

Annexes



Annex A: Biography of Sir Michael Pitt

Sir Michael Pitt is the current Chair of NHS South West, the strategic health authority for the South-West region. He holds a range of other appointments, including chairing two companies (Solace Enterprises Ltd and Swindon Commercial Services) and providing consultancy advice to a variety of organisations. He was formerly the National President of the Society of Local Authority Chief Executives and Senior Managers.

Sir Michael graduated from University College London in 1970 with a first-class honours degree in civil engineering. He is a Fellow of the Institution of Civil Engineers. He has worked for the Civil Service, in the private sector and for local government, with the majority of his career being spent in county council technical departments. He was appointed Chief Executive of Cheshire County Council in 1990 and of Kent County Council in 1997. He was knighted in the Queen's Birthday Honours in 2005.

Sir Michael lives near Malmesbury in Wiltshire, and is married with two daughters.

Annex B: Pitt Review revised terms of reference

The terms of reference were revised at the end of 2007 in light of the scope of the Review extending to include the recovery phase.

Scope

The Review should be wide-ranging and consider all available evidence on the flooding that occurred in England during June and July 2007, its impacts and what this means for the future. It should hear from those involved at the local, regional and national level, including the public, their elected representatives, public organisations, businesses, the farming community and professional associations. The Review should focus specifically on issues around:

- a. Flood risk management, including the risk posed by surface water flooding and the way in which the public and private sectors might adapt to future risks.
- b. The vulnerability of critical infrastructure, including:

- i. The ability of critical infrastructure to withstand flooding, and what improvements might be made.
- ii. The resilience of dams and associated structures, and what improvements might be made.
- c. The emergency response to the flooding, including social and welfare issues.
- d. Issues for wider emergency planning arising from the actual or potential loss of essential infrastructure.
- e. Issues arising during the transition period from the response to recovery phases.
- f. Issues arising during the recovery phase.

The Review should build on previous reviews of the response to serious flooding events, other relevant reports and policy developments including making best use of resources and maximising value for money.

Objectives

Specific objectives for the Review are:

- i. To understand why the flooding was so extensive.
- ii. To learn lessons on how in future we can best predict, prevent or mitigate the scale and impact of flooding incidents in a potentially changing environment.
- iii. To look at how best to coordinate the response to flooding in future, including the significant social implications for communities.
- iv. To establish what access to support, equipment, facilities and information is needed by those involved in the response at local, regional and national levels.
- v. To ensure the public has as much access as possible to information on the risk of flooding to allow them to take appropriate precautions, be adequately informed on developments as an emergency unfolds, and be looked after properly in the immediate aftermath.
- vi. To establish how the transition from response to recovery is best managed.
- vii. To identify those aspects of the response that worked well and should be promoted and reinforced.
- viii. To look at how best to coordinate the recovery phase in the future.
- ix. To establish what support and information is needed by those involved in the recovery phase at local, regional and national levels.
- x. To identify those aspects of the recovery phase that worked well and should be promoted and reinforced.
- xi. To make recommendations in each of these areas to improve the UK's preparedness for flooding events in the future.
- xii. To make recommendations, drawing on the experience of the flooding incidents, to improve the UK's broader ability to manage the loss of essential services in any future emergencies.

Composition

The Review will be overseen by an independent chairperson, Sir Michael Pitt.

The Review team will be led by the Cabinet Office with support from the Departments for Environment, Food and Rural Affairs, and Communities and Local Government, drawing on experts from other bodies as necessary.

Governance

The independent chairperson, Sir Michael Pitt, will report to the Secretary of State for Environment, Food and Rural Affairs; the Secretary of State for Communities and Local Government; and the Chancellor of the Duchy of Lancaster.

Annex C: Science and Engineering Panel terms of reference

Chair:

Dr Stephen Huntington

Members:

Prof Richard Ashley
 Dr David Balmforth
 Prof Edward Evans
 Prof Jim Hall
 Prof Paul Mason
 Mr Steve Noyes
 Prof Edmund Penning-Rowsell
 Prof David Potts
 Dr Nick Reynard
 Mr Jonathan Simm
 Ms Sue Tapsell
 Prof Colin Thorne
 Prof Howard Wheeler

Purpose of group

Taking into account the overall Terms of Reference of the Pitt Review, the group shall have the following roles:

- i) Provide advice to the Review on science or engineering related aspects including:
 - a. what science or engineering focused research might be required and be possible within the timeframe of the Review that would assist the Review in reaching its conclusions;
 - b. how likely the scale of flooding experienced in June/July will be repeated in the future and at what frequency, taking into account the potential impacts of climate change
- ii) Provide a challenge function to the Review on the following:
 - a. the report outlining the reasons why the flooding occurred;
 - b. research produced in support of the review;

- c. emerging ideas from the Review; and
- d. draft recommendations of the Review, with a particular focus on whether any flood risk management/infrastructure proposals are technically feasible.

Frequency and mode of engaging with panel

The group will meet at key milestones during the Pitt Review. In between these meetings a virtual panel may operate enabling members to comment on specific proposals or papers via e-mail. The secretariat function for this panel will be provided by the Pitt Review Team.

Disclosure of information

In discharging their role under the terms of reference, members of the Science Panel agree not to disclose to others any information that they receive in relation to the Review and its ongoing proposals and recommendations.

Expenses

The Pitt Review will cover reasonable costs for the attendance to the Science and Engineering Panel meetings.

Annex D: List of organisations and members of the public who have contributed to this Review

The Review Team

Dr Matthew Barber
 Emily Bliss
 Dr Simon Bryars
 Jonathan Chan
 Dr Matthew Clarke
 Rosy Day
 Paul Ditchfield
 David Gledhill
 Roger Hargreaves
 Lucy Isotta
 Paul Johnson
 Penelope Kanssen
 Marcia King
 Kirsty Lord-Smith
 Philippa Makepeace
 Gregory Parker
 Eve Shuttleworth
 Nicholas Smith
 Yasmin Sonde
 Craig Trevor
 Richard Willock
 Aram Wood

Organisations

1. Central Government

British Waterways
 Department for Business, Enterprise and Regulatory Reform
 Cabinet Office
 Centre for Protection of National Infrastructure
 Chief Fire and Rescue Adviser's Unit
 Communities and Local Government
 Defence, Science and Technology Laboratory
 Department for Children, Schools and Families
 Department for Culture, Media and Sport
 Department for Environment, Food and Rural Affairs
 Department for Innovation, Universities and Skills
 Department for Transport
 Department for Work and Pensions
 Department of Health
 Drinking Water Inspectorate
 Emergency Planning College
 Environment Agency
 Government Communications Headquarters
 Health Protection Agency
 Highways Agency

HM Coroner
 HM Treasury
 Home Office
 Maritime and Coastguard Agency
 Met Office
 Ministry of Defence
 National Health Service
 Ordnance Survey
 Risk and Regulation Advisory Council
 Scottish Executive
 10 Downing Street
 UK Climate Impacts Programme
 Welsh Assembly Government

2. Government Offices

GO East of England
 GO East Midlands
 GO London
 GO North East
 GO North West
 GO Science
 GO South East
 GO South West
 GO West Midlands
 GO Yorkshire and the Humber

3. Local Government

Abingdon Town Council
 Albrighton Parish Council
 Aylesbury Vale District Council
 Bedford County Council
 Bleasby Parish Council
 Bradford Metropolitan District Council
 Bristol City Council
 Bromley Council
 Buckinghamshire County Council
 Bulcote Parish Council
 Calderdale Metropolitan Borough Council
 Cambridgeshire County Council
 Cheshire County Council
 Colchester Borough Council
 Darlington Borough Council
 Dartford Borough Council
 Devon County Council
 Dorset County Council
 Dudley Metropolitan Borough Council
 East of England Regional Assembly
 East Lindsey District Council

East Riding of Yorkshire Council
 Epping Forest District Council
 Essex County Council
 Filey Town Council
 Flintshire County Council
 Gloucestershire County Council
 Gunthorpe Parish Council
 Hampshire Association of Local Councils
 Hart District Council
 Havant Borough Council
 Hertfordshire County Council
 Hoveringham Parish Council
 Hull City Council
 Kent County Council
 Kirk Ella Parish Council
 Lancashire County Council
 Land Drainage Working Partnership
 Leeds City Council
 Lewes District Council
 Local Government Association
 London Borough of Bexley
 London Borough of Hounslow
 London Borough of Redbridge
 Lowdhan Parish Council
 Mablethorpe and Sutton Town Council
 Maidstone Borough Council
 Malvern Hills District Council
 Mid Beds District Council
 Newark and Sherwood District Council
 Norfolk County Council
 North East Lincolnshire District Council
 North Lincolnshire Council
 North Norfolk District Council
 North Yorkshire County Council
 Nottinghamshire County Council
 Oxford City Council
 Redditch Borough Council
 Rhondda Cynon Taff CBC
 Royal Borough of Windsor and Maidenhead
 Runnymede Borough Council
 Ryedale District Council
 Salford City Council
 Scarborough Borough Council
 Sefton Metropolitan Borough Council
 Sheffield City Council
 Slough Borough Council
 South Hams District Council

South Tyneside Council
Stanwix Rural Parish Council
Suffolk Joint Emergency Planning Unit
Swindon Borough Council
Tendring District Council
Tewkesbury Borough Council
Thatcham Town Council
Torridge District Council
Tunbridge Wells Borough Council
Vale of White Horse District Council
West Berkshire Council
West Devon Borough Council
West Midlands Regional Assembly
West Oxfordshire District Council
West Sussex County Council
Wiltshire County Council
Worcestershire County Council
Wychavon District Council

4. Local Resilience Forums

Avon and Somerset LRF
Bedfordshire and Luton LRF
Cambridgeshire and Peterborough LRF
Central London LRF
Cheshire LRF
Cleveland LRF
County Durham and Darlington LRF
Cumbria LRF
Derbyshire LRF
Devon, Cornwall and Isles of Scilly LRF
Dorset LRF
Durham LRF
Essex Resilience Forum
Gloucestershire LRF
Greater Manchester LRF
Hertfordshire LRF
Humber LRF
Kent Resilience Forum
Lancashire LRF
Leicester, Leicestershire and Rutland LRF
Lincolnshire LRF
Merseyside LRF
Norfolk LRF
Northamptonshire LRF
Northumbria LRF
North Central London LRF
North East London LRF

North West London LRF
North Yorkshire LRF
Nottingham and Nottinghamshire LRF
South East London LRF
South West London LRF
South Yorkshire LRF
Staffordshire Resilience Forum
Suffolk LRF
Surrey LRF
Thames Valley LRF
Wales Resilience Forum
Warwickshire LRF
West Yorkshire LRF
West Mercia LRF
West Midlands LRF
Wiltshire and Swindon LRF

5. Internal Drainage Boards

Bedford Group of Drainage Boards
Beverley and North Holderness Internal Drainage Board
Black Sluice Internal Drainage Board
Market Weighton Drainage Boards
Powysland Internal Drainage Board
Upper Brue and Upper Axe Internal Drainage Board

6. Community Groups

Anglian Regional Flood Defence Committee
Bucklebury Flood Alleviation Committee
Burton Joyce Residents Association
Chertsey Society
Crosby on Eden Emergency Committee
Derringham and Boothferry Community
Essex Flood Forum
Farnham River Watch
Flood Prevention Society
Holy Trinity Church, Tewkesbury
Hull Citizens Advice Bureau
Keswick Flood Action Group
Luckley Wood Neighbourhood Watch & Residents Committee
Much Wenlock Referendum Group
National Flood Forum
North Curry Flood Group
North West Regional Flood Defence Committee
Northumbria Regional Flood Defence Committee

Park View Residents Association
 Pickering & District Civic Society
 Regional Flood Defence Committees
 Severn & Avon Valley Combined Flood Group
 South Farnham Residents Association
 South Yorkshire Federation of Women's Institutes
 Thames Regional Flood Defence Committee
 Wiltshire Federation of Women's Institutes
 Wolvercote Commoners Committee
 Yorkshire Regional Flood Defence Committee

7. Businesses

A & F Consulting Engineers
 Analox Environmental Technology Ltd
 Association of British Insurers
 Atkins
 British Chambers of Commerce
 British Insurance Brokers' Association
 British Property Federation
 Business Continuity Institute
 Chartered Institute of Loss Adjusters
 Chartered Management Institute
 City and Financial
 Engineering Support Practice Ltd
 Experto Crede
 Financial Ombudsman Scheme
 Financial Services Authority
 Groundsure
 Halcrow Group Limited
 Home Builders Federation Ltd
 Hull and Humber Chamber of Commerce
 Indepen
 Jardine Lloyd Thompson
 KPMG
 Lane, Jeffries & Associates Ltd – Fire and Marine Safety Consultants
 Lippke, Cartwright & Roberts Inc
 National Housing Federation
 NGM Sustainable Development
 Northern Housing Consortium
 Norwich Union Insurance
 RBS Insurance
 Reynolds Partners
 Risk Management Solution
 Royal Haskoning
 Royal & Sun Alliance UK
 Sheffield Chamber of Commerce
 Sterling Insurance

Stormwater Control
 Tesco
 WeatherAction
 Weather Intelligence
 WPS4 International
 Zurich Insurance

8. Emergency Services

Association of Chief Police Officers
 Avon & Somerset Constabulary
 Avon & Somerset Search & Rescue
 Bedfordshire & Luton Fire and Rescue Service
 Bristol Primary Care Trust
 Chief Fire Officers' Association
 Dumfries & Galloway Fire & Rescue Service
 Fire Brigades Union
 Gloucestershire Constabulary
 Gloucestershire Primary Care Trust
 Hereford & Worcester Fire and Rescue Service
 Humber Emergency Planning Service
 Lincolnshire Fire and Rescue Service
 London Fire Brigade
 Metropolitan Police
 Midshires Search and Rescue
 National Policy Improvement Agency
 NHS Resilience Project
 NHS Yorkshire & Humber
 Northamptonshire Police
 Rescue and Preparedness in Disasters (RAPID UK)
 Royal National Lifeboat Institution
 Search And Rescue Assistance In Disasters (SARAID)
 Severn Area rescue Association
 Surrey Police
 Swaledale Mountain Rescue Team
 West Midlands Ambulance Service
 Wiltshire Police

9. Media

BBC News
 BBC Radio Humberside
 BBC TV Look North
 Cotswolds Observer Newspaper
 East Riding Mail
 Environment UK Magazine
 Gloucestershire Echo
 Hull Daily Mail

ITN
ITV West
ITV Yorkshire
KC FM
Sheffield Star
Sky News
Society of Editors
Sunday Telegraph
Surveyor Magazine
The Citizen (Gloucester)
Viking FM
Yorkshire Post

10. Science and Engineering

Association of Drainage Authorities
Chartered Institution of Water and
Environmental Management
Flood Protection Association
Hadley Centre
HR Wallingford
Institution of Civil Engineers
Risk Management Solution
Royal Academy of Engineering
Royal Institution of Chartered Surveyors

11. Universities and Research Organisations

Centre for Ecology and Hydrology
City University
Coventry University
Cranfield University
Demos
Imperial College London
Institute for Public Policy Research
London School of Economics
Lancaster University
National Hydrological Monitoring Programme
New College – Oxford University
River Path
Royal United Services Institute
Swansea University
Tyndall Centre
University of Birmingham
University of Bristol
University of Dundee
University of East Anglia
University of Gloucestershire

University of Hertfordshire
University of Hull
University of Leeds
University of Manchester
University of Middlesex
University of Newcastle upon Tyne
University of Northumbria
University of Nottingham
University of Sheffield
University of Southampton
University of Strathclyde
University of Wolverhampton

12. Utilities and Critical Infrastructure

Airwave Solutions
Anglian Water
Association of Electricity Providers
British Dam Society
British Energy
British Standards Institution
British Telecom
BSI Management Systems UK
CE Electric
CNI SCAN
Consumer Council for Water
EDF Energy
Electricity North West Ltd
Energy Networks Association
Energy Watch
E:ON Central Networks
National Grid
Network Rail
Northumberland Water
Ofcom
Ofgem
Ofwat
Scottish Power
Scottish & Southern Power Distribution
Severn Trent Water
Thames Water
Water UK
Western Power Distribution
Wessex Water
Yorkshire Water
UK PIA
United Utilities

13. Voluntary Organisations

British Red Cross
 De Montfort Housing Society
 Help the Aged
 National 4x4 Response Network
 Powys 4x4 Response
 Rotary International in Great Britain and Ireland
 RSPCA
 Salvation Army
 Shelter
 St John Ambulance
 Wessex 4x4 Response
 WRVS
 Women's Institute:

- Filkins & Broughton Poggs
- Hampton Bishop (Herefordshire)
- Hundelby, Lincs
- Sandhurst
- Sinnington
- South Elkington
- South Yorkshire
- Thorpe St. Peter
- Washingborough
- Worcestershire Federation

14. Cross-cutting organisations and Interest Groups

All Party Parliamentary Water Group
 Association of Directors of Adult Social Services
 Association of Drainage Authorities
 Association of Home Information Pack Providers
 Association of Inland Navigation Authorities
 Association of Train Operating Companies
 Audit Commission
 Automobile Association
 British Continuity Institute
 British Red Cross
 British Hydrological Society
 Centre for Public Scrutiny
 Chatham House
 Commission for Rural Communities
 Continuity Forum
 Country, Land and Business Association
 Emergency Planning Society
 English Heritage
 Forestry Commission
 Institute of Asset Management

International Association of Emergency Managers EUROPA
 National Association of Estate Agents
 National Farmers' Union
 National Flood Forum
 National Planning Forum for England
 National Trust
 Natural England
 Office of Rail Regulation
 Ombudsman of Estate Agents
 Passenger Focus
 Public Weather Service Customer Group
 Riding Safely
 Royal Institute of British Architects
 Royal Institute of Chartered Surveyors
 Road Haulage Association
 Royal Meteorological Society
 Royal Society for the Protection of Birds
 Royal United Services Institute
 Skills for Justice
 Soil Association
 Social Care Institute for Excellence
 Town & Country Planning Association
 United Kingdom IT Association
 Water Research Council
 Wildlife and Countryside Link
 Wildlife Trust
 World Wildlife Fund

Individuals from the general public

Christine Adamson
 P A Allen-Jones
 Ray Armishaw
 Eric Armstrong
 Dorothy Arnett
 Sue Badger
 Charles Bagnall
 Thomas Bailey
 Michael Baker
 Julie Bardsley
 Joss Barnard
 Steven Bateman
 Derrick Bates
 Robert Beckett
 Malcolm Beer
 David Bell
 R J Berkeley

J Bennett	Derek Foot
R M Bennett	Lisa Frost
E J Birt	David Girtchen
Roger Black	Alan Gordon
James R Blake	David Gosling
Gillie Bolton	Beatrice Greenfield
Jess Bouse	Mick Gudgeon
Robert E Bridges	Simon Haddrell
Howard Brier	Phil Hall
M R Broadman	Karl Hardy
Leon Brocard	Adam Hart-Davis
S J Brooks	Rod Heard
John and Dr Clare Broome Saunders	Dieter Helm
Linda Brown	Paul and Ron Higgins
Linda and Steve Brown-Pike	Sally Hilliar
Maria Bryant	Gerry Hobbs
H M Buckland	Simon Hogfress
Richard Burke	John Hopf
Jane Burrett	Anne and Colin Howes
Chris Callaghan	Geoff Howes
L Cannon	Paul Howes
Kevin Ceaser	Emma Hughes
Jeremy Chamberlayne	Cath Humphris
Natalie Clark	James Hunt
Richard Clark	Steve Hutchins
David Crichton	C H Hutchinson
Tom Crossett	Neil Hyder
Thomas Coulthard	Mary Jackson
Donna Cowley	Emma Jayne-Beaumont
Robert Dale, MBE	Jacquiline Jenkins
Martin Davidson	Dilys Jones
Bev Day	John Jones
Stuart Derwent	Wendy Jones
Jill Dewsbury	John Kane
Barbara Donovan	Ruth Keens
Kevin Duma	Keith Kennils
Iain B Dunn	Stephen King
Roy H Eardley	F E and A Langcaster
David Edge	Ewan Larcombe
Chris Elkington	Arthur Lawrence
Brian Ellis	Jennifer E Leeman
Henry Elwell	S M Lodge
Sidney Joseph England	Rev Raymond Lunt
Tim Fairhead	Caroline Mackin
Peter Farley	Rachael Maher
Tony Ferguson	K Malone
Jaap-Jeroen Flikweert	Eileen Marshall

John Martin, CBE
 Jeff Martin
 Peter Martin
 Neil McCart
 Michael McEllin
 Chris Meehan
 Edwin Miller
 David J Mills
 Bev Milner Simonds
 Patrick and Jennifer Morrissey
 David Munn
 Anil Nair
 David Noble
 Christine O'Luby
 R K Owen
 C W Parker
 P Parker
 Kim Parkinson
 Andrew Parris
 Brendan L Payne
 Jan Pendrigh
 K E Petch
 Gill Pillar
 G Pinkney
 Andrew Plane
 Adrian Porter
 Ann-Marie Powell
 Kevin Powell
 Peter Power-Hynes
 Ken Pratt
 Linda Preston
 Carolyn Price
 Graham Price
 Reg Purnell
 Arthur Rabjohn
 Leanne Raper
 Peter Rawcliffe
 Dan Raymond
 J E Read
 Michael Reade
 David G Reed
 Andy Reeley
 P S Reid
 Athee Reiss
 Mary Riley
 Brian Rodges
 Anne Robinson

Michael Robinson
 Nicholas Robinson
 Steve Robson
 Sarah Rogers
 Tom Rollins
 David Royffe
 Mary Russell
 Lesley Russell
 Peter Russell
 R E Rust
 Jayne Salt
 Clive Savage
 Gerald Savage
 Francis Shaxson
 David Sheldon
 Jane Sircombe
 Ronald Skene
 Chrysa Skouloudi
 R Smailes
 Lisa Smoult
 Howard Smith
 Kath Smith
 Patrick Smith
 Peter Smith
 Philip Smith
 Gary Sone
 Gillian Stellman
 David Steven
 Susan Stuckey
 Peter Styles
 David Sullivan
 Jackie Surtess
 Linda Swann
 Roy Taylor
 Bob Thacker
 David Thomas
 Gareth Thomas
 Richard Thomas
 Richard Tilbrook
 Petr Tomes
 John Michael Tonks
 Richard Trimmer
 Vincent Tully
 Mr and Mrs D S Turner
 Jack Turton
 Clair Twigger-Ross
 Tim Twomey

Mr and Mrs Wakefield
Edward Walker
Jeremy Walker
Rosemary Walker
Timothy Walker
Mark Wallace
Christopher Waller
Mike Walton
Richard Ward
Pauline Washington
J Wassell
Ron Watson
Jonathan Weaden
E Webber
Paul Weeden
Sara Wells
R Weston
Sharon Wheeler
Sue Wherrett
John Whitehead
Paul Whittle
Sandra Wickenden
David Wilkinson
Mike Williams
Albert Williamson
David Wilson
R M Wilson
V Wilson
Rory Witham
S Woolley
Nigel Wroe
Wren Wroe
George Yarrow

Members of Parliament

Norman Baker MP
Rt. Hon. Hilary Benn MP
Rt. Hon. Hazel Blears MP
Rt. Hon. David Blunkett MP
Tim Boswell MP
Colin Burgon MP
Rt. Hon David Cameron MP
Parmjit Dhanda MP
Philip Dunne MP
Environment, Food and Rural Affairs Committee
Rt. Hon. Caroline Flint MP
Paul Goodman MP

John Healey MP
Martin Horwood MP
Rt. Hon. Adam Ingram MP
Rt. Hon. Michael Jack
Rt. Hon. Alan Johnson MP
Diana Johnson MP
Rt. Hon. Charles Kennedy MP
David Kidney MP
Peter Luff MP
John Mann MP
Eric Martlew MP
Rt. Hon. Ian McCartney MP
Anne McIntosh MP
Shona Mclsaac MP
Rt. Hon. Ed Milliband MP
Anne Milton MP
Owen Paterson MP
Rt. Hon. John Redwood MP
Laurence Robertson MP
Prof. Steve Webb MP

International Organisations

France

French High Committee for Civil Defence
Ministry of the Interior
Ministry of Sustainable Development

The Netherlands

Ministry of the Interior and Kingdom Relations
Rijkswaterstaat Centre for Water Management

Sweden

Ministry of Defence
National Food Administration
Stockholm Vatten
Swedish Commission on Climate Change and Vulnerability
Swedish Emergency Management Agency
Swedish Meteorological and Hydrological Institute
Swedish rescue Services Agency
Swedish Civil Defence League

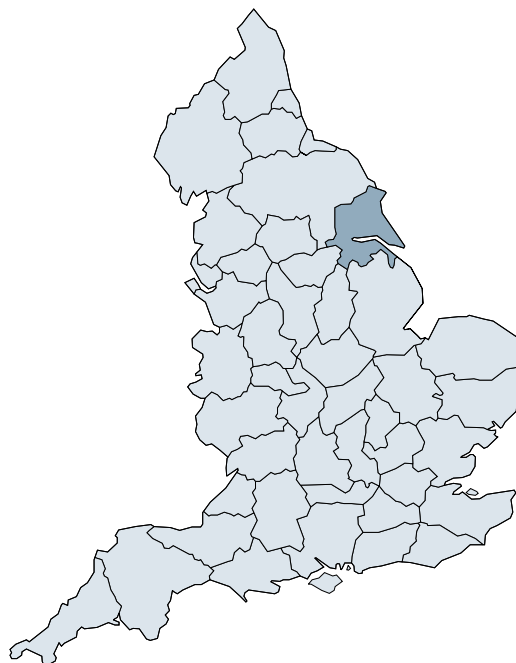
United States

Association of State Flood Plain Managers
City of New Orleans
Federal Emergency Management Agency
Office of Homeland Security
US Army Corps of Engineers

Annex E: Regional summaries

East Riding of Yorkshire and Kingston upon Hull

Key affected police areas	Humberside
Key affected local authorities	East Riding Hull CC
Area	2,479 km ²
Population	587,100
Houses flooded	Approx. 15,500
Businesses flooded	Approx. 650



The area sits on a chalk formation that extends from the Humber Estuary to the Yorkshire Wolds. Erosion from the North Sea is a major concern for the region, and the coastline is continually changing as a result. Much of the area is low-lying (90 per cent of Hull is below high-tide level) and the drainage system for Hull is entirely pumped, which means it is particularly vulnerable to flooding. The higher ground surrounding Hull causes a 'basin effect', as the region mostly drains into the Humber. Other key rivers in the region are the River Hull and the River Ouse.

Weather conditions and flooding

Between 14 and 25 June 2007, a large amount of rain fell across Humberside, causing widespread surface water flooding. Intense rainfall on 14–15 June saturated the area, and another bout of intense rainfall on 24–25 June then quickly overwhelmed the drainage systems. Between these two periods, there

were a number of other localised floods. June 2007 was the wettest month on record in Yorkshire since 1882.

Impact on communities

The sheer scale and speed of the floods caught many local residents and businesses by surprise. Almost 15,500 properties were affected in the Humber area, including an estimated 2,336 council properties. There were also a significant number – over 3,000 – of uninsured properties. About 400 households required alternative accommodation for up to a week – and over 200 households needed alternative accommodation for more than six months.

The emergency response

The Environment Agency used advanced technology to monitor rainfall, river levels and sea conditions and collated the data to issue flood warnings through its flood warning system. It issued an early warning on 22 June

and repeat warnings over the following few days. A Flood Watch was issued on 24 June followed by a Flood Warning, but this was not escalated to a Severe Flood Warning. By 25 June, a major incident was declared by Hull City Council, and later that day the police set up Silver Command.

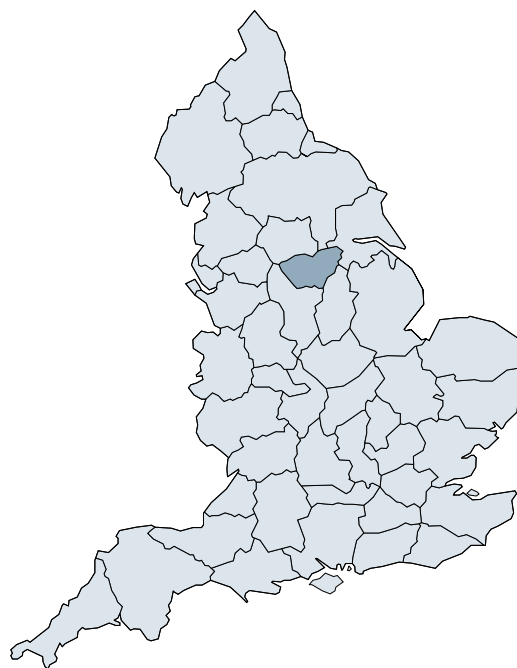
The effect on critical infrastructure and essential services

The area experienced extensive surface water flooding that caused widespread disruption to roads and essential services. The estimated cost of damage to regional roads stands at £28 million and there are further costs associated with damage to bridges (£4–5 million) and street lighting (£500,000).

More than 90 schools were damaged and over 650 businesses were affected, disrupting food supplies and other aspects of daily life for many residents.

South Yorkshire

Key affected police areas	South Yorkshire
Key affected local authorities	Barnsley MBC Doncaster MBC Rotherham MBC Sheffield CC
Area	1,552 km ²
Population	1,292,000
Houses flooded	Approx. 4,000
Businesses flooded	Approx. 1,800



South Yorkshire is a region with a major industrial history, from the coal industry to the steel industry concentrated in Sheffield. The region's principal towns and cities are Barnsley, Doncaster, Rotherham and Sheffield, and its two main rivers are the Don and the Dearne. There is also an extensive network of canals, which were built to help navigate and transport goods between the major cities.

Weather conditions and flooding

Intense rainfall between 14–16 June and between 24–25 June resulted in two serious floods in the region. Two people died and approximately 6,000 homes and businesses were flooded.

The first flood was due to heavy rain falling over a period of three days. Many locations received one to two months' rainfall in the space of just 48 hours.

The rainfall that caused the second flood was less widespread than the first and mainly affected South and West Yorkshire, Hull and East Yorkshire. Although 48-hour rainfall totals were similar to the first flood, the majority of the rain in the second flood fell in one particularly intense 12-hour period on 25 June.

In addition to the two major floods, there were a number of localised storm floods between 14 June and 23 July across North Yorkshire and North East England. Together, these events made June the wettest month on record in Yorkshire since 1882. Surface drains and sewers became overwhelmed and rivers rose to record levels, overtopping their banks and flood defences.

Impact on communities

In Doncaster, 50 caravans were sited at Toll Bar caravan park, where many residents are still living a year on from the floods. Some authorities offered to waive social housing rents and council taxes for those affected by the floods. In Barnsley, Doncaster and Rotherham,

the authorities waived both rents and council tax. In Sheffield, council tax was waived, and a £100 payment given to affected households for social housing rents.

The emergency response

Two Silver Commands were established in Sheffield and Rotherham in the first floods on 14 June. During the second flood, Silver Commands were set up in Doncaster and Barnsley, and Gold Commands in South Yorkshire and Sheffield.

The effect on critical infrastructure and essential services

The effects of the second flood were compounded by the fact that the first flood had not drained sufficiently, causing saturated ground and high water levels.

During the evening of 25 June, concerns grew about the condition of the Ulley Reservoir after reports of problems with the dam wall. The spillway, through which water escapes from the dam, had been damaged and the dam wall was eroding. This could have led to a catastrophic failure of the dam wall and put lives, property and other infrastructure assets at risk. A major effort by the emergency services and others was mounted to reduce the water levels in the reservoir and shore up the dam wall.

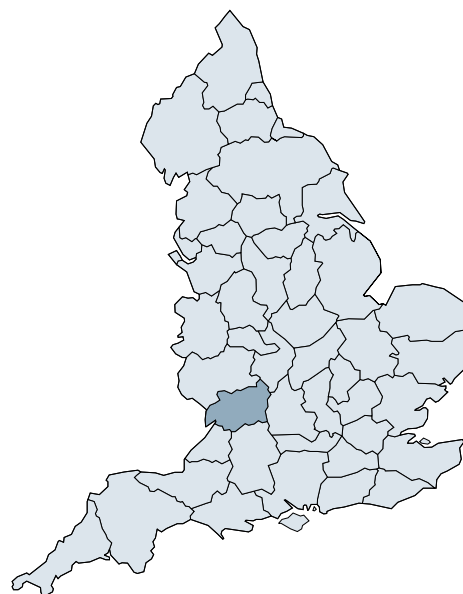
Elsewhere, Neepsend electricity substation was shut down with a loss of power to 40,000 people and there were further power failures in Hillsborough.

The floods caused significant damage to the local highway infrastructure. Several arterial roads to Sheffield were closed due to flooding, several bridges were washed away.

Rotherham train station was closed on 25 June for almost a month, and a replacement bus service was provided.

Gloucestershire

Key affected police areas	Gloucestershire
Key affected local authorities	Cheltenham BC Gloucester CC Tewkesbury BC
Area	3,150 km ²
Population	833,100
Houses flooded	Approx. 6,000
Businesses flooded	Approx. 1,000



The county of Gloucestershire lies between the Cotswold Hills, the Severn Valley and the Forest of Dean. The county is largely rural – the principal towns are Cheltenham, Cirencester, Gloucester, Stroud and Tewkesbury. The region has an extensive network of rivers, the principal waterways being the Severn, the Frome, the Teme and the Avon.

Weather conditions and flooding

Between 24–25 June there was heavy, persistent and frequent thundery rain in Gloucestershire, with almost a whole month's rainfall in two days. Flooding was predominantly caused by smaller watercourses that reacted quickly to local runoff – flooding from the River Severn was not significant at this stage.

A deluge of heavy and persistent rain on 20 July caused extensive flooding across the lower Severn catchment – in many places, river levels were the highest ever recorded. Gloucester experienced record flood levels as a result of the exceptional flows in the Teme and Avon rivers and heavy rainfall across

Worcestershire and Gloucestershire. River levels at the Gloucester Docks gauge reached a peak of 4.92 m on 23 July. This was only 1 cm lower than the highest recorded level in 1947. Normal summer levels are around 0.6 m.

Impact on communities

Over 6,000 properties were affected by the July floods, many of which were first flooded by surface water or by watercourses that reacted quickly to local runoff. The same properties were then flooded by the River Severn a few days later. Roads and transport links were affected by the floods and seriously hampered people's travel plans. The M5 flooded and left some 10,000 vehicles and their occupants stranded. In Gloucester, the flooded rail network left 500 rail communities stranded. Over 30 schools were damaged.

The emergency response

Gold Command was set up in Gloucester to coordinate the emergency response. Some local authorities offered to waive social housing rents and council taxes for those affected by the floods.

The Environment Agency monitored rainfall, river levels and sea conditions and collated the data to issue flood warnings.

There was some criticism of the Environment Agency's warning system. In particular, there was concern that warning of flooding at the Mythe water treatment works was very late.

The effect on critical infrastructure and essential services

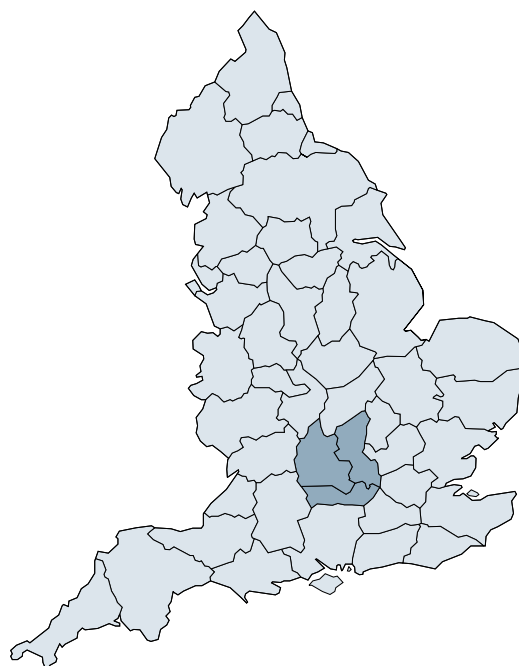
Mythe water treatment works near Tewkesbury was flooded and had to be shut down on 22 July. Mythe represented a single point of failure, as the households supplied by the works could not receive a piped water supply from any other source. This left 350,000 people across Gloucestershire without drinking water for over 20 weeks – the largest loss of essential services since the Second World War. Severn Trent Water, assisted by the Armed Forces, responded with a massive effort to provide water through bottles and bowsers to numerous locations across the county.

Electricity supplies were also threatened, as Walham and Castle Meads electricity sub stations became vulnerable to rising floodwater. The Environment Agency worked with the Armed Forces, fire and rescue services and the police to protect Walham substation. Castle Meads was shut down before it flooded, leaving over 40,000 people without electricity. The joint response from emergency responders and the Environment Agency meant that many tens of thousands of people across Gloucestershire and South Wales did not suffer from loss of power supplies.

Rough estimates suggest about one per cent of the road infrastructure was damaged costing £25 million to repair.

Thames Valley

Key affected police areas	Thames Valley Warwickshire Wiltshire Surrey
Key affected local authorities	Oxford CC West Oxfordshire DC Vale of White Horse DC West Berkshire Council Royal Borough of Windsor and Maidenhead Wokingham BC
Area	12,800 km ²
Population	4,300,000
Houses flooded	Approx. 5,700
Businesses flooded	Approx. 80



The Thames Valley covers the counties surrounding the River Thames, including parts of Berkshire, Buckinghamshire, Oxfordshire and beyond. The Cotswold hills typically mark the general landscape of the region, with steep escarpments down to the Severn Valley and Warwickshire Avon. The principal towns affected by the summer floods are Reading, Oxford and Abingdon, and the region's principal rivers include the Thames, the Cherwell and the Avon.

Weather conditions and flooding

The Thames region experienced greater than average rainfall for most of May and June, but the majority of the rain fell on 19 and 20 July. Extremely high rainfall and already saturated ground meant that drains were overwhelmed, which led to a large amount of surface water flooding. There was also fluvial flooding along

the River Thames and its tributaries, which affected Wiltshire, Oxfordshire, Berkshire and Surrey.

Impact on communities

Flooding occurred across the Thames Valley. However, the impacts were less severe than in other parts of the country. Approximately 5,700 properties were flooded – more than half of these were due to surface water flooding rather than river flooding, with the majority of affected houses to be found in the Oxfordshire and West Berkshire areas.

The emergency response

Silver Commands were put in place in several locations including Windsor, Abingdon and Reading. A Gold Command operated for the Thames Valley region. The authorities in West Berkshire used a leaflet campaign to provide advice to the public.

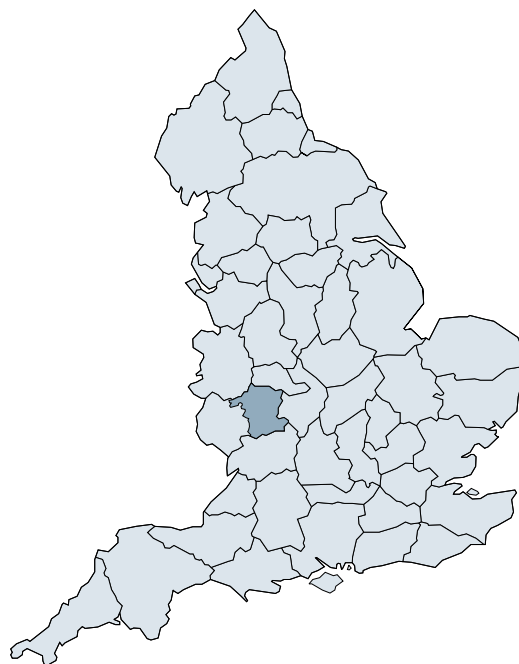
The effect on critical infrastructure and essential services

Many arterial roads into major towns were affected, including a number of A-roads leading into Oxford. Rail lines were closed as a result of flooding or the risk of flooding, and the major route between Didcot and Oxford was suspended.

Utilities infrastructure was also affected, including an electricity sub station in Oxford, and a sewage treatment works and several sewage pumping stations in or near Oxford and Abingdon.

Worcestershire

Key affected police areas	West Mercia
Key affected local authorities	Worcestershire CC Wychavon DC Wyre Forest DC Malvern Hills DC Worcester City
Area	1,735 km ²
Population	552,900
Houses flooded	Approx. 3,366
Businesses flooded	Approx. 747



The county of Worcestershire is located in the West Midlands of central England, towards the north of Gloucestershire and the Cotswold Hills. The region's principal towns include Redditch, Pershore and Malvern. Among the main rivers that flow through the county include the rivers Severn, Stour and Teme.

Weather conditions and flooding

Heavy rainfall in the region during May and June resulted in the first major pluvial flooding on 19 June in the Wyre Forest and Malvern Hills areas, damaging over 150 properties.

Flash flooding in July resulted in 18 cm of rain to fall in Worcestershire – over four times the normal average. The small market town of Tenbury Well, for example, suffered extensive

flash flooding on 17 July causing extensive damage to properties and infrastructure in the town. The most significant flooding event of summer 2007 occurred as a result of exceptionally heavy rainfall across the Midlands on 20 July, leading to fluvial flooding of the Severn, Teme and Avon and their tributaries and extensive flash flooding due to an already high water table.

Impact on communities

Approximately 6,000 buildings were affected by the flooding, including approximately 3,500 residential properties. Roads and transport links were severely affected on local roads that connect the county to some of the neighbouring major cities in the Midlands and in the South West. The economic cost to the County was estimated at £6.4 million per week during the height of the flooding.

The emergency response

A declaration of a Major Incident was made on 20 July. Strategic Gold and Silver commands were set-up in Hindlip Police HQ and Worcester Police station. Worcestershire County Council set up an emergency response centre to coordinate the response of local authorities, and a public emergency helpline was also set up.

The effect on critical infrastructure and essential services

Many of the most critical areas affected were located around the River Severn, such as Upton-upon-Severn and Kempsey. Care homes and hospitals were among the first to be evacuated. Over 90 long-term care patients were moved to temporary alternative accommodation.

Elsewhere, some of the county's key road infrastructure were made impassable by the severe flooding. The closure of the M5 due to flooding resulted in heavy traffic backing up into Worcestershire. Rail services were severely disrupted. Many of the county's roads and public rights of way were affected months after the flooding event, such as the B4084 near Cropthorne which did not re-open until December 2007.

Tourism was also severely affected across the region. The Severn Valley Railway was closed due to major landslips. It has only just recently re-opened. Regional Development Agency assistance was important towards the repair of the railway attraction, as well as helping to promote the region and to attract visitors back to Worcestershire.

Annex F: Open letter on progress of urgent recommendations 16 April 2008

16 April 2008

Dear Secretaries of State,

During December of last year we published the Interim Report on lessons learned from the 2007 floods. It highlighted 15 urgent recommendations which I believed to be necessary in order to prevent or mitigate flooding which might occur before the final report is published. These recommendations were not just for government, they also called for urgent action by local organisations, the private sector and the public.

Hilary Benn, on behalf of the Government, accepted all of the urgent recommendations on the day of publication and undertook to work with all organisations involved to deliver changes as quickly as possible. In the Interim Report, I promised to monitor work against the urgent recommendations and committed to publish a commentary on what had been achieved by the end of March of this year.

This letter, and supporting annex, sets out my views on progress. The Review Team have assessed progress against each recommendation on the basis of contributions from government departments and agencies, structured feedback from Local Resilience Forums (LRFs) and direct evidence received from organisations through the consultation process and a series of regional conferences.

We have judged each recommendation to fall into one of three categories: 'complete', for those which have been carried out as we intended; 'acceptable progress', for those which have been the subject of considerable activity and are nearing completion; and 'insufficient progress', for those which we believe to be taking significantly longer than seems reasonable.

In all our assessments, we are informed by a consideration of what those people directly affected by last summer's floods would consider to be fair. We are also mindful that our deadline for progress was demanding,

though we recognise that the time elapsed since the publication and acceptance of the recommendations will be regarded by many as generous and that of the 107 actions identified we chose to prioritise only 15.

Overall, I am pleased to report that strong progress has been made against the majority of the recommendations, particularly recommendations 1 to 9, 12, 13 and 15. Government organisations, notably Defra and the Environment Agency, have responded to the challenge with a programme of action. Good work has been done to improve awareness of specific flood risks amongst local responder organisations, particularly in those areas which face the most significant problems. This is coupled with positive work at the local level to enhance the resilience and effectiveness of emergency response, supported by new guidance from government. I am pleased to see these improvements, and overall we are already better prepared for future flooding emergencies.

Nevertheless, there are areas for concern. In particular, it is disappointing that insufficient progress has been made against the recommendations which relate to critical infrastructure and public awareness: recommendations 10, 11, 14 and 15

Recommendation 10 asked for LRFs to be given basic briefing on critical infrastructure located in their areas, so as to prevent the sort of confusion around the location, criticality and vulnerability of essential sites that we witnessed last summer. Although a briefing arrangement has been agreed in central government, this is not yet leading to sufficient action at the local level. In this respect, responder awareness of critical infrastructure and its vulnerability to flooding has not significantly improved, save for those areas which have undertaken local initiatives.

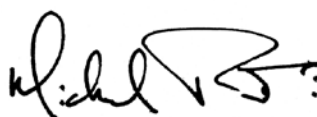
Recommendations 11, 14 and 15 related to public awareness and engagement, something which the interim report recognised as crucial to effective flood risk management. Progress has been made, but significantly more needs to be done. Moving to an 'opt-out' telephone flood warnings scheme has proved to be complicated, but more should have been

done to make decisive progress in this area including a clear timetable for action. In relation to the recommendations directed at the public, progress has also been patchy with no evidence that anything other than a small proportion of people at risk have done anything to help themselves. As a consequence, the public remain little better prepared than they were before last summer's floods.

I am also surprised by the variation in the levels of engagement, understanding and willingness to pursue improvements as set out in the correspondence from LRFs. Many LRFs were able to demonstrate existing capabilities or a commitment to rapid progress against the issues highlighted for improvement. But others have been slow to tackle the challenge, with some of the reasons cited – such as the complexity of the task, lack of resources or the inappropriateness of the recommendation – lacking credibility in the light of good progress elsewhere. The level of prevention and preparedness in relation to flood risk is variable, with different parts of the country experiencing different levels of assurance.

I hope that you will agree with me that more progress must be made on those recommendations which have not yet been completed. I will provide further commentary as necessary in my final report. To that end, I would be grateful for your views on what more might be done to speed up progress and ensure that the urgent recommendations are all delivered as quickly as possible.

Yours sincerely,



Sir Michael Pitt
Independent Chair

Annex to letter of 16 April 2008

Progress against urgent recommendations in the interim report

Flood risk awareness

Recommendation 1

The Review recommended that more frequent and systematic **monitoring of groundwater levels** at times of high risk should be undertaken by the EA, which should begin as soon as possible to predict and mitigate further serious ground water flooding from this winter onwards. The purpose of this recommendation was to counter the concern that groundwater flooding was a significant risk this winter, and should be factored into the work local areas were doing to improve their flood risk management. This recommendation has been **completed**.

The EA has made progress with this recommendation, and LRFs report good progress. EA have produced national groundwater level forecasts for all of England's major chalk aquifers, from which the risk of groundwater flooding is highest, and shared this at the local level. This was achieved by undertaking two national groundwater level scenario forecasting exercises – one in October 2007 to assess risks at the start of winter, and the second in February 2008 to re-assess the situation after the heavy January rains. These were extended analyses, compared to those undertaken routinely for Southern England, so as to include the chalk aquifers of Yorkshire and North Lincolnshire, thus covering all major chalk aquifers in England. The EA are considering the scope to undertake such national forecasting on a more regular and systematic basis.

Recommendation 2

The Review recommended that the EA, supported by local authorities and water companies, should urgently **identify areas at highest risk from surface water flooding** where known, inform LRFs and take steps to identify remaining high risk areas over the winter months. This recommendation was prompted by the significant problems caused by surface water flooding during the summer, and an assessment that information was not being shared appropriately by the various responsible organisations. **Acceptable progress** has been made against this recommendation.

Although the EA has limited responsibilities in relation to surface water flooding, it has been working with local authorities and water companies and made significant progress with this recommendation over the past three months.

The EA have pursued a number of short-term actions including meeting with many of the LRFs to share knowledge of historic surface water flooding. Following on from that, the EA is determining what information is needed to gain a fuller picture of historical surface-water flooding. They will then request the information from Local Authorities and Water Companies and, once collated, provide the information to Local Resilience Forums to allow a multi-agency risk assessment of surface water flooding. The aim by August 2008 is to have an initial indication of areas that may, in certain circumstances, be prone to surface water flooding. This will provide indicative information to LRFs.

LRFs are aware of the process, and have timetables in place to incorporate the new EA data into local flood planning. However, should this new information not be issued or prove to be insufficient for local responders, the assessment of progress in this area will be revised downwards.

Defences

Recommendation 3

The Review recommended that the EA should urgently develop and implement a clear policy on the **use of temporary and demountable defences**. This recommendation reflected community and professional confusion about the role of these types of flood defence, and the absence of a clear national approach to dealing with assets which are always in high demand during severe flooding events. **Acceptable progress** has been made against this recommendation.

The EA already has a demountable flood defence policy in place and their temporary flood defence policy will be circulated for comment to professional partners very soon. The EA intends to share and explain these finalised policies to professional partners and the public to make sure that they are clearly understood.

Local responders are informed of progress and anticipate that the guidance on the use of temporary barriers is imminent, not least because of effective dialogue by the EA. However, should this guidance not be issued or prove to be insufficient for local responders, the assessment of progress in this area will be revised downwards.

Local response arrangements

Recommendation 4

The Review recommended that all LRFs urgently reviewed their current local arrangements for **flood rescue** to consider whether they are adequate in light of the summer's events and their local community risk registers. This recommendation was driven by concern about the ad hoc nature of rescue efforts in many places, and the absence of clear operational control structures. This recommendation has been **completed**.

The returns received by the Review show that LRFs have been thoroughly reviewing their current local arrangements for flood rescue over the past three months. There is a clear sense that each area understands the strengths and limitations of local flood rescue capability, and is drawing up realistic (though often limited) plans accordingly.

However, there is no consistent approach to water rescue capabilities in England. Many LRFs have different capabilities and funding structures in place. The Fire and Rescue Service plays a central role, but other organisations (statutory and non-statutory) also form a significant part of the picture. Representations to the Review cite a variety of reasons for the differences in capability – the lack of a statutory duty on any organisation to carry out flood rescue, an absence of funding for equipment and training, no agreed national scheme for mutual aid in flood emergencies. This response to the recommendation is cause for concern. If another wide-area flooding emergency happened in the near future, those responding to the emergency would still not necessarily have the right resources or training to respond safely.

Recommendation 5

The Review recommended that all LRFs should undertake an urgent review of the **resilience of designated rest centres and other major facilities** to ensure either that they can be used in the response to flooding and other major emergencies, or that alternative arrangements are put in place. This recommendation reflected incidents during the summer floods which led to the loss of rest centres, emergency facilities and emergency equipment. This recommendation has been **completed**.

This analysis has been carried out by LRFs and contingency arrangements are being made where there are rest centres which are at risk of flooding. Other major facilities have also been checked and where there are vulnerabilities, these have been highlighted to the appropriate organisations for them to set up business

continuity plans. A number of LRFs have carried out analysis against consequential risks such as loss of power.

The number of rest centres available has also been considered by LRFs with smaller, more localised rest centres being identified in some cases to be used if the emergency causes problems with travelling to rest centres (one of the tactical lessons from the summer floods).

National planning and coordination

Recommendation 6

The Review recommended that the Cabinet Office, with other departments, should urgently consider the costs, benefits and feasibility of establishing arrangements for the urgent acquisition of supplies during a major emergency, including the use of call-off contracts or the creation of national or regional **stockpiles** of equipment and consumables. This recommendation responded to the very significant logistical challenges which the summer flooding presented, particularly in Gloucestershire. This recommendation has been **completed**.

The Cabinet Office, working with other departments, undertook a scoping study on stockpiling. This study surveyed Regional Resilience Forums to see what stockpiling, if any, was used at present and also considered possible options which could be used in the future including traditional stockpiling, call-off contracts and the use of supplies held in the community.

From this study, guidance has been written which lays out the options available. This guidance is currently going through Cabinet Committee clearance and will be issued to both the regional and local level in the summer after the National Capabilities Survey has concluded.

Recommendation 7

The Review recommended that Department of Health guidance clarifying the role and accountabilities of organisations involved in providing **scientific and technical advice** during a major incident should be implemented as soon as possible and understood by Gold Commanders. This recommendation reflected the confusion which occurred around different sources of scientific advice, and lack of clarity around the split between national and local responsibilities. This recommendation has been **completed**.

Guidance to the NHS on providing Strategic Command Arrangements across the healthcare sector was released, updating roles and responsibilities for NHS organisations during major incidents. It specifically clarifies the role of the Strategic Health Authority as the principal healthcare system manager during a crisis. Local responders have already begun incorporating the new advice into their planning activities, leading both to greater consistency and improved awareness of the role which health service organisations can play.

The Department of Health is continuing to work closely with the Cabinet Office to develop further Science and Technical Advice Cell (STAC) guidance at the local, regional and national level, including clarifying the roles of central advice and that of other health agencies. This guidance is due to be published in early summer 2008.

Recommendation 8

The Review recommended that the guidance currently under preparation by Cabinet Office to provide local responders with advice on the definition and identification of **vulnerable people** and on planning to support them in an emergency should be issued urgently. This recommendation was prompted by the particular problems faced by vulnerable people during the summer floods, and the problems which some local responders had in delivering a consistent and effective approach. This recommendation has been **completed**.

The Cabinet Office published guidance on 'Identifying People Who Are Vulnerable in a Crisis' at the beginning of March. LRFs have received this and are using it to further develop their humanitarian assistance arrangements. This fits well with a wider effort which local responders are making to improve the way they meet the needs of vulnerable people during emergencies. This work, informed by the guidance, should prove helpful during future emergencies.

Recommendation 9

The Review recommended that, in order to effectively fulfil its Lead Department role for flood risk management and emergency response, Defra needs to urgently develop and share a **national flood emergency framework**. This reflected the fragmented nature of local flood risk planning and the benefits of national level frameworks on other issues. **Acceptable progress** has been made against this recommendation.

Defra completed a review of its Lead Government Department Plan to take account of the Pitt Interim Report findings and reissued this in early 2008. This will provide a basis for developing a flood emergency framework for England. New guidance on producing Multi-Agency Flood Plans was issued in early 2008, and local areas are already using this.

Defra have explained that an outline national framework is at an advanced stage of preparation, and should be ready during April for review and initial consultation. Defra anticipate that feedback and recommendations in the final Pitt Report will be incorporated into the work with a view to finalising the framework in the autumn. Work will then begin on a planning a national exercise that will test key components of the arrangements set out in the Framework and the Defra Lead Department Plan.

This is good progress, and a clear timetable for action. However, should this new work not be delivered or prove to be insufficient for local responders, the assessment of progress in this area will be revised downwards.

Critical infrastructure

Recommendation 10

The Review recommended that **Category 1 responders should be urgently provided with a detailed assessment of critical infrastructure** in their areas to enable them to assess its vulnerability to flooding. This recommendation was a direct response to the loss and potential loss of essential services during the summer, and was the starting point for a much wider programme of engagement and information sharing. **Insufficient progress** has been made against this recommendation.

The Cabinet Office wrote to LRF Chairs in mid-March to outline the standardised procedures for how they can access this information on critical infrastructure in their areas. The EA are ready to share information on the probability of flooding from rivers and the sea to enable Category 1 responders to assess urgently the vulnerability to flooding of critical infrastructure in their areas. They have very recently been given notification of the agreed Cabinet Office process for securely sharing such information.

However, LRFs have reported or displayed uncertainty and confusion over the process, and none have presented evidence of any briefings yet taking place or even being timetabled. Many local areas seem to be

trying to initiate their own programmes of critical infrastructure planning, but claim to be hampered by legal limitations or operational security concerns.

Public awareness and engagement

Recommendation 11

The Review recommended that the EA should work urgently with telecommunications companies, consulting the Information Commissioner as necessary to facilitate the roll-out of **'opt-out' telephone flood warning schemes** to all homes and businesses liable to flooding, including homes with ex-directory numbers. This recommendation was driven by the low take up of automated flood warnings, particularly in some of the areas most severely affected by the summer floods. **Insufficient progress** has been made against this recommendation.

The EA are pursuing this issue with the Information Commissioner, British Telecom, the Electoral Commission and the Ministry of Justice. Further discussions will take place at the end of April. However, there is no clear timetable for delivering change in this area despite the wide-ranging support for the proposal. Sufficient progress would be characterised by a clear public timetable for change.

Recommendation 12

The Review recommended that LRFs urgently develop plans to **enhance flood warnings through 'door-knocking'** by local authorities based on an assessment of the post code areas likely to flood. This reflects best practice which emerged during the summer floods, and is already adopted in some areas. This recommendation has been **completed**.

LRFs have carefully considering their plans, taking into account local needs, the practicality of door-knocking in their area, the resources of the local authorities and the other options available to them to enhance flood warnings.

It seems that the effectiveness of door-knocking as a method of disseminating information is well understood by those LRFs who have undertaken it in the past. Some LRFs have plans which utilise resources of the Police, other local community groups and EA staff where appropriate. Others intend to include this in community or parish plans which are currently being developed in their areas. This seems an entirely appropriate and logical development of the recommendation, and will lead to tangible improvements in local capability during flooding emergencies.

Recommendation 13

The Review recommended that LRFs urgently make arrangements to **involve local media representatives** in the local preparedness and response to support their public information role, a recognition of the pivotal role that the media played in getting information out to the large numbers of people affected by flooding or loss of essential services. This recommendation has been **completed**.

The proposals for action on this issue have been received with enthusiasm by LRFs. Their feedback suggests that arrangements throughout the country are well underway with local media representatives being involved in various ways depending on the local need. Effective engagement with the media at early planning stages will help this relationship run smoothly during an emergency. The Review will continue to encourage LRFs to foster emerging relationships and look for new ways of encouraging local media to be involved.

Recommendation 14

The Review recommended that **members of the public make up a flood kit** – including key personal documents, insurance policy, emergency contact numbers (including local council, emergency services and Floodline – 0845 988 1188), torch, battery or wind-up radio, mobile phone, rubber gloves, wet wipes or antibacterial hand gel, first aid kit and blankets. **Insufficient progress** has been made against this recommendation.

The concept of flood kits is being promulgated by many local authorities, as well as the EA. Flood kits are highlighted on many local authority and EA websites as a sensible way of coping with the initial problems of being flooded. It is encouraging that this message is being delivered to the public by organisations.

However, it is difficult to measure any increase in the readiness of the British public to cope with another flooding emergency. Certainly, those who were flooded over the summer or who live in an area badly affected by floods are likely to understand the need to be ready for another flood and to lessen its impact. However, we have looked at the sales of those items likely to be found in flood kits to check whether there has been any marked increase in their sale since the summer but so far, we have not seen such a trend. We have also seen no evidence to suggest wider or increasing public awareness in this kind of practical improvement, nor do local or national agencies report any increased demand from the public for advice on this issue.

Recommendation 15

Linked to the recommendation above, the Review also recommended that **members of the public increase their personal state of readiness and resilience to floods by following the EA's practical advice**, where appropriate. As with recommendation 14, this recognises the importance of the public being able to help themselves during wide area emergencies. **Acceptable progress** has been made against this recommendation.

Over 37,500 homes have newly registered on the EA's Floodline Warnings Direct system since January this year. This is a result of both a recruitment campaign and pre-registering over 15,000 customers. The EA are planning on pre registering over 26,000 customers in 2008-09 to make sure more people are able to receive warnings.

So far this year the EA have had over 17,000 people log on to read their website pages on 'simple ways to protect your home from flooding', in comparison to last year when only 7,500 logged on. The EA has also had over 8,000 people log on to view advice on producing an emergency flood plan in comparison to fewer than 1,500 for the same time last year.

This reflects a step change in the level of take-up and interest, and is to be commended. The public have responded positively, and the EA has successfully encouraged that. However, this good progress needs to continue, and the Final Report is likely to return to the role of the public.

Annex G: Glossary

Aquifer – a permeable geological formation of rock, mud or gravel containing or conducting water.

Bowser – mobile water tanks deployed to distribute fresh water in emergency situations where the normal system of piped distribution has broken down or is insufficient.

Bronze command – operational level at which the management of ‘hands-on’ work is undertaken at the incident site or at affected areas.

Building Regulations – the UK Building Regulations are rules of a statutory nature to set standards for the design and construction of buildings, primarily to ensure the safety and health for people in or around those buildings, but also for purposes of energy conservation and access to and about other buildings.

Business continuity management (BCM) – a management process that helps to manage the

risks to the smooth running of an organisation or delivery of a service, ensuring that it can operate to the extent required in the event of a disruption.

Business continuity plan (BCP) – a documented set of procedures and information intended to deliver continuity of critical functions in the event of a disruption.

Cabinet Office Briefing Room (COBR) – the Government’s dedicated crisis management facilities activated in the event of a major national emergency. Key meetings are usually chaired by the Prime Minister or senior ministers covering strategic aspects of the response and recovery effort, bringing together relevant departments and/or external parties.

Capabilities Programme – the UK Capabilities Programme comprises a range of capabilities that underpin the UK’s resilience to disruptive challenges. These capabilities are either structural (for example regional response),

functional (for example decontamination) or concerned with the maintenance of essential services (for example financial services).

Capability – a demonstrable capacity or ability to respond to, and recover from, a particular threat or hazard. Originally a military term, it includes personnel, equipment, training and such matters as plans, doctrine and the concept of operations.

Catchment – an area that serves a river with rainwater, that is every part of land where the rainfall drains to a single watercourse is in the same catchment.

Category 1 responder – a person or body listed in Part 1 of Schedule 1 to the Civil Contingencies Act (CCA) 2004. These bodies will be at the core of the response to most emergencies. As such, they are subject to the full range of civil protection duties in the CCA.

Category 2 responder – a person or body listed in Part 3 of Schedule 1 to the Civil Contingencies Act 2004. These are cooperating responders who are less likely to be involved at the heart of multi-agency planning work across the board, but will be heavily involved in preparing for incidents affecting their sectors. The CCA requires them to cooperate and share information with other Category 1 and 2 responders.

Citizens Advice Bureau – a registered charity which provides a service to help people resolve their legal, money and other problems by providing free information and advice.

Civil Contingencies Act (CCA) 2004 – Legislation that aims to deliver a single framework for civil protection in the United Kingdom. The CCA is separated into two substantive parts: local arrangements for civil protection (Part 1) and emergency powers (Part 2).

Civil Contingencies Secretariat – sits within the Cabinet Office and works in partnership with government departments, the devolved administrations and key stakeholders to enhance the UK's ability to prepare for, respond to and recover from emergencies.

Climate change – the change in average conditions of the atmosphere near the Earth's surface over a long period of time.

Coastal erosion – the wearing away of the coastline, usually by wind and/or wave action.

Coastal flooding – occurs when coastal defences are unable to contain the normal predicted high tides that can cause flooding, usually when a high tide combines with a storm surge (created by high winds or a deep depression).

Common Recognised Information Picture (CRIP) – all relevant facts known at a point in time regarding a developing situation, consolidated into a single, coherent document. It is usually produced by the Cabinet Office to inform the central Government understanding and response to emergencies requiring central government involvement.

Community resilience – the ability of a local community to prepare for emergencies and to respond and recover from them.

Community Risk Register – an assessment of the risks within a local resilience area agreed by the Local Resilience Forum as a basis for supporting the preparation of emergency plans.

Consequence – the outcome of an event. This can be expressed qualitatively or quantitatively to encompass direct or indirect losses and gains.

Convective rain – occurs mainly in equatorial and tropical regions where the rate of evaporation is very high. The evaporated moisture rises along with hot air and expands due to a decrease in air pressure as altitude is gained. The wind temperature decreases, resulting in an increase in humidity levels that cause condensation of water vapour. This then falls as rain.

Cost-benefit analysis – a decision-making technique that analyses and evaluates the implications of alternative courses of action by assigning a quantified monetary value for each positive criterion (benefits) and negative criterion (costs).

Critical national infrastructure – the national infrastructure comprises those sectors that supply essential services to the citizen on which normal daily life in the UK depends. These are energy, water, communications, transport, finance, government, health, food and emergency services. The most important sites within these sectors, whose loss would have a major impact on the delivery of essential services, are deemed the critical national infrastructure.

Criticality – a relative measure that combines the consequences of a particular failure mode and its frequency of occurrence.

Culvert – a covered structure under a road, embankment etc, to direct the flow of water.

Dams – a barrier constructed across flowing water that obstructs, directs or slows down the flow, often creating a reservoir.

Depression – an area of low pressure in the atmosphere.

Detention basin – depressions in open spaces that help to slow down the run-off rate and store water on a temporary short-term basis during extreme events.

Emergency (in the UK) – an event or situation that threatens serious damage to human welfare in a place in the UK or to the environment of a place in the UK, or war or terrorism that threatens serious damage to the security of the UK.

Emergency management – the process to deal with the initial or acute phase of an emergency.

Emergency planning – development and maintenance of agreed procedures to prevent, reduce, control, mitigate and take other actions in the event of an emergency.

Ensemble – a unit or group of complementary parts that contribute to a single effect. In the context of weather forecasting it refers to running a weather prediction model a number of times with differing initial conditions to give outputs from which the most probable scenario can be derived.

Essential services – the fundamental services that underpin daily life and ensure the country continues to function socially and economically.

European Commission – an institution of the European Union, located in Brussels with 27 members (Commissioners). It is responsible for proposing new policies, implementing existing policies, and ensuring that EU rules are obeyed by Member States.

Exercise – a simulation to validate an emergency or business continuity plan.

Fire and Rescue Authority (FRA) – the legislative, public and administrative body made up of civilians and councillors that runs the Fire and Rescue Service.

Fire and Rescue Services (FRS) – the operational fire fighting body for an area.

Flash flooding – a rapid increase in water levels, leading to flooding, occurs when excessive rain falls over a short period of time.

Flood – temporary covering by water of land not normally covered with water.

Floodplain – low-lying area adjacent to a watercourse and prone to flooding.

Flood risk – product of the probability of flooding occurring and its consequences of happening.

Flood Warning Codes – the Environment Agency's flood warning system, which consists of codes: Flood Watch; Flood Warning; Severe Flood Warning; and All Clear.

Fluvial flooding – same as river flooding.

Focus group – a qualitative research technique in which a small cross-section of people are brought together to discuss issues or views on a particular topic, through unstructured but guided discussion by a moderator.

Frontal rain – (also known as **frontal precipitation**) is formed when two air masses of differing temperatures, humidity and density levels meet, with a layer separating them called the ‘front’, consisting of two parts – a warm and cold front. A warm front occurs when the warm, lighter air rises over the cold, heavier air, which cools causing moisture to condense and form clouds. The resulting rainfall is steady, lasting from hours to days. A cold front occurs when the cold air forces the warm air to rise rapidly, causing moisture to condense quickly. The rainfall is usually heavy and lasts for a short period of time.

Generic plan – a single plan designed to cope with a wide range of emergencies.

Geographic Information System (GIS) – a mapping system to display geographic information.

Gold command – strategic decision-making group at the local level. They establish the framework within which operational and tactical managers work in responding to, and recovering from, emergencies.

Government Offices – 9 offices represent 11 Whitehall departments in English regions.

Green roof – a roof purposely covered in vegetation to reduce and treat water run-off.

Greenhouse gas – a gas that absorbs infrared radiation in the atmosphere.

Groundwater flooding – occurs when water levels in the ground rise above the natural surface. Low-lying areas underlain by permeable strata are particularly susceptible.

Hesco Bastions – welded mesh, multi-cellular baskets filled with aggregate stones to form a barrier against flood water.

Home Information Pack (HIP) – a pack containing a set of documents that aims to provide house buyers with some of the information that they need to make an informed choice about a property they wish to buy.

Hydrology – the scientific study of water, including its properties, movement and effects on the Earth’s surface, underground and in the atmosphere.

Jet Stream – relatively strong, high-speed winds concentrated within a narrow current in the atmosphere; they mark the boundary that separates two global air masses with significant differences in temperature. This largely determines where weather systems will develop.

Inundation – the flooding of an area with water.

Land management – This includes the way land is drained, used and farmed in the rural environment.

Land use planning – branch of public policy encompassing various disciplines seeking to order and regulate the use of land.

Lead Government Department (LGD) – government department which, in the event of an emergency, coordinates central government activity. The department that would take the lead varies, depending on the nature of the emergency. The Government regularly publishes a full list of LGDs.

Lead responder – a Category 1 responder charged with carrying out a duty under the Civil Contingencies Act 2004 on behalf of a number of responder organisations, so as to coordinate its delivery and to avoid unnecessary duplication.

Lead time – the amount of time needed to evaluate and prepare for a change or the warning period given.

Local Government Association (LGA) – voluntary lobbying organisation to promote the interest of English and Welsh local authorities.

Local Resilience Forums (LRF) – a forum for bringing together all of the Category 1 and 2 responders within a local police area for the purpose of facilitating cooperation in fulfilment of their duties under the Civil Contingencies Act 2004.

Market Failure – the condition where the allocation of goods and services by a free market is not efficient. Market failure can be viewed as a scenario in which individuals' pursuit of self-interest leads to bad results for society as a whole.

Media Emergency Forum (MEF) – group of representatives from the media to plan and discuss communications challenges and common interests in planning for, and responding to, emergencies.

Meteorology – the scientific study of weather-related phenomena, including the study of the atmosphere and a focus on forecasting observable weather events.

Multi-agency plan – a plan, usually prepared and maintained by a lead responder, on behalf of a number of organisations that need to co-ordinate and integrate their preparations for an emergency.

Mutual aid – an agreement between organisations to provide assistance during an emergency.

National Capabilities Survey (NCS) – part of the Government's programme to make the country more resilient to disruptive events by providing an assessment of current levels of national resilience to inform national policies and prioritisation of investment in resilience. Conducted every other year, the NCS survey gathers information from a wide range of resilience stakeholders, in several different sectors and at all levels of resilience planning, to provide an up-to-date picture of preparedness, and to help plan improvements.

National Severe Weather Warning Service (NSWWS) – a service of the Met Office's Public Weather Service Programme, established as part of their requirement to provide early warnings of potentially severe weather with sufficient lead time for mitigation plans to be put in place.

Permeable – allowing liquids or gasses to pass through.

Permissive powers – the statutory granting of authority (not a duty).

Planning assumptions – descriptions of the types and scales of consequences for which organisations should be prepared to respond. These will be informed by the risk assessment process and are designed to inform emergency planning and policy formulation.

Planning Policy Statement 1 (PPS1) – Government Planning Policy statement relating to sustainable development.

Planning Policy Statement 25 (PPS25) – government policy planning statement relating to development and flood risk.

Pluvial flooding – same as surface water/run-off flooding.

Precipitation – for example, rain, snow, hail and sleet.

Primary care trust (PCT) – Statutory bodies in the NHS responsible for delivering health care in their local area.

Primary legislation – the general term used to describe the main laws passed by the legislative bodies of the UK, for example Acts of the UK Parliament. These types of legislation are sometimes referred to as 'statutes'.

Probabilistic forecasting – a weather forecasting technique that relies on different methods to establish the probability of an event's occurrence and/or magnitude.

Probability – a relative measure of the likelihood or chance that something is the case or will happen, typically expressed as a number between zero and one or as a percentage.

Protective personal equipment (PPE) – equipment and clothing to protect against the environment.

Public Weather Service Advisers – liaise directly with responders, relaying early warnings of potentially severe weather from the Met Office.

Qualitative research – research that derives data from observation, interviews or verbal interactions and focuses on the meanings and interpretations of the participants.

Recharge period – a period of time during which groundwater is absorbed into geological formations below the surface.

Recovery – the process of rebuilding, restoring and rehabilitating the community following an emergency.

Recovery coordination group – The strategic decision-making body for the recovery phase. Able to give a broad overview and present each agency's interests and statutory responsibilities.

Regional Civil Contingencies Committee (RCCC) – a committee that meets during an emergency when a regional response is required.

Regional Resilience Forum (RRF) – a forum bringing together multiagency responders at the regional level for planning.

Regional Resilience Team (RRT) – operates from the Government Office within their region and works with multiagency responders during planning and response.

Reservoir – a natural or artificial lake where water is collected and stored until needed. Reservoirs can be used for irrigation, recreation, providing water supply for municipal needs, hydroelectric power or controlling water flow.

Resilience – the ability of the community, services, area or infrastructure to withstand the consequences of an incident.

Rest centre – premises used for temporary accommodation of evacuees from an incident.

Return period – this is the measure of the rarity of a flood event and is the average time interval between occurrences of a flood event of a similar magnitude.

Riparian ownership – owning shoreline land or land on the boundary of a river or watercourse.

Risk – measures the significance of a potential event in terms of likelihood and impact. In the context of the Civil Contingencies Act 2004, the events in question are emergencies.

Risk assessment – a structured and auditable process of identifying potentially significant events, assessing their likelihood and impacts, and then combining these to provide an overall assessment of risk, as a basis for further decisions and action.

River flooding – occurs when water levels in a channel overwhelms the capacity of the channel.

Royal Assent – when a bill has completed all of the parliamentary stages, it receives Royal Assent from the Queen. After this the bill becomes part of the law and is known as an Act of Parliament.

Runoff – water that is not absorbed into the ground and drains or flows off the land, often appearing in surface water bodies.

Scientific, Technical Advice Cell (STAC) – technical experts advising Gold commands.

Secondary legislation (also called 'subordinate legislation') – is delegated legislation made by a person or body under authority contained in primary legislation for example statutory instruments. Typically, powers to make secondary legislation may be conferred on ministers, on the Crown, or on public bodies.

Silver command – tactical level of emergency management introduced to provide overall management of the response.

Single point of failure – the part or location in a system which, if it fails, will cause the whole system to fail.

Spatial – relating to relative locations on the ground surface.

Standards of Protection – the flood event return period above which significant damage and possible failure of the flood defences could occur.

Statutory duty – an action required by law.

Storm surge – abnormal rise in sea level along the shore, usually caused by strong winds and/or reduced atmospheric pressure, often resulting from storms.

Strategic Coordination Group (SCG) – a multi-agency group that sets the policy and strategic framework for emergency response at local level (see also **Gold command**).

Strategic Health Authority – responsible for managing and setting the strategic direction of the NHS locally.

Surface water/runoff flooding – occurs when the level of rainfall overwhelms the capacity of the drainage system to cope.

Sustainable Urban Drainage Systems (SUDS) – help to deal with excesses of water by mimicking natural drainage patterns.

Swales – shallow, trough-like depressions that carry water.

Team typing – a system of categorising rescue resources, allowing them to be identified and selected based on the outcome that they are able to safely achieve, rather than through a simple description of the organisation that they represent or equipment that they carry. The team is further categorised depending on its capability to carry out search operations in particular conditions, such as in still or flowing water. Team typing is applied in the UK on an ad-hoc basis.

Topographic – a map showing the physical features of a geographical area. It can include contours, types of water, vegetation and also man-made features, such as roads, utilities and structures.

Trunk main – large-diameter water pipe.

Upper-tier local authority – county councils, London boroughs, metropolitan boroughs and unitary authorities.

Urban creep – this refers to the effect of paving over green areas (such as gardens) with impermeable materials.

Urbanisation – the progressive expansion of cities.

Utilities – companies providing essential services, for example water, energy and telecommunications.

Voluntary sector – Self-governing organisations, some being registered charities, some incorporated non-profit organisations. They deliver work for the public benefit using volunteers.

Vulnerability – the susceptibility of an individual, community, service or infrastructure to damage or harm.

Water table – the upper surface of groundwater; the boundary between saturated and unsaturated soil conditions.

Watercourse – a channel (natural or artificial) along which water flows.

Weather radar – an echo-sounding system that uses an aerial for transmitting a signal and receiving the returned echo from differing weather phenomena.



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Publication date: June 2008

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Ref: 285740/0608

Prepared for the Cabinet Office by COI Communications