, for key infrastructure is included in this plan, including reference to its vulnerability. Further information is held at the Strategic Co-ordinating Centre by the police.

1.8.4 *Who to Warn and Inform – Public Information Zones*

Information on the public information zones in a reservoir emergency can be found in the “Guidance on Reservoir Emergencies – Warning and Informing the Public” on the Gov website.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/62234/reservior-warning-informing-guidance.pdf

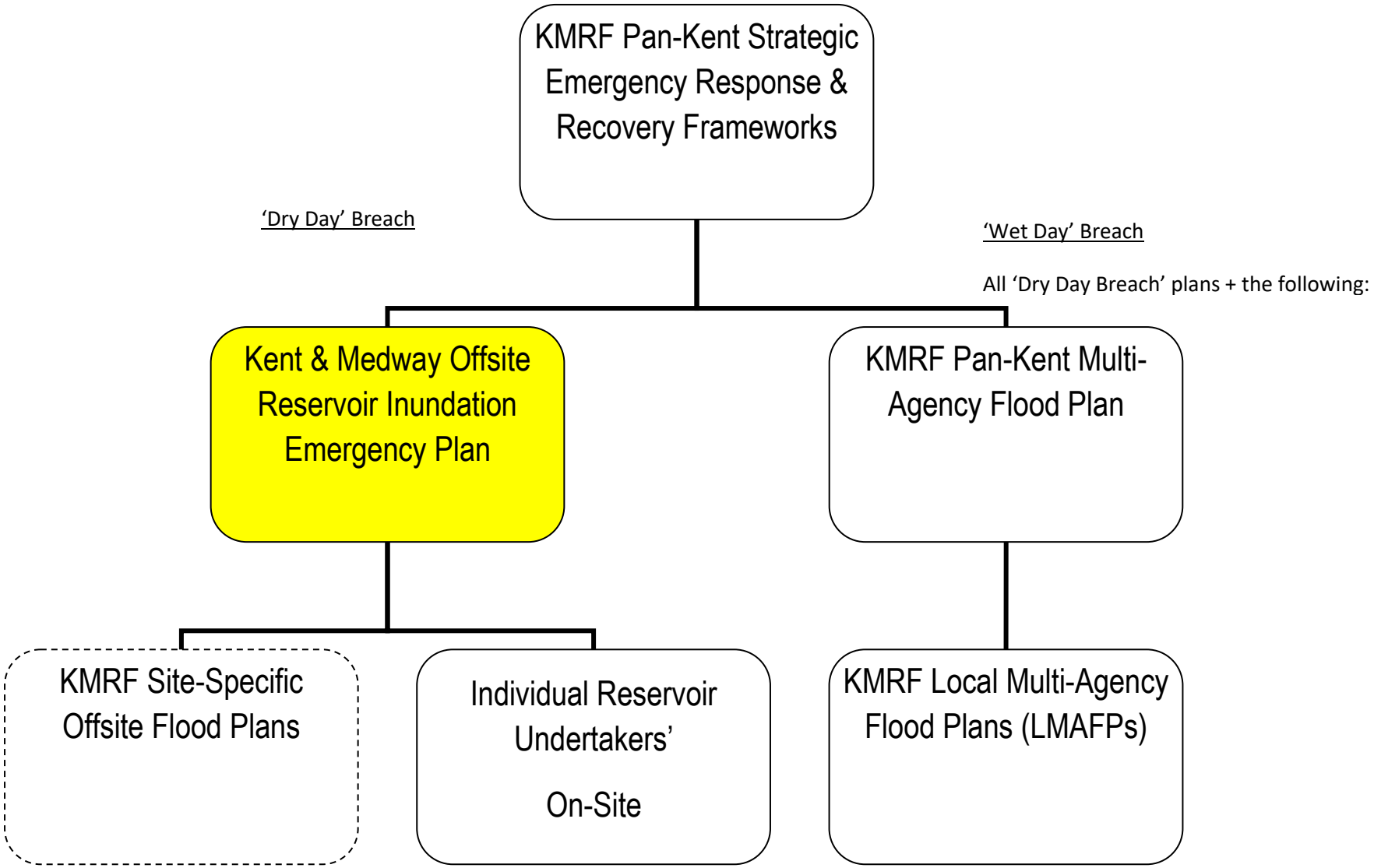
1.9 Inter-relationship between single agency Emergency Plans

The plan acknowledges that each responding organisation has its own systems and procedures for responding to an emergency. The procedures outlined in this plan describe how these arrangements are co-ordinated and seeks to ensure that respective agency roles and their inter-dependencies are widely understood.

This plan can be used as stand-alone or linked to other plans as shown in figure 1.1.

Figure 1.1: Related and Interdependent Plans

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


KMRF Pan-Kent Strategic Emergency Response & Recovery Frameworks
'Dry Day' Breach
'Wet Day' Breach
All 'Dry Day Breach' plans + the following:
Kent & Medway Offsite Reservoir Inundation Emergency Plan
KMRF Pan-Kent Multi-Agency Flood Plan
KMRF Site-Specific Offsite Flood Plans
Individual Reservoir Undertakers' On-Site
KMRF Local Multi-Agency Flood Plans (LMAFPs)

1.10 Reservoir Locations

The Resilience and Emergency Planning Service hold a separate spreadsheet containing all site specific information of each reservoir referred below, utilising detail from each individual onsite plan.

1.10.1 Reservoirs within Kent County Council administrative area

There are currently 47 reservoirs within the administrative county of Kent, (please see **Figure 1.2** for map showing the location of these reservoirs

Aldington - Ashford .
Bayham Lake – Bayham Abbey, Tunbridge Wells .
Bedgebury Park Great Lake – Bedgebury, Tunbridge Wells .
Bough Beech – Nr. Edenbridge .
Brook Farm - St Nicolas-at-Wade .
Cheveney Farm Upper Lake – Nr. Sevenoaks .
Churches Reservoir - Maidstone .
Coombe Bank Lake – Nr. Sevenoaks .
Coult Stream Dam – East Peckham, Tonbridge and Malling .
Culnell's Fishing Lake – Nr. Iwade .
Dreamfields (ID370) – Linton, Maidstone .
Dunorlan Park Lake – Tunbridge Wells .
Eastwell Lake – Nr. Ashford .
Faringham Hill Number 2
Fowlers Field Reservoir – Ulcombe
Furnace Pond - Horsmonden .
Hart Reservoir – Nr. Folkestone .
Hever Castle Lake – Hever Castle nr. Edenbridge .
Hothfield Flood Storage Area – Nr. Ashford .
Kemsley Mill Lagoon 1 – Kemsley, Sittingbourne .
Knockholt No.2 – Nr. Westerham, Sevenoaks .
Leeds Castle Moat –Leeds, Maidstone .
Leigh Barrier FSR Reservoir– Medway .
Little Cheyne Court – Nr. Camber .
Little London Reservoir
Mill Leese Flood Storage Reservoir - Saltwood .
Monk Lake 2 (aka Riverfield) – Nr. Marden
Morghew Farm Reservoirs – Nr. Rolvenden, Ashford .
Mote Park Lake (ID398) - Maidstone .
Northwood Lagoon (aka Plenty Brook Lagoon) – Herne Bay, Canterbury .
Oakleigh (ID289) – Nr. Gravesend .
Parkwood Farm Reservoir- Boughton Monchelsea
Pembury 1 and 2 – Pembury .
Plenty Brook – Herne Bay .
Redwalls Lower – Linton, Maidstone .
Redwalls Upper – Linton, Maidstone .
Sheerland Farm Dam – Pluckley, Ashford .
Style Place Farm - Tonbridge
Surrenden Lower Lakes – Bethersden, Ashford .
Thanet Earth No. 2 – Birchington .
Thanet Earth No. 3 - Birchington .

Thanet Earth No. 5 – Birchington .
Thanet Earth No. 6 – Birchington .
Thanet Earth No. 7 – Birchington.
The Ringles – Nr. Headcorn, Maidstone .
Updown Farm – Deal, Dover .
Weirton Hill - Boughton Monchelsea, Maidstone .

1.10.2 Reservoirs located within the Medway Council administrative area

The following 6 reservoirs are located within the Medway Council area (please see **Figure 1.2** for map showing the location of these reservoirs

- Ashing Lagoons 1A – Nr. Rochester
- Ashing Lagoons 1B – Nr. Rochester
- Ashing Lagoons 2A – Nr. Rochester
- Ashing Lagoons 2B – Nr. Rochester
- Bromhey Farm Reservoir – Nr. High Halstow .
- Wall End – Isle of Grain

1.10.3 Reservoirs in neighbouring Local Authority Areas potentially impacting upon Kent

The following 15 reservoirs are located within neighbouring counties but could potentially impact Kent (please see **Figure 1.2** for map showing the location of these reservoirs

- Bay Pond – Nr Godstone, Surrey
- Bewl Bridge – Nr. Tunbridge Wells, East Sussex .
- Buckhurst Park Lake – Nr. Hartfield, East Sussex .
- Danson Park Lake – Bexleyheath, London Borough of Bexley .
- Darwell – East Sussex
- Hall Place Flood Storage Reservoir – Crayford, London Borough of Bexley .
- Hedgecourt Lake - Surrey
- Lamorbey Park Flood Storage Reservoir – Nr. Sidcup
- Leigh Place Pond - Surrey.
- Main Lake Eridge Park – Nr. Tunbridge Wells, East Sussex .
- Northumberland Heath Service Reservoir – Nr. Crayford .
- Wadhurst Park Lake – East Sussex
- Weirwood – Nr. Forest Row .
- Wilderness Lake – Tandridge, Surrey .
- Wire Mill Lake – Nr. Lingfield, Tandridge, Surrey .

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Fig 1.2

2. Warnings, Alerts & Activation

2.1 Warnings

A severe weather event will increase the risk of a ‘Rainy day’ breach (see Section 1.6.2) during this potential emergency phase the following severe weather monitoring methods will likely be used:

- Flood guidance statements by the Flood Forecasting Centre (FFC)
- Heavy and extreme, rainfall alerts, flash and early severe weather warnings issued by the Met Office
- Reports of flooding from the public

For more detailed information on warnings and alerts please refer to the **KMRF Pan-Kent Multi-Agency Flood Plan**.

2.1.1 Severe Weather Advisory Group (SWAG)

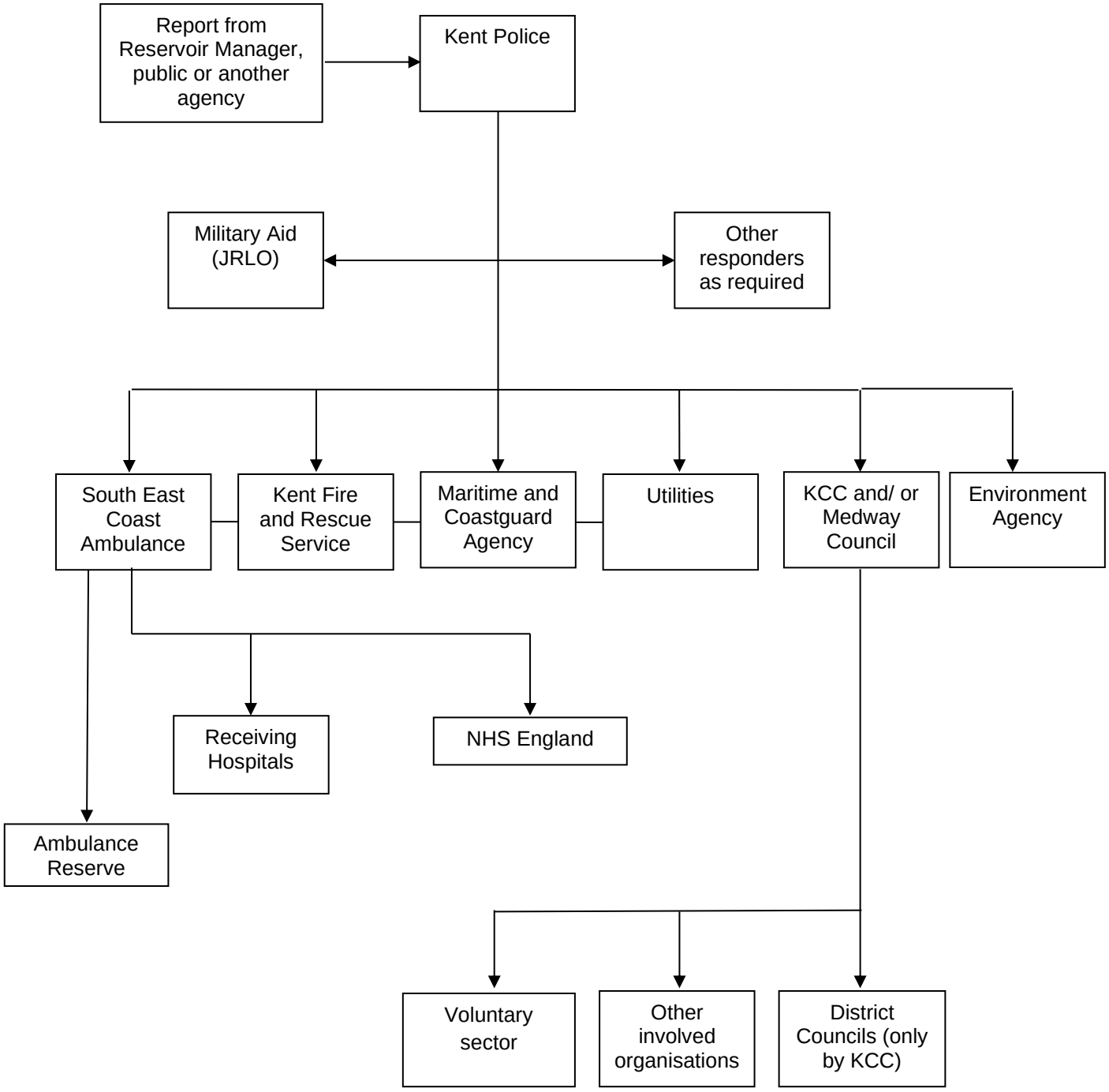
The SWAG may have formed if severe weather has increased the risk of flooding in Kent. **Figure 2.1 Alert Cascade** identifies **Kent Police** as the first point of contact from Reservoir Managers or Site operators.

Kent Police should therefore inform the SWAG of any alerts they have received to aid in the decision making for escalation to full SCG. For more information on SWAG please refer to the **KMRF Severe Weather Advisory Group framework.**

2.2 Alerts

The following diagram outlines how an alert should be disseminated to all responders **(Referenced from the KMRF Pan-Kent Strategic Emergency Response Framework)**

Figure 2.1: Alerting Cascade



2.3 Activation

Reservoir Managers or Site Operators are responsible for invoking On-Site Reservoir Emergency Plans. Any partner can request that Kent County Council or Medway Council mobilise the Off- Site Reservoir Inundation Plan using the following triggers:

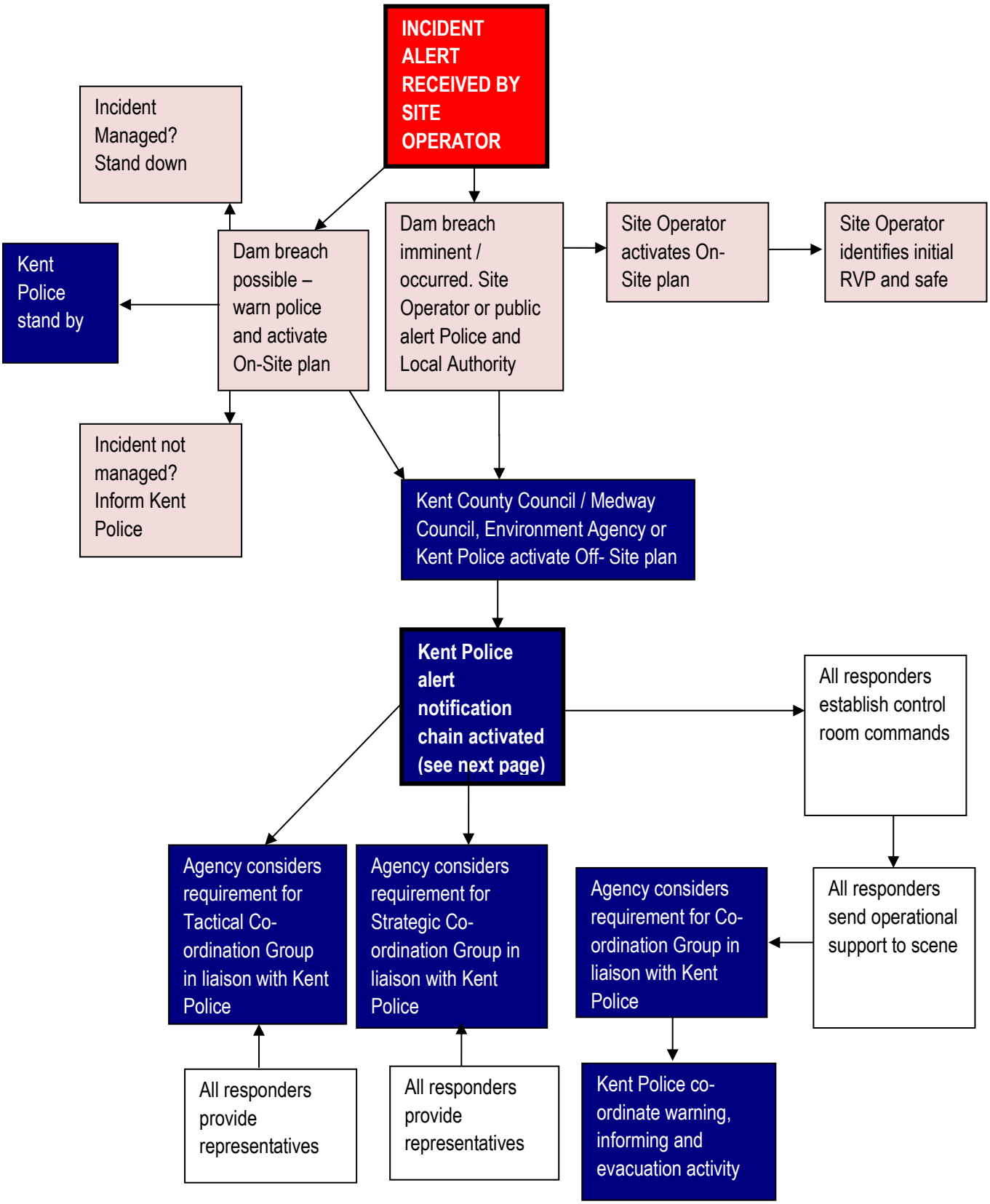
Table 2.1: Trigger Levels for Activation of Plan

Trigger Level		Activation of plan
Potential Emergency	Alert Advisory Trigger	Standby for possible dam breach
	Alarm Trigger	**Mobilise Specific On-Site plan**
		An emergency draw down is required
Emergency Phase	Imminent Failure Trigger	**Mobilise Specific On-Site plan/ Kent & Medway Offsite Reservoir Inundation Emergency Plan Mobilise KMRF Pan-Kent Strategic Recovery Framework**
		Control has been lost
	Failure Trigger	**Mobilise Specific On-Site plan/ Kent & Medway Offsite Reservoir Inundation Emergency Plan**
		Control has been lost
Recovery Phase	Stand Down	**Utilise KMRF Pan-Kent Strategic Recovery Framework**
		All clear received, identify lessons learned using the KRF debrief protocol

Full details of the trigger levels and actions associated with them can be found in the specific On-Site Emergency Plans for each reservoir.

The following diagram details the activities of responding agencies upon issue of an alert for a possible or actual reservoir inundation emergency.

Figure 2.2: Responder actions upon issue of an alert



3. Command & Control

3.1 Management Structure

The KMRF Pan- Kent Strategic Emergency Response Framework contains the relevant information about the management structures, including strategic, tactical and operational management and their functions and responsibilities. The framework also contains information on sub-groups, which would be established to provide advice on particular areas of the response, for example in this case, The Scientific & Technical Advice Cell (STAC) and The KMRF Media & Communications Group (M&CG).

3.2 Summary Emergency Response Stages

Table 3.1: Summary Emergency Response Stage Actions

(Please note, these are suggested actions, therefore not all will be applicable to every response)

TASK	RESPONDER
OFF- SITE EMERGENCY NOTIFICATION	
• Initial alert (STANDBY or TRIGGER) • Initiate cascade notification	• Site Operator • Kent Police
EMERGENCY SERVICE RESPONSE TO SITE / ZONE	
• Co-ordinate response of emergency services and ensure liaison with other Category 1 and 2 Responders • Deploy responders • Treat casualties, evacuate to hospital	• Kent Police, KFRS and SECAmb
INITIAL CO-ORDINATION OF THE MULTI-AGENCY RESPONSE	
• Maintain co-ordination of the response until Strategic Co-ordinating Group formed. • Set up the Strategic Co-ordinating Centre	• Kent Police
COMMAND, CONTROL AND CO-ORDINATION	
• Convene the Strategic Co-ordinating Group • Convene Tactical Co-ordination Group	• Kent Police • Kent Police
MEDIA & COMMUNICATIONS	
WARNING & INFORMING THE PUBLIC	

Warn Public Information Zone residents by: • Door-to-door knocking with Evacuation Cards • Use of the Kent Police helicopter's 'Skyshout' system.	• Kent County Council / Kent Police • Environment Agency • Kent Police
Further information to the public may also be provided through: • Local alert systems • Specific internet sites used for emergencies • Public information lines invoked for the event • Social Media	
MEDIA MANAGEMENT	
• Issue initial Media Statement • Co-ordinate the multi-agency media response • Set up media briefing arrangements	• SCG / M&CG
TRAFFIC CONTROL AND PUBLIC ACCESS	
• Establish checkpoints / roadblocks • Provide signage	• Kent Police and Kent County Council / Medway Highways / Highways Agency
EVACUATION, SURVIVOR RECEPTION CENTRE AND REST CENTRES	
• Evacuation • Assembly Points • Transport • Medical Support • Survivor Reception Centre / Rest Centre	• Kent Police • Kent Police • Kent County Council / Medway Council • SECAmb / NHS • District Council / Kent Police / KCC / Medway Council

4. Actions, Roles and Responsibilities

The following table outlines Actions, Roles and Responsibilities for responders with specific management roles in a reservoir incident. For more information including other agencies responses, refer to the Pan Kent Strategic Emergency Response and Recovery Frameworks.

Table 4.1 Actions, Roles and Responsibilities

Organisation	Preplanning	Response	Recovery
Reservoir Undertaker	• Write and hold an On-Site Plan • Provide on-going surveillance and situation assessments • Implement a range of measures to avert failure • Draw up contingency arrangements to ensure that a suitably qualified local engineer can always be contacted	• Notify the Police urgently of a heightened risk or actual occurrence of a damn breach together with any relevant details (e.g. status of warning, anticipated failure mode, actions being taken to avert failure, estimated probability of failure and timing) in line with arrangements set out in the On-Site Plan • Send liaison officer to Operational, Tactical and Strategic Co-ordinating Group, where resources allow • Record keeping	• Assist in the Recovery, where resources allow. Please see **Appendix A**
Environment Agency	• Advise on development proposals impacting upon or associated with reservoirs or reservoir inundation zones; Update reservoir inundation maps; Support Kent and Medway Resilience	• Issue warnings • Monitor catchment • Support LAs and emergency services • Supporting the operational response roles of other agencies by providing materials,	• Assist as necessary through the arrangements set out in the KMRF Pan Kent Strategic Emergency

Organisation	Preplanning	Response	Recovery
	Forum (KMRF) • CRR flood risk assessments; Maintain watercourse capacity; Maintain flood management structures • Maintain Business Continuity arrangements	equipment and staff, where resources allow. See **Appendix A** • Operating and maintaining flood defences on main rivers lying both upstream and downstream of the dam • Providing updated information to the public using the Floodline service (in areas where the service has been established) • Supply pumping assets • Investigate the cause of the incident and the emergency response and take appropriate follow-up action • Attend Tactical Co- ordination group (TCG) and Strategic Co-ordination group (SCG). • Maintain Business Continuity arrangements • Record Keeping	Recovery Framework • Attend Recovery Co-ordinating Group
Highways Agency (HA)	• Operating the Strategic Road Network (SRN) • Monitoring and maintaining traffic flows on the SRN • Clearing debris from the SRN and the road drainage system • Identifying an implementing the closure	• Implement HA emergency procedures • With partners, identify appropriate road closures and diversion routes required • Attend the TCG and SCG • Support SCG functional groups as required • Support the multi-agency response • Provide warnings to road users using VMS	• Assessing flood damage to the SRN and HA Structures. • Clearing flood debris from the SRN • Reopening the SRN in conjunction with partners.

Organisation	Preplanning	Response	Recovery
	of the HA roads and diversion routes in conjunction with partners and supplying signage as appropriate.	• Record Keeping	• Attend Recovery Co-ordination Group
National Grid- Gas & Electricity Distribution/ Transmission	• Identify plant and assets in predicted flood zone e.g. sub-stations, cable tunnels, joint bays, regulators – medium to low pressure • High pressure gas installations COMAH sites – storage • Vulnerable persons database – use system to pull off all addresses in a predicted area by post code • Contact local authorities use agreements for mutual aid	• Set up command at site. Work with blue lights to isolate supplies. Make safe. Set up additional company command and control • Wait for water to recede • Re-establish supplies • Possible reconfiguration of supplies where possible • Possible lock-out of regulators to maintain pressures in gas mains. Invoke mutual aid and resource plans. Prepare for recovery • Record keeping	
Scotia Gas / Southern Gas (SGN) 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. Consider	• Instigate E/3 procedures for incident response • Set up Operational Command / Site Main Controller at site. Work with Category 1 Responders to isolate supplies if required. Make safe. Set up additional Tactical and Strategic level command within company • Identify location of siphon tankers, water pumps and other equipment. Prepare	

Organisation	Preplanning	Response	Recovery
	all offtakes from the national transmission system (including odourisation and gas quality equipment), pressure reduction stations, other gas governing equipment, high and low-pressure storage installations (including top and lower tier COMAH sites) • Review sectorisation plans for isolation of specific areas • Locate sectorisation valves and confirm operation • Identify consumers at risk from 'Vulnerable Persons Database' – extract all relevant addresses in the predicted flood risk area • Contact local authorities, use mutual aid	resource plans and mobilise as necessary • Extract and copy asset record and plans for on-site use identifying siphons, low points etc • Wait for water to recede • Re-establish supplies • Possible reconfiguration of supplies where possible • Possible lock-out of regulators to maintain pressures in gas mains. Invoke mutual aid and resource plans. Prepare for recovery • Record keeping	
UK Power Networks	• UK Power Networks Flood Plan • Environment Agency indicative flood plains mapped into Company GIS system	• Monitor UK Power Networks substations and plant and equipment • Protect substations by temporary works • Disconnect electricity supplies if the public are at risk or if substations or plant and equipment cannot be protected from inundation	• Restore electricity supplies

Organisation	Preplanning	Response	Recovery

Kent Police	• Statutory responsibility under the Civil Contingencies Act 2004 to:
	  ○ Prepare and maintain emergency plans;
	  ○ Maintain business continuity plans and arrangements;
	  ○ Engage with KRF Severe Weather Group Partners particularly around risk assessment, planning, public warning and informing, and training and awareness
	  ○ Validate emergency plans through training and exercising
	• Identifying, with Cat 1 and 2 partners, areas of critical infrastructure at risk
	• Mobilisation planning within the Police
	• National Mobilisation Plan (internal and external resources)
	• Engagement with Kent and Medway Resilience Forum (KMRF) Public Warning and Informing Group on the forming of a communication strategy to warn and inform the public
		• Save and prevent loss, or further loss, of life in conjunction with the other emergency services and any other relevant organisation
		• Consideration of health and safety and ensure the safety of personnel deployed at the incident
		• Co-ordinate the overall response
		• In so far as saving of like, secure, preserve and protect the scene
		• Investigate the incident, obtaining and securing all available evidence in conjunction with other investigative bodies where applicable
		• Recover the deceased in a dignified manner, which ensures the integrity of their identification
		• Without undue delay, assist the Coroner to identify victims and inform the next of kin as soon as possible
		• Reassure survivors and their families, assist in establishing appropriate support systems
			• Recovery is inbuilt to the response phase of the incident as part of the Strategic Co-ordination Group
			• The appropriate 'handover' to the responsible LA will be supported as appropriate
			• Liaise and promote/provide community support
			• Attend recovery co-ordination group

Organisation	Preplanning	Response	Recovery
	• Maintain Business Continuity arrangements	• Establish an effective and appropriate family liaison strategy • Ensure an appropriate response to the media, which is open, factual, accurate, and seeks to reassure those directly involved and the public in general • Provision of warning, advice and information to the public • Strive to minimise the impact on the whole community, working with all relevant agencies to return to normality as soon as possible • Maintain Business Continuity arrangements • Record Keeping	
Kent Fire and Rescue Service	• Access to all copies of EA and partner agencies (District & Borough Council) Flood Maps through Resilience Direct (RD) • Support multi-agency training and exercising • Arrangements for pre-mobilising resources in place in line with normal response to flooding incidents	• KFRS will follow incident response procedures and ensure multi-agency working principles (JESIP) are followed • Liaise with other agencies and prioritise response and resources based on the situation • Provide assistance with the initial pumping of water • Assist with evacuation	• Assist with other agencies to minimise impact on community • Attend recovery coo-ordination group

Organisation	Preplanning	Response	Recovery
	• Business Continuity arrangements maintained to ensure response to all flooding incidents throughout the County • Give Water Safety advise to partner agencies and communities	• Attend STG and any TCG provide liaison officers to other Control rooms as appropriate i.e. Environment Agency • Activate National Mutual Aid Agreement for additional resources • Maintain Business Continuity arrangements • Maintain accurate records ensuring all decisions are recorded	
South East Coast Ambulance Service	• Emergency Preparedness Status Board (includes flooding) in place across SECAmb • SECAmb premises at risk flooding identified • Health on Call systems in place • Maintain Business continuity arrangements	• Attendance as required upon assessment • Activate Major Incident Plan • Maintain Business Continuity arrangements • Record keeping	
NHS	• Ensure Emergency Plans are up to date, and exercise tested • Maintain Business Continuity arrangements	• Provide support for vulnerable people known to the NHS in their own homes • Maintain Business Continuity arrangements • Provide support to Rest Centres and Evacuations Points • Provide support in the event of evacuation of vulnerable persons	

Organisation	Preplanning	Response	Recovery
		• Ensure representation at Multi-Agency Command& Control • Issue Public Health Advice in conjunction with the Health Protection agency • Record Keeping	
Kent County Council/ Medway Council	• Maintain offsite reservoir inundation plan and ensure appropriate planning in place to support • Maintain vulnerable persons list of lists and list of vulnerable KCC/Medway sites • Multi-agency pre-planning re. Rendezvous Points (RVPs) and transport routes • Ensure that planning decisions relating to applications affecting reservoirs or reservoir inundation zones are informed by reservoir planning principles • Pre-arranged communication strategy- what should members of the public do/where should they go? • Updated information on council website • Pre-arranged information help line and trained staff	• Activate CEC/Emergency Centre and KCC/Medway Emergency Plans including liaison with elected Members • Co-operate with emergency services and EA to co-ordinate the response • Liaise with police on traffic management interventions • Arrange for KCC/Medway representation at Tactical Co-ordinating Group and Strategic Co-ordinating Group as necessary • Liaise with partners to ensure that care is provided to vulnerable people and communities affected by reservoir inundation • Transport of public/evacuees to rest centres • Provision and staffing of rest centres and associated services in conjunction with district councils	• Assisting residents in removal of damaged furniture and household goods • Education of pupils affected by school closures • Invoking council's business recovery plan if council premises are affected • Repairs to public highways and highway infrastructure • Provision of counselling and other advice to affected/upset residents • Lead recovery co-

Organisation	Preplanning	Response	Recovery
	• Pre-arranged help line for staff (should they come into work or not- is it safe?) • Review of council properties at risk • Incorporate this risk into Business Continuity planning process • Provide intelligence on condition and viability of transport infra-structure – including Flood Depth Indication System data (Kent Highway Services)	• Flood mitigation measures (e.g. sandbags) • Mobilise personnel and resources to enable clearance of blocked highway drainage, pumping and other mitigation measures • KCC 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, and provide assistance in operation and security at survivor reception/ rest centres • Co-ordinate deployment of 4X4 and other specialist transport assets to response • Liaise with partners to ensure protection and mitigation of reservoir inundation impacts upon critical infra-structure and the wider environment • Use of SWIFT emergency report (Area Performance Monitoring Teams during office hours and Contact Centre out of hours) and public care services data on KentView to inform emergency response	ordination group

Organisation	Preplanning	Response	Recovery
		• Liaise with DEFRA, RSPCA and district councils on welfare of livestock, domestic and wild animals affected by reservoir inundation • Maintain Business Continuity arrangements • Record keeping	
District/ Borough/ City Councils	• Ensure that development control decisions on applications impacting upon or within reservoir inundation zones are informed by reservoir planning principles and adequately understand full up and downstream extent and implications of the scheme • Ensure up to date vulnerable persons and sites shared database arrangements • Pre-determine Survivor Reception, Rest Centres and Media Centres • Undertakes multi-agency pre-planning re RVPs, transport routes etc • EA, riparian district councils and flood gate owners to ensure closure mechanisms function properly • Pre-arranged communication strategy-	• Activation of Emergency Centre and internal Strategic Group and advise leader and ward members. Ensure liaison with Parish Councils/Community emergency Groups • Representation at Tactical Co-ordinating Group and Strategic Co-ordinating Group as necessary • Co-operation with emergency services and EA to co-ordinate the response • Liaison with utility and transport companies especially water company to ensure provision of clean drinking water to residents • Provision and staffing of rest/survivor reception centres and associated services • Flood mitigation measures (e.g. sandbags,	• Provision of temporary or longer-term accommodation or rehousing for residents made homeless by the flooding • Structural and condition surveying of council properties damaged by the flooding; remedial action to repair such properties • Invoking council's business recovery plan if council premises are affected • Consultation with health

Organisation	Preplanning	Response	Recovery
	what should members of the public do/where should they go? • Ensure updated information on council website • Per-arranged information help line and trained staff • Pre-arranged help line for staff (should they come in to work or not- is it safe?) • Review of council properties at risk • Incorporate this risk into the business continuity planning process • Advise on development proposals, flood risk assessments and maintain flood management structures • Prepare and maintain the Local Multi-Agency Plan • Maintain Business Continuity arrangements	where appropriate). • Advice on clearance of blocked water courses and mitigating measures • Establish various LA forward controls as necessary • Representation at Tactical Co-ordinating Group and Strategic Co-ordinating Group as necessary • Maintain Business Continuity arrangements • Record keeping	authorities on hygiene and environmental health issues • Assisting residents in removal of damaged furniture and household goods • Removal of mud/debris from council owned land • Attend recovery co-ordination group

5. Operational Response Issues

5.1 Health and Safety

Guidance for working near 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.

STAY OUT OF FLOOD WATER

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, may cause walls and bridges to be unstable;
- 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 flowing 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-existing organisations rules and qualifications needed;
Having the necessary equipment to enter water;
Other alternatives to entering water and what purpose would be served;
Whether the visit could wait till the flood water recedes;
Depth of the water, whether the tide is rising, speed of flow and pull of the water;
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).
Please see Kent Fire and Rescue Flood Water Safety Aide Memoir in **Appendix B**

Floodwater Public Health Risks

The following section deals with the following public health risks arising from floodwater inundation:

- Chemical Contamination
- Sewage/ Wastewater Contamination
- Electrical/ Fire Hazards

Chemical Contamination

Flooding can lead to disruption of water purification and sewage disposal systems, inundation of waste disposal sites, and contamination from chemicals stored in commercial, industrial, agricultural 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 protective clothing should be 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 Contamination

Flooding can cause the disruption of water purification and sewage and other wastewater disposal systems. A key risk arising from contamination of floodwater with sewage is risk to human and animal health from harmful microbes. Infectious water-borne organisms include intestinal bacteria such as E. coli, Salmonella, Hepatitis, and Tetanus.

It may be assumed that any floodwater affecting property and land could contain sewage. Contact with flood water should therefore be avoided and where unavoidable protective clothing should be worn.

Contamination of the aquatic environment with sewage and other organic pollutants, including milk and other foodstuffs, may lead to de-oxygenation through microbial blooms and requisite adverse impacts upon aquatic wildlife.

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.
- Don't assume that any part of a flooded electrical installation or appliance is safe, do not turn on their power supply.

More guidance can be found in the KMRF Public Warning and Informing Strategy Document and from the following Environment Agency link:
www.environment-agency.gov.uk/homeandleisure/floods

Welfare of livestock and other animals

Kent Fire and Rescue Service have 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.

Kent County Council / Medway Council will liaise with the RSPCA and Defra on the welfare of livestock that may require rescue or feeding on site.

The Kent Resilience Forum Animal Evacuation and Shelter Plan provides further information. The RSPCA also offer advice on preparedness and looking after pets in an emergency.

5.2 Environmental Considerations

Information on environmental considerations can be found in the Pan Kent Multi Agency Flood Plan.

5.3 Utilities

Information on utilities can be found in the Pan Kent Multi Agency Flood Plan.

5.4 Voluntary Sector

Emergency Preparedness, the Civil Contingencies Act guidance, refers to the generic support that the voluntary sector can provide. The nature, range and scale of services offered by the voluntary sector may alter depending upon the context of the emergency situation but would be provided in both emergency response and recovery related activities. They will be activated under normal existing activation protocols with either the Emergency Services or the Local Authority and will be directed by the relevant activating organisation but work to their own organisational structure. Organisations have access to mutual air on a cross-border basis.

In a flooding incident the voluntary sector can provide support to both responders and those affected by the incident. The Voluntary Sector in Kent is drawn together in the form of The Kent Voluntary Sector Emergency Group (KVSEG). The different member organisations can offer a wide variety of services, such as first aid, emergency feeding and bereavement counselling. These organisations offer a great deal of expertise with which to help the local authorities mitigate the effects of an emergency but have no statutory duties. Those services that the organisations provide are listed on the next page.

The following organisations are members of The Kent Voluntary Sector Emergency Group:

Age Concern

British Red Cross

Churches in Society (may not be a group any more)

The Citizens Advice Bureau

The Compassionate Friends

Council for Voluntary Services

Cruse Bereavement Care

Kent Search & Rescue

Radio Amateurs Emergency Network (RAYNET)

Royal National Lifeboat Institute

Royal Society for the Prevention of Cruelty to Animals

St John Ambulance

The Salvation Army

The Samaritans

Victim Support

Women's Institute

WRVS

Service provision includes the following:

- Welfare Centre staffing
- Practical and emotional support to those affected by the emergency
- Medical support to the statutory services and first aid at specific sites
- Transport & escort
- Communications
- Documentation / administration
- Premises
- Equipment & resources available
- Telephone Helpline Support

For more detailed information refer to the Pan-Kent Strategic Emergency Framework. To contact a member of the voluntary sector, please go through the Kent County Council Emergency Planning Duty Officer (as per figure 2.1).

5.5 Mutual Aid

Mutual aid is governed by specific Local Authority agreements. Please refer to the Pan Kent Strategic Emergency Framework. Mutual Aid will be formalised through the Strategic Co-Ordinating Group or directly from one LA to another at executive level.

5.6 Military Aid

Detailed guidance on military aid can be found in the Pan Kent Strategic Emergency Response Framework. Military aid will be formally requested through the Strategic Co-Ordinating Group.

5.7 Community Groups or Community Plans

Parish and Town Councils may possess their own Community Plans to support both planning and response to major emergencies. The Districts & Borough councils hold records of communities with their own emergency plans. District and Boroughs have lists of communities with trained volunteer flood wardens.

5.8 Other Useful Documents

The Kent and Medway Resilience Forum also publishes a number of documents. Copies of them can be obtained via the Kent Resilience Team, or Resilience Direct.
The documents are:

Pan Kent Strategic Emergency Response and Recovery Frameworks
Pan Kent Multi Agency Flood Plan and associated Local Multi Agency Flood Plans
Mass Evacuation arrangements
Rest Centre and Humanitarian Assistance Centre arrangements
Mass Fatality arrangements
Media and Communications arrangements

6. Media & Communications Strategy

The KMRF Media and Communications Plan, contains detailed explanations of "the arrangements for a combined multi agency media & communications response to a major emergency" and how to "provide accurate, authoritative and timely information, so that the public is well- informed and better able to respond to an emergency".

6.1 Key Objectives, Consequences & Challenges

In addition to the generic communications 'Aim, Objectives & Principles' outlined in the KRF *Media & Communications Plan*, the specific objectives, consequences challenges that will need to be achieved / overcome in a reservoir emergency are:

- Despite reservoir flood maps being made publicly available public awareness of the risk of reservoir flooding and what to do in the event of an incident is generally low;
- Unlike river / fluvial and coastal / tidal flooding, the EA's *Floodline Warnings Direct Service* does not provide warnings for reservoir flooding. Additionally, incidents may occur with little or no warning time, catching the public and responders unaware, with little if any time to issue prior warnings;
- The impacts on life, property and the environment will be severe, complex and wide spread, with large numbers of people trapped in buildings or displaced and key utilities & infrastructure disrupted; and
- Recovery of the affected area may take a long time – possibly 6 to 18 months – and those affected will need significant support, including information and advice.

6.2 Further Information

KMRF *Media & Communications Plan*	
KMRF *Identifying Vulnerable People in an Emergency Plan*	
Reservoir Flood Maps	https://flood-warning-information.service.gov.uk/long-term-flood-risk/
Reservoir Flooding FAQs	http://webarchive.nationalarchives.gov.uk/20140328084622/http://www.environment-agency.gov.uk/business/sectors/125384.aspx
EA *Floodline Warnings Direct Service*	https://flood-warning-information.service.gov.uk/

7. Vulnerable People

Identifying, planning for and providing for the needs of vulnerable groups involves a large number of partners and compiling a large amount of changing information. 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 relevant information in the event of an emergency.

Records of vulnerable people are held and kept up to date by the County Council, Medway Council, NHS and some other utilities companies and organisations, each organisation will hold records of its own clients. During a flood incident this information will be supplied to the SCG (Strategic Coordinating Group) and other partner organisations as required.

The KMRF has published a document titled; **'Identifying Vulnerable People in Emergency'.** This plan describes the inter-agency arrangements for identifying vulnerable people during an emergency.

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 are: -

- 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
- Tourists
- Travelling community
- Static and holiday caravan parks

8. Key Infrastructure

Some details of key infrastructure can be found on the Pan Kent Multi Agency Flood Plan, including a table of critical infrastructure and vulnerable facilities and locations. Further details of specific sites can be found in the Specific Off- site Reservoir Plans.

9. Evacuation Shelter & Rescue

Evacuation and shelter information can be found in the KMRF Evacuation and Shelter Plan.

9.1 Rescue

Requests for assistance and rescue assets should be made via the SCG (Strategic Co-ordinating Group) or where it has been established the Tactical Co-Ordinating Group.

This paragraph relating to the coordination of flood rescue is taken from the 'DEFRA Rescue Flooding Concept of Operations'

*'**The duty to coordinate inland flood rescue lies with the Police** and they will have primacy during major flood events. It is fully recognised that during a major flood event flood rescue asset will be deployed from a wide range of organisations including emergency services provided by volunteers (RNLI, Mountain Rescue, Lowland Search and Rescue, Cave Rescue etc.).*

*In order to ensure a safe and efficient response it is essential that these resources can operate within the area of operation and do so under a single unified command system. Therefore, it is **likely the command system employed will be based upon the Fire and Rescue Incident Command System** as applied in the flooding context i.e. adapted to take account of the specialist search and rescue nature of flooding.'*

9.1.1 Fire and Rescue Service

No body or organisation currently has a statutory duty for rescue during a flood emergency.
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.

Potential resources for flood response and rescue and be found in **Appendix A** of this document.
Kent Fire and Rescue Service has carried out a review of the rescue capabilities within the Kent Resilience and Medway Forum Area, a copy of this report can be obtained from the KRT for the KRF at the address on the front page of this plan or from Kent Fire and Rescue Service.
There are further national Fire and Rescue resources available via the Fire and Rescue Service National Coordination Centre (FRSNCC) in West Yorkshire. Contact number in **Appendix A** of the Pan Kent Flood Plan.

The following information should be provided as a minimum:

- Location of incident or expected time/location of impact;
- Nature of incident and any specific hazards, i.e. known chemical contamination;
- Prevailing weather and (where known) water conditions;
- Estimated number of persons requiring rescue;
- Local resources already in attendance/available;
- Estimate of mutual aid resources required; and
- Location (grid reference / name and address) of rendezvous point. Including local access issues created by the flooding.

9.1.2 Maritime and Coastguard Agency

Detail on the Maritime and Coastguard Agency's responsibilities including information on SAR, resources, use of the RNLI and more, can be found in the **Pan Kent Multi-Agency Flood Plan.**

9.1.3 Others

Other resources are available on request including air support from the Aeronautical Rescue Coordination Centre (ARCC). Contact number in **Appendix A** of the Pan Kent Multi-Agency Flood Plan**.**

Information regarding the equipment available for rescue is detailed in **Appendix A – Resources**

10. Recovery

Below is a general overview of the recovery arrangements following a flood incident. More detailed arrangements and information can be found in the Pan Kent Recovery Framework.
During the emergency / response phase a Recovery Advisory Group (RAG) will be established to advise the SCG on recovery issues. In the recovery phase, management of the incident will be handed over from the SCG to the RCG, which will be formed from the core membership of the RAG.
Information on responder roles and responsibilities during the recovery phase can be found in **Section 4 - Actions, Roles & Responsibilities.**

10.1 Overview of Recovery Arrangements

Kent County Council, Medway Council and District & Borough Councils
Will chair the RCG during the recovery phase and co-ordinate the multi-agency response with full support from all other organisations. This will include:

- Establishing priorities for action in consultation with other organisations
- Re-establishment of remaining non-critical public services that have not been maintained in business continuity management plans as and when is appropriate
- Provision of advice and co-ordination of social housing issues
- Co-ordination of public health issues in close co-operation with Primary Care Trust and Health Protection Agency
- Co-ordination of environmental health issues in close co-operation with the Environment Agency and Health Protection Agency
- Assessing decontamination requirements and capabilities in close co-operation with the Government Decontamination Service, as necessary
- Provision of advice and support to affected persons
- Supervising building control matters
- Co-ordinating voluntary sector involvement
- Provision of business continuity advice to the community

- Management of transport issues in close co-operation with KCC Highways, Medway Highways, Highways Agency and Kent Police
- In conjunction with Kent Police, evaluate area / site security arrangements
- Taking steps to repair damaged defences owned and maintained by local authorities

Kent Fire and Rescue Service

- Salvage assistance and aid with the initial pumping of water, until the arrival of EA (EA should be used for long term pumping)
- Advise on fire safety for affected commercial premises

Kent Police

- Maintain public order and security
- Establish and maintain cordons
- Manage traffic flows
- Support Humanitarian Assistance Centre; deploy family liaison officers as required

The Environment Agency

Present activity is largely confined to restoring the condition of watercourses and structures and post event 'surgeries' for those affected by a flood. These seek to explain the circumstances of the flood, respond to queries, gather information relevant to better understanding the flooding mechanisms (which may also serve to inform any future flood risk management measures) and encourage registration with the Flood Line Warnings Direct service. In conjunction with these gatherings and also more generally available, the Environment Agency has prepared a booklet, 'After a Flood' that provides information and advice for those living in flood risk areas.

The Environment Agency will, of course, and in so far as circumstances allow, take steps to repair any damage to flood defence assets and restore the standard of protection afforded by them and the conveyance capacity of watercourses. Limited stocks of sandbags are held against this eventuality. By exception, some may be made available to other responders.

NHS

- Provide public health advice and reassurance
- Monitor health effects in the community
- Reconfigure services as circumstances require
- Co-ordinate voluntary sector health related assistance

Health Protection Agency

- Monitor and advise on public health impacts

Transport

- Restore transport infrastructure
- Work with police to establish a traffic management strategy
- Adapt public transport services as necessary

Utility companies

- Re-establish supplies in accordance with Emergency Plans.

Stand down arrangements by each organisation involved in the recovery phase will be co-ordinated through the local authority.

Key Considerations in the Recovery Phase:

- Clean up and waste disposal
- Repairs to public assets / infrastructure – schools, buildings, roads, bridges
- Restoration of power, communications and water
- Domestic and business insurance issues
- Displaced businesses
- Humanitarian assistance needs including homeless / displaced residents and psychological impacts.
- The handover phase from response to recovery

10.2 Emergency Expenditure Arising from Reservoir Inundation

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". Local Authorities maintain General Funds for such unforeseeable eventualities. The Environment Agency is responsible for providing advice on enactment of financial/compensation provision in the event of a dam breach. However, there are a number of organisations and funding schemes (either operated by or accessible through the UK government) that may help local responders meet extra-ordinary financial costs incurred during the response to, and recovery from, an emergency. These should be requested through MHCLG- RED on the SCG.

11. Training, Exercise and Review

Each organisation is responsible for ensuring that relevant staff are fully trained in their own emergency response procedures and their particular role in support of the operation of this plan.
This plan will be subject to annual review and update of the contact details and alerting procedures. A full review will be conducted every 3 years from publication. The plan will be validated following each review.

11.1 Debriefs

All incidents involving the activation of this Plan, in full or in part should be debriefed in line with the procedures documented in the **KMRF Incident & Exercise Debrief Protocol**. A model debrief agenda is attached at Appendix J of this plan. Lessons identified, either through exercise or plan activation are captured within the KRF Lessons Learned Database.

11.2 Training & Exercise Schedule

Figure 11.1: Training and Exercise Schedule

Organiser	Title of	Type	Date	Relevant lessons or link

	exercise/training			
KCC	Exercise Tethys	Table-top	29/11/17	Reservoir inundation scenario (Bewl Water)
KCC	Exercise Willow Emerald	Virtual table-top	03/12/20	Reservoir inundation scenario (Mote Park Lake & Leeds Castle Moat)
KCC	Exercise Scarce Emerald	Virtual table-top	28/10/21	Reservoir inundation scenario (Hothfield FSR & Aldington FSR)
KCC	Exercise Southern Emerald	Virtual table-top	23/05/23	Reservoir inundation scenario (Bayham Lake and Dunorlan Park Lake)

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Appendix A: Resources

Resource	Who / Where
Air support	**Aeronautical Rescue Co-ordination Centre (ARCC) and Military Aid.**
Voluntary Sector Involvement	Various Organisations County wide

Data Available	**Data from Environment Agency**
	Fluvial and Coastal flood maps
	• Flooding Outlines for a number of return periods *(NOT AVAILABLE IN ALL AREAS)*
	• Can provide mapping where requested and the data is available
	• The EA hold some flood animations and animated model runs *(NOT AVAILABLE IN ALL AREAS)*
	• Possible number of properties affected in a given area
	• Forecast and potential scenario
	Reservoir maps
	• Inundation outline maps
	• Hazard maps
	Data from Local Authority
	Fluvial and Coastal flood maps
	• Mapping within SFRA (Strategic Flood Risk Assessment)
	  ○ Flood Outlines, including for different return periods
	  ○ Hazard Mapping including depth and velocity
	  ○ Inundation zones
	  ○ Breach modelling
	NOT ALL THIS DATA IS AVAILABLE IN ALL AREAS OR IN ALL SFRAs
	Reservoir maps
	• Inundation outline maps
	• Hazard maps

Other Resources	**Kent Fire and Rescue Service:** • 45 life jackets, 45 pairs of waders and another ancillary PPE as a non-mobile special. These are based at Maidstone, Canterbury and Medway Fire Stations • 10 x 5 metre air track paths capable of being towed by a rescue boat, these have a capacity of rescuing 10 members of the public, these are based at Strood, Sheppey, Whitstable and Larkfield Fire Stations • Some councils hold supplies of bedding and other supplies on behalf of **KCC** **Environment Agency:** The Environment Agency has pumping systems and lighting rigs. These are mainly used as part of the EA's defence duties, but could be made available at the request of an SCG

The Kent Resilience Team compile a list every autumn of resources available to respond to severe weather, including sandbags, vehicles, pumps and welfare resources etc.

Appendix B: Kent Fire and Rescue Services Water Safety Aid 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=Lifejackets/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)

Appendix C: How to Contact UK Power Networks in an Emergency

How to report a power cut or emergency

All power cuts should be reported to our 24-hour management centre using the free phone 24-hour hotline for your area:

London 0800 028 0247

South East (Kent, Surrey & Sussex) **0800 783 8866 or 0800 316 3105**

- Your call will be answered by an automated message system, the call agents are trained to deal with Category 1 and 2 responders.
- To help us help you, we need to know **the postcode and address of at least one of the properties** affected by the power cut and **the time the power cut happened**.
- Explain to the call agent who you are and why you are calling - that is, your role and your involvement in the incident.
- If you are able to offer help to the customers affected, then please tell us.
- To restore supplies, we reconnect the largest number of customers possible at each stage.
- If you have information that you think could influence our restoration strategy, please tell us but be aware that we may not be able to act on this for technical reasons.
- If power is essential to the affected property or properties, then business continuity plans should consider this and have strategies in place to mitigate against power cuts.

Informing us of a power cut is an action and not a reasonable mitigation strategy.

Business as usual response

- Will aim to arrive at site as soon as possible
- Until we have established the location and cause of a power cut, which can take three hours, we may not have enough detailed information to give you estimated restoration times for the property or area affected.
- Locating the cause of a power cut can be complex. Historically 90% of customers are restored within three hours and over 99% of customers are restored within 18-hours of us first becoming aware of the problem. Under adverse conditions, such as during bad weather, power cuts can take longer to fix.

Non-business as usual response – emergency response

- Will declare a System Emergency
- UK Power Networks response will be managed by the UK Power Networks Strategic Team
- Strategy Team will appoint a “Gold/Silver Liaison Officer” and will liaise by telephone or in person at our discretion
- Will divert non-essential work resource to concentrate on the response

To help us help you, we need to know **the postcode and address of at least one of the properties** affected by the power cut and **the time the power cut happened. Always ask for a call or an incident number and note it down in your log (it will be in the format “CALL-12345-X” or “INCD-12345-X”).**

- **Tell us this number whenever you call back for an update. Don’t expect us to keep you updated unless we offer to.**

Appendix D: References & Useful Links

KMRF Documents

KMRF *Pan Kent Multi Agency Flood Plan* [online]

KMRF *Pan Kent Strategic Emergency Response Framework* [online]

KMRF *Pan Kent Emergency Recovery Framework* [online]

KMRF *Humanitarian Assistance Plan* [online]

KMRF *Vulnerable Persons Plan* [online]

KMRF *Media & Communications Plan* [online]

PHE Documents

PHE SE (2017) *Scientific & Technical Advice Cell (STAC) Plan* [online]

DEFRA and Cabinet Office Guidance

Cabinet Office (2011) *UK Emergency Planning: Homepage* [online] available from https://www.gov.uk/government/policies/emergency-planning

DEFRA (2014) *National Flood Emergency Framework for England* [online] available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/388997/pb14238-nfef-201412.pdf

DEFRA (2010) *OffSite Reservoir Plans Guidance* [online] available from https://www.gov.uk/government/publications/reservoir-off-site-plans-documents

DEFRA (2017) *On-Site Reservoir Plans Guidance* [online] available from https://www.gov.uk/government/publications/reservoir-emergencies-on-site-plan

Flood Forecasting Centre, Met Office and Environment Agency

Met Office (2011) *Public Sector: Emergency Response: Homepage* [online] available from http://www.ffc-environment-agency.metoffice.gov.uk/

Flood Forecasting Centre (2011) *Hazard Manager: FFC Services Online* [online] available from http://www.ffc-environment-agency.metoffice.gov.uk/services/web.html

Environment Agency (2011) *River and Sea Levels: monitoring service* [online] available from https://flood-warning-information.service.gov.uk/river-and-sea-levels

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Appendix E: Glossary, Terms & Definitions

Cascade (reservoirs in cascade)	A cascade is a series of two or more reservoirs on one watercourse, where the escape of water from one reservoir may trigger the failure of other reservoir(s) in its downstream path.
Drawdown	The controlled release of water from a reservoir.
EA	Environment Agency
Impounding reservoir	A reservoir formed by construction of a dam across a river valley.
KCC	Kent County Council
KFRS	Kent Fire and Rescue Service
KMRF	Kent and Medway Resilience Forum
LA	Local Authority
Non-impounding Reservoir	Non-impounding reservoirs do not block the natural flow of water and are generally filled by pumping water, or by piped inflow into the reservoir.
Off- Site plan	A plan prepared by local area emergency responders detailing how they will respond to a potential or real reservoir failure.
On-Site plan	A plan prepared by reservoir owners detailing how emergency responders will respond to a potential or real reservoir failure.
Panel Engineer (Qualified Civil Engineer)	A chartered civil engineer appointed to one of the reservoir panels by the Secretary of State. Responsible for the design and supervision of construction, the supervision of measures in the interests of safety, inspection of reservoirs and the on-going supervision of reservoirs. There are currently four panels of engineers: • All Reservoirs Panel • Non-impounding Reservoirs Panel • Service Reservoirs Panel • Supervising Engineers Panel
Reservoir emergency	Any incident, such as a reservoir failure or expected failure, requiring the activation of a reservoir flood plan.
Reservoir Inundation Map (RIM)	A map showing any actual or predicted characteristic(s) of a reservoir inundation, such as extent of flooding, depth of flood water, velocity of flood water etc.
SCC	Strategic Co-ordination Centre
SCG	Strategic Co-ordinating Group
SECAmb	South East Coast Ambulance Service
Service Reservoir	A service reservoir is any water containing structure which is intended to store water (for drinking, washing and cooking) that has been treated with a view to complying with applicable regulations, unless that structure is at a treatment works.
TCC	Tactical Co-ordination Centre
TCG	Tactical Co-ordinating Group
Undertaker	Definition under the Reservoirs Act, broadly meaning the

	reservoir owner or user (person or organisation carrying out an undertaking) of the reservoir. The undertaker is the party responsible for the safe operation of the reservoir and for compliance with the Reservoirs Act.
KRT	Kent Resilience Team
PHE (SE)	Public Health England (South East)
MHCLG	Ministry of Housing, Communities and Local Government
Properties	All residential dwellings and commercial premises. Including occupied mobile homes and caravan sites in low-lying coastal zones (including summer tourists).
Property Flooded	A residential or commercial building where flood water has entered to a level that has resulted in damage or limitation of use, including basements that are habitable or of commercial use.
Property Impacted	A residential or commercial building where flood water has entered the boundary of land but not resulted in the property itself being flooded.
Strategic Coordinating Group. Also referred to as Gold. *Gold or Strategic management and coordination*	Strategic, or Gold, management deals with policy issues around the response. It will normally be located away from the incident and will make decisions about such topics as future resourcing, finances, priorities, future implications and the return to normality. Each organisation will have its own Strategic/Gold Commander, responsible for the activities of their own organisation. For multi-agency working, the function will be known as the Strategic Coordination Group who will work from a pre-nominated Strategic Coordination Centre.
Tactical Coordinating Group. Also referred to as Silver. *Silver or Tactical management and coordination*	Tactical, or silver, management deals with the overall management of the front of the line response to the incident itself. Tactical/Silver Commanders will plan and coordinate the tasks which their staff must carry out in order to respond within the strategy which their Strategic Command level has set or is predetermined within specific Emergency Plans. Each organisation will have its own Tactical Commander who will take charge of work closely together- usually coordinated by the Police- to ensure that the organisations work effectively together. There may be more than one Tactical Commander in some organisations where the response is at more than one location. Tactical controls will be located according to that nature of the incident. This may be in pre-designated accommodation identified at the time or in dedicated command vehicles.
Operational Coordination Group. Also referred to as Bronze	Operational, or Bronze, Commanders will take on responsibility for specific areas or roles according to the needs determined by their organisations Tactical Commander.

Appendix F: EA Incident Report Form

Reporting for UK Dams: Incident Report Form

Part A: Dam and Contributor

1 About you

Your name			
Address			
Phone		E-mail	
Date this report form completed			
Your role in relation to the dam			

2 Dam owner details (if different to above)

Name			
Address			
Phone		E-mail	

3 About the dam

Dam/reservoir name		Dam grid ref.	(e.g. AB 123 456)

Part B: Notification

4 Declaring the incident

The incident was recognised as serious on		date
at (time)		am / pm

5 Provide details of the observations, which triggered the incident being declared.

This could include leakage, slope instability, cracks, instrumentation readings, material failure, overtopping of the dam, etc. If there was more than one trigger, please give further details. Please quantify the indicators (for example leakage rates, crack widths as far as possible).

6 If no action had been taken, how do you think the dam would have eventually failed?

Examples for embankment dams include external erosion, internal erosion and foundation failure. If you also wish to speculate on the estimated time to failure, please do so.

7 What immediate physical actions were taken at the reservoir to manage the incident?

Include a description of any arrangements that were made to lower the reservoir water level, and comment on how effective you thought they were in reducing the threat to the dam. Also include details of evacuations if appropriate. You should provide information on medium to long-term measures to repair the dam or render the reservoir safe in section 12 below.

8 Add any other information on the incident which you consider may be relevant.

Consider whether there is any other information that you think should be recorded to help others learn from your experiences in **managing** the incident.

Part C: Assessment

This section should be completed when the owner is satisfied that the cause of the incident has been reasonably well established, and when any permanent remedial/improvement works have been completed and assessed.

9 What studies or investigations, if any, were carried out to find out the cause of the incident and/or to determine the scope of remedial/improvement works?

Studies might include flood safety assessments, seismic studies, risk assessments, drawdown studies, site investigations, hydraulic model studies, slope stability studies, etc.

10 What was the main factor(s), which led to the incident?

Possible factors might be flood, internal erosion, slope instability, vandalism, earthquake, settlement, deterioration of materials or equipment, instrument malfunction and human error. Provide brief details.

11 How effective was the instrumentation leading up to the incident?

If the dam was monitored using instruments (crest surveys, piezometers, etc.), describe the instrumentation used (type/location), how often readings are usually taken, and the time between the last set of readings and when the incident happened.

12 Describe any actions that were taken some time after the incident to improve the safety of the dam. Include brief details of physical works, changes in reservoir surveillance, improvements in instrumentation and any changes in reservoir operation. Please include information on the typical surveillance frequency before and after the incident, and the date of the inspection before the incident.

13 Consider whether there are any lessons that could be learned regarding, for example, the routine surveillance of the dam, instrumentation, operational conditions, physical conditions or particular features of the dam.

14 Add any further information on how the cause(s) of the incident was assessed and how effective the permanent measures in improving reservoir safety were. Would you consider doing anything differently for:

- **Post-incident assessment;**
- **Providing permanent remedial works/measures,**
- **if a similar incident happened again?**

Appendix G: Model Debrief Agenda

Kent County Council Reservoir Inundation Emergency Plan Debrief Agenda

Incident:

Date:

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

7. Are changes required to KCC Reservoir Inundation Plan (Chair / All)

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

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

10. Outline next steps and close meeting (Chair)

Offsite Reservoir Inundation Emergency Plan

Version 4.3 (December 2024)

Plan owner: Resilience and Emergency Planning Manager