Environment, Food and Rural Affairs Committee

The Environment, Food and Rural Affairs Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Department for Environment, Food and Rural Affairs and its associated bodies.

Current membership

Mr Michael Jack (Conservative, Fylde) (Chairman)
Mr Geoffrey Cox (Conservative, Torridge & West Devon)
Mr David Drew (Labour, Stroud)
Mr James Gray (Conservative, North Wiltshire)
Patrick Hall (Labour, Bedford)
Lynne Jones (Labour, Birmingham, Selly Oak)
David Lepper (Labour, Brighton Pavilion)
Miss Anne McIntosh (Conservative, Vale of York)
Mr Dan Rogerson (Liberal Democrat, North Cornwall)
Sir Peter Soulsby (Labour, Leicester South)
Dr Gavin Strang (Labour, Edinburgh East)
David Taylor (Labour, North West Leicestershire)
Paddy Tipping (Labour, Sherwood)
Mr Roger Williams (Liberal Democrat, Brecon & Radnorshire)

The following members were also members of the Committee during this inquiry

Daniel Kawczynski (Conservative, Shrewsbury & Atcham), Mrs Madeleine Moon (Labour, Bridgend) and Mr Jamie Reed (Labour, Copeland).

Powers

The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No. 152. These are available on the Internet via www.parliament.uk.

Publications

The reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at

www.parliament.uk/efracom

Committee staff

The current staff of the Committee are Chris Stanton (Clerk), Nerys Welfoot (Second Clerk), Sarah Coe (Committee Specialist—Environment), Marek Kubala and Joanna Dodd (Inquiry Managers), Professor Frank Farquharson and Professor Colin Green (Specialist Advisers), Andy Boyd and John-Paul Flaherty (Committee Assistants) and Mandy Sullivan (Secretary).

Contacts

All correspondence should be addressed to the Clerk of the Environment, Food and Rural Affairs Committee, House of Commons, 7 Millbank, London SW1P 3JA. The telephone number for general enquiries is 020 7219 5774; the Committee’s e-mail address is: efracom@parliament.uk. Media inquiries should be addressed to Laura Kibby on 020 7219 0718.
Witnesses

Wednesday 10 October 2007

Baroness Young of Old Scone, a Member of the House Lords, Chief Executive, Dr David King, Director of Water Management and Mr David Rooke, Head of Flood Risk Management, Environment Agency

Wednesday 7 November 2007

Professor Edmund Penning-Rowsell, Head of Flood Hazard Research Centre, Middlesex University and Professor Howard Wheater, Professor of Hydrology, Imperial College

Wednesday 14 November 2007

Mr Kim Ryley, Chief Executive and Professor Tom Coulthard, Leader of the Independent Review Body in Hull, Hull City Council, Sir Robert Kerslake, Chief Executive, Councillor Jan Wilson, Leader of the Council and Mr John Charlton, Director of Streetforce, Development, Environment and Leisure, Sheffield City Council

Mr Kevin Whiteman, Managing Director and Mr Robert Salmon, Director of External Communications, Yorkshire Water, Mr David Fullwood, Clerk to Beverley and Holderness Internal Drainage Board, Preston IDB and Wilberfoss and Thornton Level IDB, Dr Jean Venables, Chief Executive of the Association of Drainage Authorities and Mr David Sisson, Engineer to Lindsey Marsh IDB, Internal Drainage Boards

Wednesday 21 November 2007

Mr Duncan Jordan, Group Director for Environment, Gloucestershire County Council, Mr Richard Dudding, Director for Environment and Economy and Mr Dave Etheridge, Assistant Chief Fire Officer, Oxfordshire Fire and Rescue, Oxfordshire County Council

Mr Tony Wray, Chief Executive, Mr Andy Smith, Water Services Director, Mr Martin Kane, Customer Relations Director, Severn Trent Water, Mr Richard Aylard, External Affairs and Sustainability Director and Mr Bob Collington, Director of Wastewater Services, Thames Water

Wednesday 28 November 2007

Mr Stephen Haddrill, Director-General, Association of British Insurers, Mr Igal Mayer, Chief Executive, Norwich Union and Mrs Bridget McIntyre, UK Chief Executive, Royal and SunAlliance

Ms Regina Finn, Chief Executive and Mr Jonathan Hodgkin, Director of Network Regulation, Ofwat
Wednesday 12 December 2007

Mr Richard Benyon MP, Rt Hon David Curry MP, Martin Horwood MP, Mr Laurence Robertson MP and Ms Angela C Smith MP

Dr Ann Calver, Head of Site and Mr Terry Marsh, Leader, National Hydrological Monitoring Programme, Centre for Ecology and Hydrology, Professor John Mitchell, Director of Climate Science and Mr Steven Noyes, Director of Operations and Customer Services, Met Office, Dr Chris West, Director of UKCIP and Ms Jacqui Yeates, Deputy Science Team Leader, UK Climate Impacts Programme

Wednesday 9 January 2008

Mr Dan Hawthorn, Senior Policy Adviser, Planning and Development, Mayor’s Office and Mr Kevin Reid, Senior Planner, Greater London Authority, Mr Rynd Smith, Director of Policy and Communications, Royal Town Planning Institute

Ms Pamela Taylor, Chief Executive, Mr Phill Mills, Deputy Chief Executive, Mr Bruce Horton, Policy Adviser, Mr Jim Marshall, Policy Co-ordinator and Mr Richard Venters, Legal Adviser, Water UK

Wednesday 23 January 2008

Sir Michael Pitt, Independent Reviewer and Mr Roger Hargreaves, Head of Pitt Review

Mr Jeremy Walker, Chair, Yorkshire RFDC, Dr Peter Ryder, Chair, Thames RFDC and Mr Tim Farr, Chair, Midlands RFDC

Wednesday 30 January 2008

Mr Paul Temple, Vice President, Mr Andrew Clark, Head of Policy Services and Mrs Anna Hall, Water Adviser, National Farmers’ Union, Mr Andrew Wood, Executive Director and Mr James Marsden, Director of Policy, Natural England

Mr Steve Batty, Mr Malcolm G Coward, Mr Paul Rouse and Mr Mark Harrison

Mrs Julie O’Neill, Chair, Burton Joyce Residents’ Association, Mr Peter Jesse, Chairman and Cllr Keith Marquis, Councillor, Strensall and Towthorpe Parish Council, Cllr Reginald A Shore, Leader and Mr James Nicholson, Director of Neighbourhoods and Health, West Lindsey District Council
Monday 4 February 2008

Mr Alan Raymant, Director of Operations and Asset Management, Central Networks, Mr Nick Winser, Executive Director, Transmission and Mr Chris Murray, Director of Asset Management, National Grid

Baroness Young of Old Scone, a Member of the House of Lords, Chief Executive, Mr Phil Rothwell, Head of Flood Risk Management Policy and Mr David Rooke, Head of Flood Risk Management, Executive Agency

Wednesday 6 February 2008

Mr Phil Woolas MP, Minister of State (Environment), Mr Martin Hurst, Director of Water and Mr David Wright, Resilience and Institutional Framework Programme Manager, Department for Environment, Food and Rural Affairs
List of written evidence

Mr Tony Adams Ev 592
Ms Christine Adamson Ev 396
Alde and Ore Association Evs 552, 553
Ashchurch Parish Council Ev 458
Association of British Insurers Evs 120, 123, 140
Association of Drainage Authorities Ev 513
Mr M Baker Ev 406
Norman Baker MP Ev 377
Revd. Robert Barlow Ev 411
Dr R A Barnes Ev 542
Mrs Jean and Mr Gordon Basnett Ev 397
Mr Steve Batty Ev 283
BBC Radio 4: You and Yours Ev 586
Mr Michael A K Bell Ev 565
Richard Benyon MP Ev 155
Clive Betts MP Ev 376
Professor Keith Beven Ev 562
Ms Margaret Bishop Ev 409
Blueprint for Water Ev 482
Mr Chris Blunkell Ev 580
British Damage Management Association Ev 529
British Ecological Society Ev 438
The British Insurance Brokers’ Association Ev 484
British Water Ev 572
Buckleybridge Flood Alleviation Committee Ev 591
Ms J D Budden Ev 553
Colin Burgon MP Ev 370
Burton Joyce Residents’ Association Ev 293
Butler Sherborn Ev 469
Mr Peter Butterworth Ev 557
Ms Rosie Callinan Ev 404
Rt Hon David Cameron MP Ev 376
Mr Roger Case Ev 398
Central Networks Ev 304
Chaceley Parish Council Ev 402
Chairmen of Regional Flood Defence Committees in England Evs 249, 261
Chalford Parish Council Ev 395
Mr Jeremy Chamberlayne Ev 393
Chartered Institution of Water and Environmental Management Ev 479
Mrs Judy Chipchase Ev 389
Clanfield Parish Council Ev 439
Ms Alison Cobb Ev 448
<table>
<thead>
<tr>
<th>Name</th>
<th>Ev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Melvyn Cole</td>
<td>494</td>
</tr>
<tr>
<td>Coleford Area Market and Coastal Towns Initiative Partnership</td>
<td>507</td>
</tr>
<tr>
<td>Mr Peter Collier</td>
<td>388</td>
</tr>
<tr>
<td>Commission for Rural Communities</td>
<td>490</td>
</tr>
<tr>
<td>Consumer Council for Water</td>
<td>543</td>
</tr>
<tr>
<td>Revd. Stephen Cope</td>
<td>394</td>
</tr>
<tr>
<td>Country Land &amp; Business Association</td>
<td>441</td>
</tr>
<tr>
<td>Mr Malcolm G Coward</td>
<td>284</td>
</tr>
<tr>
<td>Rt Hon David Curry MP</td>
<td>155</td>
</tr>
<tr>
<td>Datchet Parish Council</td>
<td>528</td>
</tr>
<tr>
<td>Department for Environment, Food and Rural Affairs</td>
<td>343, 366</td>
</tr>
<tr>
<td>Ms Mary Dhonau</td>
<td>550</td>
</tr>
<tr>
<td>Down Ampney Parish Council</td>
<td>403</td>
</tr>
<tr>
<td>Eastington Parish Council</td>
<td>447</td>
</tr>
<tr>
<td>Mr Robb Eden</td>
<td>428</td>
</tr>
<tr>
<td>Mr D F and Mrs A L Edwards</td>
<td>555</td>
</tr>
<tr>
<td>Ms Jane Edwards</td>
<td>556</td>
</tr>
<tr>
<td>Engineering Services, Calderdale Metropolitan Borough Council, West Yorkshire</td>
<td>559</td>
</tr>
<tr>
<td>English Heritage</td>
<td>531</td>
</tr>
<tr>
<td>Environment Agency</td>
<td>Evs 1, 29, 335</td>
</tr>
<tr>
<td>Nigel Evans MP</td>
<td>370</td>
</tr>
<tr>
<td>Ms Sue Everett</td>
<td>508</td>
</tr>
<tr>
<td>Mr Tim Fairhead</td>
<td>579</td>
</tr>
<tr>
<td>Farm Crisis Network (FCN) in Yorkshire</td>
<td>446</td>
</tr>
<tr>
<td>Ms Pauline Farman</td>
<td>401</td>
</tr>
<tr>
<td>Flood Hazard Research Centre, Middlesex University</td>
<td>Evs 34, 53</td>
</tr>
<tr>
<td>Frampton-on-Severn Parish Council</td>
<td>398</td>
</tr>
<tr>
<td>Mr Dudley George</td>
<td>391</td>
</tr>
<tr>
<td>Gloucestershire Constabulary</td>
<td>Evs 516, 527</td>
</tr>
<tr>
<td>Gloucestershire County Council</td>
<td>93</td>
</tr>
<tr>
<td>Mr James Harris</td>
<td>396</td>
</tr>
<tr>
<td>Dr Nick Haycock</td>
<td>567</td>
</tr>
<tr>
<td>Rt Hon David Heathcoat-Amory MP</td>
<td>379</td>
</tr>
<tr>
<td>Mr Roger Hendry</td>
<td>394</td>
</tr>
<tr>
<td>Hesco Bastion</td>
<td>471</td>
</tr>
<tr>
<td>Mr Fred and Ms Jean Hollier</td>
<td>415</td>
</tr>
<tr>
<td>Ms Carolyn Horsewood</td>
<td>413</td>
</tr>
<tr>
<td>Martin Horwood MP</td>
<td>156</td>
</tr>
<tr>
<td>Chris Huhne MP</td>
<td>371</td>
</tr>
<tr>
<td>Hull City Council</td>
<td>54</td>
</tr>
<tr>
<td>Institution of Civil Engineers</td>
<td>497</td>
</tr>
<tr>
<td>Mr David Jones</td>
<td>413</td>
</tr>
<tr>
<td>Mr Julian Jones</td>
<td>591</td>
</tr>
<tr>
<td>Dr Susan Juned</td>
<td>417</td>
</tr>
</tbody>
</table>
Mr Holger Kessler Ev 398
Mr Allen Keyte Ev 392
David Kidney MP Ev 380
Professor Donald Knight Evs 462, 467
Landmark Information Group Ev 589
Mr Ewan Larcombe Ev 541
Ms Patricia Lee Ev 551
Leeds City Council Ev 501
Mr Richard Long Ev 558
Peter Luff MP Ev 372
Mr C G Mann Ev 556
John Maples MP Ev 387
Ms Janet Marrott Ev 391
Mr Roger Martin Ev 389
Mayor of London Evs 206, 220
Mr Peter J D McNally Ev 539
Met Office Evs 178, 203
Mr Peter Mills Ev 594
Mr Joe Morris & Mr Tim Hess Ev 423
Ms Carole Mortimer Ev 400
National Farmers’ Union Ev 265
National Grid Evs 307, 317
National Trust Ev 453
Natural England Evs 270, 282
Natural Environment Research Council Evs 169, 202
Mr Colin Newlands Ev 394
Ms Rebecca Nicholls Ev 407
Norwich Union Insurance Evs 124, 141
Ofwat Evs 143, 154
Ordnance Survey Ev 416
Oxford City Council Ev 445
Oxfordshire County Council Ev 94
Ms Gill Pett Ev 397
Pickering & District Civic Society Ev 495
Pickering Flood Defence Group Ev 493
Sir Michael Pitt Ev 237
Ms Fay Price Ev 401
Prudential Property Investment Managers Ltd Ev 585
Quedgeley Parish Council Ev 401
RSPB Ev 534
RSPCA Ev 451
Rt Hon John Redwood MP Ev 373
Resthaven Nursing Home Ev 393
River Dene Action Group—Wellesbourne Ev 568
Laurence Robertson MP Ev 156
Mr Paul Rolph
Mr John Rossetti
Mr Paul Rouse
Royal & SunAlliance
Royal Town Planning Institute
Mr David Royffe
Mr Timothy Royle
Martin Salter MP
Severn Trent Water
Mr R B Shacklock
Sheffield City Council
Mr Graham Shelton
Mr Bill Sherwood
Angela C Smith MP
Ms Lorraine Smith
Mr Roland M Smith
Mr Tony Smith
Mr Edward Stephens
Stoke Orchard and Tredington Parish Council
Ms Susan Stoner
Strensall and Towthorpe Parish Council
Stroud District Green Party
Graham Stuart MP
The Survey Association
Sir Peter Tapsell MP
Ms Jacqui Taylor
Tewkesbury Chamber of Commerce and Industry
Tewkesbury Town Council
Thames Water
Ms Margaret Thompson
Miss D Thorne
Paddy Tipping MP
UK Climate Impacts Programme
United Utilities
H R Wallingford
Water UK
Mr Stephen Watkins
Mr Nick Weir
West Lindsey District Council
Professor Howard Wheater
Whiteshill & Ruscombe Parish Council
Ms Julie Wickham
Wildlife Trusts
Wildwood Trust
The Witham First and Third District Drainage Boards
List of unprinted evidence

The following memoranda have been reported to the House, but to save printing costs they have not been printed and copies have been placed in the House of Commons Library, where they may be inspected by Members. Other copies are in the Parliamentary Archives, and are available to the public for inspection. Requests for inspection should be addressed to The Parliamentary Archives, Houses of Parliament, London SW1A 0PW (tel. 020 7219 3074). Opening hours are from 9.30 am to 5.00 pm on Mondays to Fridays.

Peter Hebblethwaite (FL 025) - Background paper
Strensall & Towthorpe Parish Council (FL 039a) - Photographs
Mike Smith (FL 043) - Background paper
Chairmen of the Regional Flood Defence Committees supplementary (FL 063a) - Map
National Grid (FL 080) - Appendix
Butler Sherborn (FL 086) - Appendices
Hesco Bastion Ltd (FL 088) - Appendix
Water UK (FL 095a) - Photographs
Sue Everett (FL 107 & FL 107a) - PowerPoint presentations
Oxfordshire County Council (FL 126) - Annex
The Alde and Ore Association (FL 136) - Annexes
O M Goring (FL 146) - Background paper
John Rossetti (FL 150a) - Background paper
Mayor of London (FL 151a) - Annex
River Dene Action Group - Wellesbourne (FL 153) - Annex
The Witham First and Third District Drainage Boards (FL 155) - Annex
Landmark Information Group (FL 163) - Map
Julian Jones (FL 165) - Appendices
Beverley & North Holderness Internal Drainage Board - Background papers
Upton St Leonards Parish Council - Background paper
Wiltshire and Swindon Local Resilience Forum - Background paper
Timothy Maddison - letter to Welsh Assembly
Dr David Stephens - letter to Chairman
Tony Cowley - letter to the Chairman
Ken & Gill Holway - letter to the Chairman
HJ Harper - letter to the Chairman
Ian Hill - letter to the Chairman
Denis Gibbs - Letter to Lynne Jones MP
David Drew MP - Notes from meeting with Tim Brain, Gloucester shire Chief Constable
Oral evidence

Taken before the Environment, Food and Rural Affairs Committee

on Wednesday 10 October 2007

Members present

Mr Michael Jack, in the Chair
Mr Geoffrey Cox David Lepper
Mr David Drew Dan Rogerson
Mr James Gray David Taylor
Lynne Jones Mr Roger Williams

Memorandum submitted by the Environment Agency (FL 121)

SUMMARY

The Environment Agency welcomes the opportunity to respond to the Environment, Food and Rural Affairs (EFRA) Committee inquiry into the recent flooding across England.

The following memorandum summarises the role of the Environment Agency, our initial views on the key issues arising from the floods of June and July 2007, and on the significant policy and leadership challenges we face.

This memorandum will cover:

— Inland Strategic Overview Role
— Characterisation of Risk (mapping flood risk)
— Development and Flood Risk
— Sustainable Drainage
— Emergency Planning
— Protecting Critical Infrastructure
— Rural Flood Risk Management
— Reservoirs
— Investment
— Governance

Our internal review is due to report in December 2007, but we have incorporated our preliminary findings into this submission. We look forward to the findings of this and other reviews of the floods this summer. Our initial conclusions include the following:

— The weather event that led to the flooding was unprecedented in many places, with significant amounts of rain falling in very short periods of time. The flooding occurred largely because urban and land drainage systems were unable to cope with the large volumes of water which resulted.

— We are still analysing the performance of our flood defences during the event but early indications are that with virtually no exceptions, the majority performed to design standard and did not fail. They were, however, in many places simply overwhelmed and overtopped by the sheer volume of water.

— There were many communities that were satisfactorily protected by defences, including some for the first time following recent investments.

— The Environment Agency’s flood warning systems performed well with no problems with service provision. We warned over 45,000 properties at risk; our flood agents took almost 55,000 calls; we received over 200,000 calls to our recorded message service and received over 43 million “hits” from 4 million individuals on our website. All of our systems stood up to the challenges of increased usage.

— Our links with the Met Office and the data provided by them were crucial in allowing the appropriate deployment of staff and resources. However, the specificity of forecasting information is not yet such as to define with sufficient accuracy where rain will fall so that more local impacts on surface water and small watercourses can be assessed.
1. INTRODUCTION

1.1 The severe flooding that affected much of the country in June and July followed what we now know to be the wettest May to July period since records began in 1766. The sheer volume of water overwhelmed many drainage systems and some defences, and much of the flooding occurred because these systems could not cope with the sheer quantity of water. However, whilst little reported, our activities and previous investment to protect homes and businesses substantially reduced the impacts of this extreme event.

1.2 Nevertheless, the effects were severe. Several people lost their lives, 44,600 homes and 7,100 businesses were flooded. Transport infrastructure was disrupted, and many properties were without power and water for many days. Recovery from such an event can take years, as properties are dried out, cleaned, repaired and redecorated. Rural areas and businesses too have had to face the impacts of flooding. Many farmers have suffered significant losses of livestock and crops.

1.3 Every flood provides a learning opportunity to examine the root causes and identify areas for improvement. The summer floods brought into sharp relief a number of issues, many of which we were already tackling. This incident was characterised by severe surface water flooding and potential problems with reservoirs, as well as flooding from rivers and other watercourses.

1.4 A particular challenge is urban surface water drainage. In many places, flooding occurred as a result of prolonged heavy rainfall, leading to surface water run-off and drainage systems being overwhelmed. Pressures on drainage infrastructure had been increased by new development, infill of previously undeveloped land and increased levels of impermeable paving. Climate change is likely to make urban surface water flooding more common as rainfall is predicted to increase by 10–30% by the 2080s, and intensity could increase by up to 20% (UKCIP, 2002).

2. INLAND STRATEGIC OVERVIEW ROLE

2.1 There is a need for clarification of responsibilities for inland flooding from whatever source. At present, no single organisation has the strategic overview role for all inland flooding issues, including flooding from river systems and surface water. Whilst local government will be the key local player for urban surface water flooding, there needs to be a strategic overview and co-ordinated approach to flooding from all sources, including rivers, seas and surface water. There are benefits to be gained from a co-ordinated national approach. These include, for example, in the methodology and techniques used for risk characterisation and surface water management; in aligning the design capacity of surface water systems with those of river and coastal defences; and in the contributions that whole-catchment approach to water management offers.

2.2 Defra wrote to key stakeholders in June 2007 to seek views on their approach to the intended Environment Agency Strategic Overview for Inland Flood Risk Management, and to ask for feedback on their draft impact assessment for the Integrated Urban Drainage work. Additionally, the Defra Making Space for Water initiative has funded 15 pilot studies in urban areas in England examining different approaches to urban flood management. These studies will report in 2008 and provide an evidence-based approach to policy development. The Environment Agency believes there is an urgent need to establish a strategic overview role, to provide national leadership, advice and support to all bodies who have roles to play in the management of flood risk for the future, including the several bodies locally who have a key role to play in the management of surface water flood risk. The issue of the overview of surface water flooding is also identified in the independent review of the 2007 floods in Kingston-upon-Hull, commissioned by Hull City Council.

2.3 Working within a strategic framework, advice, support and tools provided by the Environment Agency, Local Authorities, as the key local players, would undertake Strategic Flood Risk Assessments covering all forms of flooding to inform spatial planning decisions. Where necessary these would trigger the preparation of a Surface Water Management Plan (SWMP). A SWMP would take account of flooding from surface water, sewers, combined sewers and the impact of these sources in combination with flooding from rivers, the sea, groundwater, canals and reservoirs to provide a more holistic approach to the problem of urban flooding. Input on flood risks from rivers, the sea, groundwater, canals and reservoirs would continue to be provided by the Environment Agency. At present markedly different design standards are applied by operating authorities to urban drainage systems. Typically, return periods of up to 1 in 30 years will be applied but not universally and not in a co-ordinated approach with others to appropriately manage urban flood risk. Retro fitting the application of higher standards and increased risk protection would be prohibitively expensive but regulation to ensure that all new build and redevelopment conforms to new standards would bring significant improvements over time. Surface Water Management Plans would also allow the identification of priorities for the remediation of surface water flooding “hot spots” in current systems.

2.4 The forthcoming Planning Reform Bill could introduce a duty for all utilities, regulators and agencies to work with local authorities to produce a Strategic Flood Risk Assessment (SFRA), where Environment Agency Catchment Flood Management Plans identify a significant risk of urban flooding.
2.5 A methodology for developing these plans is critical. The Environment Agency could develop a methodology that would be applied nationally by Local Authorities. A SWMP would provide input to the Local Development Framework for the Local Authority.

2.6 We believe that the Environment Agency could perform an effective strategic overview role for all types of inland flooding. However, the role needs careful specification and the balance of responsibilities between the Environment Agency, Local Authorities and other organisations will need to be clearly articulated.

3. Characterisation of Risk

3.1 We already have a well-established way of characterising and mapping the risk of flooding from rivers and the sea. The Environment Agency is not, currently, responsible for floods from surface water. Were we to be given the overview role outlined above, it would still be far more difficult to characterise and warn against the risk from other sources of flooding. Water moves in complex ways through the changing landscape in a dynamic urban environment, and is extremely challenging to map. Planning decisions, urban design and changes in sewerage provision all conspire to make it difficult to accurately predict flooding. Little work has been done on mapping areas at risk from urban surface water flooding. There is no nationally consistent approach. There needs to be developed a workable, risk-based methodology for characterising urban flood risk. This will be an important part of implementing the European Floods Directive, and critical for the Environment Agency in taking a meaningful strategic overview for all forms of flooding, as proposed by Defra.

4. Development and Flood Risk

4.1 The new planning policy guidance on development and flood risk (England: PPS 25) published in December 2006 introduces a strengthened presumption against developing in areas of flood risk. At the same time the Government introduced new powers for the Environment Agency to challenge planning authorities that overrule our advice based on the basis of riverine or coastal flooding and flood risk from surface water drainage. It remains difficult to identify urban areas at high risk from surface water flooding in a consistent way and therefore the full potential of PPS25 is not being realised.

4.2 In 2005–06, we objected to more than 4,000 planning applications in England because of concerns about flood risk (High Level Target 5—Development and Flood Risk, 2006). In the end, only 10 major developments went ahead against our advice in 2005–06, but that is 10 too many. Our report on building in the floodplain for 2006–07 will be completed in November.

4.3 Increased storminess and the possibility of flooding occurring more widely outside the floodplain due to surface water issues, means that the resistance and resilience of buildings to floods needs to be increased, to reduce the damage when such floods occur. The feasibility should be examined of introducing flood resistance (preventing water entering buildings) and resilience (reducing the impact of water which has entered buildings) requirements into the Building Regulations as part of measures to adapt to climate change.

5. Promoting Sustainable Drainage

5.1 Sustainable drainage systems (SUDS) slow the movement of surface water through the built environment to emulate natural processes. These include allowing water to soak into the ground and providing absorbent surfaces, buffering or storage. In doing so, they reduce the impact of rainfall on the drainage system. However such systems do require long term maintenance and, at present, there is no legal clarity as to whose responsibility this is or who will fund it.

5.2 Local Authorities should take the lead on providing SUDS. In the forthcoming Planning Bill, a presumption in favour of SUDS should be introduced to add weight to existing policy in PPS 25. Local Authorities should apply a presumption in favour of SUDS in planning applications for new developments by applying conditions. So-called General Binding Rules could be introduced, requiring parking areas or other surfaces to be made permeable, as envisaged in the Defra non-agricultural diffuse pollution consultation.

5.3 Section 106 of the Water Industry Act 1991 (right of connection to a public sewer) should be amended to encourage the use of SUDS. Currently this section gives property owners a right to connect to a public sewer without having to consider alternatives or demonstrate that SUDS are not feasible.

5.4 Greater transparency in charging for surface water drainage could reward organisations that place a smaller load on the surface water drainage system. This would encourage more permeable surfaces, reducing surface water runoff.

5.5 PPS 25 requires that drainage issues be appropriately considered as part of the flood risk assessment. Where flood risk from drainage has not been adequately considered in this way the Environment Agency will object.
6. **Emergency Planning**

6.1 The multi-agency approach to emergency planning is sound. The Environment Agency, Police, local government, Fire and Rescue Service and others jointly develop strategies for responding to flood emergencies and these worked during the floods. The fora and collaborative mechanisms set up under the Civil Contingencies Act stood in good stead during the flood emergency, so these need further development to focus on particular flood emergency issues.

6.2 The Environment Agency played a full role in supporting the Government at a national level through attending meetings of the Civil Contingencies Committee (known as COBRA meetings) and in providing briefings for Ministers and members of Parliament.

7. **Protecting Critical Infrastructure**

7.1 The experiences at Walham electricity sub station operated by National Grid and the Mythe Water Treatment Works operated by Severn Trent Water have brought into sharp relief the necessity for protecting our critical infrastructure. The Receptors Vulnerable to Flooding project (Environment Agency and JBA, 2007) found that significant numbers of public and private sector critical infrastructure facilities were at risk from flooding. These included 15% of major energy installations, 14% of emergency response installations (fire, ambulance and police stations), 9% of hospitals and health centres and surgeries, and 57% of water and sewerage treatment works, as well as railway stations and lines, roads, telephone exchanges and schools.

7.2 The Civil Contingencies Act requires business continuity plans to be prepared by category 1 and 2 responders. However, this does not extend to a specific duty to protect critical assets from flooding. Our experience of the recent floods suggests that some utility companies may not have appropriate business continuity plans in place to address all the potential impacts of major flooding. We encourage utility companies to review their business continuity plans in light of the most up-to-date information that we have available. Our reviews from previous floods have identified this as an issue. To ensure that adequate progress is made, the Environment Agency would want to see proposals to include a specific requirement in the Climate Change Bill for utilities and all critical infrastructure and service providers to take account of climate change adaptation needs.

8. **Rural Flood Risk Management**

8.1 Considerable rural land flooded during the summer floods. The Environment Agency works with landowners and Internal drainage Boards to help manage rural flood risk where possible. The Agency prioritises the provision of defences and the maintenance of watercourses on a risk basis. In the case of maintenance of watercourses, including dredging, the Environment Agency provides maintenance and dredges where that will help reduce flood risk. There are a number of ways in which land owners and managers can help reduce flood risk. Two current research projects under Defra’s *Making Space for Water* initiative are helping to provide the scientific evidence to show land owners and managers what role they can play in reducing floods from their land. In addition, the use of farmland adjacent to rivers to store floodwater and re-create natural floodplains, perhaps subject to payment, can help manage flood risk.

9. **Reservoirs**

9.1 During the floods problems were identified at a number of reservoirs including the well-publicised Ulley Reservoir near Rotherham. The Environment Agency became the enforcement authority for reservoirs across England and Wales in October 2004. Our experiences over the past three years and from the floods lead us to conclude that a review of the legislation would be timely. The combination of the impacts of climate change and an ageing reservoir stock mean that risks from dam failure are likely to increase and having a modern risk-based legislative framework in place is in our view a pre-requisite to managing those risks.

10. **Investment**

10.1 There is strong justification for increased investment in flood risk management to cope with the existing backlog of floodplain development, growing development pressures, additional duties and obligations placed upon us by our changing role and developing legislation, and to take account of the impacts of climate change. The economic benefits are clear—for every £1 spent on protecting homes and businesses and building in resistance and resilience, the cost of clean-up and repairs following a flood can be reduced by up to £6 (Defra Zero-based review of flood risk management, 2006 unpublished). The investments we make are therefore paying for themselves many times over. The pressures on the flood risk management budget remain and the cost of bringing urban drainage systems up to standard and improving standards will also be considerable.
10.2 The continued investment and provision of flood defences for properties in areas at high risk of flooding is a fundamental part of Government’s agreement with the insurance industry. The “Statement of Principles” agreed with the ABI states that insurance for flood risk will continue to be offered by the industry as long as Government investment in flood risk reduction measures continues. The ABI has called for flood risk management budgets to be increased at 10% per year (A future for the floodplains, ABI, 2006), and the Environment Agency believes it is prudent to increase the budget this steadily so that capacity can increase in line with a real increase in budget.

10.3 The Government announced in July its intended expansion of overall funding in flood risk management from £600 million per year to £800 million per year by 2010–11, although it is not yet clear how much the Environment Agency will receive, or when. The National Audit Office identified the need for an additional £150 million to be spent on bringing our existing assets into “good” standard. The ABI’s view is that this commitment should be made over and above the increase to £800 million annually already announced, and they have identified a case for an additional £8 billion to be spent over 25 years on east coast defences alone. The Government’s Foresight report also advised that an increase in spending of £30 million per annum in real terms would be necessary to contend with the best current predictions of the effects of climate change.

10.4 So, we warmly welcome the extra funding announced by the Secretary of State for Environment, Food and Rural Affairs. We believe it should increase steadily in 2008–09 and 2009–10, and in accordance with the ABI’s proposals after 2011. Increases should continue through the next spending review, towards reaching over £1 billion annually.

11. Governance

11.1 Some commentators are already suggesting disaggregation of flood risk management to more local control. The Government consulted on governance and funding after the extensive floods in autumn 2000 and concluded that a national approach was needed to enable effective focus on priorities and more efficient use of resources and skills. Government has just agreed that the Environment Agency will take on the responsibility for strategic overview on the coast and is consulting on giving the Environment Agency a similar role inland.

11.2 Other commentators have suggested that management of flood events point to the need for a single flood agency which would handle all aspects of flood emergency management from forecasting and warning through to event management, community support and post-flood recovery. The management of flood events requires collaboration of a wide range of organisations. For example, the skills of both the Environment Agency and the Met Office are needed for flood forecasting. Emergency management needs close collaboration between Local Authorities, the emergency services, utility companies, Internal Drainage Boards, voluntary organisations and others. The important factor is clarity of responsibilities and excellence of co-ordination, not the creation of a single organisation, which would cut across the ongoing “peacetime” responsibilities of other organisations.

11.3 A fundamental principle behind the creation of the Environment Agency was the need for the integrated management of rivers, including pollution control, water resources, the land / water interface and biodiversity as well as flooding. This is even more valid now. The Water Framework Directive requires such an approach and this will soon be universal across Europe.

11.4 A response to the flood event that focuses on organisational restructuring rather than action on the issues risks losing output for up to two years while restructuring takes place and reductions in productivity for some three years after as the new arrangements bed down. Many of the issues identified as arising in the summer floods were highlighted in reports from previous flood events. It is vital that the real issues are tackled, rather than resorting to restructuring as a substitute for real focus and action.

12. Conclusions and Recommendations

12.1 In reaching conclusions and making recommendations, we must bear in mind that the full picture of the events in June and July, and the full impacts of the flooding have yet to be clearly understood. The internal “lessons identified” review that we are undertaking, together with reports from other studies, will add flesh to the bare bones of information that have so far been available, and help us direct our future thinking, policies and activities. Our interim views, based on what we know so far, are as follows:

— Recommendation 1—we believe that there needs to be an effective strategic overview role for all types of inland flooding. The role needs careful specification and the balance of responsibilities between the Environment Agency and other organisations will need to be clearly articulated. The Environment Agency could provide leadership, advice, expertise and national support. Local Authorities would need to take a lead role in the local management of surface water flooding. These roles would need to be supported by appropriate powers and resources, and by Surface Water Management Plans that would set out a package of responses to risks that were identified in a consistent way (Section 2.0).
— Recommendation 2—We need to develop a workable, nationally consistent toolkit for characterising urban flood risk and prioritising responses (Section 3.0).

— Recommendation 3—PPS 25 gives the Environment Agency the greater involvement in planning decisions we called for. However, to be effective it must be rigorously applied and supported by Local Authorities (Section 4.0).

— Recommendation 4—Resistance and resilience requirements should be included in the Building Regulations for new development in areas that could flood, from whatever source (Section 4.0).

— Recommendation 5—In the forthcoming Planning Bill, a presumption in favour of SUDS should be introduced to add weight to existing policy in PPS25. Local authorities should apply a presumption in favour of SUDS in planning applications for new developments by applying conditions and clear arrangements need to be put in place for ongoing maintenance (Section 5.0).

— Recommendation 6—Section 106 of the Water Industry Act 1991 (right of connection to a public sewer) should be amended to encourage the use of SUDS, and charging regimes should reward organisations that place a smaller load on the surface water drainage system (Section 5.0).

— Recommendation 7—Local Authorities together with Local Resilience Forums should be given greater accountability for ensuring emergency plans are adequate in relations to the level of flood risk (Section 6.0).

— Recommendation 8—Measures that promote investment in resilience and prevention of flooding of critical infrastructure need reviewing. There should be a specific climate change adaptation role for utilities and service providers in the Climate Change Bill (Section 7.0).

— Recommendation 9—Land owners and managers should be encouraged to consider the many ways in which their activities can help reduce flooding, for example by careful soil management or creating washlands and water storage areas (Section 8.0).

— Recommendation 10—Reservoir safety legislation should be reassessed to learn the lessons of the recent events (Section 9.0).

— Recommendation 11—Investment in flood risk management is promised to increase but longer-term commitment to such funding needs to be given by Government in the face of climate change impacts (Section 10).

— Recommendation 12—Fundamental changes to governance of flood risk would be counterproductive. Defra should take forward its intention to give the Environment Agency an overview role of all inland flooding (Section 11).

Environment Agency

September 2007

Annex 1

Our role and activities during the summer floods 2007

1. THE ENVIRONMENT AGENCY

1.1 We are the lead agency for providing flood risk protection and warning of flooding from “main” rivers. Other bodies, (Local Authorities, the Highways Agency and utility companies) are responsible for the standards and maintenance of smaller watercourses, culverts, drains and sewerage systems. We have a regulatory role in managing flooding from reservoirs, except where we own reservoirs specifically managed to reduce flood risk. Riparian owners are responsible for other watercourses on their land.

1.2 This memorandum explains how we discharged our responsibilities during the summer floods. It explains how we worked with others in discharging those responsibilities across the range of our activities, including mapping and modelling flood risk; interpreting weather warnings; forecasting flooding and issuing flood warnings; building and maintaining flood defences; incident management and response; clean-up operations; and aftercare.

1.3 Although it is not possible to conclusively attribute any particular event or series of events to climate change, we do know that predictions for the UK suggest we can expect more severe storms accompanied by intense rainfall. This, combined with predicted sea level rise, mean that the risks of coastal and inland flooding are likely to increase.
2. Forecast and Warning

Mapping

2.1 We map flood risk and provide free to the public, via our website, the most detailed mapping analysis of flood risk of any country in Europe. This information is regularly updated and shared with local authorities and the insurance industry to assist in planning and insurance provision. We map areas at risk of flooding from the sea and from rivers. We do not currently have a responsibility to map areas that may be vulnerable to surface water flooding, sewer or groundwater flooding.

2.2 Most of the areas that flooded were identified on our flood maps as being at risk of flooding. Those that weren’t identified by flood maps as being at risk tended to be areas affected by drainage systems being overwhelmed by the run-off from exceptional rainfall. Early data analysis shows that five times as many properties were affected by surface water flooding as against those directly affected by river bank overtopping, although the relationship between the two is complex. Areas where urban flooding was caused solely by overwhelmed urban drainage systems do not receive flood warnings under the current system.

Data gathering

2.3 We constantly monitor rainfall, river and sea conditions. We also use weather forecasting information provided by the Meteorological Office (Met Office) on rainfall forecasts, weather radar, tide levels and wind conditions. These data help us plan and warn for events.

2.4 The data are fed into our national flood forecasting system (NFFS), which predicts river and tide levels for critical locations across England and Wales and allows us to warn people at risk and professional partners. When severe weather is predicted, our national and regional flood forecasting duty officers are in regular and direct contact with Met Office forecasters.

Triggers for action

2.5 The Environment Agency’s operational flood response can be triggered in a number of ways, depending on the response required, for example:

— Using weather forecasts from the Met office—for informing professional partners, running river level and tide forecasts, putting staff on standby;
— Using detected river levels through remote sensing or direct observations—used to issue flood warnings and operate our flood control structures, including putting up our temporary flood barriers; and
— Through reports of flooding from the public or others—these can be received by Floodline (our flooding information telephone service 0845 988 1188); our National Customer Contact Centre (NCCC) during office hours, or through our Regional Communication Centres (RCCs) using our emergency out of hours contact number. They are then passed to the relevant local duty officer to investigate and act.

Flood warnings

2.6 We issue flood warnings when rivers or sea levels reach trigger levels, or when high levels are forecast. Before we issue warnings to ensure we try to be as specific as possible about which communities will be affected. However, we have to find a balance between the needs for accuracy and the importance of alerting the public and our partners early enough for them to react appropriately. We also need to be aware of the problems of raising false alarms, which, if repeated, reduce the willingness of people to respond.

2.7 We aim to give at least two hours’ notice of flooding, but in some locations, where catchments respond very quickly to rainfall, this notice period is not feasible. We do not currently have a responsibility to provide a flood warning service for flooding from sewers, drains or surface water, although work is currently being done under Defra’s Making Space for Water initiative to study the feasibility of expanding current flood warnings to cover other flood risks.

2.8 During the summer floods:

— We warned over 45,000 properties of flooding through our free flood warning systems.
— Our flood agents took almost 55,000 calls and we received over 200,000 calls to our Floodline Recorded Message Service. Our call centres were manned with triple the usual number of staff.
— We issued 233 Flood Watch Warnings, 272 Flood Warnings, and 51 Severe Flood Warnings.
— We received over 43 million “hits” to flood pages from 4 million individuals on our website which contain advice on preparing for flooding, what to do during a flood and on cleaning up after a flood.
Floodline Warnings Direct (FWD)

2.9 We have invested £10 million over the last 3 years in our new national flood warning dissemination system, Flood Warnings Direct (FWD). It has proved a robust and reliable way of getting warnings out to public and our professional partners. This system is unique in the world, warning free of charge registered users at the highest risk of flooding via telephone, fax, text, mobile, pager and email.

2.10 We have sustained a long running campaign to raise awareness of flooding and the availability of flood warning and advice. To date 40% of those offered FWD have voluntarily signed up for the service. We continue efforts post-flood to encourage sign up, for example by taking out full-page adverts in three national newspapers, local newspaper advertising, direct mailing, and going door to door.

3. Response

3.1 During the June and July flooding we mobilised all appropriate head office and regional operational teams. Their activities included checking the condition and stability of our flood defence assets; confirming telemetric readings; installing demountable flood barriers; monitoring and forecasting; issuing warnings; manning our incident control rooms; and responding to queries from the public, Government Ministers and officials, Members of Parliament and the media. Many staff from non-flooded areas and other disciplines of Environment Agency work were drafted in to supplement formal flood risk management staff, an example of where a large, multi-functional agency is able to provide a more robust response in such emergencies.

3.2 Over this period, up to 23 National, Regional and Area Incident Rooms were operational, and staff attended the same number of Gold and Silver Control Centres.

Gold and Silver Controls and Civil Contingencies Committee

3.3 The Gold and Silver Command structure is used to co-ordinate a managed response to major incidents where a range of agencies and emergency services have a role to play. Communication between the Environment Agency Regional contacts and Gold and Silver Controls across the country worked well, largely due to pre-established relationships and links made during emergency planning exercises and Local Resilience Forums. We were able to provide updates as necessary on flood risk in many areas. These were widely cascaded to responding agencies and authorities on a regular basis and the information was often the basis for informing evacuation plans and informing the public. The same material was used extensively by our own staff to brief the media, provide press statements and give interviews.

3.4 The importance of our role in control centres is recognised—Hull City Council and Humberside Fire and Rescue have both indicated that the Environment Agency were “invaluable in providing accurate and vital information on river levels, tides, and weather forecasts” at Silver Command in Hull (Hull Floods Independent Review Body).

3.5 We also provided liaison officers in the Met Office and in the Fire and Rescue Service (FRS) National Flood Support Team. These staff were able to keep direct contact as needed with both the National Incident Room (gathering and co-ordinating situation report information from local Operational staff for onward transmission) and with Area Forecasting teams (monitoring river levels and environmental conditions predict their possible effects). For the FRS, this provided useful intelligence on how rainfall was affecting river flows and levels, predicted peak times and locations. Without this, the FRS would not have been able to co-ordinate the deployment of water rescue staff and assets as effectively.

3.6 We played a full part nationally in the Cabinet Office Civil Contingencies Committee (known as COBRA).

Local communities and residents

3.7 After the floods, we put significant efforts towards working with and talking to local communities and answering questions about flooding in their areas. We organised or took part in drop-in centres and advice sessions where our staff were on hand to answer questions and offer practical advice on all aspects of the flooding, as well as to hear first hand from people affected by flooding. Many of these took place on a multi-agency basis so that together we could provide as much information as possible locally. We also had staff acting as “flood ambassadors” in some communities to offer on-the-spot advice and answer questions.

3.8 Our Floodline is available to provide advice 24 hours a day during a flood event. Flood pages on our website contain information on preparing for flooding, what to do during a flood and cleaning up after a flood.

3.9 We provided four national briefings to MPs during and after the flooding as well as briefing MPs in affected constituencies at a regional and local level. We supported the Government by providing briefings for Ministers and assisted with Government briefings for members of Parliament.
4. Assets

4.1 Across England and Wales, the Environment Agency flood risk infrastructure assets comprise 17,400 structures and 22,800 kilometres of coast and riverbank defence with an estimated replacement cost of £20 billion. Over the five years to 2007–08, our capital investment programme will have reduced the risk of coastal and river flooding to an additional 155,000 properties.

4.2 We assess the condition of our assets and grade them from 1 (very good) to 5 (very poor). Improvements to our condition assessment work have helped to improve the classification of our defences based on fit-for-purpose performance. Currently more than 90% of our assets are graded as being in fair (3) or better condition.

Performance during events

4.3 Past evidence has shown that the majority of instances where flooding occurs is due to either an absence of defences or where the design capacity of the defences is overwhelmed. Our records show that only around 1% of instances of flooding arises directly from an asset failure. Current evidence from the summer flooding of 2007 confirms that asset failure was not a significant contributory issue.

Standards of protection

4.4 Flood defences in England and Wales are provided under the Environment Agency’s permissive powers—there is no legal requirement on the Government to protect property to a given standard, or at all. Government policy in England, set through Defra, identifies indicative standards of protection. These are currently between 1 in 50 and 1 in 100 for fluvial defences and 1 in 200 years for tidal flooding. The standard for each location is established through economic assessment and focuses on optimising the benefit to cost ratio. It typically enables standards of protection of around 1 in 100 years for urban river systems and 1 in 200 years for urban coastal defences. There are exceptions; most notably on the Thames where defences protecting London from tidal flooding are set to the 1 in 2000-year standard.

4.5 Calculating standards of protection is based upon statistical analysis of the historical record. The frequency and severity of intensity of rainfall are predicted to increase as a consequence of climate change. These are major drivers of river flooding. We therefore build increased tolerances into our flood management works to cater for climate change inland and at the coast. We allocate funds to areas of highest risk taking account of the need to spread risk reduction as far as possible with the funds available.

Temporary and demountable barriers

4.6 Temporary flood barriers are totally removable and portable flood control systems and are one of a number of mechanisms that we can use to protect people and property from flooding. They are used as a short-term measure, for example when repairs to permanent defences are being undertaken or during construction of a permanent defence. We regularly use them in a number of locations in England (where permanent schemes cannot be justified). Our temporary defences were used to protect the electricity substations at Walham, maintaining electricity supplies to 500,000 people across Gloucestershire and South Wales, and Castle Meads. Temporary barriers at the Mythe Water Treatment Works near Tewksbury enabled recovery work to start at the plant and restoration of water supplies to begin far earlier than would have been possible without defences.

4.7 Demountable defences are set in pre engineered locations where permanent fixings are in place to which barriers can be attached. They are used successfully in a number of places where it is not possible to put permanent barriers, often for aesthetic reasons. We successfully deployed demountable defences at Bewdley in Worcestershire and Shrewsbury protecting many properties.

4.8 Reliance on the use of temporary barriers however is not without risk, as shown in the case of Upton-upon-Severn, where we were unable to install temporary defences in time. As previously agreed between the Environment Agency, local community and Local Authority, the barriers for Upton are stored 23 miles away at Kidderminster, where secure storage facilities, equipment for loading and removing them from lorries are available. Under normal circumstances, excellent transport links enable us to be on site within an hour. However, the extreme weather conditions caused severe traffic disruption and, despite our best efforts and help from the police, we were unable to reach Upton in time to erect the barriers. We now know that due to the unprecedented amount of water flowing through the area, even had we been able to erect the barriers, they would have been overtopped.

4.9 Even though the barriers were not used at their intended location in Upton, we were able to deploy them to great effect at Walham electricity sub-station, preventing the loss of power to half a million people.
Dredging

4.10 Whilst there are certain circumstances where dredging and channel clearance may help reduce flood risk, we have largely found in the past that, overall, channel maintenance contributes little to reduction of flood risk in major events and it is therefore less economically beneficial than other flood risk management tools. To reinstate more widespread channel management practices on top of our other flood risk management activities would, therefore, require significant additional resource.

4.11 River channel clearance would have had limited immediate benefit during the summer floods. Rivers only stay inside their banks in low to medium flows. Above this the river will flow onto the floodplain, which is as much a natural part of the river as the channel itself. Channels, which are over-deepened beyond their natural profile, quickly silt up as they try and find their natural state of equilibrium.

5. Recovery

5.1 The focus on the floods has now moved from incident management to the recovery phase and to longer-term reviews of what went well and the challenges for the future.

5.2 Our immediate role in the aftermath of a flood is to inspect defences and other equipment to ensure they remain serviceable and to remove debris and blockages from main watercourses where we believe they are increasing flood risk. Local Authorities have the lead role in co-ordinating recovery efforts following a flood. We believe that planning for recovery is as important as planning for the flood itself.

5.3 Current direct costs of the floods to the Environment Agency stand at £20 million. Three quarters of this will be needed to repair our flood defences.

Clean up operations

5.4 We have a limited role in post event economic and social recovery but we work with others to help people get their lives back to normal as quickly as possible. As flood levels receded, our workforce was deployed to help remove water from flooded areas as quickly as possible, including using large temporary pumps through to unblocking debris from culverts and under bridges, and helping the emergency services remove obstacles and blockages.

Environment Agency

September 2007

Witnesses: Baroness Young of Old Scone, a Member of the House of Lords, Chief Executive, Dr David King, Director of Water Management and Mr David Rooke, Head of Flood Risk Management, Environment Agency, gave evidence.

Q1 Chairman: Good afternoon, ladies and gentlemen. I am delighted to see so many people here taking an interest in the Committee’s first session after the summer recess. Can I just deal with one small but important piece of housekeeping before we start? As some colleagues here may be new to the Committee or may have forgotten how we operate, it would be very helpful if you could make certain your mobile phones or other alert mechanisms are turned off. I welcome our first witness in our inquiry into Flooding, the Environment Agency: Baroness Young, their Chief Executive, Dr David King, their Director of Water Management and Mr David Rooke, the Head of Flood Risk Management. You are all very welcome and thank you for your comprehensive submission and offers to the Committee of further briefing to enable us to understand in even greater detail some of the lessons learned from the summer’s flooding. I would just like to say at the outset that this particular inquiry has attracted an unprecedented response, particularly from members of the public. On behalf of the Committee I would like to express my thanks to those people, some of whose lives were blighted by flooding, but nonetheless have seen fit to share with the Committee their own thoughts and indeed posed some very pertinent questions which I hope, as we proceed with these hearings, we will be able to reflect and reflect upon when it comes to reaching our conclusions. I would like to start, Baroness Young, if I may, by asking you a question borne out of the fact that there do seem to have been an awful lot of reports on the subject of flooding and flood management with lots of very good advice. I looked back to the predecessor committee of this and I think it was in the Session 1997–98 when they published a report on Flood and Coastal Defence and in their recommendations they made an important observation that there needed to be integrated management of flooding issues. If I may, by asking you a question borne out of the fact that there do seem to have been an awful lot of reports on the subject of flooding and flood management with lots of very good advice. I looked back to the predecessor committee of this and I think it was in the Session 1997–98 when they published a report on Flood and Coastal Defence and in their recommendations they made an important observation that there needed to be integrated management of flooding issues. They concentrate on main rivers, non-main rivers and internal drainage board areas and made the distinction between that and coastal activity. In the case of our own Committee we published a report, Climate Change, Water Security and Flooding on 16 September 2004 in which we made a number of pressing recommendations, including asking the Government to publish a White Paper on the subject of the Foresight Report which very accurately predicted the onset of more extreme weather...
conditions and made some very important recommendations about should be protected, including vital infrastructure. The Government’s own activity in terms of their response to *Making Space for Water* for example had conclusions which said (and I quote): “The aim will be to manage risks by employing an integrated portfolio of approaches which reflect both national and local priorities.” Their first thought was that these were all aimed at reducing the threat to people and their property. With so much advice how come it went so wrong? *Baroness Young of Old Scone:* Thank you for giving us an opportunity to say that we do not think it went wrong as a result of the advice. The reasons why these floods were so severe was because the weather that prompted them was indeed severe. There was an unprecedented amount of rain in June and July, more than ever before.

**Q2 Chairman:** Just to interrupt, you say it was unprecedented but Sir David King’s report alerted everybody—albeit on a long timescale—to the onset of more extreme weather conditions associated with climate change. If you look at the scientific evidence in volume two of his findings a lot of the kind of the things that we saw happen in the summer—for example the lack of protection for vital infrastructure—were flagged up as work areas in that document. What did you, as an Agency, do when Sir David published his findings in terms of giving advice to the Government?

*Baroness Young of Old Scone:* We have looked, as you have, at all the reports that have been done on floods since 1998 and if you look at all the recommendations coming from these reports a considerable number of them have been acted on and implemented. Some of them are currently part of a process of implementation as part of *Making Space for Water* which is the Government’s strategy for flood risk management. I think the issue really, as far as the previous findings are concerned, is the pace at which they are being implemented. In some cases this is as a result of the pace that can be achieved through funding; in other cases it is changes in legislation; sometimes it is cultural and a change in hearts and minds. It is a big and complicated process of implementing all of these reports. I believe we need to move faster and I do hope that the reviews that are currently taking place—your own and Sir Michael Pitt’s—will in fact reinforce the need not to come up with new conclusions but to implement the ones that have already been reached.

**Q3 Chairman:** Let us get to the heart of the matter. It is refreshing to hear you say that things should move faster and this is borne out of, if you like, a reaction of some very harrowing situations which occurred in the summer. Going back to 2004 when that report was produced—indeed, you are continually working in the area of dealing with flood prevention issues—did you sit down formally with government and in 2004 deliver a hurry up message in the context of the then available resources?

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**Baroness Young of Old Scone:** There has been a huge amount of sitting down with government on the *Making Space for Water* strategy, which is the primary vehicle for changing the way in which flood risk management is delivered. That has achieved a whole variety of changes including the work that has gone on to take a risk based approach to flood risk management for the future. We have delivered more techniques of assessing risk, we have made considerable progress in delivering our mapping and warning systems. As a result of that report there was also the injection of additional funding into the system through the spending rounds and there are a number of things that are currently underway, including giving us a role on the coast to integrate (you made the point about integration) and consulting on whether we are going to have a role in flooding in-land from all sources of flooding. So some of these things have been done and some of these things are currently out to consultation and some of them remain to be done. I do not believe that any of the messages from previous reports or indeed from the report that you are referring to have not been worked through in the *Making Space for Water* strategy.

**Q4 Chairman:** You made a very telling statement at the beginning, a candid statement in which you said that things should happen quicker. When did you start to deliver to Defra the message that things should accelerate? Was it as a result of what has happened this summer or was it as a result of study and thought at an earlier time?

**Baroness Young of Old Scone:** It all depends very much on which of the elements of the report are taken into account. One of the things we have done in the review of all the various reports is to work out who, in fact, was responsible for taking the lead. Some of those things we were responsible for taking the lead in, others it was parts of government, others it was local authorities, others it was individual agencies, parts of government, whatever. I think the important thing is that we have pressed on as fast as we possibly could with the things that we were responsible for. We have urged government to move forward on the things that they are responsible for and there are quite difficult conundrums to face in terms of the wide variety of responsibilities, particularly for surface water and urban flooding where Defra was consulting prior to the floods on a “minded to” basis about our role in co-ordinating all of the organisations that are responsible in the urban and surface water areas, for example local authorities, water companies, the Highways Agency, highways authorities, the development and re-development process where clearly at the moment there is huge confusion to the public and a lack of co-ordination.

**Q5 Chairman:** I think it would be helpful to the Committee if you could lay out in writing and in more detail, bearing in mind the reports to which I have referred, to give us some kind of time line of activity in terms of your exchanges with government to see the type of recommendations that you were making to ministers, what degree of urgency you, as an Agency, attach to them; the kind of response you
were getting from Defra as to whether, in your judgment, they were motoring fast enough in the light of the advice that you were giving.

**Baroness Young of Old Scone**: I am certainly happy to do that as far as our responsibilities go, but I would not want it to be left on the record that we are responsible for all flood risk policy. That is a Defra role and that is one you will have to put to them.

**Chairman**: We are going to come on to who else may be responsible because in your evidence you put forward some quite candid conclusions about better co-ordination of bodies. You alluded to them in your remarks a moment ago and we will want to probe that in detail. Before I go on to look in more detail at the June and July floods I want to bring in David Taylor.

**Q6 David Taylor**: In your comments a moment or two ago I think you were suggesting that you were going to take a risk based approach to flood risk management. What on earth other approach would you take? I do not understand that.

**Baroness Young of Old Scone**: I can probably turn to David King or David Rooke on this because they have been around flood risk longer than I have, but my understanding is that over the last ten years or slightly less we have been increasingly able to map and assess flood risk and to direct our activities and our resources towards the areas of higher flood risk than we have been previously in the past. History played quite a large part and indeed if you remember the 2000 floods to some extent history played a bit of a part there in that the prime minister of the day went around standing on bridges, looking at flooded communities and saying “This must have a flood risk management scheme”. So it was very much that if somewhere had flooded we tended to say that we should look at what needed to be done to resolve that situation rather than stepping back and saying, “Where, in these flood risk management areas, are the highest priorities? Where are the places that are most at risk? Where can resource and focus save the most in the way of property and risk to human life, rather than simply going on the basis of where had previously flooded. The two Davids may want to comment.

**Dr King**: I think it is worth saying that the underpinning philosophy in the 50s and 60s and right up through the 80s was about flood defence. Almost implicit in that was that you could build defences that would stop flooding. The reality is, of course, that you cannot do that; you can only be better prepared against the impact of floods. Therefore it is a change of view; it is about looking at how you manage the risk down and it is also accepted that you manage the risk down by a basket of different interventions which on one side might be about development control, keeping buildings away from inappropriate development of a flood plain to, of course, building and maintaining defences. It is a whole different thought process that now exists around managing floods.

**Q7 Chairman**: Let us look briefly at what happened in June and July because the view has been created that the floods that we experienced both in the rural and the urban settings were unprecedented and very different from anything that we had had before. Perhaps you could comment on that.

**Baroness Young of Old Scone**: They certainly were different from what we have experienced before to an extent that there was a huge amount of rain in a very short space of time. They were the wettest June and July ever recorded. Much of the flooding came not from what we would regard as a traditional flood, as it were, from the rivers or the seas but from the huge volume of water simply overpowering the surface water drainage systems and causing fairly instant flooding, quick flooding. That might later on have been complicated by flooding from the rivers in many cases as well, but the initial flooding was very much surface water flooding. For those of you who remember seeing some of our motorways running like rivers, that was certainly the cause there. I think there were some big lessons to be gained from that about these heavy rainfall events if they are going to become increasingly common with climate change. The other complicating factor was, I think, that it was a summer flood rather than a winter flood and indeed there were two events very close to each other so that we had a series of very saturated catchments and very little capacity either in the river systems in the second case or indeed in the ground itself to take more water. So that made the situation worse. Generally speaking in terms of a traditional flood, as it were, the systems that were in place worked well. We had good collaboration with the Met Office, although we have to make the point that the capacity of the Met Office to predict to very fine grain that helps us then predict floods to very fine grain is not yet technically there. We issued warnings for flooding from the river systems pretty well. There were a few occasions when it did not quite go right but mostly it went well. The big problem was of course that the majority of floods were not from the river systems, they were from surface water systems which are not currently subject to flood warning and indeed are not currently able to be mapped. They are very unpredictable and the title gives a clue on occasions in that many of them are very flash floods so there was not much time to warn even if the technology had been there. Our defences generally stood up well in that we did not have catastrophic collapse or failure of defences other than a few where structures that are mechanically operated or electrically operated failed as a result of their power supply going out. There were a small number of defences in that category but of course the majority of our defences that were implicated were simply overwhelmed by the volume of water because the sorts of design standards to which they had been designed were insufficient to take this unprecedented flood. We did have a number of flood defences that worked extremely well and did defend communities and worked well to their design standards. The message from us for the floods and what makes them so different was very much the huge volume of water in a very short space of time and the fact that it was...
the surface water systems that failed to respond. I think the third thing is the critical infrastructure issue.

Q8 Chairman: We are going to come on to discuss that so you will be able to go into it in more detail, but there is a concerning point I want to conclude on this. You said that at the moment you do not have a model that can deal with the kind of urban flooding situation that we saw and yet you as an Agency, in defending your position about responding to these floods, have made great play about your flood risk mapping, about your helpline and your Floodline (the information that can go to people). It does beg the question that if we are looking forward what are you going to do to try and address the impact of what we currently regard as unprecedented but which might become the norm. One of the things that worries me about the modelling arrangement is that you do it on a frequency basis of one in 50, one in 100, one in 200 or even one in 1000 year events but nobody seems to have actually gone back and said, “Well, if this kind of rainfall occurs anywhere, what would the flood risk map actually then look like?” We have had a lot of focus on coastal and river flooding in terms of your mapping, but you have admitted that there is a gap in terms of the urban environment and there seems to be a dearth of mathematical modelling to say that if we get so-called unprecedented events anywhere, not trying to predict when it is going to rain but just to look at the country as a whole and say, “If this lot drops anywhere, what are the risk factors?” What are you doing to improve the modelling and the anticipation of this type of event in the future?

Baroness Young of Old Scone: Can I make some points of principle and then perhaps pass to David Rooke to talk about the whole issue of characterising urban flood risk? We are not working on modelling of urban flood risk at the moment because we do not, as yet, have a responsibility for urban flood risk? We are not working on modelling urban flood risk at the moment because we do not, as yet, have a responsibility for urban flood risk other than from rivers.

Q9 Chairman: Why not?

Baroness Young of Old Scone: Because as yet the Government has not given us that responsibility. They were consulting on whether they should put together a proposition before the summer events but we are not responsible for urban flooding from all sources.

Q10 Chairman: So at the moment it is local authorities, is it, who are supposed to be responsible for that?

Baroness Young of Old Scone: At the moment it is a very complicated mixture of responsibilities of local authorities, of owners of land, of the Highways Agency, the highways authorities; in circumstances where it is the water company assets that are involved—sewers and drains—it would be the water companies. So it is a very mixed and uncoordinated picture. In some areas there has been a degree of coordination, for example following the floods in Carlisle there has been very good work to bring together all the parties and put together a surface water drainage plan and flooding plan combined. However, in the vast majority of urban settlements at the moment that will not have been done. As yet we are not looking at modelling floods from surface water issues within cities. Let me just take one point of principle also about your extreme events happening anywhere. We could in theory look at our flood mapping and risk approach and work out what was needed to protect everywhere against the possibility of a very extreme event. I personally do not believe that that would be the best use of public money because it would be highly unpredictable. Where some of these very extreme events will happen, although they may be increasing in frequency with climate change, only once in a lifetime or two lifetimes or three lifetimes in some locations. To engineer the whole of the country to that standard would be quite expensive.

Q11 Chairman: I am not suggesting that that was the outcome I was seeking, it was “do the modelling and then decide from the response the approach” which seems to be lacking.

Baroness Young of Old Scone: I certainly think that nationally there needs to be a discussion and debate at government level about the standard of protection that we believe is important and how frequently we would regard as acceptable an event that would overwhelm the traditional defences. We also need to look at other ways of making sure that if these extreme events occur that proper contingency planning is in place and that generally speaking we build our buildings and our settlements with more resilience.

Chairman: We are going to come onto that but Mr Williams wants to come in here.

Q12 Mr Williams: You have talked about the consultation that is taking place as to whether the Environment Agency should take the legal responsibility in urban flooding from surface water. How did that consultation arise? Was it because of a ministerial announcement?

Baroness Young of Old Scone: It is part of the Making Space for Water strategy and this was the beginning of the process of looking at integration. We have gone through the process of Defra consulting on integrating the roles in coastal flooding and coastal protection. That has now been agreed and we are going to have a combined role in coastal flooding and coastal protection. This was now moving onto consulting on the inland role integrating surface water drainage with flooding from the rivers as well. It was partly the process of implementing Making Space for Water.

Dr King: Making Space for Water is the Government’s strategic framework for handling flood risk over the next ten to 15 years. Sitting under that strategy document are somewhere between 15 and 20 programmes of work which largely sweep up all of the recommendations that the Chairman made reference to. Many of those have progressed but it is true to say that most of the focus over the last number of years has been on fluvial and coastal flooding. However, the issue of urban flooding, for
example last December the Government set a number of pilots looking at urban flooding, surface water flooding, specifically to try to understand how we might best manage the surface water issue. In addition to and as part of that Defra are consulting on the need for a strategic overview. There are five or six different organisations involved in managing urban flooding. They all have an important part to play and must continue to do so, but there is a need for a strategic overview part of which would be the characterisation of national risk. My belief is that in terms of characterisation mapping surface water flooding, which is a lot more difficult for a whole variety of technical reasons, we are significantly behind where we are with our understanding of characterisation and mapping of fluvial and coastal.

Q13 Mr Williams: Can I just ask how far the consultation has proceeded? What conclusions have you come to?
Baroness Young of Old Scone: It has gone through the consultative process and Defra now has the responses. They are not going to act on those until the review, chaired by Sir Michael Pitt, has come to some conclusions.

Q14 David Lepper: Could I concentrate on your responsibilities for flood warning systems and public information. There is no doubt at all these have been under very heavy pressure during the summer. I think you talked of some 43 million hits to your website during that period, but you concluded in your evidence to us that the current system stood up to the challenges of increased usage. On the other hand, we have a number of those organisations and individuals who have submitted evidence to us which suggests differently, for instance Sheffield City Council say that severe flood warnings were only given when the water level was already up to the windscreens on vehicles. The National Farmers’ Union says that farmers who had been signed up for a warning did not receive the warning until it was too late for them to rescue their livestock. Residents in Oxford complained about incorrect and confusing information. Would you agree that you do need to review the processes of warning—accepting the fact that this was perhaps a once in however many years occurrence—that pressures were put on the system and many of those individuals who were relying upon the Agency’s own warning system and information felt that they were let down.
Dr King: The first thing I would say is that when you get an event of the severity that we did clearly there will be lessons learned and there will be improvements that we will make. The second point that I would make is that our warning system is exclusively associated with fluvial, so flooding from rivers. In the dissemination of warnings we use the Floodline Warnings Direct which enables you to give a warning either by fax, phone or pager. We use the Internet and obviously we use the local radio as well as Floodline. In terms of warnings, we gave out 45,000 warnings and we strive to give a two hour warning. We know that about 75 per cent of warnings were given with at least two hours, but obviously there are 25 per cent where we did not. Given the nature of the flooding that unfortunately has happened. In terms of our website, you mentioned we had 43 million hits from 4 million people and although there was some minor slowing of the system we are talking about seconds. Normally 95 per cent of the enquiries are within three seconds, it went down to a minute in some periods.

Q15 David Lepper: We had Tewkesbury Chamber of Industry and Commerce telling us that in relation to Tewkesbury, where the flood happened on a Friday night (or at least the worst part of it), they tell us over the weekend it was impossible to connect to the Environment Agency website. That is not just a matter of the slowing down of the process because of the number of hits, but they are telling us they could not get any connection at all to your website.
Baroness Young of Old Scone: We can certainly give you the evidence from our own logging process that shows that the website was active throughout. If people were not getting onto it obviously we need to look at it. Perhaps I could just comment on one or two of the examples you gave. Sheffield, for example, was one of those areas where there was considerable, very rapid flooding from surface water drainage issues and that was the primary cause of most of the flooding in Sheffield and therefore it was very difficult to give warning at all. We currently do not have a warning system there. The NFU issue, if there are farmers who were signed up for a warning and did not get one, we need to explore that but my understanding is that in many cases it was that they did not feel they got it in time. Our standard is a warning, if we can, two hours beforehand. I think the one point I would want to make about the farmers is that we still have remarkably few farmers and others signed up to the warning system. Only 41 per cent of people who are eligible have signed up and we would very much like to press for more people to be signed up to it so that we can, where possible, give warnings. Again we can look at instances where farmers are saying they did not get a warning in time and see whether it was within our standards and whether, therefore, the standards are not going to be sufficiently long in advance for farmers to move stock which may cause us technical problems. It may not be possible, we would have to look at that. In Oxford the situation was very complicated. It is a very complicated river system in Oxford and I must confess at one stage when we were trying to predict the peaks of flooding points through Oxford somebody said to me that we had more peaks than the Himalayas because they were coming through in a very complex fashion and there were occasions when, having warned people that there was a peak, we then had a higher peak and they felt they had been short changed as it were because the first slug of water coming through which we would call a peak was obviously not the peak, if you see what I mean. There are a whole load of complicated issues about these flood warnings. Our local lessons learned reviews will be looking in detail.
at how every single flood was caused, what the issues were around forecasting these, around the warnings, taking on board the issues that people have raised locally. Generally speaking the reality of these floods is that the vast majority of our warning systems worked well. We dealt with a huge volume. There was a strong possibility that our systems could have fallen over with the degree of hits that they were taking and they did not. Part of the issue is that many of the floods that occurred were indeed not floods that we would normally warn against because they are from surface water issues. So there is a complicated picture there.

Q16 David Lepper: Just to take up one point, Baroness Young, that you made a little earlier and that was about co-operation with the Met Office. From what you have said I get the feeling that maybe some of the information the Environment Agency was receiving was perhaps not always as accurate and as timely as it might have been. The Institute of Civil Engineers tell us in their evidence that they believe the Agency and the Met Office should work more closely together. You have talked about the need to improve co-operation between the two bodies, could you tell us a little bit more about the extent to which it is lacking at the moment and what you are intending to do about that?

Dr King: I think the co-operation with the Met Office worked extremely well. As soon as the Met Office were picking up a weather depression they were talking to us from the Monday. During the week we had some forecasters embedded with the Met Office forecasting team. What is important to point out is that the Met Office did extremely well in some of their forecasts in that they were giving an 80 per cent probability that you were going to get heavy rainfall over a country. That is very good except a county may have a number of different catchments in it so, for example, if the rain was 20 miles north of where it fell in Warwickshire the floods would not have been in the Severn they would have been in the Trent. That is the issue. It is not a criticism of the Met Office; they are working at the limits of their forecasting at the moment but we must know where it falls in order to translate it into a flood warning.

Q17 Lynne Jones: Could I just explore that a little more? Just after the floods I put down some parliamentary questions and what was conspicuous by its absence when I got replies was the lack of response to the “when” question. Dr King, you have just referred to the fairly accurate predictions of the Met Office and at 10.06 on Thursday 19 July they were predicting an 80 per cent chance of floods in areas centred around Tewkesbury. They were spot on in terms of the area they were identifying as having a very high risk of flooding. When after that did you start issuing warnings through the Floodline and through your press releases? You issued press releases the next day but referring to the weekend. It seems not to have been really timely in terms of the warnings. I know you say the surface water system is not subject to flood warnings, but you had this information from the Met Office and it should have informed the information that you already had in terms of your own systems.

Dr King: My recollection is that we issued a joint press release with the Press Office on the Thursday and we have a tiered system of warning which goes from flood watch to warning to severe warning and we were certainly issuing flood watches on the Thursday and then we would have led into warning and severe warning. There is a big difference between a severe weather warning and a severe flood warning because a severe weather warning is issued for a whole series of different purposes and quite often a severe weather warning, even when it involves rain, may not involve flooding. We have to translate the rainfall into a flood forecast and that really does mean that we need to know on what river system it is going to fall. We use the Met Office weather radar, we use our own flow forecasting and we use a whole system of rain gauges, but all of that needs to be modelled and as I said 20 miles makes a big difference as to where the flood is going to happen.

Q18 Lynne Jones: I accept that it is difficult to be absolutely spot on, but you have this quite localised area where the Met Office were predicting widespread heavy rain and it still appears from the evidence that we have that people were not getting warnings, so much so that you had your own floods defences trapped in traffic on the Friday. I still have not really got any perception of how you translate the information that you have from your own evidence and the information from the Met Office into warnings and the timescale for those warnings to be issued.

Baroness Young of Old Scone: Can I just comment on the point that Dr King raised about the difference between a severe weather warning and a flood warning. Our flood warnings generally are based on our monitoring systems from rivers.

Q19 Lynne Jones: It was widespread heavy rain. Baroness Young of Old Scone: Yes, but what we had been doing was keeping in close touch with the Met Office all the way during that week. Indeed I spoke to them on the Tuesday, there was regular contact with them. By the Thursday we were aware that this was going to be big and they were beginning to be able to tell us approximately where. Up until then we could not get much information as to absolutely where until Thursday.

Q20 Lynne Jones: Thursday morning at ten o’clock. Baroness Young of Old Scone: At that point we agreed jointly with them that we would issue public information about a severe weather warning and its location and that we would contact our partners—local authorities and others—about the fact that there was a severe weather warning on the way. As soon as a severe warning goes out the public begin to get information through the media. Our regions issued press releases and generally speaking we were able to up the tempo of the fact that there was a severe weather event on the way. The process of moving from that to actually being able to say in
detail how these surface water systems would react is not currently part of our remit, nor are we able to do it with current technology. The process of that then resulting in river levels going up and us being able to activate our flood warnings in the way in which our modelling systems trigger particular flood warnings at particular times was very much the back end of the process because most of the early flooding was in fact from the surface water impact. I think that that continues to highlight the issue of the fact that we have not at the moment got a co-ordinated process for dealing with flooding from all sources but that is a fact and we cannot deny that.

Q21 Lynne Jones: The flood warnings that went out, were they going out throughout the day? How did they work?
Baroness Young of Old Scone: I think you have to differentiate between a warning that there may be flooding to the public as a whole.

Q22 Lynne Jones: The 45,000 Floodline warnings, when did they go out?
Baroness Young of Old Scone: They would be going out throughout the event depending on where the particular flood was likely to happen.

Q23 Lynne Jones: When did they start going out?
Mr Rooke: For the River Avon we issued our first warning on the 20th at 15.13.

Q24 Lynne Jones: But you had had warnings on the 19th early on that there was going to be these excessive rainfalls.
Mr Rooke: Yes, and we fed that information into our models. We were talking to what we call professional partners—the local authorities, the police, et cetera—on the Thursday. I was talking to the Met Office on the Thursday and we got the warnings out before the properties flooded in good time on the River Severn and the River Avon.
Baroness Young of Old Scone: I think we have to make this distinction between the warnings that we give jointly with the Met Office that there is going to be severe weather and the individual warnings which go to the public at large and to our professional partners. The individual warnings that we give to members of the public through their mobile phone or through their pager or through their landline or whichever way they choose to have it, they are about what is going to happen in their particular flood area and we have a commitment to give them that warning two hours before they flood. So we give the general warning to the public in a particular area that we think there is going to be very heavy weather that could result in flooding and then as the rivers respond we can give individual and particular flood warnings to people based on our modelling of how the rivers are responding.

Q25 Lynne Jones: You should have had plenty of time to get those warnings out to give people the two hours since you had had this warning from the Met Office on Thursday, and yet people are telling us that they were not getting these warnings in time.

Baroness Young of Old Scone: Only where they were able to be warned about flooding from rivers because we do not have a responsibility to warn from surface water flooding. Nobody at the moment has a system in place to warn about surface water flooding other than in a very general way to say that there is going to be a lot of water and we could find some surface water flooding.

Q26 Lynne Jones: People might say that it is difficult to distinguish between the two because if there is heavy surface water that affects the rivers and then we get river flooding, so I am not quite sure of the distinction. People will say, “We signed up to these floodlines: we thought we would get advanced information rather more advanced than what is being given out generally”.

Baroness Young of Old Scone: I think what you are saying very much reinforces the fact that we now have to get a proper co-ordinated approach and proper co-ordinated role and clarity about who is actually responsible for co-ordinating. Let me just take Hull as an example. 95 per cent of the flooding in Hull was from surface water flooding rather than from river flooding and it is actually quite possible to determine which was which because the amount of river flooding in Hull was comparatively small and quite localised compared with the vast majority of flooding which was from surface water drainage.

Q27 Lynne Jones: What needs to be done to improve public information and what role should the Environment Agency play? Do you expect to have responsibility for issuing flood warnings about surface water flooding?
Baroness Young of Old Scone: I think that is one of the things that needs to be clarified if were given a role in having an overview of flooding from all sources in urban areas. The fine grain of what happens in terms of drainage systems is very much a local issue. You can understand that when you are looking at flooding from rivers you are looking at the whole river system because it is one system. If you are looking at flooding within the urban area you are looking at the rivers but you are also looking at some very, very complicated and fine grain drainage and surface water systems and sewerage systems as well. This is very heavily influenced by the development process and also by things like roads and what water companies do. We believe we should have a national overview which would put in place advice, guidance, tools and techniques for being able to do the risk assessment and the mapping but that there needs to be a key role for local authorities in individual localities because they are the folks with the levers in their hands. They have the planning levers that can impact on drainage systems and surface water systems and the whole process of getting permeable and sustainable drainage systems, not building too much impermeable concrete, making sure that urban settlements are planned in ways that allows drainage to be sustainable.
Q28 Lynne Jones: You mentioned earlier that there had been one area where you had had more successful co-ordination. I forget where it was but what was the impetus? Who took the lead in developing that sort of strategy?

Baroness Young of Old Scone: The example I used was Carlisle, following the two sets of Carlisle floods which were quite complicated combinations of river and surface water flooding. David Rooke may want to comment on the whole issue of surface water drainage, including the whole issue of sustainable drainage systems. Working with Defra at the moment we have 15 pilot projects looking at how this issue of surface water drainage systems and floods from surface water can be dealt with. They are trying out a number of different techniques and also different ways of collaborating and having governance of that to see what works. Our anticipation is that once Defra have completed those pilots there will be some models there that emerge that look as if they are successful and can be applied across the country as a whole. Just going back to the issue of predictions of flooding and what we would like to see, if we do get this overview role we will want to look at what mapping and modelling of surface water drainage looks like and whether a warning system is possible. However, to be frank, at the moment we think that technically it will be extremely difficult and financially incredibly expensive and so it may not be the best way of dealing with surface water drainage issues. The best way of dealing with surface water drainage issues may be to start rapidly getting surface water plans in place for those areas that we know are prone to surface water drainage issues and resolving some of the hot spots, making sure that new development takes account of these issues and actually has got better flood proofing in its water drainage systems.

Q29 Mr Drew: If we could now move on to the actual emergency itself, as someone who had a fairly interesting role through it, there is just one thing that I suppose surprised all of us. When the Mythe water treatment centre went down (and obviously the Environment Agency were key to Gold Command in Gloucestershire) what was the response of the Agency when Gold Command turned to Severn Trent and said “You have lost your treatment centre; what is Plan B to get drinking water to thousands of people?” and the answer was, “We do not really know”. Has the Environment Agency played through in some of your roles what happens when you lose key establishments like a water treatment centre or an electricity sub-station? To what extent are you now re-thinking the whole way in which you would work in an emergency and prior to an emergency?

Dr King: In terms of the critical infrastructure and utilities it is very much the responsibility of the operator of that facility to have a business continuity plan in place. Severn Trent Water in that case have responsibility under the Civil Contingencies Act and indeed I think under the Water Services Act to ensure that they have emergency plans to put in place. The Agency does not actually have a role in that at all, but there is legislation that covers it.

Q30 Mr Drew: What level of discussion did you have with water companies and electricity companies prior to this season of floods and have you had a lot more chatter since then on what should be done to protect some of these key establishments?

Dr King: Clearly one of the lessons coming out of the floods is the vulnerability of the critical infrastructure and it is certainly unacceptable. The operators of those installations do have to flood proof the installations. There is a role undoubtedly for government in putting a duty on them to do so. We can certainly help in characterising the risk but at the end of the day it is the operator that will have to make the flood risk assessment of that particular installation and prioritise where they want to put the investment in.

Q31 Mr Drew: What happens if they will not? What happens if you have a clear case where a particular important facility that you know is in the wrong location because you know how risky that particular location is, you have done all your measurements, and they do not come to you, do you have any powers at all to go to them and say, “You have to get hold of this because if it did go down you will have major problems”?

Baroness Young of Old Scone: Can I just pick this one up because I think there is a real issue for the Committee here. We have done the work to map the flood risk to a whole set of public services and critical infrastructure—not just water but telephones, roads, railways, healthcare facilities, power distribution, energy installations of all sorts—and our role is to provide information to these installations and the people who run them about their degree of flood risk through our flood mapping process. That is our role. The Civil Contingencies Act lays upon them a requirement to be contingent and we take part in local contingency fora where all the players get together to try to establish what the biggest risks locally are. On occasions flood risks have been pretty low down the pecking order. Many of the civil contingency fora have been very, very obsessed with the threat of terrorism and other issues like that and I think that it would be good if flood risk comes up the agenda now.

Q32 Chairman: Have you actually discussed the recommendation in paragraph 7.2 of your evidence that an amendment to the Civil Contingencies Act to address this deficit should be included in the Climate Change Bill?

Baroness Young of Old Scone: We have done a number of things. One is that either through the Civil Contingencies Bill or through the Climate Change Bill to get a duty laid on what would be category one responders and category two
responders under the Civil Contingencies Act to have a duty to take account of adaptation in their plans.

**Q33 Chairman:** Have you specifically discussed this with Defra?

**Baroness Young of Old Scone:** We have indeed, yes.

**Q34 Chairman:** What have they said?

**Baroness Young of Old Scone:** I think we are not clear about their response yet; you need to ask them. The other thing I think the Committee should note again the mixed responsibility here. I was asking who should now write to all of these services that we have identified as being in the floodplain and at high risk and say to them, “If you have not already got your act together, you need to start thinking about it sharpish”. That is a moot point. Is it Defra with their role in flood risk management? Is it the Cabinet Office with their role in civil contingencies? Is it BERR with their role as the industry sponsor? To be frank, I think it is probably all of them so again I think we need a clarification on who is actually going to drive through getting our infrastructure resilient for the future. It is not just about people being alert to the issue; there will be investment issues for these businesses.

**Q35 Chairman:** Who is responsible for these creaking reservoirs you have mentioned in paragraph 9.1 of your evidence?  

**Baroness Young of Old Scone:** Creaking reservoirs are even more complicated. I am beginning to get depressed about this evidence. If you were reading it cold you would be thinking “Who are these people? They are supposed to be responsible for floods and every time you ask them a question they are very simply telling you it is not their job.” However, that is the reality. It is a hugely diverse set of responsibilities at the moment. If you want to hear the story about reservoirs David is a world expert.

**Q36 Chairman:** You have 30 seconds to enlighten us on reservoirs without repetition or deviation.

**Mr Rooke:** We took over the enforcement authority for reservoirs across England and Wales in October 2004 so we have some three years’ experience. Ulley Reservoir which was on virtually every television screen across the country in June highlighted some of the issues. We do think that as a result of our experience of being the regulator and what happened at Ulley and elsewhere—there were a number of other reservoirs which were adversely impacted—that it is timely for a review of the legislation. The legislation goes back to 1930 and it is still basically in force today. It has been updated through the 1975 Act and some amendments since then, but primarily it is back to the 1930 Act which came out of a number of reservoir failures that led to the deaths of quite a large number of people. We want to move it into a modern risk based approach. We have ageing reservoir stock and the average age of reservoirs in this country is 110 years. With climate change we need a modern risk based regulatory approach in place before those risks start to increase.

**Q37 Mr Drew:** Presumably you were happy with the way in which—I can only talk my own experience in Gloucestershire—the Gold Command structure worked.

**Baroness Young of Old Scone:** Broadly speaking we feel that the Gold and Silver command structure is the right structure.

**Q38 Mr Drew:** There were some issues about how Gold related to Silver.

**Baroness Young of Old Scone:** Yes and one or two issues also for us about just how we get the right sort of input into this, but generally speaking I think the model is a good one.

**Q39 Mr Drew:** I think everyone would agree from all the evidence we have received and from all the personal experience that Gold and Silver command worked very well. However, a lot depends on people being able to deliver once decisions have been taken and in one respect there is a very good story that there was a lot of helpful intervention by British Waterways (which is quite close to our heart) but if there had not been the ability to pump water through the Gloucester to Sharpness Canal the potential flooding in and around Gloucester and Tewkesbury would have been even worse. On what basis were those decisions taken? They were certainly taken and I am interested in that which is a good news story but also what is not such a good news story where there were water courses where flooding could have been prevented if other private individuals or private organisations had also been acting in the same way because so much depends on people opening the sluices, people making sure that they maintain under riparian ownership their responsibility. Can you take me through what I see on the one hand a good news story but what potentially is not very helpful where you may not have the ability let alone the capability to be able to instruct people to do some of the things you need them to do?

**Mr Rooke:** I support what Barbara said in terms of the Gold and Silver which worked extremely well. The Gold takes the strategic decisions and the Silver takes the tactical decisions. There is also a Bronze level as well which is actually on the site; people on the site can take local decisions. That command structure is well tested; it is used for all emergencies, not just flooding. All the players generally know each other and come together and they exercise when there are no real events as well. The exercising is an important part of being a member of Gold or Silver. When you attend Gold or Silver you bring with you your organisation’s resources and put them at the disposal of the Gold or Silver or Bronze commander and that enables resources to be prioritised. It enables additional resources to be brought in from outside if necessary and certainly during the flooding the military played a key role in coming into Gold and Silver to help and that was very valuable indeed. Trying to get that replicated at
a very local level with private individuals is maybe something that needs to be looked at. Often parish councils could play a role in this. We do have flood wardens who we use to issue flood warnings. There may be a role for flood wardens to co-ordinate very local specific activity but it is at street level, it is at farm level, it is certainly not at county level or beyond that at regional level.

**Q40 David Taylor:** Can we turn to the question of flood defences. In your opening remarks on that, Baroness Young, you said that with virtually no exception the majority of flood defences performed to the design standard and did not fail; they were simply overwhelmed and overtopped by the sheer volume of water. You went on to say in the evidence that even temporary defences would not have been adequate to reach Upton-upon-Severn because they were stored 23 miles away at Kidderminster and were being transported to the region as their community was being flooded yet again. Is there a lesson to be learned from that?

**Baroness Young of Old Scone:** There certainly is a lesson to be learned from Upton. The question of where the barriers could be stored had been the subject of considerable discussion between ourselves and the local authority and community in Upton. Upton is, as you saw, quite a difficult town because it is waterfront; that is what makes Upton so special. The size of the barriers is such that they would need a substantial building to be stored in and that was not thought to be the best solution. Under normal circumstances, where we are able to give warnings long in advance of the river rising we would have plenty of time to get the defences from Kidderminster. The fact that there was so much surface water flooding blocking the roads because of the sheer scale of the event long before the river came up meant that we could not get through even with the best support from the police and emergency services. I think there are questions about storing closer but there are also questions about how far in advance of events we put barriers up because the other thing that the barriers in Upton do is disrupt the town quite considerably and for a town that is dependent on its waterfront, having a whacking great barrier across it on a kind of prophylactic basis just in case it floods is not something that the community wants. We did in fact make the decision to deploy the Upton barriers some four hours earlier than we would normally do because we were aware that there was severe rainfall coming. That, in retrospect, was not early enough but even had we got the Upton barriers up it would not have stopped the town from flooding because the floods would have overwhelmed the barriers.

**Q44 David Taylor:** There is another example that I would like to put to you which I know you are familiar with, I saw you on the day. Three members of this Committee—David Drew, James Gray and myself—spent a day in Gloucestershire and South Worcestershire and we went to Upton-upon-Severn where we encountered one of those who had been affected by the flooding of that community and asked what his views were. He was utterly speechless and disappeared indoors muttering language that I have not heard for a long time. The substance of his case was that flood defences had not been able to reach Upton-upon-Severn because they were stored 23 miles away at Kidderminster and were being transported to the region as their community was being flooded yet again. Is there a lesson to be learned from that?

**Baroness Young of Old Scone:** There certainly is a lesson to be learned from Upton. The question of where the barriers could be stored had been the subject of considerable discussion between ourselves and the local authority and community in Upton. Upton is, as you saw, quite a difficult town because it is waterfront; that is what makes Upton so special. The size of the barriers is such that they would need a substantial building to be stored in and that was not thought to be the best solution. Under normal circumstances, where we are able to give warnings long in advance of the river rising we would have plenty of time to get the defences from Kidderminster. The fact that there was so much surface water flooding blocking the roads because of the sheer scale of the event long before the river came up meant that we could not get through even with the best support from the police and emergency services. I think there are questions about storing closer but there are also questions about how far in advance of events we put barriers up because the other thing that the barriers in Upton do is disrupt the town quite considerably and for a town that is dependent on its waterfront, having a whacking great barrier across it on a kind of prophylactic basis just in case it floods is not something that the community wants. We did in fact make the decision to deploy the Upton barriers some four hours earlier than we would normally do because we were aware that there was severe rainfall coming. That, in retrospect, was not early enough but even had we got the Upton barriers up it would not have stopped the town from flooding because the floods would have overwhelmed the barriers.
but faced with a flood of the nature of the one that we had no amount of temporary barriers would have saved it.

**Q46 David Taylor:** How long does it take to erect and deploy in Upton, do you know?

**Baroness Young of Old Scone:** Quite a number of hours. We would normally set off at the trigger point that would allow us plenty of time to get the barriers up successfully before any flooding risk occurred. Because of the fact that the roads between us and Upton were full of water as a result of surface water flooding and in spite of the fact that we set off early—considerably earlier than we would do under normal circumstances—we were just unable to get through in company with a very large number of folk who were stuck as a result of the same flash flooding.

**Q47 David Taylor:** You referred to the overwhelming and the overtopping of the flood defences. Presumably that caused some damage to them. Do you have any assessment at this point of the cost of the damage that was done to flood defences by that overwhelming and overtopping and will that cause you unsustainable pressures within your budget?

**Dr King:** Specifically Upton?

**Q48 David Taylor:** In general.

**Dr King:** Across the country?

**Q49 David Taylor:** Yes. You have had damage to your flood defences caused by the fact that they did not fail but they were just overwhelmed by the volumes they were trying to handle.

**Dr King:** The total cost for us managing the flooding, including the damages to the defences, is in the order of £20 million.

**Q50 David Taylor:** The damage was not £20 million but it is included within that £20 million.

**Dr King:** Yes, it is included within that £20 million.

**Q51 Mr Gray:** I do not think anybody would disagree with your broad thesis at the beginning of your evidence that these were exceptional circumstances and extraordinarily heavy rain which, certainly in urban areas, caused surface water flooding. Would you accept that there might be slightly different circumstances in some rural areas less badly affected perhaps—one thinks of my own constituency in Wiltshire—where there was severe flooding of quite a different nature and quite a different type to what we saw in Gloucestershire. If you accept that, do you accept what a number of people who have given evidence to us have said that it was not only to do with exceptional rainfall in those areas, it was actually to do with lack of maintenance of the waterways and rivers in rural areas. I saw myself in East Tiverton, just outside Chippenham where the Avon flooded because of the lack of activities of the authorities. One or two parish councils just south of Gloucester said the same thing. The rivers had not been dredged, there was a lack of maintenance, there was blockage. The Environment Agency was not performing as it should have been in previous years and that caused the flooding in those rural areas.

**Mr Rooke:** We have only got so much money that we can spend on flood risk management and so we have to prioritise. Most of our money goes into urban areas because that gives the greatest return on the investment to the tax payer. We do a considerable amount of work still within rural areas to protect rural areas and to protect agricultural areas. However, we have to prioritise and in prioritising we choose the most appropriate maintenance. We have cut back in some areas on some of our maintenance activities; in other areas we are still carrying out maintenance activity that we have carried out for a number of years. So it will vary across the country on this risk based approach where we look at our high risk, our medium risk and our low risk systems and we make the investments accordingly. There will be variations across the country but I can assure the Committee that we still spend some £3 million a year on dredging; we are still spending some £8 million a year on cutting weed and we are still spending a lot of money on grass cutting, tree removal and that type of activity. There is a lot of activity going on. In terms of our risk based approach the bulk of it now goes into urban areas.

**Baroness Young of Old Scone:** Could I just comment before we move on from that point. There are two issues, one is that it was complicated by the fact that this was the height of summer which is probably the worst time to have a flood like this because there is at that stage the biggest amount of weed growth in rivers and therefore they are less able to carry away water. Under normal circumstances where the flooding season is the winter, by the time our maintenance programmes have been carried out at the back end of the summer and into the autumn we are ready for the rain as it were. However, this of course was a summer flood. The second point I want to make is the sort of “cleanliness is not next to godliness” point. There was a tradition in flood risk management in the past that routine bank clearing, tree clearing and dredging were carried out almost as an act of faith, that it was just what flood risk engineers did. Now with our risk based approach we do look at where the £13 million or so that we spend on dredging and bank maintenance is best spent to make sure that it is focussed on reducing flood risk. Probably the biggest mail box following the flood has been about clearance of obstruction, weed clearance, bank maintenance and generally the belief that if only we had dredged the rivers harder the water would have been able to run away more quickly. We do not believe that that is the case. In many cases dredging systems simply erodes banks, it moves water further down stream and floods urban areas more quickly and very often simply corrects itself very rapidly. If a river wants to silt up it will silt up.

**Q52 Mr Gray:** There is a slight difference between what you have said and what David Rooke said a moment ago. He said, “We do our best within the resources available to us”, the implication being that
presumably if there were more resources more would be done. What you are now saying is that even if you had more resources you would not want to do it.

**Baroness Young of Old Scone:** I think there is a middle course. The reality is that if we had more we would probably do more that was effective in reducing risk; in some of the lower risk systems we could do a bit more. However, I do not think we want to go back to the routine dredging and clearing that was carried out as an act of faith in the past because it is simply not good value for public money.

**Q53 Mr Gray:** You have been given a strategic overview of coastal flooding and you are bidding for a strategic view of inland flooding as well. For those of us concerned about rural areas, is there not a risk that if you do that you are becoming increasingly strategic; your focus on urban areas will become worse and your interest in rural matters—of key concerns to MPs such as myself—will become less.

**Baroness Young of Old Scone:** I hope not but there does need, I think, to be a discussion and a policy decision made at government level about just exactly what the balance between urban and rural needs to be. At the moment with the risk based approach that we take and the cost effectiveness approach that we take it will automatically mean that the majority of funding goes towards urban areas. If, as a nation, we want to make sure that the rural areas also get a fair whack it may well mean that there needs to be a policy decision that that is the case. At the moment we have an agreed process for assessing priorities under a process whereby we assess the cost effectiveness of individual interventions. If that is to change we would need that to be a government policy decision and indeed a treasury policy decision because much of the assessment that we do is blessed in terms of the rules by the Treasury.

**Q54 Mr Gray:** Can you talk us through how you would see this strategic overview role with regards to inland flooding actually working in the event of another very severe event of the kind we saw in the summer happening again? What would be different?

**Baroness Young of Old Scone:** Just before I leave the last point, I should advise the Committee that the Public Accounts Committee gave us a very bad time because they felt we focussed too much on protecting what they called empty fields, i.e. the rural stuff.

**Q55 Chairman:** Can we just be clear that the criteria which currently determine how you assess and respond to risk is something which is, in terms of history, agreed between the Agency and the Government or did the Government say, “We have looked at it, these are the ground rules, now you guys carry out a policy”?  

**Baroness Young of Old Scone:** I do not quite know how to respond to that one. Certainly the processes by which we choose priorities are agreed with Defra.

**Dr King:** There is clear government stated policy that the Agency, in carrying out maintenance, should move away from maintaining uneconomic sea walls and there is the expectation that that same approach should apply to inland. If it is about reducing risk and best economic return then that automatically guides you towards more urban interventions than rural.

**Q56 Chairman:** I just want to pursue this question of the definition of risk because if you talk to the people in rural Britain who have been affected by the recent flooding, in the light of what you have just said they might feel a bit let down that somehow the risks that they, as individuals face, seem to have been downgraded in some way in relation to the higher score which is put to dealing with risk in an urban situation. I suppose the question we ask, given what has happened, is: does there need to be a reassessment of relative risks in determining how the resources ultimately are to be used to deal with the results of potentially more extreme weather conditions? Is that a fair assessment of the way the debate at least has to go?

**Dr King:** At the moment we would define risk as the probability times the consequence and the consequence would be a measure of what is the risk to life and property, so the greater number of people and the greater economic value will be in urban areas. As Barbara has pointed out perhaps there should be a debate following this: what is the value we put on agricultural land?

**Q57 Chairman:** You used the word “should”, are you going to be specifically asking the ministers in Defra for clarification of the risk criteria which underpin the work that you do in the light of these recent events? You have raised some interesting questions about it but are you going to specifically say to Defra ministers: “We would like you to review the instructions you have given us on these relative risk issues?”

**Baroness Young of Old Scone:** I do not think we would. Unless there was hugely more funding provided I still think that, as a tax payer apart from being Chief Executive of the Environment Agency, at the moment we still have a very large number of densely populated communities with big economic value at stake.

**Q58 Chairman:** You are almost saying, “I am not going to ask the question because I know I do not have the resources to deal with a possible change in the answer”. Do you not think that your job is to pose the difficult question to ministers and then make it quite clear who bears the responsibility if ministers say, “No, the risk scenario stays where it is”. At least the ball is firmly in somebody’s court as opposed to bouncing backwards and forwards between you.

**Baroness Young of Old Scone:** I am sure that the many, many people who have been in contact with us and indeed with you about the issue of protection for rural areas, particularly for agricultural land, will be making that point in spades to ministers.

**Q59 Mr Drew:** Can we just turn this on its head because obviously in the various reports we have done one of the points that we have been arguing is
that there should be a policy of managed flooding, that we should be recognising that some land will flood on some occasions. We have argued very clearly that people who face that threat, when it happens, should be compensated, but also recognising that this is something that is going to be increasingly happening we should be using the single farm payment to compensate those people for the risk as well as the reality. Where have we got to with this? You seem to be backing away from that and I do not understand that. I thought we were all as one saying that this was a very sensible way to take forward how we could manage that flooding risk.

Baroness Young of Old Scone: Whenever we are putting forward a flood risk management scheme we will look at the options of using land for flood storage as an option and if it is a sensible option and gives us a good return on investment we will deploy that. For example, Lincoln has two major flood storage areas round it which are operated at times of flood and indeed saved Lincoln this time round. They were the result of an agreement with farmers 14 or 15 years ago to do so and they were compensated for that. Indeed, in terms of issues around the coast we have also got a number of areas where we have agreements about using agricultural land and we will continue to do that, but I think that is a different issue from farmland flooding fortuitously or as a result of heavy rainfall where we do not have a proposition that that land is specifically there for flood alleviation. I think one of the things we do need to get better research on is the concept of using land as a sponge to hold water back in order to reduce flood risk further down the catchments. There is a lot of support for that but there is not, as yet, much research evidence for what the possibility is. There are some groups going around saying that if we had simply got land management up the catchments better we would not have these floods. That is clearly not true. It may make a contribution and we need to assess what its contribution is, but it is not the panacea, particularly in the case of these flash floods where quite frankly what was happening in the catchment was immaterial to what was going on in Sheffield or Hull or wherever. There are a number of areas where the whole issue of land management needs to be properly evaluated but I do not think we should be using single farm payment as a kind of recompense system for flooding of farmland in general. I think the single farm payment needs to be targeted at where we really believe it is going to make a significant flood reduction impact and these payments that we make from our flood risk management budget to use farm land in a very specific way need to be absolutely because they are the best option for a particular flood risk problem.

Q60 David Taylor: A moment or two ago you said that the Agency needed hugely increased resources to be able to respond to flood risk management in a way which would satisfy more people. I think that is what you said.

Baroness Young of Old Scone: What I meant was that you would have to have an awful lot of money around in the flood risk management system to be able to do everything in the rural areas that people ideally want us to do. We think that the amount of funding that has come into flood risk management which has doubled since 1997 is going in the right direction and the £200 million that the prime minister announced in the middle of the floods is extremely beneficial.

Q61 David Taylor: Your budget for flood risk management in this year, 2007/08, is £600 million and the Secretary of State for Environment, Food and Rural Affairs today announced in a written answer that that would go up to £650 million next year, £700 million—both leaps of about eight per cent—in the year 2009/10 and in 2010/11 it will go up £100 million to £800 million. They seem very substantial increases with the backdrop that we heard announced yesterday by the Chancellor. They are hugely increased resources are they not? Does that mean that the future is set fair to be able to respond to some of the concerns my colleague James Gray referred to?

Baroness Young of Old Scone: We are very pleased with the way in which funding has increased over each of the Spending Reviews and we are very pleased about getting additional funding for the next three years and also to see what is going to come in year one and two as well as year three because we need to get planning to use that money. However, we do not think it is the end of the road by any means. This will allow us to tackle the backlog of flood defence schemes that have been waiting for communities that are inadequately defended, for example Leeds which is not defended particularly at the moment and is a huge economic asset for the nation if it went under. It will allow us to improve the amount of maintenance we do on our high risk and medium risk assets to make sure they are all up to the standard that they ought to be, but there are still pressures for the future both in terms of creating new assets and in maintaining the growing body of assets, in coping with the fact that climate change is going to mean that we need to increase the standard of protection in many of our flood defence systems. If we take the Thames barrier, for example, and the whole Thames Estuary system, we could be looking at several billion required to invest in bringing that up to scratch for climate change. Of course we have more properties being built as a result of the development boom, all of which are going to require some flood risk assessment if not flood defences. We think that the assessments that were made by the Foresight study which said that we should be aiming for a billion pounds a year investment by 2015 are in fact in the right ball park and we would want the following spending review (the one after this) to continue that upward trajectory of investment. I do not think it is Christmas and birthday yet; it is good but it is not the end of the road.

Q62 Mr Williams: Those of us who have contacted the Environment Agency from time to time about the maintenance of water courses have been told that the Environment Agency responsibility is only for
main water courses. Is that an arbitrary decision that has been taken by the Environment Agency or does that rest in legislation?

Mr Rooke: It is written in legislation and we have only got powers to do works on what are called main rivers. A main river is a river that is marked on a map that has been approved by the Secretary of State.

Q63 Mr Williams: Where do we see those maps?

Mr Rooke: They are available on the Defra website and they are also available in our offices.

Q64 Mr Williams: It does seem to me that a lot of responsibility for maintaining water courses does rest with private individuals and it is not very encouraging for those private individuals to be involved in very expensive work if they see that the water courses that they are responsible for which flow into the water courses that the Environment Agency are responsible for are not going to be maintained in a way that is thought to be acceptable. I am not promoting scouring out water courses but as Baroness Young said there is a middle way here and the Environment Agency have a responsibility to play their part in what is a private/public responsibility.

Baroness Young of Old Scone: I would agree and where we have internal drainage boards that represent particularly agricultural riparian owners of these smaller water courses, we do have quite an intense relationship about how the funding that they provide to us for carriage of water away from their area most effectively works. I am sure you have had a submission from the Association of Drainage Authorities on that one. Where it is more complicated is where there is no internal drainage board and where we are dealing with a very large number of riparian owners and that becomes extremely complicated. It may well be that there needs to be this debate about what the relative priorities between urban and rural are. As I said, I would not want us to get back to a point where we were simply carrying out maintenance for maintenance sake rather than truly reducing flood risk.

Q65 Lynne Jones: You were referring earlier to the need for mapping and modelling of urban drainage systems and you said this would be extremely expensive and you started talking about concentrating on hot spots. Could you perhaps elaborate further on what is exactly a workable risk based methodology for characterising urban flood risk that you envisage?

Mr Rooke: That is a piece of work that we would want to take forward once we have the green light from government in terms of giving us the overview on urban flooding. There is some work that Defra is undertaking with the Met Office that we are involved with on characterisation of extreme flood events, the types of rainfall, and there is various work being done by some of the universities and some local authorities. I think in Scotland Glasgow is a good example of where there was urban flooding some years ago and the local authority, with loads of other partners, have got together to come up with solutions. At the urban level a solution can be down to what height is a particular kerb on a road, what green spaces can be used to store water or to channel water if the sewers cannot take it, so it does get very local. In terms of our ambition we were to be given this England overview, working with the Met Office we would be able to forecast where these so called pluvial events—as opposed to fluvial being rivers—would take place and provide a warning for that, and to be able to provide a mapping of those areas so that you could go onto our website where you can at the moment see whether your house is on the floodplain or not, you would be able to go onto our website and see what risks there were from surface water flooding. Then the local authorities, water companies, the Highway Agency and ourselves involved in urban areas would again be working together under our leadership to provide solutions.

Q66 Lynne Jones: How feasible is such an approach in a very widespread manner? What input does the insurance industry have into this work because they have their own mapping system for flood risk?

Mr Rooke: We want to work with the insurance industry as we do at the moment. We provide information to the insurance industry that is also available to the public on our website. We provide that to the insurance industry. We envisage that we would do the same, but this will need powers from government; it will need funding from government to enable us to put in place all this new technology and there will be some groundbreaking stuff. It is done in some other parts of the world and we want to learn from that.

Q67 Lynne Jones: Which other parts of the world?

Mr Rooke: Certainly parts of Europe where they are taking forward urban flooding and experiencing urban floods. Also, interestingly (Barbara had an e-mail from a company the other day on this in terms of intense, heavy rainfall) in parts of the Middle East.

Q68 Lynne Jones: What about individual responsibility? A lot of people are concreting over their gardens, even their back gardens; should there be some control over this?

Mr Rooke: There is an interesting statistic; we can give you a note on it in terms of the number of gardens that have been paved over in London over the last five years and it will be having a significant impact in terms of water no longer being able to get into the ground and be stored in the ground and is running straight off into sewers. We are advocating what we call sustainable urban drainage systems such that where there are new developments taking place we would want them to drain through SUDS before they come into a sewer system or before they come into a river system such that you would try to replicate the run off but had it still been agricultural land.

Baroness Young of Old Scone: Could I just comment on the overview role because I think what David has described by way of mapping, forecasting and...
warning is ambitious. I do not know whether it is doable quite frankly. I think technically you could do it ultimately, but whether as a nation we are able to afford to do that is a moot point. The second issue for me is in terms of actually taking action to make sure that urban drainage and sewerage systems are actually as flood proof as possible and there it has to be the local authority in the lead co-ordinating the local partners, including us, using our information but very much taking the lead because they are the people who are the planning authority, they are sometimes the highways authority, they are certainly in touch with developers and re-developers. Just looking at the task, as it were, of re-draining our cities I do not think we are going to see a scale of investment that would allow that to happen wholesale. I suspect that what we need to press for is first of all to make sure that no new development goes ahead with inadequate drainage and sewerage and we have some powers under PPS25 in that, and secondly to make sure that re-development re-develops the sewerage and drainage systems as well as the actual properties themselves. Thirdly, focussing on the priorities—the hot spots—where traditionally we know there have been problems. If we can make fast progress in solving those three priorities the remainder of urban drainage systems can come along behind that.

Q69 Chairman: You have given us the Barbara Young “if we can make progress” shopping list, have you specifically made formal recommendation to Defra that those items be actioned?
Baroness Young of Old Scone: All the policy proposals and changes that we have outlined in our evidence have of course gone to Defra as well.

Q70 Chairman: Specifically to ask local authorities to start, for example, a scooping study on the capability of their own drainage systems to cope with the types of event that we have been discussing. Have you asked for that to be done?
Baroness Young of Old Scone: We know that some local authorities that were involved in the flooding this year are now beginning to look at that as an issue, but Defra’s position at the moment is, having consulted on the role that we should have in overview, they want to wait until they get the Michael Pitt recommendations before they work out, as it were, what the system will look like so that it is clear what our responsibility would be and what the local authority’s responsibility would be.

Q71 Chairman: Do local authorities have the resources and expertise to do that work?
Baroness Young of Old Scone: I do not think at the moment anybody really has the resources and expertise to do that work. The few places we have done it are beginning to develop that expertise and the 15 pilots sponsored by Defra on urban drainage and urban surface water issues are beginning to develop track record in that so it can be spread more widely.

Q72 Mr Gray: Why do we not just have one major agency for flooding? What is wrong with that?
Baroness Young of Old Scone: There have been two sorts of one-stop shop proposed really and I think there is a third emerging. One is a kind of emergency floods agency that does everything from predicting the weather down to restoring individual houses and sorting out benefits for people which I think is clearly not on because the numbers of different functions that need to be included in that need to be done by the specialist folk. What you need is good co-ordination and through the Cabinet Office and subsequently through BERR the co-ordination of that in terms of handling the emergency and then recovery post-emergency is already the responsibility for co-ordination of these two elements of an event are already fairly clear. Then there is the proposition that we have a sort of single floods agency that all our floods responsibilities are taken off into a separate agency. I think there are two concerns about that, one is in the urban setting, like it or not, the water companies, the local authorities, the Highways Agency and a number of individual owners and developers will have to be involved so it is never going to be a kind of single bullet. The other issue is, as this Committee well knows, the integration of management of water is extremely important and rivers are not just about floods, they are also about water resource, water supply, water quality; they are about the biodiversity of our rivers and the wetlands and indeed the Water Framework Directive brings together the management of land with the management of water bodies. Our view is that our integrated role which takes land, air and water together and particularly takes an integrated approach to the management of our rivers and river basins, is a very important one. We have had that role in the UK—not the Environment Agency but its predecessors—for several tens of years. Europe as a whole is only coming late to that as a proposition. Indeed, many countries in Europe are having to adopt a much more integrated approach than they have had previously. We believe it would be a backward step for the environment and for flood risk if the rivers were being managed for flood risk by one body but managed for all sorts of other purposes by another body. The third little bit of tit-for-tat that is coming out of the system at the moment is whether you need somehow to split off the regulatory role of the Environment Agency and the doing role of the Environment Agency. Our view is that we are not hugely a regulator in this although obviously if we had an overview role in an urban setting we might be conveniently put in the box of being a regulator, but we do not think that is the role that we want in the urban setting. The role that we want in the urban setting is to set a framework to provide advice, to provide tools, to provide expertise on a national basis that the local authorities can then take forward.

Q73 David Taylor: One of my most vivid memories of that day in Gloucestershire is when we were on the minibus leaving the badly hit town of Tewkesbury. We were splashing along and we saw the yellow
developers sign to the Riverview Development or something like that. You said a moment or two ago that you doubted whether or not the £800 million in 2010/11 would be sufficient to meet the pressures placed on you for flood defences. You explained that a little by saying in the light of developments that will take place between now and then. Do you think you have the powers to influence the building of properties on the floodplains? Are they adequate? Are you trying them out? Is your eye on the ball on this one? 

**Baroness Young of Old Scone:** Perhaps I could ask David to respond on the issue of development and control, but you are obviously right. The one that I dine out on is Swan Pool in Lincoln where there is a whacking great proposal to develop in the floodplain. There is a bit of a clue in the name, if it is called Swan Pool and if you are living in a house in the middle if you might not want it to be a swan pool. I think there are real issues about development on the floodplain that still exist but David will tell you more about that.

**Dr King:** I think I would say that we are not where we would like to be in terms of development control but having said that there has been a significant tightening and improvement of the legislation under PPS25. Our most recent analysis is for the period April 2006 to March 2007 which was under the old PPG 25. If you look at performance there we still had 13 major cases that went against the Agency’s advice. We had five appealed decisions which were determined contrary to our advice and something like 63 per cent of our objections were because there were inadequate flood risk assessments carried out. In December last year we had a change in the legislation which was to PPS25. That has improved things in a number of ways. Firstly the Agency is a statutory consultee. Secondly, if a local authority is now minded to go against our advice there is the power of direction for us to request call in first to the government office and then to the secretary of state. Thirdly, in terms of the actual guidance of steering development away from high risk areas, it is a lot clearer and a lot tighter than previously.

Q74 David Taylor: Collectively you feel you probably do not have the authority necessary to adequately control.

**Dr King:** I think the PPS25 is actually a good piece of legislation. What remains to be tested is how rigorously it is applied. We are still in the first year of that so it is difficult to say. I think PPS25 is a big step forward.

Q75 Mr Cox: Baroness Young, you said it yourself I think but what has been striking me as I have been listening to your evidence and those of your colleagues, is that it seems to me, summing up your evidence, one conclusion could be that you are an institution that has only partial responsibility for the overall problem, that it is too weak to influence government agencies and local authorities to take appropriate pre-emptive action. Almost on every occasion when a problem is confronted to you by a question you answer that you either do not have the power or the legislation is not in place or it is a very complex problem. What we need, do you not agree, is an agency that has the power to take a real lead in this and provide genuine leadership which I think was the perception that people had at the time of these floods, that there was an absence of some single directing body that could take a lead with the urgency required to address the problems. Surely what we need is either a flood defence agency with genuine powers to compel authorities, even possibly private individuals, to take the action that is required if we are going to be faced with a serious succession of these floods, or your own Agency needs to be given the powers to deal with these problems.

**Baroness Young of Old Scone:** First of all if I can take the issue of the many agencies involved. I think it is a complicated picture and it is distressingly complicated not only for those of us who have to operate within it but also for the public in understanding. I am not sure that you can magic that one away by a single agency because the reality is that it would have to operate by getting other agencies to do things and governments are notoriously anxious when faced with the prospect, for example, of laying costly duties on local authorities for example but at the dictate of a government agency. I think there will continue to need to be an agreement between parts of government about who does what and a tasking down governmental/departmental lines of individual bits of government machinery.

Q76 Mr Cox: You do not have the responsibility for so many aspects of the overall problem, do you?

**Baroness Young of Old Scone:** If this had been a winter flood I think you would have seen ample examples of leadership, if this had been a flood that resulted in rivers rising and flooding being primarily from the systems for which we are responsible, ie the rivers or on the coast. We have revolutionised our approach to flood risk management over the last ten years and indeed I think it is a sign of confidence in what we have been trying to do that the Government has given us substantial additional funding on every occasion when the spending review came round. There is a very, very confused set of responsibilities and accountabilities in the surface water urban area and that is becoming more pressing as a result of climate change so I do believe that one of the things that must come out of the various reviews following these sets of floods is a greater clarity about what government cites, about what the Environment Agency’s role is and about what the role of local authorities and providers of critical infrastructure are.

Q77 Mr Cox: Planning is an example. is it not? I hear what you say about the progress made in PPS25 but as you rightly point out there are still major developments going ahead in spite of your objections. Some developments are going ahead, certainly in my own patch in Devon, without significant Environment Agency involvement despite them being on floodplains (these may be
smaller developments). What can be done in your view to improve your ability to get local authorities to heed the need to take these issues seriously when it comes to planning approvals?

**Baroness Young of Old Scone:** I think there are a number of things we have already done. The annual reports we produce on local authority performance have had an impact. We are seeing an improvement in the performance of local authorities and PPS25 will help with that. I think the current floods will have woken up a few local authorities to the fact that building on the floodplain against our advice is not good news. The insurance industry we would like to flex more muscle but it is quite nervous of that. The insurance industry does point out that development on a floodplain against our advice will mean that insurance will only be achievable at very high premium but that is not to say they are not prepared to insure which would be the most successful way of persuading local authorities.

**Dr King:** PPS25 is less than one year old so I think we need to have the opportunity to test it. I would just reiterate that it is significantly stronger than PPG25 in that we are now a statutory consultee, local authorities have to consult us and we do have the power to request flooding direction. I think it is significantly stronger and we will see at the end of this year how things have panned out.

**Q78 Lynne Jones:** I would like to come back in here about planning guidance. There was recently a consultation on permitted development. I want to go back to the point I was raising earlier about the propensity for people to concrete over gardens which I think is having a significant effect. Apparently the consultants recommended that there should be a requirement for planning permission if more than 50 per cent of the garden was being concreted or tarmacked or covered over and yet the Government did not include that in the consultation paper. Is this something you think ought to be looked at because it is happening all over the place? **Baroness Young of Old Scone:** Certainly we believe there needs to be an assessment of the permitted development rights of concrete. The figure that David referred to was 22 parks’ worth of concreting of front gardens alone in London as assessed by the mayor.

**Q79 Lynne Jones:** This is not going to be covered by the planning guidance for new developments and it would be a very simple thing for the Government to do which might help some of the problems that we have been talking about.

**Dr King:** The other point worth making is that if people are concreting over for parking or whatever there are other ways of doing this using gravel or membranes or porous pavements that is as effective but at the same time allows the water to go through.

**Q80 Mr Cox:** As my colleague says, it is not just concreting over gardens, it is of course building in gardens which is happening on a massive scale now. That is what I meant, in fact, where in my own patch we are seeing a lot of small developments going ahead often in green spaces within urban areas—market towns, coastal towns and so on—without interaction or involvement of the Environment Agency but which manifestly cumulatively are going to have an effect on the ability of the land to soak up the water and could cause a real problem. What are we to do about that unseen and hidden problem? You are dealing. I know, with several thousand a year and are objecting to them (4000 I think in 2005/06) but of course that is a fraction of the applications that are going forward to use up green spaces and gardens and other pieces of land inside urban areas. Cumulatively this is going to become a massive problem; in my own patch it is a serious problem. What can we do about that? PPS25 is not really dealing with that, is it?

**Baroness Young of Old Scone:** I think this is one of the areas where the whole question of risk assessment in the urban setting is going to be crucial. David may want to talk about the hierarchy of plans and strategies that we envisage under a system that would mean that eventually carrying out the flood risk assessment for a local authority for its own areas would mean that they could pinpoint where some of these issues were actually creating flood risk and then develop the strategies to include that within their flood risk assessment and where there were flood risks there should be a requirement on developers to undertake the risk assessments and submit those with their planning applications.

**Q81 Mr Cox:** You agree with me that the building on gardens which we are seeing on an increasing scale is a potential problem. You are nodding: is that right, Baroness Young?

**Baroness Young of Old Scone:** I think there are number of problems associated with it. One is that if it is in a flood plain and it is diminishing the amount of flood storage, that is an issue. The second is that if it is increasing the amount of concrete and therefore the run-off issues. There are a number of things we would be concerned about. David may want to say more about the way in which we would plan for that in the future.

**Dr King:** I think there are a number of things that could be done. We would like to see the mandating of sustainable urban drainage in new development and also there is currently a right to connect to a public sewer and we think that again should be modified and that sustainable urban drainage should be considered part of that, so there are things that you can strengthen and encourage in planning law. PPS25 does indicate that SUDS should be considered but that needs to be strengthened.

**Baroness Young of Old Scone:** Could I just comment briefly on other things to do with development? We would be particularly keen to see a change to the building regulations to improve the flood resilience of properties and also to encourage the insurers to reinstate properties post-floods to a level of resilience rather than the level that they were before the flood occurred.
Q82 Mr Cox: Can you provide some examples of the kinds of resistance and resilience requirements you would like to see in the building regulations?

Baroness Young of Old Scone: The sorts of things that we would be envisaging are water resistant plaster, solid floorings rather than sprung flooring, electricity supply being brought in at a higher level rather than at ground floor level and also simply appliable gadgets to block airbricks and block doors and entry points. The estimate is that the average cost to a property after flooding is about £26,000 and that could be brought down to single figures with the right sorts of resilience measures providing the flood is not so huge that you are up to the top of the first floor which is clearly a different kettle of fish. Where the ingress of water would be comparatively low these simple resilience techniques could make a huge difference to the bill being faced by householders and indeed by the insurance industry in the country as a whole.

Q83 Mr Cox: How would you enact them?

Baroness Young of Old Scone: Building regs.

Q84 Mr Cox: Applicable to high risk areas? Applicable to all new buildings? How would you do it?

Baroness Young of Old Scone: To be frank I think these days with the surface water drainage issue and the flash flood issue, it may well be that we simply have to recognise that you can flood on top of a hill these days which is not the traditional approach we have had which is very much to focus on the floodplains. I do think there are issues of simple, more resilience that we could look at that might be cost effective generally. Certainly some of the more heroic stuff would only be appropriate in areas of high risk. Personally I would like to see the kitchen manufacturers making a non-exploding kitchen. At the moment most of the kitchens that are made from chipboard if you add water they simply turn into grey goo quite quickly.

Q85 Chairman: We have had an indication now of the way in which money will flow to the flood defence budget up to 2010 in the form of a parliamentary answer but the Association of British Insurers (ABI) came out today indicating that their £1 billion figure is something which they think ought to be here now rather than later. It was a position they adopted in 2004 when this Committee did the Foresight Report. Can I ask you to respond to some evidence which came to the Committee from the Norwich Union, part of the ABI, who said the following: “At present Defra’s budget for flood management is not accompanied by any clear rationale to justify allocation of flood defence resources in one area as opposed to another. The UK’s flood defence budget must be spent appropriately and directly related to flood risk posed. A clear assessment of flood defence is a key element in underwriting flood risk for insurers.” So place versus place, no rationale. In the same evidence they go on to be critical of your points system in determining where investment is made and they cite the following: “Under the terms of the points system that currently exists some communities such as Upton-upon-Severn and Lewes which are regularly flooded do not have flood defences in place and it is unlikely they will receive them in the future.” That is a direct challenge to the fact that your points system does not deliver the flood defences when the insurance industry thinks they ought to be and in terms of giving comfort for them to maintain their cover clearly they are looking for burden sharing between government and the industry in terms of investment. Norwich Union do not think much of the current investment criteria. Can you comment on how you think this money that you now know is going to come and the phasing of it is going to be spent, and how the way you will decide that money’s use stucks up against the industry’s criticism?

Baroness Young of Old Scone: I am rather mystified at the Norwich Union criticism because we do have a system for allocating funding that takes account of risk and increasingly prioritises our maintenance towards high and medium risk systems and provides a nationally consistent process for deciding which new flood defences and improved flood defences should go ahead. They may take issue with the points system but it is the fairest way we have at the moment. We are looking at the moment to see whether we can develop a revised prioritisation process building on the experience we have had with the points system. However, the points system does not just take how often people flood. Let me take the one I know best which is Pickering. Pickering floods regularly but we are unable to put together a flood risk management scheme that provides the right return on investment that would give it sufficient priority to go ahead. The new funding will help with that in that some of the schemes that previously were given too low priority on the points system will now be able to go ahead because we have additional funding. Gradually, with that increased level of funding, we ought to be able to catch up with some of those communities where a flood risk management system is viable but is not at the moment able to get a sufficiently high priority. I am rather bemused by the Norwich Union’s approach to that. Certainly there are two things underway that will also help. Our catchment flood risk management plans are a catchment based approach to look at what the risk and priorities ought to be within each catchment and we are working on a long term investment strategy looking forward 20 years over what needs to happen both by way of maintenance of the existing assets and creation of new assets to look at what the scale of that should be and therefore how we can anticipate over a longer timescale how much we are going to be able to get done with the level of investment that we currently have or a future level of investment.

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7 Ev 125, para 15

8 Ev 126, para 19
Q86 Chairman: You said at the beginning of your evidence that we should be moving faster in a number of areas in responding to flooding. Does that mean that whilst you welcome the money it is still going too slowly?

**Baroness Young of Old Scone:** We welcome the money and we will put in place measures to take rational risk based decisions about spending it. If we had more we could probably do more. If we had a million tomorrow we would have some difficulty because it does take some months or even in the case of some complicated schemes several years to put them together, to consult on them and to get planning permission. However, I do believe there needs to be an uplift for the future.

Q87 Chairman: I did a little calculation. I applied a 2.5 per cent inflation rate to the current £600 million budget and by the time I got to 2010 the actual net extra that this money worked out was £115 million above what you need to inflation proof current spending proposals. It does not sound like a lot of money to me.

**Baroness Young of Old Scone:** In fact the 2.5 per cent inflation rate is probably inadequate because construction costs are going up much more dramatically.

Q88 Chairman: So the actual net extra by the time we get to 2010 is actually quite small really.

**Baroness Young of Old Scone:** Yes, but that has been offset by the fact that as we get bigger programmes and as we get better at the risk based approach and at the work we do with our contractor partners, we are able to get better efficiency from the money we have so we are improving our efficiency by about £15 million annually on the current budget so some of that inflation is offset by our improved efficiency.

Q89 Dan Rogerson: I am trying to get to grips with the size of the task that is there. Obviously as you said there are schemes which would be nice to do if you had the resources to do it, but in terms of those that are there and ready to go subject to funding what would be the total cost in today’s prices of those sorts of schemes, not those that hypothetically we might do but those which are drawn up and ready to go?

**Baroness Young of Old Scone:** We try not to do that because we know from bitter experience if we put a scheme in place and consult on it widely and have it ready to go and then the money is not available, (a) the scheme ages quite rapidly, and (b) it raises expectations within local communities which are then dashed and it is very hard for them. What we are trying to do now is in fact to anticipate over a longer period what we believe the basic funding will be so that we can get moving on schemes that we know will go ahead and then use any additional funding to accelerate that pace, but we do not want to have a huge backlog of schemes stacked up ready to go because it is really hard on people to say that we know we can do this for you but we are not going to be able to do it and we do not know when we are going to be able to do it. We want to have those schemes in place so that we can say to people that we have this scheme, we know we can do it for you and we will do it in 2012 or 2009 or 20-whatever.

Q90 Dan Rogerson: In my constituency there was a scheme that was in that particular bracket, it was doable but because of the points system other schemes were higher up the priority order. There must be a point at which a scheme moves from being a “Yes, we could to something in this area” to “Yes, we could do something, we know what it is and this is how much it would cost”. You have to feed it into your points system and go through that process so you may not be consulting on it publicly but there must be a batch of schemes that are at the moment beyond funding. I would like to get a picture of how big that is.

**Baroness Young of Old Scone:** We did a piece of work to look at how long with the level of funding we were anticipating it would take us to work through the schemes that we have got to a point where we know we can do them but I cannot remember what the timescale was but it was comparatively short. We have not backed up a huge backlog to the point where they are all ready to go and buildable. Something like four years I think.

Q91 Dan Rogerson: You said that the existing schemes by and large worked quite well. Of that money, extra money being made available, how much of that would need to go to deal with those schemes where they did not quite work as they should have done?

**Baroness Young of Old Scone:** Sorry, I do not quite understand the question.

Q92 Dan Rogerson: Where schemes have failed in some ways or not failed but you have looked at the extremity of the event and because of climate change you think those defences might need to be re-visited, how much of that budget would need to go to make those schemes future-proof rather than looking at new schemes?

**Baroness Young of Old Scone:** That is where our long term investment strategy is going to be really important. What we are looking at there is what is going to happen in the next 20 years, including the impact of climate change and including what we need to do by way of maintenance and improvement of schemes. Also we have been modelling what would happen in terms of investment if the decision was made as a nation that we wanted to go to a higher or lower standard of protection. However, we are long way from having completed that work.

Q93 Lynne Jones: Does your points system, which is driven by economic impact, favour affluent areas as suggested by the Institute of Civil Engineers?

**Baroness Young of Old Scone:** We do not think it does. It has social and environmental points in it as well as economic, but the economic ones tend to be quite strong. One of the things we are doing as a result of the work we are doing on looking at alternative ways of prioritising is to see whether in
fact there needs to be an adjustment of the relationship between the environmental, the social and the economic.

Q94 Lynne Jones: So there could be something in it then?
Baroness Young of Old Scone: It favours property but it also has social issues attached to it. One of the things we are very anxious about is not to penalise people at high risk of flood for whom it is more devastating than if you are rich. If you are rich and you lose stuff and you are insured you buy some more, you get the insurance company in. If you are poor like we saw in Hull and places like that and you have no insurance and you lose everything, it is devastating.

Q95 Mr Drew: Going back to critical infrastructure, in your evidence to us you identified that 57 per cent of water and sewage and treatment works are in flood risk areas. I was not totally clear earlier whether you would be asking for additional powers or indeed you would take on more duties to really say that somebody has to do something about this. I know David King did say, “Look, sorry, that is up to the individual companies and so on” but after what we have learned from Gloucestershire or what is likely to come out in the report, somebody has to do much more in this area. A final area really is, if you were asked to take it on what would you want bottom line in terms of the support and the authority to be able to deal with this?
Dr King: There is a way forward and there is the opportunity with the draft Climate Change Bill and what we would advocate is that there should be a duty on those operators to consider adaptation.

Q96 Mr Drew: Do you not want a power yourself?
Dr King: No.

Q97 Mr Drew: Why not?
Dr King: At the end of the day it will be the operators of those critical infrastructures that will have to undertake the work.

Q98 Mr Drew: That is very risky. We were talking about evacuating 550,000 from the county of Gloucestershire, that is pretty high-risk, tightrope walking work that somebody has to evaluate. Surely there must be a power that you would welcome to insist on some of these important infrastructure places being properly maintained and protected.

Dr King: The Agency would have a role in terms of provision of advice including mapping and risk characterisation. If you put a duty on an operator, make regulations, you can define standards and then there is a clear responsibility on that operator to put in defences to whatever standard is decided is acceptable. We can advise but it is very much the operator of the infrastructure’s responsibility to provide flood protection.

Baroness Young of Old Scone: We do also recognise that flood risk is a contingency that the Civil Contingencies Act is aimed at helping co-ordinate much as any other civil contingency. If we were going to cut across that for flood risk then fine, but I think we would need to make sure that we are not in a position where umpteen different people are involved. At the moment the mechanism that government has chosen is to give people a responsibility for collaborating with local contingency fora and I believe that is the best way forward for flood risk as well as for other risks that communities are facing. We could be given a role with some installations to check their plans, but again it would require considerable resource.

Q99 David Taylor: When you say in your evidence that some of these strategic control centres and some of the regional fire control centres were said to be in floodplains and were at risk of flooding, what level did you set that risk at? Are you talking about one in one thousand, one in a hundred years or what?
Baroness Young of Old Scone: Many of the figures we have been quoting are one in 75 years. We categorise by one in 75, one in 100 and one in 200.

Q100 David Taylor: So when you said “at risk of flooding” you mean a greater risk of flooding than one in 75 years.
Baroness Young of Old Scone: Yes.
Chairman: Thank you very much indeed. It has been a long but useful session and you have given us a very good start to our inquiry. Can I thank you again for your written contribution and for your offer to provide further technical briefing to the Committee should it be necessary as we proceed with our inquiry. I think it is an offer that certainly some of us will want to take up. Thank you very much indeed for coming.

Supplementary memorandum submitted by the Environment Agency (FL 121a)

Flooding in Worcester

Background

1.1 Worcester has a long history of widespread flooding. One of the first areas flooded each time (and therefore most frequently) is at Hylton Road. The area was therefore selected as part of trials of the use of temporary barriers. The site was also useful to test how the equipment performed in particular circumstances, i.e. a long stretch of construction. This pilot was the first of its type in the Midlands for trialling
this form of flood alleviation. The barriers were always to be deployed on a “best endeavours” basis, and were to be seen as a possible replacement for sandbags. The barriers also enabled us to identify issues such as groundwater seepage or sewer flooding.

1.2 When deploying the equipment it is necessary to close the road. We have occasionally been criticised in the past for deploying when the levels don’t subsequently justify it because of the unnecessary disruption to the traffic. This has been an ongoing issue of debate with both Worcester City and County Councils.

1.3 The temporary defence protects a combination of light industrial units, commercial units, and residential property and affords a benefit to maintaining highway access into the city. There are approximately 20 properties protected.

Summer Floods

June 2007

1.4 A decision was taken not to deploy the temporary defences in the June event because the river was predicted to peak at a lower level than that required to trigger deployment of the barriers. It was marginal, however, and we sent a team to Worcester to sandbag any low points in the bank and to monitor the situation as a contingency.

1.5 There was then an increase in the rate of rise of river levels at Worcester, caused by an influx of water from the River Teme. The rate of rise on the River Teme in this area was unprecedented, with levels being higher than they had been for 47 years. This caused water in the River Severn, at its confluence with the Teme just downstream of Worcester, to back up very quickly.

1.6 As a consequence of not deploying the barriers, the highway was flooded and became impassable. No property was flooded on this occasion.

1.7 We would not normally deploy the barriers just in order to maintain highway access, as to do so would require the road to be closed in any event, so it would not have any benefit.

July 2007

1.8 A decision to deploy the barriers to Hylton Road in July was taken in good time and the necessary workforce, plant and materials were deployed based on what is normally an easy journey on good roads. However, widespread disruption caused by the severe weather led to the closure of the M5 and grid locking of other routes. We got the barriers through but, despite having a police escort, we couldn’t get the workforce there in time to erect them in a safe manner as, by then, they would have had to be working in water.

1.9 In Worcester, 120 properties flooded from main river and 85 properties flooded from surface water sources. Approximately 20 of those properties were in Hylton Road and would have been protected had the barriers been installed.

The Way Forward

1.10 Regional Flood Defence Committees are developing a scheme using Local Levy funding (subject to RFDC approval) which will provide the same level of protection at Hylton Road as is provided by the barriers. This would cost £650k. We are also exploring the possibility of a contribution from the City Council which could mean a scheme that gives a higher protection may be possible. A scheme could be in place within the next 12–18 months.

2. The number of gardens paved over in London over the last five years

2.1 In September 2005, the Greater London Assembly’s Environment Committee published a report entitled “Crazy Paving—The environmental importance of London’s Front Gardens”. The report draws attention to the detrimental effects on wildlife and visual amenity, and the potential increase in flood risk caused by the “urban creep” caused by concreting over London’s front gardens.

2.2 The report puts forward a number of facts:

- Front gardens cover between 3% and 5% of London’s land area and for the purposes of the report, a conservative estimate of 3% is adopted. This equates to 47.8 km² (18.5 square miles).
- Research commissioned by the Committee and carried out on its behalf by the Greater London Authority’s Data Management and Analysis Group suggests that at least two thirds of London’s front gardens are already at least partially covered by surfacing other than vegetation—paving, bricks, concrete and gravel being the most likely.
— London’s front gardens have given way on a huge scale to parking bays, covering an area of 32 km2 (12 square miles). This area is compared with the size of the boroughs of Islington, Hammersmith and Fulham combined; 22 times the size of Hyde Park; 16 times the size of the new Olympic Park in east London; and 5,200 football pitches.

2.3 Further, the Committee makes the following recommendations:

— The Mayor, in partnership with relevant stakeholders, should initiate an awareness-raising campaign to inform Londoners about the detrimental environmental impact of paving over front gardens, and to raise the profile of environmental sustainable alternatives to concrete and paving slabs. We invite the Mayor to tell us in his response to this report what action he plans to take towards this end.

— The Greater London Authority should make available its data for use by the London Wildlife Trust or other suitable organisation to conduct a more detailed analysis of the extent and patterns of hard surfacing in front gardens, in order to inform future policy and initiatives.

— The Mayor’s revised London Plan should include consideration of the strategic importance of London’s gardens as a crucial environmental resources, wildlife habitat, amenity resource and flood protection system. It should set objectives for the promotion and protection of the large area of green space that is made up by front gardens, and should encourage and enable London boroughs to do the same in their own development plans.

— The Association of London Government host a seminar at its next Liveable London conference to share knowledge and experience of using planning, transport and other policies to manage the numbers of new pavement crossovers, enforce the law relating to illegal crossovers, take account of the likely impact on front gardens when introducing parking restrictions, and more generally promote the environmental significance of front gardens.

— The Government amend the Town and Country Planning (General Permitted Development) Order 1995, to enable local authorities to require planning applications to be submitted for all proposals to install pavement crossovers.

2.4 The Environment Agency shares the Greater London Authority’s concerns on this issue.

3. Understanding how the Environment Agency can forecast flooding from rivers and the sea

What do the Environment Agency and Met Office do to forecast river and sea flooding?

3.1 The Environment Agency and Met Office work closely together to forecast flooding from the rivers and the sea. Both have unique capabilities and skills which come into play at different stages during a developing flood incident.

3.2 The Met Office forecast changes in the weather and the Environment Agency forecasts changes in river flows and levels and local tide levels. The Met Office employs meteorologists and the Environment Agency hydrologists.

3.3 The Met Office are constantly monitoring the weather conditions, updating their forecasts and sharing their information with organisations including the Environment Agency.

3.4 The Environment Agency monitors rainfall amounts and the locations where it falls, monitors river and tide levels and uses this information to forecast flooding. We do this 24 hours a day, 365 days of the year.

Why don’t we just issue flood warnings when we know of heavy rain?

3.5 In a typical year we are likely to receive over 500 Severe Weather Warnings from the Met Office. We need to understand the impact of a weather warning before we issue flood warnings or mobilise our workforce to operate flood defences.

3.6 Not all heavy rainfall results in flooding and, although heavy rainfall can cause serious flooding from rivers, there are many factors that need to be considered before the true extent of flooding can be predicted if indeed flooding is predicted at all.

3.7 It is consideration of these factors that allows the Environment Agency to translate general warnings of heavy rain from the Met Office into targeted warnings to individual homes and businesses.

3.8 By reacting prematurely we can waste a lot of time and effort which in turn could affect our ability to respond when there is a real need. The public can easily become immune to receiving many warnings when nothing happens—so called false warnings, and as a consequence do not take action.
What do we need to know to forecast flooding?

3.9 Before we can forecast flooding it is necessary to answer as far as possible the following questions:

- What is the current state of the river and catchment?
- How much will rain will fall and with what intensity? and
- Where will the rain land?

3.10 Although these questions might appear simple, answering them is a complex and expensive business. In conjunction with the Met Office we have developed many tools that we use to try answer these questions. The information and tools we use are:

- Weather forecasts (from the Met Office)—providing information on amounts of expected rainfall on a regional basis
- Weather radar information (shared EA and MO)—provides information on the rate of rainfall and where it is falling
- Outputs from the Storm Tide Forecasting system (from the Met Office)

3.11 We have also developed our own tools to predict the impact of rainfall on river levels and high tides on the coast which include:

- Rain gauge information—we have an estimated 1200 number of gauges in England and Wales recording rainfall amounts.
- A network of river level and flow recorders—these are devices that measure the level and in some cases the flow of water in a river at a given location. All principal rivers in England and Wales have a number of these recorders which total in number 2800.
- River models for forecasting—most principal rivers are modelled in some form or other and we can use the models to predict whether or not flooding will occur using rainfall and river level information.
- Local tide models—these predict tide levels in estuaries and specific coastal lengths.

What is the process for forecasting flooding from rivers?

3.12 In order to understand the process of forecasting floods it is necessary to appreciate what information is available as we lead into a flood incident which is represented in the following sections:

A few days before flooding

3.13 We need to know the state of the catchment conditions. This is the state of the land and the soil before it rains. If rainfall is preceded by a dry period, the land will be dry normally allowing more absorption which reduces the amount that runs into the river. This is not the case after a prolonged period of drought when heavy rain on parched soils can run straight off into rivers. A similar phenomenon occurs in winter with frozen soils. Floodplains, large areas of low lying land next to rivers, are empty after dry spells which means they all available to store their maximum capacity and likewise most reservoirs will be low which means they can also store some of the flow. The Environment Agency monitors these conditions and takes them into account when making flood predictions. If it rains for a few days then flows on rivers can increase significantly once floodplains are full of water and there is no storage left.

3.14 Another complicating factor is one of lying snow. Any snow within a catchment is additional stored water that may run off with any predicted rainfall if the temperature conditions are right. This can significantly increase the flood risk in the catchment. 300mm depth of lying snow is equivalent to about 25mm of rain.

3.15 The amount of rainfall, peak intensities and where it lands are never the same from one flood to the next making it more difficult to predict the impact of the rainfall directly. Even small differences in the predicted pattern of rainfall in a catchment can radically change where the rainfall is channelled and the subsequent timings and size of flood peaks.

3.16 In order for us to predict flooding we need information on rainfall amounts, intensity and where it will land. The short term weather forecasts, up to 48 hrs ahead, give rainfall amounts in more specific locations. We can now begin to use this information in our river models to predict flooding. However we are using a forecast to predict a forecast and the accuracy and our confidence in flooding at this stage is still uncertain.

3.17 If the Met Office predict very heavy rainfall they send us a Severe Weather Warning. This tells us where the heavy rainfall is predicted at a regional level. This is useful for us to know as we can expect heavy rainfall but not all heavy rainfall results in flooding so we still need to get more accurate information before we can predict flooding with reasonable certainty. As mentioned earlier in a typical year we are likely to receive over 500 Severe Weather Warnings from the Met Office generally resulting in less than 10 significant flooding incidents.
12 to 24 hours before flooding

3.18 We can supplement the rainfall information with information from our network of radars. These radar images can give us information on how much rainfall is actually falling, its intensity and just as important where it is falling. It can also be used to as a tool to forecast, about 6 hours ahead, and where the rain is heading. Information from radar and other Met Office information are combined in our models to help improve the accuracy. Even at this stage we may still not be in a position to predict flooding for certain although we may have issued flood watches and began to mobilise our workforce.

3.19 There is a network of rain gauges across the British Isles that are used to measure rainfall amounts in a specific location. They send rainfall amounts to our models as frequently as every 15 minutes. These measured amounts, together with the radar information, begin to give us certainty in the forecasts of our models. We are now beginning to give, with reasonable confidence, flood warnings to the public at specific locations and deploying our workforce to operate our defences. We will alert local authorities and other partners such as the emergency services that flooding is likely and that they need to start implementing their response plans.

3.20 From 24 hours in, the forecast from the Met Office was accurate, but this is not always the case and much further work will be required if greater accuracy is to be achieved. However, the ability to forecast accurately heavy rainfall sufficiently far in advance and at an appropriately local scale will almost certainly always be difficult to achieve.

6 to 12 hours before flooding—River Levels

3.21 In dry spells river levels will be low to start with and so can accommodate more rainfall and flow before flooding occurs. If there has been a wet spell before the heavy rainfall then rivers may be running higher than normal and react more quickly to smaller amounts of rain.

3.22 These conditions also vary depending on the time of year. For example it is normal in the summer for larger rivers to be running at lower levels than in the winter and that the ground will be drier. Also in the summer there is more plant growth and tree cover which affects how fast rainfall runs off the land into rivers and the rate at which water is soaked into the land.

3.23 Once the rain has landed and run into the river we can detect river level rises using our network of river level recorders. This gives us the best information possible to help forecast whether flooding will occur. We will normally track a flood wave(s) down the river. Once we know what the peak is upstream we can more accurately predict the peak downstream. At this stage we can also predict if there is likely to be overtopping of defences or extreme flooding. If this is the case severe flood warnings will be issued to the public and command centres will be operating. The timing of flood waves is very significant where major tributaries join rivers. If flood waves meet at river confluences then levels can be much higher and this is difficult to predict.

During the flood

3.24 During flooding we would continue to monitor the rivers and would be looking ahead up to 48 hours to try and predict if any further rainfall is likely to occur. Further rainfall will prolong flooding and could generate an extreme flood such as those in 1998, 2000 and 2007.

3.25 If no further rainfall is predicted then we would be forecasting when river levels are likely to begin to fall and the process of clean up and recovery can begin.

3.26 Summary

— We work closely with the Met Office to get the best available information to help us predict flooding but we cannot always get sufficiently precise location information sufficiently early.
— The forecast of heavy rainfall does not necessarily imply that there will be flooding from rivers.
— We do not know for certain how much rain is coming into the rivers until it has landed on the ground and we have measured it.
— We are using all available tools and technology to help predict flooding but even this has its limits.
— We continue to develop our network of river level gauges and rainfall gauges.
— We are still developing our capability to confidently predict river flooding to provide accurate flood warnings and operate our defences in a timely and efficient manner.
— We currently use the output from models for local forecasters to add their experience and professional judgement to produce forecasts that decisions can be taken on to issue warnings and close flood gates, etc.

Environment Agency

November 2007
Wednesday 7 November 2007

Members present

Mr Michael Jack, in the Chair

Mr David Drew
Mr James Gray
Lynne Jones

David Taylor
Mr Roger Williams

Memorandum submitted by the Flood Hazard Research Centre, Middlesex University (FL 113)

GENERAL

1. Overall, flood risk management in England is advanced compared to other countries. Particular strengths are the community of researchers and practitioners that Defra has built up through its annual conference and the tradition of local involvement in decision making.

2. It is important that flood risk management is not treated in isolation but only in the wider context of sustainable development and integrated water and land management.

INTEGRATED WATER AND LAND MANAGEMENT

3. The big challenge and necessity, shown up by the 2007 floods, is integrated land and water planning, and integrated water management, including integrated urban drainage plans. The imperative is to deliver integration through what is necessarily a mosaic of organisations, and thus we have to become good at partnership models. The success of an organisation is increasingly determined by its ability to influence the actions of others (e.g. the Environment Agency’s ability to influence the spatial planning strategies of local authorities and also the public through flood warnings).

4. We have always had to manage water in order to make the best use of land: land is scarce, absolutely scarce in the case of the South-East of England. Since local authorities are also generally the Highway Authorities, the logic is to make the development of sustainable drainage plans the responsibility of the planning authorities. Indeed, the case can be made that the River Basin Management Plans required under the WFD ought to be the responsibility of the local authorities rather than the Environment Agency. It might be useful to look at France and the Netherlands to see how they are trying to integrate land and water management.

5. We also have to shift away from treating flood risk management in isolation from Integrated Water Management; for example, how we manage flood risk management can impact upon the risk of droughts. For example, Ian Calder has shown that afforestation, whilst it may reduce the risk of floods, can simultaneously increase the risk of low flows in summer. Climate change will make water management more difficult, particularly through increasing rainfall intensities. Storage will become an increasingly prevalent flood risk management option and likely to be combined into drought management.

FLOOD RISK AND DEVELOPMENT

6. New development is potentially a great opportunity which must be grasped; currently we are only replacing our existing housing stock at the rate of 0.1% per annum which means that we have to deliver sustainable development very largely through our existing stock of buildings. Thamesmead was an early attempt at development on a major flood plain in which the development was adapted to the flood risk. Therefore we must avoid unnecessarily “sterilising” flood plains by prohibiting development there, but we must plan development and flood defence / flood risk management in tandem.

7. Equally, it is our existing stock of buildings that constitutes the major part of the problem. With climate change, it is likely that we will have to abandon parts of some existing urban areas in order to make space for water. We have to do this without creating planning blight but we lack the instruments, for example, to buy up land. One possibility would be a “Water Conservation Charge”, similar to that used in China, which could be used to improve the sustainable development of rivers and coasts.

8. Because we need to move towards Integrated Water Management, rather than PPS 25 we need guidance on integrating water into spatial strategies. At the same time, spatial planning must continue to be multi-objective and to recognise multiple constraints: a land use planning system based only upon water management issues would be a disaster.
PUBLIC SAFETY

9. The Environment Agency proposed, after the Boscastle flood, to identify the areas of highest risk to life from flooding; this study is urgently needed.

FUNDING FOR FLOOD RISK MANAGEMENT

10. Under the existing financing system, both water and wastewater companies lack incentives to promote sustainable water management. The anticipated shift towards demand management, source control, rainwater harvesting and similar techniques will potentially reduce the revenue to the companies without necessarily reducing their costs. Moreover, the revenue of the wastewater companies is tied to that of the water companies but their interests do not necessarily coincide, particularly when the emerging target for demand management is a reduction of 50% in consumption. In consequence, it is not surprising that the companies are not promoting the adoption of sustainable water management techniques.

11. The increasing investment in flood and coastal defence potentially creates a dangerous imbalance for the Environment Agency which always had four roles:

— integrated water management,
— integrated pollution control,
— promoting sustainable development,
— and a major construction and operational role in flood and coastal defence.

Since its inception, the bulk of the Agency’s funding has been for flood and coastal defence. With the increasing expenditure on flood and coastal defence, there is a risk that the other strategic roles of the Agency will be overwhelmed by the high visibility activities of flood and coastal defence. At some point, it may become necessary to separate the constructional and operational aspects of flood and coastal defence into a separate agency.

12. Across the world, flood and coastal defences are generally primarily funded collectively rather than exclusively by those at risk. At present, river and coastal flood and coastal defence schemes, on average, cost about £15,000 per property protected. Dealing with sewer flooding can cost £250,000 per property, OFWAT agreeing that a significant proportion of schemes with such a cost being included in the last price and quality round. The £15,000 average cost is equivalent to about three hip replacements, and over their lifetime the average household will “give” (through general taxation) some £1500 to those at risk of river and sea flooding in the way of funding flood defences. So critical questions are:

— How much are members of the public prepared to contribute towards protecting other people from flooding?
— Under what conditions?
— For what?

INSURANCE

13. Insurance is a luxury good: uptake of all forms of insurance increases with income and lack of access to insurance is recognised as a form of social exclusion. At the same time, the UK is essentially unique in providing flood insurance without governmental support either in the form of subsidies or as the reinsurer of last resort. The UK is also almost unique in that governments have never provided compensation to those affected by natural disasters, and historically the Treasury has rejected compensating disaster victims. It is not clear that this model is viable over the longer term.

RESEARCH

14. The 2007 floods revealed some major knowledge gaps that need to be filled with new research:

— How much are members of the public prepared to contribute towards protecting other people from flooding?
— The major effect of the floods on infrastructure and hence on disruption (M5; water; power).
— Evacuation triggered by power and water outages, as well as from flooding itself.
— The extent to which floods occur well beyond the floodplain when in essence they are pluvial driven events. This is a serious issue for spatial planning, insurance, etc.
— The apparently increased connections between urban drainage and river flooding.
— We have had serious floods in 1998, 2000, 2003 and now 2007. Yet we do not know if this is a new trend. It is not yet clear whether this is because we do not know, or because it is still not outside the confidence limits of the normal events.

_Flood Hazard Research Centre_  
Middlesex University  
_Sepember 2007_

**Memorandum submitted by Professor Howard Wheater (FL 119)**

SOME OBSERVATIONS ON UK FLOODING

**EXECUTIVE SUMMARY**

**Is UK flood hazard increasing?**
- urbanisation increases flood risk, but the problem is well known and mitigation measures are normally put in place
- agricultural intensification increases flood risk at local scale—effects at larger catchment scales are not yet known
- land use effects have greatest impact for frequent floods
- there is potential to mitigate flood risk by changing land management and the return of floodplains to washland; the magnitude of effects is uncertain, but research to quantify effects is ongoing
- climate change is expected to increase the intensity of storms and to increase flood risk, but quantitative estimates are highly uncertain
- there is currently no guidance concerning climate change impacts on extreme events such as the Boscastle storm.

**Does the UK have the policy, resources and technical tools in place to manage flood risk effectively?**
- DEFRA’s “Making Space for Water” provides a far-sighted basis for flood management policy, but tools for implementation are not yet available
- Responsibilities for flood management in urban areas are unclear. Technical advances will shortly provide new tools for urban flood design
- There is legacy of inappropriate floodplain development that requires policy attention
- Technical developments are needed for groundwater flooding, but research is in hand. Other technical needs were discussed above and include modelling tools for land use management. There is a particular need to represent and reduce uncertainty in estimates of climate change, and to provide some guidance on climate change effects for high return period extreme floods
- Human resources are limited by a lack of numerate graduates
- If improved standards of flood protection are to be implemented in a reasonable period of time, substantial additional financial resources will be required.

**MEMORANDUM**

1. Floods will always occur and are part of the natural functioning of river systems. Floods cannot be prevented, but people and infrastructure can be protected. Key strategic questions are:
   a. What level of flood hazard is acceptable?  
   b. Is flood hazard increasing?  
   c. Does the UK have the policy, resources and technical tools in place to manage flood risk effectively?

2. This note attempts to provide an overview of the UK situation and a personal perspective. I would be happy to provide amplification and further information as appropriate.

3. What level of flood hazard is acceptable?

4. The term “return period” is commonly used to describe flood frequency, and is easily misinterpreted. A return period of 10 years means that such a flood will occur on average once every 10 years, or more usefully, that there is a 1 in 10 chance of such a flood occurring in any given year. Thus a 100 year flood has a 1 in 100 chance each year of occurrence. The cumulative risk over a period of time can easily be calculated; for example, over a 70 year period (a human lifetime, or a design lifetime of a structure or facility, perhaps), there is a roughly 50:50 chance of a 100 year flood occurring.
5. Floods occur across the full range of frequencies. The Boscastle flood (August 2004) was associated with an extreme rainfall (181 mm in 5 hours), estimated to have a return period of the order of 1000 years or more. It is inconceivable that protection could be provided nation-wide for such an extreme event—the costs would be huge, and the landscape altered unacceptably. The Carlisle flood (January 2005) is a different story. Damage was estimated at £450 million, and 2 lives lost. The flood had an estimated return period of 150 years, whereas the defences were designed for levels of protection from 20 years to 70 years. This raises the question of what is an acceptable level of risk for an urban area, which is essentially a political question. Conventional practice in the funding of flood protection schemes weighs the costs of protection against the economic benefits from preventing flooding for a range of frequencies. This ignores wider issues of social equity (protecting the rich is economically more justified than protecting the poor), as has recently been recognised by DEFRA, and a target level of the 1 in 100 year flood has been identified. However, very few UK towns and cities achieve this level of protection. For example the Jubilee River, recently built to protect Maidenhead from Thames floods, was designed for an approximately 1 in 60 year event (similar to the 1947 Thames flood). Clearly where major assets are at risk, higher levels will be appropriate, but is 1 in 100 years (with a roughly 50/50 lifetime chance) an appropriate target level of risk as a baseline for our towns and cities?

6. There are two important footnotes to the above discussion. One is that any level of flood protection has a finite risk of being exceeded, and there are important issues of (lack of) public awareness of that risk. The second is that, for certain facilities, lifetime risk is important. In a recent case, consultants unthinkingly suggested a 1 in 100 year level of flood protection for an important facility with a lifetime of 70 years. As noted earlier, that gives a 50/50 chance of flooding—which in that case was completely unacceptable. Where lifetime risks are important, much rarer floods must be considered.

7. A final point concerns extreme flood hazard. Where facilities such as reservoirs have significant risks associated with potential dam failure, such as substantial loss of life, under UK practice rare extreme events are considered, for example the 1 in 10,000 year flood, and the Probable Maximum Flood (the largest flood that is considered possible). I return to this point, below.

8. Is UK flood hazard increasing?

9. Flood risk is generally considered to be a product of a) flood hazard (the chance of flooding) and b) the consequences of flooding. Nationally (and globally) flood risk is increasing, as more properties are built in vulnerable areas, and as the value of properties and infrastructure at risk increases with economic growth. Here I consider just flood hazard. A brief discussion follows—more detail can be found in Wheater (2006).

10. Land use change

11. Man’s activities continuously change the environment, and hence flood risk. New build replaces vegetated sites with impermeable surfaces—roofs, roads, car parks, etc. This changes the runoff—more surface runoff, less soil storage, with runoff usually collected in storm drains and channelled rapidly to watercourses. This increases river flood peaks and may reduce low flows. It may also change flood seasonality—rural streams mainly flood in winter, urban areas generate high runoff from intense summer storms. These effects are well known and hence urban development usually comes with a requirement to provide temporary storage (for example in detention reservoirs) to mitigate these effects. There is also interest in SUDS—sustainable urban drainage systems—where for example soakaways, permeable pavements and in-pipe storage can be used to reduce the rate of runoff. Confused responsibilities for flood management and maintenance in urban areas have inhibited uptake of these methods in England and Wales. Nevertheless, effects of urbanisation are well known and design solutions are commonly provided to mitigate the effects. (Flooding within urban areas is of increasing concern, not least to the water utilities responsible for sewerage in England and Wales and the insurance industry. Flooding may occur due to intense rainfall within an urban area overloading the drainage systems (sometimes called pluvial flooding), due to a failure in the sewer system, or due to interactions with river or coastal flooding. I return to this issue below.)

12. While urban development is a clear and dramatic example of changes to the environment, other changes are more subtle. There has in recent years been much concern about the effects of agricultural intensification. Changing arable land management practices include changing cropping patterns (with increased working of bare soils in Autumn and Winter) and the use of contractors (with increased size and weight of machinery, and constraints on time available for land access). There is evidence of associated degradation of soil structure and mainly anecdotal evidence of associated “muddy floods”. In the uplands, there has also been intensification. In Wales, for example, sheep numbers increased by a factor of 6 from the 1970s to the 1990s, and changing breeds led in some cases to a doubling of weight per animal. The DEFRA/EA Flood and Coastal Defence R&D programme recently funded a definitive review (project FD2114) which concluded that there has been a lack of hard evidence on the local scale effects, and a lack of methods to predict with reasonable confidence the effects at the scale of river systems. Under the Flood Risk Management Research Consortium (FRMRC), led by the Engineering and Physical Sciences Research Council, but co-funded by DEFRA, the EA, the Scottish Executive and the Northern Ireland Rivers Authority, a research programme was established in 2004 to develop the science base in this area. Current
results suggest that agricultural intensification has led to locally-increased flood risk and demonstrate that changes to upland land management practices can reduce flood runoff, at least at local scale (individual fields up to 20km² river catchments). Effects at larger scale are the subject of continuing studies, funded variously by DEFRA/EA, the FRMRC and NERC’S FREE (Flood Risk from Extreme Events) programme.

13. For both urban development and agricultural intensification, impacts are greatest for frequent flood events. As the severity of the rainfall increases, so the relative effects of the land use change decrease. For urban areas, it is speculated in UK practice that impacts are minimal for the 500 year event. Research to quantify rural effects is yet to report.

14. The previous discussion in this section has focussed on runoff generation. River flows are routed downstream in river channels and, under flood conditions, in the associated flood plain. Flood protection works often have the effect of protecting flood plain areas from flooding—either to protect properties built on the floodplain, or to allow agricultural development in the floodplain. This involves disconnecting the river channel from the natural floodplain storage, so that the natural storage and attenuation is lost. This has the effect of transmitting increased flood peaks downstream. This issue is of major concern in Europe, for rivers such as the Rhine. Flood risk for downstream towns and cities on the Rhine has significantly increased as a result of river engineering and floodplain disconnection and efforts are being made to re-establish some floodplain storage. In the UK, creation of washland storage may be considered an option in the design of flood relief schemes, and there is considerable interest in the potential use of floodplain agricultural land to provide flood storage, at the expense of a loss in agricultural flood protection.

15. Climate Change


17. Scenarios of climate change for the UK, developed from Global Climate Models and embedded Regional Climate Models, suggest a change in the South to warmer, wetter winters and hotter drier summers, and in the North, to wetter summers and winters. It is important to note that Global Climate Models are impressive in explaining global temperature change, but are poor at representing rainfall—for example they fail to capture the correct daily cycle of rainfall in the tropics. And as the scale of interpretation is reduced, the uncertainty in rainfall estimates increases. It is recognised that there are large differences in quantitative estimates of response to emissions scenarios between models, and even between the same model, with different initial conditions. Hence while there is reasonable consensus between models concerning the direction of climate change for the UK, quantitative estimates are highly uncertain. Recent work by NERC’s Centre for Hydrology and Ecology, Wallingford, has shown that when Hadley Centre climate model scenarios are combined with hydrological models, results can be mixed. In many catchments flood risk is increased, but in some it is reduced, as a result of the effects of the drier summers. The main message is that estimates of future rainfall and consequent flooding are extremely uncertain. Recent work funded by DEFRA and the EA (e.g. project FD2113) has sought to develop new methods to improve the confidence in estimates based on Global and Regional Climate Models, and this task remains an important research challenge.

18. Climate models provide a basis for estimating extreme rainfall with fairly frequent occurrence (return periods of say a few decades). However, there is no guidance currently available to quantify climate change impacts on extreme events, such as the Boscastle storm, for example, or the rare events considered for dam safety. This is a strategically important gap in knowledge.

19. An alternative to modelling to evaluate climate change is to look at the historical record to detect change. However, since extreme events are by definition unusual, there are major technical difficulties in determining whether they indicate changing response. My understanding of the literature is that, although short records may indicate change, there is as yet no evidence for the UK from long term data that floods have increased. However it seems likely that within the long term natural variability, flood occurrence is currently greater than 30 years ago, which was a relatively dry period with respect to flood occurrence.

20. Does the UK have the policy, resources and technical tools in place to manage flood risk effectively?

21. Making Space for Water

22. DEFRA has recently developed a vision for water management “Making Space for Water” (MSW) which is a visionary and far-sighted document. MSW embodies a radical change in perspective for flood risk management from earlier approaches that focussed on local assessment of hard defences. MSW emphasizes the need for integrated management of flood risk at the spatial scale of the whole river catchment or the whole shoreline. This requires consideration of both structural and non-structural measures, including rural land use solutions, and a more integrated approach to specific issues such as urban drainage, coastal flooding and erosion. MSW also emphasizes the need to “deliver the greatest environmental, social and economic benefits consistent with the Government’s sustainable development principles,” which requires broadly-based multi-criterion assessment. Implicit in this new perspective therefore is the need for new and broader
approaches to decision support systems and modelling. MSW must also be seen in the context of European developments, in particular the Water Framework Directive, which has wide-ranging implications for water management and the protection of ecological quality, and the forthcoming Floods Directive.

23. There are, however, major technical challenges in taking forward such broad-based assessment. The DEFRA/EA R&D programme has recently funded an expert group, which I led, that has mapped out a technical vision to achieve this (project FD2118) over a 5 to 10 year timescale. In the meantime, the EA has been developing Catchment Flood Management Plans (CFMPs), with the aim of providing more integrated assessment with the more limited tools currently available (these tools are unable adequately to represent features such as land use change, or changes in river geomorphology). It is however unfortunate in this context that the recent reorganisation of the EA has removed the river catchment as a basic management unit—a structure that had been in place for 30 years or more and viewed internationally as a flagship example of how to organise river management.

24. MSW recognises that land use management and flood management are intimately related, and the current structure of DEFRA combines these responsibilities. However, a truly holistic approach has yet to be achieved. For example, changes to rural land use to mitigate flood risk are likely to have associated benefits for diffuse pollution, but a framework to account for such multiple benefits has yet to be achieved.

25. Another issue of coordination within DEFRA was that until recently, responsibility for reservoir safety (and the associated issue of design for very extreme floods, discussed in para 7 above) was divorced from fluvial flood protection. This led to a situation where a new code of flood design practice was introduced for fluvial flooding in 1999, which when extrapolated beyond the return periods for which it was intended, gave very large flood estimates, in some cases bigger than the previously considered Probable Maximum Flood values. This left the dam owner community in a difficult position, with potentially large costs to be incurred to meet new standards of protection, which might be incorrect. Work was eventually funded by DEFRA to reconcile this issue, but in 2007 it has yet to report. Recently these responsibilities have been integrated, however.

26. Urban flood management

27. In the urban situation, as noted above, there has, in England and Wales, been divided responsibility for flooding between the EA (responsible for main rivers), the water utilities (responsible for sewer flooding) and Local Authorities (responsible for lesser watercourses). DEFRA has been aware of these problems, which inhibit the development of integrated solutions to flooding problems and implementation of methods such as SUDS, where responsibilities for maintenance have been unclear.

28. For urban flooding there has also been an important technical gap. Storm sewer design has been based on models to simulate flow within the piped system, and criteria for the acceptable frequency of pipe-full flow (return periods of just a few years). The relationship between sewers flowing full or under pressure (surcharge), and surface emergence of flows is site-specific, and the tools have not been available to represent surface flooding for the sort of return periods commonly considered for river flooding (eg 20–100 years). New technology is changing that, and within the FRMRC, colleagues are using detailed remote sensing topographic data (from airborne LiDAR) to identify surface flow paths in urban areas. These can then be used with models that can represent the interaction of storm drain and surface runoff in urban areas. This provides the potential for a completely new approach to the design and management of urban flood infrastructure in the future.

29. Groundwater flooding

30. Current fluvial flood estimation methods focus on surface water flooding. Extensive and prolonged groundwater flooding occurred in the wet Autumn and Winter of 2000–01, affecting areas such as the Chalk landscape of South-East England where streams are predominantly fed by groundwater. In these areas, normal river flows are low (typically just 2% of rainfall appears as rapid runoff), but under exceptional periods of prolonged wet weather, dry valleys begin to flow, springs break out in new areas, and much larger volumes of runoff occur. A notable example is the flooding of Chichester in 1994. New technical methods are needed to assess and manage groundwater flooding. NERC’s FREE research programme has commissioned some of the first studies in this area, led by me, which began in 2007.

31. Floodplain management

32. There is a major legacy of inappropriate floodplain development, approved by local authorities against the advice of the EA (and its predecessors). Recent strengthening of the EA’s voice in floodplain planning issues is welcome, but as the floods of this Summer have demonstrated, there is a major issue of legacy development and inappropriate siting of buildings and other infrastructure in floodplains. Apart from the recent example of Severn-Trent’s water works, it is not uncommon to find hospitals, old peoples’ homes and the bases for emergency services located on sites at risk of flooding. This is clearly an unsatisfactory situation.
33. **Human resources**

34. As Director of the UK’s oldest MSc programme in Hydrology (which started in 1955), I should report that there is a severe shortage of technically competent and experienced hydrological specialists in industry and the EA, which is reflected in demand for the engineering-based students which we produce. However, in particular over the last 5 years, we have struggled to recruit suitably qualified students to both MSc and PhD programmes, despite the availability of funding from UK Research Councils for UK students. There are large numbers of students wishing to follow careers in this area, but lacking the necessary background in Mathematics to enable them to develop the appropriate technical skills. One consequence of this is that many overseas graduates from our MSc course take up UK posts, another is that funded training opportunities remain unfilled, a third is that employers use underqualified staff. It would in my opinion be most helpful to the provision of skilled manpower if Research Council grants could be made available in full to EU residents.

35. **Financial resources**

36. In my opinion, much of the UK’s flood infrastructure provides levels of protection that are incompatible with society’s expectations of risk. This has implicitly been recognised by DEFRA, in establishing guidelines of 1 in 100 risk as appropriate for urban areas. Raising defences nationally to this level (or better) within a reasonable time frame will require very significant expenditure.

**Reference:**


Professor Howard Wheater FREng
Department of Civil & Environmental Engineering
Imperial College London
September 2007

**Witnesses:** Professor Edmund Penning-Rosell, Head of Flood Hazard Research Centre, Middlesex University, and Professor Howard Wheater, Professor of Hydrology, Imperial College, gave evidence.

**Q101 Chairman:** Good afternoon, ladies and gentlemen, to a further evidence session in the Committee’s inquiry into flooding. I would like to welcome Professor Edmund Penning-Rosell, the Head of the Flood Hazard Research Centre at Middlesex University and Professor Howard Wheater, who is the Professor of Hydrology at Imperial College. Gentlemen, you are very welcome. Can I thank you in advance for the written submissions which you have both made. Professor Penning-Rosell, I would like to start by inviting you to try and put our problem of flooding in the summer into some kind of context and perhaps compare the experience we had in this country with other flooding incidents, perhaps in a European context or perhaps, with thoughts of what is happening, sadly, in Mexico, in an international context. How serious was it?

**Professor Penning-Rosell:** How serious was 2007?

**Q102 Chairman:** Yes. **Professor Penning-Rosell:** It depends what you take as your metric of seriousness. Some people lost their lives, not very many fortunately; quite a lot of property was flooded, but not tens of thousands; there was a lot of dislocation of the local economy and people’s lives in Gloucestershire and, to a lesser extent, further up the River Severn, but if you look internationally then the flooding problem we have in England and Wales is not as serious, for example, as that experienced in the United States of America, where regularly scores of people are killed each year as a result of flooding, which tends to have a different mechanism, largely driven by hurricanes and coastal storms. If you look at the Continent of Europe, the Netherlands is blessed with having no serious flood problem at all as a result of major investment since 1953; Germany has suffered serious flooding on the Oder and to a lesser extent on the Rhine. There is not a good database on the extent of flood problems across Europe, except the database in Belgium on loss of life, and this shows that in most cases most countries have a more serious loss of life from flooding problem than does England and Wales. So, in that respect, we are fortunate that many years of investment have mitigated the effect of flooding, and that has been the consistent policy of government right back to 1930. On the other hand, we are now experiencing greater dislocation, we understand, of our society as a result of the flood experience. This is a relatively new phenomenon and some features of the flooding in 2007 were certainly different from previous flood events. That does not categorically answer your question, except to say that I do not believe that Britain is amongst the foremost in flood affected countries and, certainly, if you look further afield to South East Asia, you will find countries such as Bangladesh where the flood extent is greater and the flood severity is greater. We do not even have in Britain the largest proportion of flood plain in the country. That is, again, in the Netherlands or Hungary. So, I would be cautious about saying we
have a flood problem above the average in Europe and certainly not above the average in the rest of the world.

Q103 Chairman: Again, to put it into context, you deal with flood risk management. If we take the different types, you made an interesting observation when you said that there were some different characteristics of the flooding this summer, I think, particularly with the urban dimension, because up to now most of the focus has been on coastal, river, estuarial flooding, but we had some other things that occupied our minds. In terms of order of priority, order of risk, the things that worry you as an expert, looking at the spectrum of flooding that we have in this country, what are the things that cause you the most concern? If you lose sleep at night on these matters, what might be the cause of that?

Professor Penning-Rosswell: I do not lose a lot of sleep at night as a result of that kind of problem.

Q104 Chairman: I presume you do not live in a flood plain then.

Professor Penning-Rosswell: Quite close, actually. I think if I were to characterise the three most serious flood problems that I foresee in this country, they will be, firstly, a repetition of a 1953 type coastal flood event, although I think it will be true to say that the effect of that event will be far less than 1953, for reasons that I could go into. The second problem would be a repeat of the 1947 type event on the Thames, and there was a similar event in 1894 which is perhaps more serious, although it differs in different locations because there are large areas of the lower Thames catchment which are not substantially protected from flooding, particularly between Windsor and Teddington, and there a major event, such as a repeat of 1947, would cause tens of thousands of properties to be flooded and scores of thousands of people to have to be evacuated for upwards of a week and perhaps as much as a month. That is the second of my problems. The third of my problems would be a repeat of the 2007 event, and perhaps less the 1998 event, over a very large metropolitan city such as London: because if you had 100 millimetres of rainfall over London, as Gloucestershire had 100 millimetres of rainfall, you would have a much, much more serious situation. Those are my three worst scenarios.

Q105 Chairman: In your evidence at paragraph nine you say, “The Environment Agency proposed, after the Boscawton flood, to identify the areas of highest risk to life from flooding. This study is urgently needed.” Have you got any idea why we have not seen any results of that?

Professor Penning-Rosswell: No, you would have to ask the Environment Agency that. It is quite a complicated problem, but the flood mapping programme that the Environment Agency has undertaken was to have had a loss to life component to it, and some research was done by Hydraulics Research Wallingford in that direction. I do not believe it has been adequately followed up by maps or other types of information which would indicate areas where loss of life was more likely than elsewhere, and I think that is needed as an element of research which would help the Agency and particularly the emergency response organisations to cope more satisfactorily with the kind of events such as 2007.

Q106 Chairman: I wonder if you can help us. You have taken us, if you like, into the forecasting and the probability side of flooding and we are humble politicians, we are not statisticians and we are not experts. You were talking about events almost on a probabilistic basis, but one of the things which we were alerted to when we did our report on the basis of the Foresight Report was the growing severity of an event as well as the question of the probability of things happening, and as lay people, we might be seduced by recent events to think that, to put it crudely, there are more big floods happening. In other words, they are happening with greater frequency and they seem to have to deal with more water. That is in its very crudest terms. Yet the concept of preparing for flooding on a frequency basis is defined in terms of events that occur one in 100 years, one in 150, one in 200, but they do not seem to talk about the severity of the event. In other words, I am not clear who defines what a one in whatever number of years’ event it is; so how do you decide on the quotient of severity of the event and are we, with climate change, seeing the degree of severity starting to increase? Therefore, the third question that follows from that is, if any of those first two premises are correct, true or provable, what should we do about it?

Professor Penning-Rosswell: That is a very complicated question.

Q107 Chairman: That is why I put it to an expert.

Professor Penning-Rosswell: Howard can deal with probability and I will have a few words on severity towards the end.

Professor Wheater: I think the concept of a return period is very misleading. It is just a shorthand way of talking about probability. So, when we talk about a one in 100 year event, what we mean is we have got a giant dice and every year we throw that dice there is a one in 100 chance that in a particular year we will have a flood of a certain level of severity or greater. So, the scenarios for climate change we can talk about, but under certain scenarios in certain locations we expect the flood risk to increase, and that means that the chance of a large event will increase with time.

Q108 Chairman: Let me stop you there, because that bit I understand: the rolling of the dice. That is, if you like, gambling basically. We have got gambling; we understand that. In terms of the event—just focus on the event—who defines the event? Who says what a one in 100 year event is?

Professor Wheater: You can define it with respect to various criteria. You can choose those criteria.
Q109 Chairman: Who does choose it though?

Professor Wheater: It depends on the purpose for which you are doing an analysis, but the most common one would be the peak flow in the river, that is the highest discharge in terms of the amount of water moving down the river, so many cubic metres per second. That would be the most common criteria. Then what you would do is collect long records of data and look at the highest flow each year, and then you would look at the statistics of that and you would say, “Okay, that flow is a one in 50 and that flow is a one in 20 year event.” If you were designing some flood protection, you might be interested in what happened when, say, flood walls were overtopped. In that case, you might be interested in a certain volume of water above a certain threshold, and you could do the same analysis but your criteria then would be the volume over that threshold.

Q110 Chairman: The reason I asked those questions is that we covered this in the short-term against a background of unprecedented amounts of rain falling in certain locations—Hull, Sheffield, Tewkesbury, for example—in very short periods of time (two days), getting effectively a month or more than a month’s rainfall at one fell swoop. That is a pretty extreme event by our weathering. The question that had occurred to me is that, in terms of when you are modelling flood risk maps and trying to determine the policy decisions, Professor Wheater, to which you adverted a second ago, it comes down to the question now, when you are defining the event, as to how you should define it. So one of my questions is: taking into account the statistics of floods, the most common one would be the peak flow in the river, which you are doing an analysis, but the most common one would be the peak flow in the river, so many cubic metres per second. That would be the most common criteria. Then what you would do is collect long records of data and look at the highest flow each year, and then you would look at the statistics of that and you would say, “Okay, that flow is a one in 50 and that flow is a one in 20 year event.” If you were designing some flood protection, you might be interested in what happened when, say, flood walls were overtopped. In that case, you might be interested in a certain volume of water above a certain threshold, and you could do the same analysis but your criteria then would be the volume over that threshold.

Q111 Chairman: So I do not misunderstand, Professor Wheater, what you said earlier on, you seem to agree with the view that we need to revise our current modelling arrangements and from the evidence I have read some people question whether we have sufficient data to make that decision, particularly in terms of how the impact of climate change. What we have had is the Chief Scientist Foresight Report which postulates a number of scenarios of more intense weather conditions. So, that is a projection saying these are things that could happen, what we have is a series of events that have happened and we have, if you like, our short-term memory of look what happened this summer. Therefore, from a policy-making point of view, would you say that there is some solid ground to say, against that background, some of conjecture some of events, that we should revise our modelling and do we have the tools sufficiently well developed to make the kind of predictions that will ultimately guide the policy-maker? One would conjecture again that what we would have is that certain locations would become more risky to flooding and, therefore, the question is: what do you do about it?

Professor Wheater: That is quite a complicated question. I think that there are significant uncertainties in modelling future climate, as you will appreciate. There are uncertainties about how the global community will respond in terms of future emissions, and so on. So, that is why there are various scenarios to try and scope out the range of possible futures and then within those scenarios the best tools that we have are models that try and represent the whole of the global climate system, and that is a pretty tall order. They can get some things remarkably right, so they do a great job in explaining what has happened to temperature over the past
hundreds of years, but, as I said, rainfall is difficult and more complicated, and what you find is that the estimates of global climate models for rainfall are not very reliable. So, there are two ways forward to try and come up with better estimates. One is to improve the density of your simulation of climate over a region of interest, and so we have things called “regional climate models”, which are high resolution. If you look at a global climate model, it averages the whole of the climate and the land surface over areas of the order of 300 by 300 kilometres, which is very coarse. You get a few grid squares over the whole of the UK. If you can nest a fine resolution model within that global model, you can come back to a grid that is maybe of the order of 40 kilometres, 50 kilometres, something that is still a bit big but more useful. There are limitations to that, because you have to take the boundaries from the coarse model, feed them into the fine model and within the fine model you cannot represent all the feedbacks and the oceans, and so on, but that is one set of tools that you have in your tool box. The Hadley Centre has a range of regional climate models which it is using for looking at future climate scenarios. The other approach is to say, there are certain things in climate models that we can believe more than others—those are things like temperature, pressure and humidity—and we can take those pieces of information and use them to drive statistical models that will then allow us to generate possible rainfall sequences for the future, and that is one of the lines that is being funded in the UK.

Q112 Chairman: Let me finally, before I pass on to Mr Drew, ask you this question. You have analysed some of the challenges using predicted models. What we saw this summer in two days was a month’s rainfall. Do we have models whereby you could say, very crudely, “Okay, I am going to apply that rainfall. Do we have models whereby you could say, we saw this summer in two days was a month’s rainfall. Could you do that?

Professor Penning-Rowsell: It could be done, but it would be difficult, in the sense that the way in which the UK is modelled is on a region by region basis and to inconsistent levels of detail, but it could in principle be done.

Professor Penning-Rowsell: The Foresight Report was not too far away from what you have just said, which in a sense dumped a whole belt of flooding over the whole country, not related to catchments but related to grid squares, and looked at the consequences.

Q113 Chairman: I think there was an element of surprise in Sheffield, for example, about what happened. In terms of trying to identify where serious flooding might in theory occur and, therefore, what the implications would be, certainly looked at from the layman’s point of view, I would say if you could apply these things universally, what pops up? Bearing in mind you have got concentrations of population, is that kind of approach any use whatsoever in helping you to decide your future flood protection analysis, or is it just another interesting statistical game but without any sort of reason to it?

Professor Penning-Rowsell: That is exactly what the Environment Agency is doing through its catchment flood management plans: a slew of programmes to look at each catchment in turn to look at exactly what you are suggesting. Where are the hot spots? Where are the real pinch points? Where would investment be best directed? At a strategic catchment level. That is something that has been done over the last five or six years and that has given us a view of the country which we did not have before.

Q114 Chairman: To conclude then, does that process need in any way further refinement or further investment to improve the quality of its outcomes?

Professor Penning-Rowsell: Probably.

Professor Wheater: Yes, I think that---. Well, we can think about modelling at different scales. There is work at the moment being done, for example at the Centre of Ecology and Hydrology, funded, I think, by Defra and the Agency, which is looking at a set of small catchments over the UK, running different climate scenarios and seeing what the responses are. When we work with the bigger catchment systems, it is a more complicated modelling task because we have to consider the interactions of all the contributing areas and the way in which floods are routed. At the moment in the current stage of catchment flood management plans, that is being done in a relatively simple way which is not very amenable to looking at climate change. We actually need an improved generation of models to allow us to simulate these responses continuously so we can incorporate the dry summers and the wet winters and then determine the outcomes.

Lynne Jones: We had a submission from Professor Knight, who was very critical of the Environment Agency’s expertise and also of their modelling.2

Chairman: Would you like to remind us who Professor Knight is?

Q115 Lynne Jones: Professor Donald Knight from Birmingham University. He criticised the over-reliance and the bias towards hydrology and the lack of consideration of hydraulics and hydrodynamics. Maybe your response is, “Well, he would, would he not”, I do not know. He also says that there is a lack of in-house expertise within the EA and is critical of the fact that there is no chief engineer and also says that the 20 per cent rule is very much an underestimate. Would you care to comment?

Professor Wheater: Yes, there are two aspects of flood generation really. First of all, how much water is going to get into your river and then what is going to happen to that water as it moves down the river system? The area that Donald Knight has been referring to is the movement of water down the river system, and the hydrological problem that he refers to is how much water is going to run off from the land into the river system. So, of course you need to

2 Ev 462
understand both problems, but the chances are that you can go very badly wrong in estimating the amount of water that gets into the river and, if that is the case, it does not matter how good your river routing model is if you have got the wrong amount of water in it. For me, speaking as a hydrologist who is interested in the run off, I think the biggest question is how much water is going to arrive in the river, and then the second question, how is that going to transmit downstream? The question of expertise in that area: I think that probably there is not a large amount of expertise within the Agency on the particular problem of river hydrodynamics. However, the Agency does a lot of work through consultants who are well qualified in those areas and have models which are developed to a high level and applied widely, not only in the UK but overseas. So they have expertise that they can call on without having particular scientific expertise on the nitty-gritty of the computer code of those models.

Q116 Lynne Jones: You think that is adequate, because certainly Professor Knight does not. He criticises it for outsourcing all its hydrodynamic modelling?

Professor Wheater: I think that there is a generic issue really about how much work an organisation like the Environment Agency does in-house and how much it subcontracts.

Q117 Lynne Jones: I think it is concerned with the lack of continuity that you can have people involved on an ad hoc basis rather than having the in-house expertise on a long-term basis?

Professor Wheater: Yes. I think that it is difficult for people who are purely managing external programmes to really keep in touch. In an ideal world one would have some in-house expertise that is actually working on the problems and, hence, has a real in-depth understanding of them, and I think in this area that is not something that the Agency has at the moment. I think the Agency, in terms of its science programme, has been through quite a lot of changes. It used to be, going back ten years or more, that science was organised in a fairly ad hoc way, but then they developed in my mind a rather good programme of developing centres of technical expertise, but in recent re-organisations those centres have been disbanded and the expertise is managed in a rather different way. I am not entirely sure what the current status of the Agency science programme is because I know it is undergoing fairly radical change at the moment.

Q118 Mr Drew: Can I take Professor Penning-Rosell back to his paper to start with, but it does relate to what I want to ask you about. You said post Boscastle the Environment Agency were going to identify these areas of highest risk of flooding. Is not that what the flood maps already do? I accept that Norwich Union would argue their maps are better than the Environment Agency’s, and there may be some justification for believing that, but how much more information can you give people without effectively either worrying them to death or accepting that these areas have such a risk that you would not want to situate additional development there?

Professor Penning-Rosell: There is a balance to be struck there. The comment on paragraph nine is about information of risk to life from flooding, and that has not been followed through by the Agency in a way that I think needs to be done.

Q119 Mr Drew: Can you do that?

Professor Penning-Rosell: Oh, yes. We are getting much more research and intelligence about the factors that lead to loss of life in floods. In general terms it is to do with the velocity of flood waters, it is to do with the depth of flood waters and it is to do with the vulnerability of people who might be exposed to flooding. So in areas of substantial water depth where velocities are large, the risk of loss of life is much more obvious, much more apparent, much more real than right at the edge of the flood plain where velocities might be quite low and the flood water might be quite shallow. So there is gaining intelligence about the factors that lead to loss of life. It is not a perfect science by any manner of means, because sometimes loss of life from floods is a function of the behaviour of the people involved rather than the flood itself, but the Agency has commissioned research under the Defra, EA Research and Development Programme to look at this and some algorithms have been produced which could result in maps produced by the Agency within its flood plain mapping programme, which is relatively unsophisticated in the sense that it is for public consumption and it is not in very great detail. It is the kind of thing you can look up on the web for your own house and see whether it is blue or whether it is turquoise, indicating a flood or a serious flood. It does not go further than that, although it does differentiate between areas that are defended or not, but it does not say this is a very serious flood, with high velocities and lots of deep water around, as it might do for Tewkesbury or for Oxford or for the coastal locations. It does not do that. That is the point we are making under paragraph nine.

Q120 Mr Drew: The reason I am interested is obviously, sadly, the deaths in Tewkesbury all came about, if you like, as a consequence of the flood rather than because of the flood.

Professor Penning-Rosell: Yes.

Q121 Mr Drew: That may be sad, but it is a bit of a difficult game to try and say how many people would be well served---. Can we look at this issue of pace of change then. This is something that we are obviously going to major on and Sir Michael Pitt is also presumably going to try and spend some time on. The Chairman has already mentioned the Foresight Report and we have got the Defra Report Making Space for Water. The Chartered Institute of Water and Environmental Management basically said that the lessons have not been learned. Rather that these have been occasions to note what has happened previously and then perhaps there will be some unearthing of policy in the due course of time. Is
there a lack of urgency and does that really mean that, sadly, the next time we get Hull, Sheffield, Gloucestershire happening the same issues will arise but they could be worse, could be slightly better?  

Professor Penning-Rowsell: I do not agree with the CIWEM comment there at all actually. Obviously each flood incident is slightly different and, therefore, there are always lessons to be learned from each one, and sometimes those lessons are learned immediately and sometimes they take time; but if you go back within the last decade, we had a serious flood incident in 1998 which largely affected the Midlands and, as a result of that, it was recognised that the flood warning system, that the embryonic Agency that was operating then, was not adequate and a great deal of work has been done to improve our flood warning system as a result of that experience from that flood. I know it was a different kind of flood in autumn 2000, but the warning arrangements in autumn 2000 were a dimension better, an order of magnitude better than those of 1998. So, lessons were certainly learned from that. I want to go on a bit further than that and talk about the autumn 2000 event, which had a slightly different characteristic of flooding, being very dispersed across the country. The key lesson that was learnt from that was about development in flood plains and, as a result of that, PPG25 was first of all drafted and then debated and then changed to PPS25 so that a much tougher regime was put in place.

Q122 Mr Drew: In terms of planning policy is that the right gradation of impact, if you like, in terms of intervention, or should it be tougher, or should it be more widespread in terms of the implications of that particular planning policy statement?  

Professor Penning-Rowsell: It is a national policy position. It is applied—

Q123 Mr Drew: I raise that because we still do it in the flood plain. We might be clear and say no building in the flood plain.  

Professor Penning-Rowsell: No, I would not take that view at all. We are rather short of land in this country and we need to use every square metre that we have, and certain developments in flood plains are actually a wise use of that resource and should be promoted and not rejected. It would be wrong to sterilise our flood plains and prohibit development when in fact here we are sitting in the Thames flood plain now and enjoying the benefits of the central location; and if somebody was to decide to build a new building such as this one, I do not think it would be very sensible for the Agency to say no.

Q124 Chairman: We are on the first floor!  

Professor Penning-Rowsell: I was very conscious of that when I accepted the invitation to come, but you take my point. We have some very successful flood plains which are protected, and the key point we make in the paper is that we need to make those decisions in concert so that when we develop flood plains, we also protect them.

Q125 Mr Drew: In terms of the idea of a European flood directive, does that make any sense at all? Is there any commonality? Given that both of you have alluded to the fact that these are somewhat unpredictable events and are unpredictable events within a country, even between areas, quite close to one another, what has Europe got to do with this? What is the sense of a directive? What can you actually direct governments to do that they are not already wanting to do even if they do not necessarily do it?  

Professor Wheater: The big problem in Continental Europe is that they have big rivers and those rivers are international.

Q126 Mr Drew: We could develop a few bigger rivers, I am sure. We dug out the Norfolk Broads!  

Professor Wheater: We only have little rivers in the UK. Our biggest rivers in England are the Severn and the Thames. They are 10,000 square kilometres. The Nile is several million. The big rivers like the Rhine and the Danube clearly have an international dimension that needs to be resolved, but I think that by and large the proposals, the flood directive reinforces what we are already doing in the UK. It talks about the need to manage on a river basin basis, which we are doing. It talks about the need to put flood risk maps in place, which we are doing. There are some interesting aspects that emerge though. For example, they talk about the need to have maps that show velocities, which is the point that Edmund was making, and they also talk about the need to recognise that there can be pollution associated with flooding, and that is something which we are starting to think about in the UK at the moment but very much from a zero base. So, the first studies are being done at the moment, and clearly it is an interesting and potentially important area and that would be reinforced by the EU requirements.

Q127 Chairman: Can I jump in and ask: there was a point in paragraph 23 of your evidence where you said, “It is however unfortunate in this context that the recent reorganisation of the Environment Agency has removed the river catchment as a basic management unit.” Does that not slightly go at odds about what you said was a good way of organising your flood policy?  

Professor Wheater: Yes. I think that for about the last 30 years we have been able to travel the world saying that the UK is a flag ship in the way in which it integrates its water management based on river catchments, and I was rather horrified to find when I ran a workshop recently on the Severn that when they are looking at flood risk they are now moving to districts and those districts do not necessarily coincide with the—

Q128 Chairman: Why?  

Professor Wheater: I think it is a problem with the multi-functionality of the Environment Agency. It has responsibilities not just for flooding but for

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3 Ev 39
Ev 46 Environment, Food and Rural Affairs Committee: Evidence

7 November 2007 Professor Edmund Penning-Rosse1 and Professor Howard Wheater

waste management and ground water contamination and so, I think, for administrative reasons that has been a change.

Q129 Chairman: So it is wrong in your judgment?
Professor Wheater: Yes.

Q130 Mr Drew: Wearing one of my other hats, Gloucestershire Rural Issues Taskforce, we did actually identify that. The Environment Agency and, I seem to remember, Severn Trent came to talk to us, but it was partly at our instigation, because there were some issues about how they were going to divide the upper reaches of the particular area round the Severn that they now define as the Upper Severn and the lower bit. I raised the point then (and I well remember this) that if the Water Framework Directive meant anything, we did need catchment management across the whole Severn, and this has always been the issue. I know that this is not being recorded so I can say this. I have always argued quite strongly to make sure Gloucester does not get too much protection, because if it gets it, then we get it lower down. My secret is out now! But there is an issue, and I have always felt this, that if you look at the protection of some areas to a greater extent, then you cannot isolate that from what happens elsewhere along the length of the river because somebody else will get it some time.

Professor Wheater: You need an integrated solution based on the whole river system.

Q131 Mr Drew: That is not what we are doing at the moment.
Professor Wheater: I think it is being done in practice, despite this administrative change. There are offices, for example, that manage the Upper Severn and the Lower Severn as integrated units.

Mr Drew: Tewkesbury flooded in the recent episode. They did suffer along with the rest of us, to be fair.

Chairman: I am going to move on to Mr Taylor.

Q132 David Taylor: This is to Professor Penning-Rosse1 and about his evidence, particularly paragraph three of that evidence.4 The northern city inundations that we saw—Hull and Sheffield in particular—were typically caused by flash floods with the fact that drains and sewers were totally overwhelmed by the amounts they were being asked to absorb in a very short timescale. You refer in your comments to a mosaic of organisations that are responsible or have some responsibilities, and that would include internal drainage boards, riparian owners, Environment Agency, Highway Agency, local authorities, waste water companies and so on. How do you feel that (to use your words) the mosaic of organisations coped, particularly in the northern cities, with the responsibilities that they had?

Professor Penning-Rosse1: It is quite difficult to answer that question without having a model of how else you would do it: because each of those organisations have legitimacy over their own territory but it is still a mosaic. You could not, I believe, have a single body being responsible for all aspects of water and flooding in metropolitan areas—I do not think that would make a lot of sense—so they do need to have several different types of organisations. You say: how do they cope?

Q133 David Taylor: Jointly and collectively, with the specific focus on co-operation. Mosaic suggests some sort of shape, form and function but sometimes there will be gaps and there will be overlaps. It is all of those concerns I wondered whether you could comment on?

Professor Penning-Rosse1: I do not have experience of the operational efficiency of those organisations on the ground in Hull or in Sheffield or wherever, so I would be loath to criticise them, I am afraid, and say that they were not fit for purpose. What I did observe was a great deal of activity. People were not sitting on their hands. There was a great deal done to help the people who were affected and afflicted. Again, emergency response organisations were apparently affected, but I probably only read the same reports as everybody else, I have not done any research on that about how effective or efficient they were. The Environment Agency and actually the Met Office did give warning of those floods. Whether it was adequate people will have to judge for themselves, but there was warning, which there certainly has not been in certain floods before, and that warning was disseminated as effectively as they could do, which is never perfect but it is very difficult to make dissemination of warnings perfect. I am probably not answering your question very well because I do not have the evidence-base to know (a) exactly what happened on the ground (you probably know that better than I do) and (b) what organisational change would lead to a greater degree of effectiveness. That second point I really do not know the answer to.

Q134 David Taylor: It is just the inference I draw from your statement that the imperative is to deliver—I assume in brackets—better integration through this mosaic of organisations. What ideas do you have as to how that integration can be better achieved?

You have already discounted the possibility in an urban or metropolitan area of having a single body responsible for flood risk management. If not that and if not the existing mosaic, which did seem to have significant weaknesses, what suggestions do you have as to how that integration can be better achieved?

Professor Penning-Rosse1: I think in urban areas such as Hull, I do not know so much about Sheffield, you do need a much more finely graded view of what the risk is. If you look at the flood map for Hull, which I happened to do, it is blue all over the place, but it does not differentiate within Hull where areas are more serious, where is the greatest severity. It does not, for example, show you areas where there are more vulnerable populations or more vulnerable infrastructure or services that could be disrupted. So in metropolitan areas we do not have a very good risk assessment system, partly because that is a split responsibility between the sewerage agencies and the

4 Ev 34
Environment Agency, and I think probably in urban areas—no, I do not think, I am sure that we need a more sophisticated risk assessment. Moving on from that, you also need to be more sophisticated in your response to events when they happen by tailoring that response more to the risk that is likely to occur. Obviously, you direct your resources to where risk is greatest and move them away from where risk is not so great. From my experience of emergency planning organisations, they are not very good at that, they are not very good at differentiating different levels of risk in different areas and actually targeting the response accordingly, and I think that could be more sophisticated. From what I know, from my experience of major events, I think the co-ordination during flood events has hugely improved, thanks to the gold and silver command systems that the police have set up. I do not think it is a lack of information necessarily that leads to an ineffective response, if there is an ineffective response, but it might be, for example, lack of equipment or lack of personnel in the right place at the right time; and you have to bear in mind that these are very rare events. You would not have a standing situation in Hull, for example, every summer, every July, to counter the floods that might come, because they might only come once every 100 years. So it is quite a delicate balance you have to strike to learn how much resource to give to these things and how much you can, as it were—I was going to say on-the hoof, I suppose I do mean on-the hoof—actually create systems and structures as you are going along during a flood event. That is difficult in the kind of event that we had in 2007, because it was such a sudden event and you may get overtaken by events, but the response to these events is never going to be perfect; it is always going to be imperfect. There are always going to be problems; there are always going to be mistakes made; there is always going to be suffering of the afflicted population; there is always going to be damage and destruction. The question is: what is the balance between mitigating that and having a standing system of emergency response which costs you money while it is standing?

Q135 David Taylor: So you say insufficient differentiation was an issue?

Professor Penning-Rosswell: I think that is where you start.

Q136 David Taylor: Then you went on to say that authorities should learn to focus on that which is more probable. Where you are dealing with very rare events anyway and where the past history does not give too much of an accurate indication as to what are the high risks in East Yorkshire, for instance, authorities have a very difficult task, do they not?

Professor Penning-Rosswell: Absolutely.

Q137 David Taylor: Therefore they are going to be literally bailing out on the day rather than anticipating years ahead as to how they might avoid all of this?

Professor Penning-Rosswell: I am afraid, and it sounds a rather callous thing to say, that might actually be the best strategy for the nation to adopt in countering many of these very rare events. You do, however, need to look at certain things. You need to look at the infrastructure, for example. In South Gloucestershire we realised that the infrastructure was much more vulnerable than we had thought and the effect of flooding or disrupting the infrastructure has an effect way beyond the flood plain. It affects people who are nowhere near being flooded. So that is something that I think we learnt from this summer’s events. It is something of concern.

Q138 Mr Gray: Responding to events is one thing, but I am still slightly puzzled here and forgive me for using a very low key constituency example. Being a simple child that is the sort of way I operate. The town of Wootton Bassett in my constituency was flooded in these events and in attempting to discover why and what we could do about it, it appears at the moment that the County Council are saying that, while they are responsible for surface flooding in the town, they cannot do anything about it because that would be a matter of infrastructure; the Environment Agency are saying they have no responsibility for it at all; the District Council are saying that, while they are allowing planning of 20 new homes in the particular area that was flooded, they are not allowed to take account of flood risk in terms of the issue and anyhow it was done some time ago and the planning permission was already in place; Network Rail are saying they cannot clear out the culverts because of the amount of work and absolutely nobody, that I can make out, seems to have responsibility for the very serious floods that occurred in Wootton Bassett. Surely there is an argument that says: okay, let us have a senior organisation—the Environment Agency, and I suspect that they would rather like that task—who would be able to say to this myriad of different organisations, “Your responsibility is to do such and such and here is what you are not doing and here is what we would like you to do”, and so on. Give them a sort of over-arching responsibility in some way or other for flood prevention rather than dealing with the event?

Professor Penning-Rosswell: That is absolutely fine, but you would have to fund the Agency to do that, and you would have to give it substantially more funds. The Agency is only responsible for flooding on a main—

Mr Gray: Sure, but our problem is not funding, that is for the Treasury. Our problem is deciding what needs to be done. If the Treasury then turns round and says, “I am very sorry, you cannot do that because it costs too much”, that is another matter, but the purpose of our sally today is to assess what went wrong and to assess what you do about it, and the Environment Agency, I think I am right in saying, are bidding for an over-arching role of that kind so that they have responsibility for all planning.
Q139 Chairman: To fire up that, I wrote down a moment ago that you said, “We need a more sophisticated risk assessment in the urban situation”, and the thought that went through my mind, to follow Mr Gray’s thought processes, was who would trigger that improved risk assessment being undertaken? Who should be the person who says, “We must do this”? Professor Penning-Rowsell: I was not thinking of Wootton Bassett at the time, I was thinking of London, Birmingham, Manchester—major metropolitan areas. Who would do it? The Environment Agency would do it. It is the organisation with the greatest expertise in flooding in this country. It would not, in my view, be the organisation with the greatest expertise in flooding generated by inadequate sewerage. The Environment Agency was responsible for sewerage agencies, the water companies.

Q140 Chairman: The Environment Agency seem to have gone out of their way to say, “Urban is not us”. Professor Penning-Rowsell: Well, it is not.

Q141 Chairman: No, and that is why I am saying that you are now immediately loading the responsibility for this flood risk assessment in an urban environment under the Environment Agency whilst they are busy saying, “Urban ain’t us”? Professor Penning-Rowsell: It is not that, but you could change that if you wanted to. “You”, collectively, could change that if you wanted to. If you wanted to say through Parliament that the Environment Agency was responsible for sewerage-related flooding, no doubt it would be quite difficult in drafting terms to say what is a sewer and what is a river bed, that it is a different matter. You could do that, but currently it is not the Environment Agency’s responsibility to worry about urban flooding generated by inadequate sewerage.

Q142 Mr Williams: The Government will be spending round about £600 million on flood risk management or flood prevention this year. In the Foresight Report in 2004 the figure recommended was about one billion pounds, and that was a figure that was repeated in a report that this Committee produced about a year or so ago. The Government is now saying it is going to increase its expenditure to about £800 million. Perhaps you could tell us where this one billion figure came from and how it was calculated? How was it derived?
Professor Penning-Rowsell: Well, it was not calculated in any very sophisticated way, because the Foresight Report did not look in that level of detail at exactly what the level of spend might be in any catchment in any one year. The Foresight Report said that it looks to be that there is a growing problem in this country, driven by climate change, which is having some effect, and societal change, which is having a big effect, and it modelled what flood damage might be in 2080 and said, “My goodness, we have got a problem here.” Under any scenario, even the most benign scenario, flood damage was due to rise twofold and under some scenarios it was due to rise 20-fold, and if you compound that up over an 80-year period, you will find it comes to some large sums. A relatively small amount of investigation was done to say: what might be the level of expenditure which we could anticipate that would hold the line on that rather benign scenario of perhaps doubling flood damage over that period of 80 years, and it came up with something in the order of £975,000, and we thought that was far too precise, so let us call it a billion. The Foresight Report was done at that scale of analysis. It was not up to the Foresight Report to say: is it 975 or is it 980? It was not that kind of exercise. So it came up with that figure, which actually matched their analysis of what the flood damage potential on an annual basis was now, and it said, if we are a suffering that kind of flood damage now we probably ought to spend the equivalent sort of sum mitigating that damage in the future.

Q143 Mr Williams: The Association of British Insurers has said that the Government has failed to grasp the seriousness of the situation and they have plucked out the billion pound figure as well. Are their calculations based on anything more than just wishing to get as much flood protection as possible in order to protect their industry, or have they got some other calculation up their sleeve? Professor Penning-Rowsell: I doubt it. Professor Wheater: I think there is an issue of what is an acceptable level of risk and that the situation across the UK is quite patchy, so for example Carlisle was flooded, as you know, with £450 million worth of damage and a couple of deaths. Part of that city was protected just to a one-in-20 level and part to a one-in-70. In fact it was a one-in-150 event that they were hit with. It seems to me that there are areas where the level of protection is probably not one that most people would be happy with. We are moving into an increasingly risk-averse society and even if you have a one-in-100 level of protection that means that within a lifetime there is a 50/50 chance that you will be hit with. It seems to me that that is probably not one that you would like to make is if you look at the project investment appraisal process that the Agency and Defra operate, you will find that the average benefit to cost ratio for flood and coastal erosion management projects is something like six to one, so you spend £1 and get £6 back. This is very, very high internationally; in fact it is astronomically high in relation to the kind of investment that the World Bank would be interested in, but it is high even in this country and therefore, if you like, that supports the case of the Environment Agency in saying there is a queue of projects that cannot be done because of funding shortages, and it is demonstrated by this very high level of benefits to costs. I am working on projects where the benefit to cost ratio is five to one and we cannot get it through the process because the Defra score, which is designed to match the funds available to the projects coming forward, simply is working at an even higher level.
Q144 Mr Williams: The calculation to get to £1 billion, or whatever, does that take into consideration just the traditional river and coastal flood protection or does it take into account the type of urban flooding that we have seen?  
Professor Penning-Rosell: No it does not. That is just the Agency which is to do with rivers and coasts.

Q145 Mr Williams: And if we were investing at that level, would there come a time when the level of investment could decline because we would have achieved what was thought to be a suitable risk?  
Professor Wheater: I do not think I can give a very informed answer to that because I am not really sufficiently on top of the costs, but clearly we do expect flood risk to increase with climate change and we do need to be aware that to provide the current level of protection in future climate is going to cost money just to stand still in terms of risk.

Q146 Mr Williams: So the schemes that you are doing would give a return of £5 to £1 invested. If we were getting towards the £1 billion, would many more of those schemes achieve the Defra requirements?  
Professor Penning-Rosell: Yes, absolutely.

Q147 Lynne Jones: Could I ask Professor Wheater if you could explain the research base into flood risk management and how it is funded?  
Professor Wheater: Well, I guess there are three main areas of funding and two that are particularly important, so first of all MAFF and now Defra in conjunction with the Environment Agency have a research and development programme in the area of flood and coastal defence and that, I think we worked out, has a budget of the order of £2.5 million, which might sound a lot but compared to the annual spend is fairly pitiful actually.  
Lynne Jones: Is it pitiful compared with the annual spend or pitiful compared to the job it needs to do, because they are different things?

Q148 Chairman: Or both?  
Professor Wheater: It is certainly pitiful in comparison with the annual spend, and I think there could be a lot of benefit from an increase in resources in that area. There are notable successes from that programme. The UK is fairly unique in having a national, integrated technical base of tools for flood design, and that was funded through MAFF and then more recently through Defra. There is a recognition that we need to change the kind of modelling tools that we work with to handle climate change, and this programme has been funding research which has delivered products that can contribute to that. That programme has been reorganised over the last three or four years, mainly following a review that Edmund carried out. It has become more thematic, it has become more inclusive, and in some areas it has, I think, done a very good job in looking strategically at what the research needs are and trying to map out the task, but it tends to shy away from the kind of fundamental research base that is needed, and so for that we turn to the research councils, and I guess particularly the Natural Environment Research Council, although Engineering and Physical Sciences has also been very active and over the years they have funded research in this area. Most recently there has been a really interesting development because actually the two sides have got together and there is an integrated programme which is led by one of the research councils—EPSRC—but co-funded by the Environment Agency and Defra and the Scottish Executive and Northern Ireland Rivers and UK Water Industry Research, and that is aiming to address some strategic issues and trying to satisfy all its masters by having some short-term benefits that the Environment Agency and Defra can latch on to, and of course the longer term benefits of improved techniques looking out to five or ten years hence.

Q149 Lynne Jones: What about European funding?  
Professor Wheater: The third strand is European funding and there are some substantial European projects. I am not personally involved in those. European funding, in my experience, is somewhat idiosyncratic. You can have a very good proposal and not win funding and you can have a rather poor proposal and win funding. It requires a lot of investment of effort in Brussels.

Q150 Lynne Jones: Would you care to suggest why that might be? Is that because of doling out the shares to the different Member States or just pure poor appraisal of budgets?  
Professor Wheater: A bit of both I think.

Q151 Lynne Jones: Okay and you referred to—  
Professor Wheater: Just to follow that up there are some substantial resources available within the EU for flood research and UK organisations are active in that area.

Q152 Lynne Jones: Tapping into it?  
Professor Wheater: And the research is linked, but in fact the programme that is put together through the EPSRC was originally funded for £5.6 million and we expect that there will be a £7 million extension, and that is quite a large funding in comparison with the European Union resource.

Q153 Lynne Jones: I get the impression that you are not concerned then about the integration of the programme? You referred to this new integration under the EPSRC, so you are not worried about any overlap or omissions? You think that that is now sorted?  
Professor Wheater: I think that having an integrated programme with a consortium of funders is a very important step and it is relatively unusual within the UK research funding arena. That does not mean to say that there is not a lot of work to do and that all the work that needs to be done is being done to the level that one would like, because there are a lot of tasks and money has to be distributed.

Q154 Lynne Jones: And yet earlier I think you said that we were disbanding centres of expertise.
**Professor Penning-Rosswell:** That was Environment Agency centres, the national centres.

**Professor Wheater:** The Environment Agency at one point set up particular areas of expertise and then it changed its organisational structure. That is a separate point.

**Q155 Lynne Jones:** I am a bit confused as to whether we have now got a satisfactory structure or not.

**Professor Wheater:** Within the research community of universities and research institutions, both within the research council arena and outside, I think there is very good integration at a national level. There are a lot of joint programmes and increasingly there is a very good integration at a national level. There are those issues and are very keen to promote delivery of products that are useful.

**Q156 Lynne Jones:** And so is the problem then about conversion of the research findings into practice—going back to this business about disbanding of centres of expertise?

**Professor Wheater:** I did once sit on an Environment Agency R&D committee that looked at a long list of projects that they had funded and tried to work out how many had actually been successfully translated into practice, and it was a small number. That is very much an issue of concern to this flood risk management research consortium, which has end users who are really very keen to see products that are deliverable. There is generically a bit of a gap in that universities on the whole are funded to do research and graded through a research assessment exercise which is all to do with the quality of their published output, and what the UK actually needs is products that can be delivered into practice, and so there is a bit of a funding gap. I think that is increasingly being recognised and to some extent facilitated, but it is important to realise that there is a big step between producing research results and producing a tool that engineers can use in design, and that is a step which is not always easy to fund. However, I think Defra and the Agency are aware of those issues and are very keen to promote delivery of products that are useful.

**Q157 Lynne Jones:** Could I ask you how severe is the shortage of trained flood risk management specialists in this country?

**Professor Wheater:** I think it is very worrying. I can only speak from my own experience. I run a postgraduate training programme in this area and there is huge demand from industry for technically qualified, numerate graduates for consultants, for the Environment Agency and for research organisations, and yet we find it difficult to fill places on our Masters programme and we have research studentships for collaborative work with the Environment Agency currently unfilled because we do not have suitable candidates with the right qualities. When we come to staff research programmes for Defra and the Environment Agency, we need to appoint people with PhDs in relevant areas and we find none in the UK; we have to go to Greece and China and Italy and places like that, so my personal experience is that it is a big issue. It really relates to numeracy. If we go back 20 years then there was a stream of people coming through our programme from a range of backgrounds—engineering, the hard sciences and also geography. Nowadays people coming from the softer science background do not have the mathematical skills to cope with the methods that they need to use in practice, so there are a lot of people being produced who are effective managers but they cannot necessarily use the development tools and do the quantitative analysis to solve the problems.

**Q158 Lynne Jones:** Have you got any suggestions as to what could be done about that?

**Professor Wheater:** It really goes back to maths in schools.

**Q159 Lynne Jones:** Back to more people doing maths at school and wanting to go on and do maths and physical sciences at university?

**Professor Wheater:** Yes.

**Q160 Mr Drew:** If we can look at this issue of the maintenance of existing flood defences, if you look at some of the evidence that has come our way—which I presume we have published and so is in the public domain—there are a lot of people who feel very strongly about some of the maintenance gaps. We have had this popular debate, for example, should we be dredging the rivers? I am pretty sure that this is not helpful in terms of anything other than good maintenance, but it would not to my mind prevent flooding. I just wondered where both of you stand on this issue about the degree to which the Environment Agency, and indeed the water companies, have been negligent in some of the maintenance programmes that they have operated, and is this something that in a sense we should be really hot on in terms of our report?

**Professor Wheater:** I do not really have personal expertise to give you a comment on that. I think there are people who could help you, so there is Professor Jim Hall from Newcastle who has done a lot of work in this area, and a team at Hydraulics...
Research at Wallingford, including Dr Paul Sayers, but I have just not been involved with the maintenance side of the business.

Professor Penning-Rosswell: The same.

Chairman: It is no use asking these two!

Q161 Mr Drew: Could I have a quick rejoinder there. You have given us some pointers as to who we should go to, but looking at the more strategic direction, you said that you are not expert but, again, if it is a climate change denier, which I am not, I think I could come up with a pretty good set of opinions on how this could all be sorted out in due course of time, we do not need all this big map stuff, we can deal with it on a pretty micro level, and just a few thousand years will make all the difference. I see Professor Penning-Rosswell has roused!

Professor Penning-Rosswell: I think you have to remember that in the 2007 events very few flood defences failed. They may have been overtopped—

Q162 Mr Drew: --- Hilary Benn always reminded us on that.

Professor Penning-Rosswell: I think that is a very important consideration and poor maintenance, if it were really poor, would show itself as failure; it would not show itself as over-topping because every flood defence has a finite standard and may be overtopped, particularly when you get ten centimetres of rain in 24 hours. If you are to criticise maintenance you would have to show that there were widespread failures and I do not think you can demonstrate that.

Q163 Chairman: Do I assume that perhaps the probing of you gentlemen about changes in farming practice and flooding may also be slightly outwith your knowledge?

Professor Penning-Rosswell: No, he knows lots about that!

Chairman: Roger, you are on!

Q164 Mr Williams: In terms of land management there are two ways you could approach it: change your land management to prevent run-off; or dedicate land for taking water that could flood other areas. Are both those approaches being investigated?

Professor Wheater: Yes, I think there are some important issues in the area of agricultural land management and river flood plain management, and technically they are quite challenging. I think it is clear that there has been a very large amount of intensification in the rural agricultural sector and there is quite a lot of anecdotal evidence that that has given rise to increases in local flooding, but there is no evidence of what the impacts might be at the larger scale of the Severn River, for example. At the moment I lead a research programme which is working with a consortium of farmers in Wales to consider impacts of intensification on the way in which run-off is produced and what that might do for flood risk. Just to give you some examples, over the period from the 1970s to the 1990s the number of grazing animals—sheep mostly—went up by a factor of six and in some cases the weight doubled, and so the farmers themselves were very concerned about issues of compaction and the fact that they perceived that run-off was occurring more rapidly and streams were having more flashy response and a higher flood response. Interestingly what the farmers have been doing is to reinstate some of the features they were paid to take out—and that is things like hedges and shelter belts—and what has been observed as a result of that is a significant improvement in the structure of the soil and hence its ability to absorb water. We are carrying out trials at the moment with different land use, different grazing densities, different land use in terms of tree planting, and those are fairly long term, and we have also developed models which have been built around the data to come up with predictions of effects, and you can clearly see that if you put tree shelter belts, improve the soil structure and put them in the right places, you can improve flood risk. The level of improvement is still very much open to debate, particularly as you move up scale, and of course the effects are likely to be much more evident for the frequent events than for the really big events because with the really big event everything that is going to run off is going to run off, and what you do on the land has less effect, but our work indicates that you might reduce flood risk by the order of a few tens of per cent. There is a certain amount of work that has been done at the larger catchment scale, up to 100 square km, simply by simulation modelling and the conclusions there are that under an extreme range of different land uses you might see a ten or 20 per cent change in flood risk. For the rarer flood events—50 or 100 years events—it might be a three to ten per cent effect. That is in terms of run-off production. I think there is certainly scope for mitigating flood risk by appropriate changes to agricultural practice, and those are the sorts of changes that are consistent with what you would need to help the problem of nutrients and pollution from fertilisers and so on. Thus there is a need for an integration of land management and water management; I think that is clear. The problem of transmission is very interesting because clearly the history has been that flood plains have been progressively disconnected from the rivers for urban protection, and also to increase agricultural productivity, and there is a lot of interest in reconnecting them and using them for retarding the floods and stalling the floods. There are some examples of flood mitigation schemes which use constructed flood plain storage, but there is a lot of interest, I think, within the agricultural sector in the return of some farmland to increasingly active use for flood mitigation, and that can have quite a significant and beneficial effect.

Q165 Chairman: I just want to conclude to go back Professor Penning-Rosswell to some critique you were making about the scoring system for prioritising future flood expenditure. The Chartered Institution of Water and Environmental Management have advised the Committee that this activity should be reviewed because they say that the rules of the system “allow for almost no consideration of scheme components that do not
Ev 52  Environment, Food and Rural Affairs Committee: Evidence

7 November 2007  Professor Edmund Penning-Rowsell and Professor Howard Wheater

directly contribute to flood alleviation”, and they would like to see what they describe as a more holistic approach to be adopted in terms of the scheme justification criteria.13 Taking that into account, are we too narrow and too restrictive and, in contrast, are there any other types of flood prevention prioritisation processes that you have seen outwith of the United Kingdom that we ought to be aware of and ought to look at?

Professor Penning-Rowsell: The answer is we have been too narrow but there is a change being made now away from a narrow economic appraisal of flood and coastal erosion risk management investment towards a series of outcome measures which are broader in scope, and Defra has been consulting and the Agency has been consulting over the last, I guess, 12 months on that new system, which would move away from a simple economic analysis to one based on a number of metrics including social, environmental and economic considerations. In that respect, I think we probably are ahead of practice in many countries which are only just catching up with our rather narrow approach that we are now rejecting, if you see what I mean. So if you look at countries across Europe the investment criteria has become rather narrow in its focus on economic analysis whereas we are moving in the other direction. The effects of that other direction in the UK will not be felt for some time because of course the investment programme that the Environment Agency has stretches ahead for many, many years—several years anyway—so you will not see a change immediately, but the philosophy has been changing quite radically since Making Space for Water was introduced and Making Space for Water made it clear that a broadening of the appraisal criteria was needed and it set out some ideas which have now been taken forward by Defra.

Q166 Chairman: So effectively this broadening process will not have any impact until after the current Comprehensive Spending Review?

Professor Penning-Rowsell: I do not know what the timescale of the Comprehensive Spending Review is.

Q167 Chairman: Three years.

Professor Penning-Rowsell: Three years from now?

Q168 Chairman: Yes.

Professor Penning-Rowsell: I would say that the effect of the outcome measures will probably be felt towards the back end of that period but not before because otherwise you simply waste the effort that has been put into appraising the projects that already are in the queue and, as I said before, the queue is congested and therefore there are undoubtedly schemes that should be done. Whether a slightly different and broader appraisal system would bring other schemes in and throw some out, I am not very clear about, but a change is afoot, and I think a change for the good.

Chairman: That is a good note on which to end.

Lynne Jones: Could I ask one last question?

Chairman: As long as it is a tiny postscript.

Q169 Lynne Jones: We were discussing earlier the inadequacy of investment in this area. Is there any scope for UK plc, as it were, to benefit in this area—you said we were ahead of game—in terms of benefits to the economy for having this expertise and offering it in other countries?

Professor Wheater: I think that we have a very strong engineering sector in the UK with a huge international portfolio and these techniques and the skills will be marketable and used worldwide, particularly I think within Europe under the new Floods Directive that will encourage much more of an integrated assessment, and I think there are opportunities there.

Professor Wheater: I think that we have a very strong engineering sector in the UK with a huge international portfolio and these techniques and the skills will be marketable and used worldwide, particularly I think within Europe under the new Floods Directive that will encourage much more of an integrated assessment, and I think there are opportunities there.

Chairman: Jolly good. Thank you both very much indeed both for your oral evidence and, as I said at the outset, for your written evidence. There may be one or two points upon which we would like to quiz you further and I hope you will not mind if we decide in the future to write to you. Thank you very much indeed for giving us the benefit of your knowledge and perspective; it has been genuinely very useful.

13 Ev 481, para 23
Is it easier to justify flood defence protection for well-off households and urban areas than poor or rural areas?

Decisions about flood risk management measures (including flood defence) are guided by a benefit cost analysis. Such analyses have also dominated the Priority Score system that Defra has had in place to “sieve” out those schemes that are to be funded. There is evidence that, within the “block grant” system of funding to the Environment Agency from Defra, the Agency’s funding decisions remain dominated by the benefit costs tests.

**Well-off Households Rather than Poor Households**

The benefits of flood defence are the flood losses thereby avoided. The higher these potential losses, the more worthwhile will be investment to reduce these losses.

Thus, for one residential property defended, it will be worthwhile to spend more on flood defence if that property is large and full of valuable contents. In these circumstances it will indeed be “easier to justify flood defence protection for well-off households”.

But flood defence projects traditionally do not protect just one property; indeed there are substantial economies of scale in flood defence works such as embankments, so that most (if not all) state funded flood defence projects protect land on which a number of properties are built. And the larger the area of land (other things being equal) the more cost-effective will be most flood defence schemes (because cost is related, very approximately, to the length of the perimeter of the area affected).

Poor households tend to live in small houses packed closely together. Thus for any given area protected (and any given length of perimeter embanked) there will be more poor households protected.

Taking examples from the Thames catchment, in affluent Maidenhead there might be just five households per hectare of land protected, living in large detached houses, whereas in one hectare on the Osney Island area of Oxford there might be 100 households occupying small terraced dwellings. The potential flood damage to one house in Maidenhead is not 20 times the flood damage in a house in Osney Island, so in that case it is not “easier to justify flood defence protection for well-off households (rather) than poor . . . areas”.

Indeed, other things being equal, the reverse is the case.

So, it all depends on the density and type of each development, rather than just the affluence or poverty of the households.

**Urban Areas or Rural Areas**

By definition, rural areas are less densely developed than urban areas. Therefore flood defences there are less easy to justify, in that fewer households and businesses are likely to be defended per unit area of land or per unit length of embankment or river works.

But there may be other factors that influence decisions. Rural flood defences may be cheaper than urban flood defences. This can be because rural areas can accommodate earth embankments whereas urban areas may have to have concrete walls, owing to the lack of space for building the flood defence works. The one may be cheaper than the other. And land purchase costs for these works may be lower in rural areas than in urban locations although, since land purchase involves a transfer between buyer and seller, there is no economic gain/loss to the nation (which is what benefit-cost analysis counts).

In general, however, it is easier to justify flood defence protection for urban areas than for rural areas.

*Edmund Penning-Rowsell*
Flood Hazard Research Centre
Middlesex University

*December 2007*
Wednesday 14 November 2007

Members present

Mr Michael Jack, in the Chair

Mr David Drew
Patrick Hall
Lynne Jones
David Lepper

Dr Gavin Strang
Paddy Tipping
Mr Roger Williams

Memorandum submitted by Hull City Council (FL 124)

HULL’S RECENT FLOOD EXPERIENCE

Executive Summary

1. On 25 June 2007, the city of Hull experienced its most devastating flood in living memory. The scale of destruction to property was much greater than that in other storm affected parts of the country—with over 7,000 houses, over 90 local schools, and dozens of businesses being flooded.

2. Hull’s effective flood defences are designed to protect from river or tidal flooding in the Humber Estuary. However, the widespread flooding across the city was caused by Hull’s pumped drainage and sewerage system being overwhelmed by the exceptional level of rainwater which fell on the city on 25 June.

3. Hull’s unique topography makes it particularly vulnerable to pluvial flooding, for which there is no established UK warning system. However, many of the lessons learned from Hull’s experience will be applicable in other UK towns and cities.

4. In the wake of the flood, Hull City Council set up an Independent Review Body, to establish the causes of the flooding and to make recommendations on how the city’s flood defences and response arrangements could be improved in future. The Council also established its own, internal review of its flood preparedness, and co-ordinated joint aspects of flood responses by the local councils in the Hull and Humber City Region.

5. A number of recommendations for action on future flood improvements have resulted from these reviews. Some of these are for the City Council and its local partner agencies, some are for action by other key players such as the Environment Agency and Yorkshire Water, and some will require action at national level by the Government.

6. Although significant longer term investment will be needed to improve Hull’s flood defences, particularly in response to the effects of climate change, some practical measures can be taken quickly. A creative and collaborative approach, on a multi-agency basis, should ensure that the future impact of such flooding is much reduced and that the city’s recovery is swifter and less costly.

Hull’s Recent Flood Experience—Issues Requiring Action

1. The unique location of Hull

Its low elevation and reliance upon pumped drainage place Hull in a unique position compared to other UK cities. Whilst all major UK conurbations can be liable to flooding caused by heavy rainfall, Hull is especially vulnerable, as it has limited natural methods of drainage. This increases its vulnerability to flood damage should the pumps malfunction or fail. Hull is also vulnerable to tidal flooding, but has significant and effective flood protection defences. However, these are designed to protect from flooding from the River Hull or from tidal flooding breaching estuary defences.

2. Hull’s drainage system

2.1 The overall management of Hull’s drainage system is confusing. It involves a multi agency inter-relationship of separate, but complementary, responsibilities. The Environment Agency is responsible for all open bodies of water—watercourses. They are also responsible for river and tidal flood defence. Where watercourses are culverted or flow underground they are largely the responsibility of Yorkshire Water, who are also responsible for the sewers. Feeding into the sewers at street level are a system of gullies. They are the responsibility of the city council (when on a public road or council land) or the landowner/homeowner (when on private land).

2.2 In short, no single agency has accepted responsibility for any elements outside their own terms of reference nor have they historically allowed others to influence their own obligations. There has been inadequate consultation, co-operation and unity between the agencies, and this must end quickly.
3. **Rainfall in June 2007**

3.1 June 2007 was the wettest month recorded in Yorkshire since 1882. The records for Hull show that over 250mm fell in June, with over 70 mm falling on 15 June and over 110 mm on 25 June.

3.2 The floods on 25 June were caused by Hull’s pumped drainage and sewerage system being overwhelmed by the volume of rainwater. This led to backing up of water along the sewer and drainage network leading to widespread flooding across Hull. The drainage system in Hull is complex and several of Hull’s open watercourses flow directly into the main sewer system. In Hull itself, there were no reports of blocked watercourses and sewers. It appears that, as the sewers were full to capacity, the watercourses had no-where to drain to.

3.3 Despite the devastation, there are many positives to take from the floods. Given the magnitude of the storm (greater that 1 in 150 years) it is very encouraging that key pieces of important civil infrastructure did not fail. Hospitals were open, electricity supplies were (largely) uninterrupted, and drinking water supplies also functioned throughout. Telephone and other utilities also worked throughout the storm. Sadly, there was one fatality, but it is to the great credit of Humberside Fire and Rescue, as well as Hull City Council operatives and other agencies, that there were no other casualties.

4. **The extent of flooding**

4.1 The number of houses located in roads affected by flooding were initially estimated at about 16,000. Subsequently, it was established that over 7,000 properties experienced water ingress into the home, a scale of property destruction for greater than in other storm damaged areas of the country. Also, there were large areas of standing water in many other parts of the city, especially in open or park land with local schools being disproportionately affected.

4.2 Almost every one of the 99 educational establishments in the City were affected in different degrees by flooding, with only seven schools not being closed temporarily.

4.3 Parks and school playing fields could, in future, provide temporary storage areas into which flood water could be pumped to avoid the drainage system overflowing. But, this will require a new design model for school buildings (at greater cost) to ensure that they are flood proof.

5. **Flood warning**

5.1 The flood warning system in Hull and across the UK is only designed to deal with the threat of coastal, estuarine or river flooding. There is no provision for warning from events such as the 25th that were a result of pluvial flooding—that caused by heavy rainfall. No agency seems to have responsibility to provide warning from pluvial flooding. A warning system for flash floods should be developed. This will require policy change at a national level.

5.2 There is a lack of understanding within other agencies of the differences between the EA’s different levels of warning (ie Flood Watch, Flood Warning and Severe Flood Warning). There was Severe Flood Warning for Hull on this occasion, perhaps reflecting the capacity of the watercourses on this occasion to cope. However, this highlights the problem which appears to be a national one, that no one agency has responsibility for issuing warnings about rainfall flooding.

5.3 Furthermore, it is not clear what warnings were actually given to members of the public. It appears that the EA’s flood warning system, which is an automated telephone system, does not operate in Hull and is only designed to cover the area in the immediate vicinity of a river. A pre-warning by the EA would allow the earlier initiation of emergency procedures.

5.4 Surprisingly, an immediate requirement raised by the flooding was the absence of critical baseline information on the ownership of current watercourses, whether or not they are pumped, and their maintenance regimes. The Environment Agency, Yorkshire Water, East Riding of Yorkshire Council and Hull City Council must provide and share data, and baseline information on the ownership of current watercourses as a matter of urgency. Responsibilities should be reviewed and, where possible, rationalised as early as practical thereafter.
5.5 In addition a major public communication campaign around practical storm awareness and preparedness issues should be developed and the different agencies’ roles and responsibilities should be made clearer to the public. A joint agency public communication strategy needs to be developed, and regular radio bulletins issued during the course of any future events. Statements should come direct from Silver/Gold command. There is a need also to educate, and incentivise action by, the public on their obligations as homeowners to take reasonable measures to flood-proof their homes.

6. Role of the Fire and Rescue Service

6.1 In the event of severe weather conditions, the priorities of the Humberside Fire and Rescue Service are:
   - Fire and rescue work—fire risks
   - Flooding involving life—this includes: children, disabled and the elderly
   - Flooding that involves at risk properties—hospital, telephone exchanges, power and substations etc.
   - Flooding in other properties
   - General flooding assistance

6.2 Co-ordinating and providing large scale pumping operations is not a Humberside Fire and Rescue Service statutory priority. The HFRS pumping capability is an emergency resource beyond the pumping and water discharge operations for foul and surface water operated by Yorkshire Water and the Environment Agency. Fire and Rescue Service emergency pumping prevented some flooding and removed water from flooded areas. There is not sufficient clarity about the role of HFRS and the expectations of HFRS from Government, public services and the public in such emergencies may be unreasonable. In general, it is questionable whether HFRS is sufficiently resourced to cope with such responsibilities.

6.3 On 25 June calls for assistance or advice from HFRS quickly reached a peak of around 100 calls an hour and were sustained for the next fifteen hours. Difficulties were encountered by Kingston Communications and BT in connecting callers to HFRS requiring queuing, call holding and reconnection attempts, with more than a third of calls being unanswered.

6.4 Arrangements to divert calls to less busy Fire and Rescue Services were made, with 904 further notifications received by HFRS by fax and email. HFRS administrative staff also handled 255 calls for assistance. HFRS received a total of 3,054 calls in 18 hours. Many calls did not warrant the emergency services, for example being concerned with the provision of sand bags. An even higher volume of calls from the public also temporarily overwhelmed the City Council’s Call Centre, and threatened a crash of the City’s telecommunication network, the capacity and robustness of which is limited in such emergencies.

6.5 A better appreciation of the priorities and responsibilities of HFRS could reduce inappropriate calls. Also, the public wrongly believe that HFRS will give priority to protecting private property in such emergencies. It was not clear whether the redirection of calls to other Fire and Rescue Services has greater potential to provide reassurance to callers and prioritise action or whether the Fire and Rescue Service is resourced to satisfactorily assess the volume of information in emergencies of this scale so as to prioritise the response.

6.6 There should be better co-ordination of emergency responses to the public, with a single point of contact for flood emergencies.

7. Declaring a state of emergency

7.1 There is some confusion between agencies about whose responsibility it is to initiate a state of emergency and call Silver or Gold Command. The decision of the Chief Constable of Humberside Police to call a Silver Command only may have restricted the strategic co-ordination of the emergency response locally, and had the effect, unintentionally, of signalling to Government that Hull did not appear to be experiencing a major disaster.

7.2 Generally, Silver Command coped well with the immediate emergency, however there are important lessons to be learned. Surprisingly there was a lack of local knowledge of Hull City from Silver Command hierarchy as well as a need for a list of key points of civil infrastructure. Silver Command is reactive and (for example) will only be alerted once threats to key items of infrastructure have occurred instead of anticipating dangers. Communication to the public from Silver Command needs to be better managed, formalised and more frequent. Local media are vital for disseminating information and direct and formal links should be made for future situations.
8. Involving the Army

There was some confusion on this and on the question of any costs involved. Without authorisation at Chief Executive level (ie Gold Command) the Army will change for their services. The fact that Hull stayed at Silver Command could have prevented the deployment of the Army if they were required. All concerned need to have better awareness of how and when the Army can be called in and take this factor into account when deciding whether to move from Silver to Gold Command.

9. Emergency Plans

9.1 A list of strategic installations, in particular key pumping locations, to be protected was not produced until the worst of the flooding had occurred. This should be part of Emergency Plans and of any future planning exercises. This should also include the water company’s pumping stations and power supplies.

9.2 Very few of the participants in this actual emergency had attended earlier emergency planning training. This calls into question the value of doing such an exercise every three years, as recommended by DEFRA. Consideration should be given to increasing the frequency of these exercises. Inevitably, there will be institutional turnover, and staff training programmes should reflect the continuing need to cover flood response situations.

10. Drainage and sewerage in Hull

10.1 It is apparent that Hull’s drainage and sewerage system was a main factor in 25 June floods. Given Hull’s reliance on the capacity and resilience of the Yorkshire Water pumping system, a key first step should be a major hydraulic study to model flows in the city as a whole and to better understand the impact on systems of climate change which may result in an increased frequency of major rainfall events and rising sea and river levels. This may then lead to recommendations to upgrade the system, or re-model the existing configuration. The study should include projections of climate change in accordance with the latest Ofwat recommendation.

10.2 Key factors may have exacerbated the flooding. As Hull’s drainage system is entirely pumped, Hull is reliant upon these pumps working and being designed to the correct capacity. We have significant concerns as to whether the pumping system is correctly designed to cover a 1 in 30 year storm event. Humbercare, or parts of the Humbercare system, may not have been designed to afford protection from a 1 in 30 year storm prior to 2005. Furthermore, it is a concern that Yorkshire Water appear to have a lack of monitoring data on sewer and pump discharges that make it very hard to assess how well the sewer and pump system was operating. Importantly, the availability of additional pumping would also provide backup, or contingency, should any of the existing pumps fail.

10.3 This would necessarily involve the city making choices on what level of risk and protection is required, taking into account the likely impact on customers’ bills of any major new investment in the sewerage and pumping network, and that even the best infrastructure in the world would be most likely to over-topped and over-whelmed by 1 in 150 year rainfall events.

10.4 It is difficult to decide what level of protection is appropriate. However given the occurrence of two greater than 1 in 30 events within ten days in June 2007, we seriously question whether a 1 in 30 level of protection is adequate. We believe that Hull is in a unique position and its reliance on pumping drainage mean that a greater level of protection and contingency (e.g backup pumping) should be incorporated.

10.5 At a national level, the level of protection for drainage systems is set at 1 in 30 years by an industry standard. There is no indication of whether this is regularly updated to incorporate new large storm events that will increase the size of a calculated 1 in 30 year storm, nor whether present day drainage systems are regularly re-checked and re-evaluated to ensure they meet new levels. Furthermore, there appears to be no accommodation for climate change in these design criteria. Nationally, we suggest that for urban drainage the level of 1 in 30 years should be reviewed as a minimum, and that some additional capacity should be factored in for possible climate change.

11. Costs—Financial Implications for the Council

11.1 The flooding of 25 June has had a significant impact on Council services and as a result considerable costs have been incurred to date with further expenditure inevitable as the full implications become clear.

11.2 An initial estimate of the impact of the floods (in terms of additional costs incurred/income lost) on service revenue has been amended over the course of recent weeks as updated information has been received. In summary terms, the current situation is as follows:
Ev 58  Environment, Food and Rural Affairs Committee: Evidence

<table>
<thead>
<tr>
<th>Response and recovery costs</th>
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<tbody>
<tr>
<td>£ million</td>
</tr>
<tr>
<td>(a)</td>
</tr>
<tr>
<td>Street Scene</td>
</tr>
<tr>
<td>— Gully clearing, sandbags, tree cutting, emergency road repairs, waste collection and disposal</td>
</tr>
<tr>
<td>Housing</td>
</tr>
<tr>
<td>— Contractor support on cleaning, emergency bed and breakfast</td>
</tr>
<tr>
<td>Community Care</td>
</tr>
<tr>
<td>— Residential and home care support for vulnerable adults</td>
</tr>
<tr>
<td>Other services</td>
</tr>
<tr>
<td>— Overtime, other relief activity</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>(b) Lost revenue income, e.g. Leisure Centre trading</td>
</tr>
<tr>
<td>(c) Contents replacement</td>
</tr>
<tr>
<td>Schools and other services</td>
</tr>
</tbody>
</table>

11.3 A part of the response and recovery costs may be reclaimable through the Bellwin emergency scheme, though there is a threshold of Council expenditure of £690k before costs can be reclaimed. The Bellwin rules specifically exclude claims for lost revenue income so these will need to be borne by the Council. However, there is uncertainty over what the Bellwin scheme will cover and this, coupled with the need to reclaim such Council expenditure retrospectively, could hamper decisions on future relief efforts in the event of a major civil emergency. The Government should consider an alternative funding approach, such as establishing a National Disaster Relief Fund, which could be drawn on immediately by local councils and other agencies in a crisis.

11.4 The current assessment of the financial impact of the emergency on the Council’s asset stock may be summarised as follows:

<table>
<thead>
<tr>
<th>Estimated Repair Costs</th>
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<tbody>
<tr>
<td>£ million</td>
</tr>
<tr>
<td>Schools</td>
</tr>
<tr>
<td>Housing Stock</td>
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<tr>
<td>Highways</td>
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<tr>
<td>Other Corporate Assets</td>
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<tr>
<td>Total</td>
</tr>
</tbody>
</table>

11.5 Note 1:

The figure for schools reflects the simple like for like reinstatement cost (which will be covered by insurance for some sites) but does not include the cost of additional work to enable replaced or existing schools to be made more flood resistant, which is likely to be significant.

11.6 Note 2:

The current estimate for Highway repair of £1.2 million is that originally forecast at the time of the floods. The nature of the damage for this infrastructure required a more in depth review of the longer term damage to roads and footpaths. A more accurate cost of repairs is still awaited, and this is likely to be significantly higher.

11.7 Note 3:

Of the other corporate assets figure, the main items include Woodford Leisure Centre (£1 million), the Education Centre (£1.0 million), Catherine Ellis Resource Centre (£0.6 million) and the Holden Centre (£0.9 million).

11.8 Information on the precise extent of the damage to many buildings is still being compiled, and these figures will again be subject to change as that process progresses.
11.9 There is, as yet, no clarity on the extent of any Government assistance in meeting these major unplanned costs. Without Government funding support, there is concern that the Council will need to utilise capital resources that have been earmarked for investment in the regeneration of the City’s physical infrastructure, thus undermining momentum in the growth of the local economy.

11.10 The flood has inevitably had a significant effect on some of the measures that are used to judge how successfully the Council is serving its residents, particularly in our Community Care, Housing, Revenues & Benefits and Children & Young People’s services. Some of these may be recoverable through the rest of the year; however, the LAA targets for decent homes, for example, will be very hard to recover because of the 2000 Council houses that were damaged by flood water; similarly, the SAP energy efficiency standard for housing may not achieve its 2007–08 target, putting at risk the Government reward grant to the Council for meeting stretch targets in 2009–10. The Government’s audit and inspection regime needs to take proper account of the impact of this emergency on the Council.

Hull City Council
September 2007

Memorandum submitted by Sheffield City Council (FL 96)

RESPONSE TO FLOODING—JUNE 2007

EXECUTIVE SUMMARY

1. The rainfall experienced in Sheffield over 24–25th June came on top of an already saturated water table and Met Office records show that between 22.00 hours on 24th June and 22.00 Monday 25th June 88 mm of rain fell in the Sheffield catchment. The total monthly average for June is 67 mm. This, added to the already saturated ground conditions, created an unprecedented level of water coming off the high ground and into city.

2. The major distinguishing feature of the flooding that affected Sheffield was the sheer volume, force and speed of water coming down the fluvial river system in a very short period of time.

3. During the floods the Council worked in partnership with a wide range of other authorities to co-ordinate the immediate response and the ongoing recovery process.

4. Flooding in Sheffield has previously been seen as low risk. Following the June 2007 floods a number of initial issues have been raised and while the experience in Sheffield highlights some issues that are specific to our own particular location the learning points may also assist other areas in planning and preparation for flooding.

5. KEY ISSUES:

5.1 Need for accurate, good quality, timely warnings (para 4.2)
5.2 Allocation of responsibility for rainfall flash flooding (para 4.2)
5.4 The need for flood defence and prevention work (para 4.3)
5.5 Managing public Information and expectations and educating the public (see para 4.8)
5.6 Resilience of the critical infrastructure (para 4.5)
5.7 Improved involvement of Utilities in future emergency planning (para 4.5).
5.8 Confusion caused by split in Utilities ownership and responsibilities (see para 4.5)
5.9 Clarification on responsibility for Dams in recreational use (para 4.5)
5.10 Better access to Dam/Reservoir Flood Inundation plans and clarification on responsibility for dams in recreational use (para 4.5)
5.11 Use of Assistance Centres should be recommended as good practice (para 4.8)
5.12 Emphasis on benefits of training and exercises

1. BACKGROUND

Sheffield is built on “7 hills”, intersected by valleys with five rivers converging at or before reaching the City Centre. The rivers drain an extensive upland catchment with moorland rising to 500 metres within the city boundary.

1.1 Water from all five rivers is then carried by the River Don from the City Centre through the Lower Don Valley to Meadowhall, near the Rotherham boundary, where it is joined by a further tributary (Blackburn Brook, also subject to flood risk). When the surrounding moors become saturated, water passes quickly through to the city and the overall gradients mean that it is not retained in the same way as in more low-lying areas such as Rotherham, Doncaster and Hull.
1.2 During 14–16th June Sheffield experienced rainfall totalling 136 mm. This caused some localised flooding but was managed effectively within our normal plans and procedures.

1.3 The rainfall experienced over 24–25th June came on top of an already saturated water table and Met Office records show that between 22.00 hours on 24th June and 22.00 Monday 25th June 88 mm of rain fell in the Sheffield catchment. The monthly average total for June is 67 mm.

2. Impact

2.1. The major distinguishing feature of the flooding that affected Sheffield was the sheer volume, force and speed of water coming down the fluvial river system in a very short period of time and this resulted in two fatalities.

2.2 The effect of the flooding on the City of Sheffield was devastating with the City divided in half by floodwater, along a corridor some 23 km in length, effectively isolating half of the city from access to the main accident and emergency centre. Numerous roads were badly damaged, closed or inaccessible.

2.3 RAF Sea King helicopters were used for rooftop rescues with other people being rescued by boat and in some cases by a tractor.

2.4 A large number of people were left stranded and unable to get home; others were evacuated from flooded homes. A number of reception centres were established these included pre-determined and ad hoc centres to accommodate over 1400 people.

2.5 The City’s railway station was closed and passengers were left stranded, needing accommodation and assistance the following day with onward travel arrangements.

2.6 Power cuts averted the north of the city with 48,000 homes without power.

2.7 The M1 was closed between Junctions 32 and 35 due to fears that Ulley Dam would burst with the potential for 2 million cubic metres of water cascading across the motorway and damaging the Catcliffe substation with dire predictions of the imminent loss of most of Sheffield’s power supply for a considerable period of time.

3. Response

3.1 Sheffield City Council (SCC) operated from the Council’s Emergency Control Centre at Silver Command level and the Emergency Plan was activated. The Council has a very clear plan for responding to emergencies, which is supported by training and exercises at all levels.

3.2 The initial Council response was focused on:
— Minimising the impact of the flooding
— Dealing with the immediate crisis
— Managing the recovery of the city back to normality

3.3 Our response included:
— Full participation in all multi agency structures
— Mobilisation of full emergency plan
— Deployment of strategic and tactical resources city-wide to prevent harm to the public and to mitigate damage to property and to care for those in need
— Liaison with Government, Regional and National
— Setting up a network of reception centres
— Liaised with other local authorities on mutual aid basis
— Direct communications with press and public
— Activation of Assistance Centres in accordance with the plan

3.4 Resilience to continue to deal with the emergency and the need to manage the transition from immediate response to recovery was recognised at an early stage. The following action was taken to ensure this:
— Key personnel rested during night of 25th–26th so they could take over on 26th
— Handover briefing/debriefing meeting at 6.00 am on 26th June chaired by CEX
— Recovery phase structures put in place on Tuesday 26th to operate parallel with the incident management structure.
— Recovery objectives set and continuously reviewed
— Rota, welfare and support arrangements in place to sustain recovery effort
— Key partners actively involved in response and recovery with partner resources secured.
3.5 Resources were just sufficient, but stretched and consideration should now be given to looking at providing extra resources at alternative strategic locations.

3.6 Offers of assistance came from many organisations, local authorities, voluntary organisations and members of the public. While mutual aid arrangements are in place locally these should also be formalised at a wider regional and national level.

3.7 The flooding resulted in significant financial cost to the City Council. The recovery process is lengthy and carries significant longer-term risk for the Council, both financial and reputational.

4. LESSONS FOR THE FUTURE

4.1 Command and Control

SCC fully participated in all multi-agency structures and attended Gold Command within 40 minutes of being activated with an officer who has previous experience of operating at Gold Command. The Gold Command incident structure remained in place until 1st July 2007, making it, at the time, the longest-running Gold Command in the UK.

4.1.1 The Council’s Silver Control was activated in the Emergency Control Room in the Town Hall.

4.1.2 South Yorkshire Police activated multi agency Silver Control, co-located in the SCC Emergency Control Room. A major incident was declared at 14.00 hours.

4.1.3 A full multi-agency silver control ran 24 hours a day from Monday 25th until Saturday 30th June and then operated on reduced hours over the weekend to deal with predicted severe weather with potential for further flooding.

4.1.4 The importance of training and exercises should not be underestimated and it was evident during the floods that people who had attended training and exercises, particularly Exercise Loxley in December 2006, were much better prepared for and aware of the role in the response and recovery.

4.1.5 Issues Raised

— Location of Gold and Silver controls need to be reassessed
— Representation from utility companies needs to be timely and at an appropriate level
— Split in utility responsibilities led to confusion and delay
— Importance of attending, training and exercises for all levels of command and control should be emphasised

4.2 Warnings—Met Office and Environment Agency

4.2.1 Although Met Office and Environment Agency (EA) do liaise, more account should be taken of previous weather impact.

4.2.2 Good quality, accurate and timely information is vital.

4.2.3 A Severe Flood Warning was not given for Central Sheffield (Kelham Island) until 16.28 hours on the 25th June (water level was already up to windscreens on vehicles).

4.2.4 In Sheffield the differentiation between Warning and Severe Warning becomes more difficult due to the relatively steep gradient feeding surface water into rivers.

4.2.5 Warnings need to be easily understood and perhaps converted into something people understand for example flooding likely to extend to x area or y height up key buildings and walls.

4.2.6 Automated Verbal Warnings on telephones are available from EA but there has been limited take up (only 18% of homes and businesses have registered). Registration is voluntary and could perhaps be compulsory with an opt out clause available. Since flooding there has still been no significant take up.

4.2.7 There is no warning system for rainfall flash flooding.

4.2.8 The impact on people who have been flooded is just as devastating whether pluvial or fluvial. Homes or businesses don’t really care which type of flood water it is; whichever type the impact for them is just the same.

4.2.9 Issues Raised

— Need for accurate and timely information
— Consistency between the warnings issued from Met Office and Environment Agency.
— Allocation of responsibility for flash flooding.
— Need for identification of trigger points for activation and initiation of plans and command structures
— Programme of information to the public and businesses on weather warnings
— More co-operation between agencies eg EA, Yorkshire Water etc
— Locally based telemetry to provide better focussed information
— EA to understand their role in the warning and informing process in relation to Cat 1 and Cat 2 responders.

4.3 Flood Prevention

4.3.1 Discussions with Environment Agency are ongoing. EA are working on a Sheffield Catchment Flood Management Plan. This was originally scheduled for completion in December 2008, but is now delayed and it will be Spring 2009 before all options are considered. It is unlikely that any major EA scheme for Sheffield would commence for at least 4 years.

4.3.2 Environment Agency Drop in Advice Sessions have been arranged in four locations throughout the affected areas of the City.

4.3.3 SCC are holding discussions to ensure that links with other agencies are in place in advance of remedial highway repair work to ensure any work is co-ordinated and not piece-meal.

4.3.4 Work is currently being undertaken to calculate the time of water travel in the River Don to assist in planning flood management.

4.3.6 Issues Raised

— Time of water travel through river catchments
— Identification and assessment of Flood Management systems
— Need for better consultation with affected areas

4.4 Community Impact

4.4.1 1273 homes were affected by flooding, 200 people were evacuated from Winn Gardens. SCC staff visited all affected homes and financial support packages organised.

4.4.2 Over 1400 people stayed in a number of reception centres set up throughout the city.

4.4.3 Power cuts affected 48,000 homes over a number of days and involved rota power cuts.

4.4.4 SCC provided support to make property habitable and gave a £100 good landlord payment.

4.4.5 A recovery package of up to £1000 included:
— Making safe electricity
— Water and sewage checks
— Pumping of cellars
— Dry vac cleans
— Emergency heating/humidifiers
— Removal of contaminated items

4.4.6 Longer term issues are being co-ordinated through a care and support project being undertaken. This will look at immediate issues, signposting to professional help and community wellbeing and rebuilding.

4.4.7 Issues Raised

— Public perceived differences in financial support for insured and non-insured and services available to council tenants v private owner-occupiers
— Some areas felt isolated and neglected as the main focus of attention went to particular areas
— VIP visits need to focus on all areas—not just immediate high profile areas
— Floodwater—pluvial/fluvial—people flooded aren’t worried whether the water is from rivers or drains—the impact is still as devastating
— Clarify identification and availability of information on “vulnerable people”
— Importance of addressing the longer term impact and community
4.5 Critical Infrastructure

4.5.1 During the flooding Sheffield was faced with the prospect of the Ulley Dam in Rotherham bursting its bank. Had it breached, the impact would have been much wider than the flooding itself and would have impacted on other critical infrastructure such as water, sewerage, communications etc.

4.5.2 Other utility flood defences were also shown to be vulnerable e.g. Service pipes below bridges. The loss of Neepsend substation during the floods led to the power outages to around 48,000 homes in the city. Rota cuts introduced into the city on Wednesday am led to confusion over exactly which premises would be affected.

4.5.3 Difficulties with the split in utility providers and confusion over ownership of different parts of network and problems accessing contacts numbers for some Category 2 responders caused unnecessary confusion and delay.

4.5.4 Utilities relied on other emergency responders to supply resources (e.g. sandbags) to defend critical sites when all were fully stretched responding to wide range of flood related emergencies.

4.5.6 Issues Raised

— Utilities should be engaging with partner organisations at local level.
— Critical infrastructure should have appropriate defences.
— Critical links between the different providers should be assessed.
— Clarity on responsibility for dam and reservoir overtopping plans—who has the statutory duty to warn and inform?
— Clarification on responsibility for dams in recreational use.
— The split in utility providers and ownership of different parts of network leads to confusion over responsibility and uncoordinated decision making.

4.6 Highways Infrastructure

4.6.1 The sheer speed and force of the floodwater caused major damage to the city’s highways and rural road network.

4.6.2 Initial work included the clean up and disposal of debris from roads, bridges, culverts and highway drainage systems, removal of abandoned vehicles from roads and rivers, providing sandbags, temporary traffic management, removing major blockages in rivers.

4.6.3 Work has now been undertaken to make safe and restore the general highway system, repairs to carriage ways, footpaths, street lighting, traffic signals, signs, retaining walls, bridge parapets etc.

4.6.4 Other work is still outstanding. Two of the main routes from the North into the city the A61 and A6102 remain badly affected.

4.6.6 Issues Raised

— The need for liaison with EA and Utilities to ensure co-ordinated approach
— Impact on work programmes and the knock on effect on areas of the city’s performance over the next 12 months
— Problems identifying the location of major services under bridges
— Ensuring Health and Safety Issues are complied with for people working in exceptional conditions eg Working in Water.

4.7 Business

4.7.1 There has been significant impact on many businesses in the city as the flooding affected the city’s main industrial area. Over 1000 business were affect amongst which are a number of large business and major employers directly and indirectly.

4.7.2 There is likely to be a significant long-term effect on business in the city.

4.7.3 The Sheffield Recovery Group immediately established a business helpline in conjunction with the Assistance Centre and appointed a business champion to lead on business related issues.

4.7.4 Meadowhall closed for first time in its history (except for Christmas and Easter).
4.7.5 Issues Raised

- Impact of redundancies—direct and indirect
- Confidence and the need to counteract negative publicity
- Impact on local trades
- Impact on suppliers

4.8 Public Information

4.8.1 An Assistance Centre was set up at the Customer Service centre and also based locally in affected areas. This was publicised and face to face, phone and email information and advice was provided.

4.8.2 The 101 system proved invaluable as a first line information point.

4.8.3 There were 22,000 phone contracts between 25th June to 19th July.

4.8.4 The Assistance Centre continues to operate at reduced hours.

4.8.5 Questionnaires have been delivered to 2,378 affected addresses and published on the website. Results of the public consultation will be published on the website.

4.8.6 A regular information Flood Newsletter is being distributed to affected properties.

4.8.7 Public information is particularly important not least around raising awareness for the public to make their own preparations and not rely totally on the local authority to supply resources for everyone, for example sandbags. The public need also to be made aware of other options of flood protection for their properties.

4.8.8 Issues Raised

- Ensuring that the public are informed on how to:
  - prepare for flooding
  - understand their responsibilities
  - understand the roles of different agencies and what they can do
  - Managing public expectations
  - Assistance Centres and representation in the community should be followed as good practice
  - How do we get people to recognise they could be affected by flooding?

Sheffield City Council

September 2007

Witnesses: Mr Kim Ryley, Chief Executive and Professor Tom Coulthard, Leader of the Independent Review Body in Hull, Hull City Council; Sir Robert Kerslake, Chief Executive, Councillor Jan Wilson, Leader of the Council and Mr John Charlton, Director of Streetforce, Development, Environment and Leisure, Sheffield City Council, gave evidence.

Q170 Chairman: Good afternoon, ladies and gentlemen. Welcome to our further evidence session on flooding. For those of you who may miss the odd moment of action, this session is being televised. For those of you who missed part one, it was on the Parliament Channel, I think, last Saturday or Sunday, so there is always an opportunity to see how you perform as far as the Committee is concerned. Can I formally welcome representatives of Hull City Council in the shape of Mr Kim Ryley, their Chief Executive, and Professor Tom Coulthard, Lead of the Independent Review Body in Hull; and from Sheffield City Council, Sir Robert Kerslake, their Chief Executive, Councillor Jan Wilson, the Leader of the Council, and Mr John Charlton, the Director of Streetforce, Development, Environment and Leisure. You must be a very busy man, Mr Charlton, with quite the longest title we have had for a while. You are all very welcome indeed before the Committee. Naturally we were very sorry about what happened to both of your cities. In human terms they were tragic events and certainly caused an enormous impact on your respective cities but, nonetheless, we are delighted you have been able to come before us today. May I thank you also for the written evidence that you were able to give us, it was very helpful indeed and very clear in giving us a flavour and insight into what happened. If I might start with Hull. You have been undertaking your Independent Review and I wonder if you might give a flavour to the Committee of your initial findings and perhaps clear up one concern that we have had. When they came before us the Environment Agency gave us the impression that Hull had triumphantly said there should be a national body to co-ordinate everything that you ever wanted to do with flooding. Looking at your evidence, I think what you said in paragraph six was: “A creative and collaborative approach, on a multi-agency basis, should ensure that the future impact of such flooding is much reduced and that
the city’s recovery is swifter and less costly”\textsuperscript{14}, which seems to be slightly at odds with what the Environment Agency in the shape of Baroness Young were saying to us. Preliminary findings and comment on the Environment Agency, please?

Professor Coulthard: Thank you. One of our first preliminary findings was that there is a difficulty in the organisation of drainage systems in the UK, certainly in Hull, in that you have the Environment Agency that is responsible for water and open watercourses, and that same water may then flow into a culvert, the same watercourse being covered, and it is the responsibility of the council, the council is responsible for gullies at the edge of the road and these all drain into sewers, in the case of Hull, which are then the responsibility of the local water utility, in this case Yorkshire Water. So you can have the same piece of water that can flow from someone’s house into the EA’s watercourse into a council culvert and then into Yorkshire Water’s sewer. There seemed to have been a clear lack of co-operation in the past between these three bodies. There seemed to be very little evidence of them talking. At one of our first meetings about two months after the floods, which was when the Environment Agency, Yorkshire Water and the Council gave presentations, the representative of the Council showed us this map and said, “It’s great, we have all got together and for the first time we have got a map of where all the watercourses and drains and culverts go within Hull. We’ve all got together and talked to each other”, and I thought, “It’s a bit of a shame that’s the first time you have done that”. That was quite a surprise.

Q171 Chairman: In your evidence, in the second paragraph it says: “Hull’s effective flood defences are designed to protect from river or tidal flooding in the Humber Estuary” \textsuperscript{15} and then it goes on to talk about “Hull’s pumped drainage and sewerage system being overwhelmed . . .”

Professor Coulthard: Yes.

Q172 Chairman: Given that before these events Hull already had a clearly challenging and complex set of drainage arrangements, did you discover why the parties to which you have just referred had never got together to discuss the agenda? You very clearly, if you like, in a verbal schematic said it is pass the parcel with the same piece of water going in and out of different people’s systems but, given the complexity of Hull’s drainage requirements, why had such conversations not taken place before then?

Professor Coulthard: I do not know is the answer. I think that is a very good question. I imagine there had been some conversation between them, I do not think it was a complete silence, but there appeared to have been a complete lack of co-operation when it came to designing, planning or managing the system. You almost get the impression it is like when you cross a county line from one county council to another and the road surface suddenly changes because they tarmac up to that point. You get the impression that gullies were cleaned up to one point and then it came into the council’s operation or the Environment Agency’s area and there was a different practice. There is a lack of joined-up thinking there. I cannot answer what went on before.

Q173 Chairman: Mr Ryley, do you want to add something because I am sure you do not not talk to your colleagues in other organisations?

Mr Ryley: No, indeed. There has been dialogue in the past, particularly around day-to-day operational issues. The lack of strategic thinking in the past about holistically designing a complete system, which of course stretches well beyond the city boundaries into the East Riding anyway, which is where the water flows from originally, particularly from rainfall, is a real problem we have identified. Whilst there has been an ongoing dialogue and whilst there has been good co-operation on the ground over individual operational issues, and particularly over the design in the past of tidal flood defences, which are now very effective, what the nature of the flooding in Hull revealed was a different problem which perhaps had been inadequately prepared for and inadequately thought about and where there was not an holistic approach to designing the whole system to cope with an event of that kind. That is really what has been thrown up for us. The absence of a single drainage board, for example, for Hull as a co-ordinating body is something that we are now anxious to alter and correct.

Q174 Mr Drew: If we look at this whole area of relationships, I think it would be very useful if you could be quite candid rather than saying it all worked terribly well and you have learned lessons but you all got on well. If we look at the issue in both cases, and in my own case in Gloucestershire, the key agency initially in terms of the overview of this is the Environment Agency. I would welcome your views on what you felt your relationship was with the Environment Agency prior to the flooding, during the flooding and certainly subsequent to the flooding. This may have come out in terms of the post-recovery scenario. If you like, a very quick view of how you thought the Environment Agency performed and performs.

Mr Ryley: It may be difficult to generalise in response because the Environment Agency operates on a regional basis and different parts of the country and different authorities will have a relationship with different parts of the Environment Agency and it may operate differently in different places. Certainly in relation to Hull, as we have said in our evidence, that relationship has been a positive one. The Environment Agency are willing to work very closely and collaboratively with us. Their expertise was much valued, particularly during the emergency itself, and they played an instrumental role in our emergency service response in avoiding the flooding being far worse and improving our recovery and response to it. Their ability to offer expert advice about watercourses and rivers, the dangers of them being

\textsuperscript{14} Ev 54
\textsuperscript{15} Ev 54
overtopped, which we feared would happen in Hull, allowed us to direct resources on the ground, particularly key pumping operations, in a way that was very effective and at the end of the day prevented the flooding being much worse. In that sense, they are a strong partner from our point of view but, as Tom has said, their concern is very much with rivers and watercourses and not with the whole system.

Professor Coulthard: Certainly in very urban areas, simply because you are dealing with an urban drainage system as opposed to rivers and open watercourses, the local water utility is going to take a larger role in the drainage of that area, whereas in more rural areas the Environment Agency is going to have a far greater role in the management of that situation.

Q175 Mr Drew: Sheffield?
Sir Robert Kerslake: Your three questions were before, during and after?

Q176 Mr Drew: Given the overview that the Environment Agency has, before, during and after what was your relationship? Let us pinpoint initially the Environment Agency.

Sir Robert Kerslake: Before we give a response to that, I think it is important to say that Sheffield’s circumstances were different from Hull’s.

Q177 Mr Drew: I am looking at commonality.
Sir Robert Kerslake: Hull was clearly an issue of drains and the issues with Sheffield were about the rivers. This is very relevant to the performance of the Environment Agency. Before the event we had perfectly good working relationships on key issues. We were not seen as one of the higher risk areas within the region in terms of flooding, and therefore had not had a major study done. In terms of our day-to-day working relationships with the Environment Agency they have been fine. At the time of the flooding I would highlight two issues. The first one is the timeliness of warnings is clearly an issue. In practice, as our submission suggests, a severe flood warning was not issued until four o’clock on the afternoon of the floods, by which time we were already severely into flooding. There is an issue about the timeliness of flood warnings. Secondly, it is fair to say that their capacity during the period, at least during the initial period, was stretched in terms of their ability to have people of the right level available in the Silver Command. After the event, we have had a good working relationship in analysing the issues and following up on public concerns. The next key stage for us is their work on the Catchment Flood Management Plan which will provide the guide to any preventative measures.

Q178 Mr Drew: I went to a session this morning which I know we, as Members, were all invited to and it was very interesting that the representative from the Meteorology Office said one of the great weaknesses structurally is the lack of joined-up thinking between meteorology, hydrology and the communication system, so it is useful to have that as a backdrop. Can I look at the emergency itself, which again is very interesting to me coming from Gloucestershire. Just so I am clear, there was Gold Command working in both Sheffield and Hull, is that right?

Mr Ryley: Not quite true. We did not go to Gold Command at any stage but we had the ability to go to Gold Command.

Q179 Mr Drew: You had the ability to go to that?

Mr Ryley: Yes.

Q180 Mr Drew: Is that the right structure of emergency response or is there a better way of working this? Is there a way in which this joined-up thinking in terms of action really does work on the ground?

Sir Robert Kerslake: Our view is Gold and Silver Command works as a model. Gold covered the whole of South Yorkshire—

Q181 Mr Drew: Silver was more specific.

Sir Robert Kerslake: Being able to operate across administrative boundaries was critical, particularly on issues like the Ulley Dam which was in Rotherham but had a huge impact on Sheffield. Gold Command operating across South Yorkshire was absolutely the right thing. Similarly, Silver Command in the Town Hall which focused on the operational issues in Sheffield was the right thing. The interrelationship between them worked pretty well during the most immediate period. I should also say that we had done an exercise on flood risk a year before and that proved absolutely invaluable. One key lesson for us was almost everything that we tried out in the dry run happened, if that is not the wrong phrase to use. Everything we did in the practice session turned out to be there in the reality and, therefore, we were much better equipped. We set up both Gold and Silver at two o’clock on the afternoon when the flooding happened and we kept it sustained during the whole of that week and it was the right thing to do, I have no question. What did we learn about that? We have got very good working relationships between the core services—local authority, fire and police—but there were significant issues in relation to the utilities, the category two utilities, in terms of electricity and gas. There are a lot of lessons to learn there about their engagement in planned exercises and subsequently.

Q182 Mr Drew: Mr Ryley, you are nodding.

Mr Ryley: We had a slightly different experience, partly because of the geography of the Humber. It is unusual perhaps to have a civil emergency on this scale on both banks of the Humber simultaneously which stretched emergency services’ resources. With hindsight, if this were to happen again we would go to Gold Command immediately rather than wait.
Q183 Mr Drew: This may have come out in the report, but why did you not go to Gold Command? I know you were hawering on that, but why did you not go to Gold Command?

Mr Ryley: The discussion I had with the Chief Constable and the Chief Fire Rescue Officer on the second day of this was that Silver was established by then and operating effectively and we felt there was no immediate benefit in going to Gold, we would keep it under constant review on a 24 hour basis and could move to Gold at any stage. Silver Command was operating effectively enough and we did not want to disrupt that, as it were, by adding another layer unnecessarily to the system. With hindsight, what we would do now is we would have a single Gold Command for the Humber with a Silver Command on each bank, one on the north and one on the south, because that would have been a better arrangement because there were local variations in the nature of the event and the response that we could have picked up better. The other thing that was something we discovered only after the event that was an unintended outcome of this was by not going to Gold Command we inadvertently signalled to outside observers and the Government that we did not have a major emergency. The Government’s response was, “If you don’t have Gold Command there isn’t a problem” and it took us a while to get people’s attention drawn to the scale of what has happening in Hull as a result of that. Again, with hindsight, we would go to Gold Command sooner. One other element where that would have been helpful as the scale of the emergency spread in scale and duration was there were issues about bringing in additional resources like the Army and so on, and procurement of resources from outside the region would have been easier with a Gold Command structure in place perhaps, although we managed fairly well without it.

Q184 Mr Drew: Professor Coulthard, is there anything you want to bring out from your Independent Review on that?

Professor Coulthard: Our Review probably echoes what Kim has just said. We identified there would have been some advantages if they had decided to move to Gold Command, in particular mobilising the Army or getting the Army’s resources seems to be much easier in that situation. Whether or not that would have been of great use is another question. Certainly from the profile point of view, it might have been important for getting aid to Hull in those first couple of days.

Q185 Mr Drew: Can I ask a question about the role of the voluntary sector, which is somewhat underestimated.

Professor Coulthard: Absolutely.

Q186 Mr Drew: I include in that obviously RNLI. How important was that in the structure of the decision-making, not just on the ground but knowing what decisions had to be made?
combination, there were parts of Hull which were cut off for periods of time when communities had to cope for themselves for the first 12 or 15 hours. It was the ability of communities to work around their local resources, their local groups, their local intelligence and understanding of the patch that in some cases was quite crucial to that initial response being effective. It threw up communication issues with Silver Command later on but we were able to deal with those quite readily in terms of better co-ordination. We are in the process now of evolving even more key frontline resources to our area level because they proved so effective at being able to direct that and having the discretion to deal with issues even before we could arrive from a Silver Command perspective.

Q189 Mr Drew: Can I conclude by saying, and this is to put this on the record, the initiatives in both Hull and Sheffield in terms of the decision-making was locally driven and although you may have brought in national support you led and there was not a national overlay, if you like, in terms of the decision-making.

Mr Ryley: That is exactly right.

Q190 Chairman: And you do not want some great national body in the future?

Sir Robert Kerslake: I think the critical issue in relation to the question you raised on the Environment Agency is who leads in the co-ordination task. I would be the last one to advocate a huge reorganisation of responsibilities, but when you do have this set of divided responsibilities there has to be someone who is primus inter pares who takes responsibility for bringing together, convening if you like, the key players, the local authority, and in our case Yorkshire Water and the Environment Agency. That is the gap at the moment in my view.

Mr Ryley: There may be some different perspectives on this because in terms of the recovery process itself the emergency in this case was quite protracted, it ran to the best part of a week in Hull, but in practice you are into a recovery process straight afterwards which is much more protracted and intensive and it is the local authority that comes to the fore at that point and is probably the only organisation—this was reflected back to us by our partner organisations—which has, for want of a better word, the moral authority to bring everyone together around what is then still an important, integrated and combined recovery effort that is going to run over several months after the immediate emergency is over. That is one type of co-ordination. There is co-ordination around some of the technical issues of dealing with the immediate aftermath or planning for another event of this kind in terms of the infrastructure that is necessary to respond in an emergency.

Q191 Lynne Jones: Professor Coulthard, you commented earlier about the lack of co-ordination between the various agencies. Do I take it that Hull did not have a Strategic Flood Risk Assessment?

Professor Coulthard: I believe that Hull is working on its Strategic Flood Risk Assessment at the moment.

Mr Ryley: Ironically we had started it in May before the floods and it is nearing completion now.

Professor Coulthard: To interject, the flooding planning in Hull in its entirety was based on the risk of coastal flooding from estuarine defences being breached or river flooding. The flood events we had this summer, which were pluvially based, that were coming from flash flooding, from rainfall flooding, were very different in their nature and in their geography in the areas which they inundated. It came from nowhere, no-one was really expecting it.

Q192 Lynne Jones: The assessment you were working on was largely based on past expectations and even though you were still working on it you had not anticipated that you would have that problem?

Professor Coulthard: That is right.

Mr Ryley: It has fundamentally changed since then, of course.

Professor Coulthard: That is being factored in, I believe.

Q193 Lynne Jones: Have you got one now?

Mr Ryley: We have indeed.

Professor Coulthard: It is nearly done.

Mr Ryley: It is nearly done. It has already influenced our planning policy locally, for example. We have had two reports to our planning committee and we have picked up a detailed raft of new planning guidance and have already had the first planning application refused on the basis of that guidance because of flooding concerns. That is an example of how quickly we have put change into place.

Q194 Lynne Jones: Have you agreed a lead agency?

Mr Ryley: We are in that process. We are waiting for the final report of our Independent Review Body, due very soon, to put the final pieces of the jigsaw together. We have certainly been working closely on the early learning we have extracted from the experience already but we are waiting for the final key pieces of the jigsaw so we can have a clear, sequenced plan of action both immediately and longer term.

Q195 Lynne Jones: Has Sheffield got a lead agency?

Sir Robert Kerslake: Sheffield has done a Strategic Flood Risk Assessment and that was formally adopted earlier this year. It links to PPS25, which covers development in flood areas. That is in place at the moment.

Mr Charlton: And was in place before the floods. It is a live document. The actual footprint of the flood pretty well coincided with the 100 year event,
So we see no reason at this point in time to update it. We will wait for the Environment Agency report, who are doing a review in the immediate aftermath of the floods, because their report might lead us to update it. When they do the Catchment Area Management Plan, which will report in April 2009, that the Chief Executive referred to earlier, that may further inform our Strategic Flood Risk Assessment. We do have one, it is a live document and it informs our planning process.

Q196 Lynne Jones: But have you an agreed lead agency in terms of all the different agencies? Sir Robert Kerslake: The short answer is at this stage we have agreed that it will be joint between the council and the Environment Agency, so we have not picked one agency because there is a lack of clarity nationally on this. Pending anything that comes from this Review, or any other reviews, we have agreed we will lead jointly on this process across all the different agencies.

Q197 Lynne Jones: Do you think it is a satisfactory arrangement? Sir Robert Kerslake: Personally I think you need one lead.

Q198 Lynne Jones: So you want somebody to tell you who it should be? Sir Robert Kerslake: No. I think we will need to determine between us and the Environment Agency. It is not simply who leads but who has the capacity to take on the role.

Q199 Lynne Jones: Who do you think it should be then with your local knowledge? Sir Robert Kerslake: Personally, for this issue I think it needs to be the Environment Agency that leads. The reason I say that is when we are talking about the watercourse system, it does not just cover Sheffield, you have to look across South Yorkshire and beyond that. Sheffield could deal with its issues but this needs an agency that has a wider span of role, and that is why I think it ought to be the Environment Agency.

Q200 Patrick Hall: Mr Ryley touched on a very important issue, which is the implications for planning policy. Could I ask, what were those proposals that were refused following the flood which otherwise would not have been refused? Mr Ryley: It was for a small scale housing development. It was literally a handful of houses, a very small scale development in a particularly sensitive area.

Q201 Patrick Hall: I suppose you are not able to draw any conclusions from that with regard to regional or national planning policy guidance. The decision either way would have been consistent with national policy guidance, would it? Mr Ryley: Yes, with the supplementary local design guidance that our planning committee has adopted in the light of—

Q202 Patrick Hall: It is an entirely local matter. Mr Ryley: Yes.

Q203 Patrick Hall: Clearly what we have got to be thinking about is some of the larger scale growth areas and the implications and lessons that can be drawn, but possibly not from a handful of houses. Mr Ryley: If I could answer the question slightly differently because one of the issues we are wrestling with now is we are looking at the reconstruction issues coming out of this, for example things around schools, since we are in a major programme of rebuilding for secondary schools in the city and our schools were particularly badly damaged disproportionately in terms of effect and number because of the way their grounds soak up water and act as reservoirs, if you like, on these occasions. Certainly we are looking at fundamentally changing our design model for future school building to make them more flood-proof, to change their footprint in that sense, to build vertically rather than horizontally, for example. Those sorts of issues are now starting to come out of these experiences and I think they are going to give rise to some significant rethinking of how we design and build key public facilities in the future.

Q204 Patrick Hall: Is Sheffield thinking about its planning policies in the light of the flood? Sir Robert Kerslake: As John said, the assessment we had was that the patterns we would have predicted for what was a 150 year event were what happened, so the basic analysis of prediction on flood risk was correct. What we are doing for the planning policy is looking at the resilience of individual developments to flooding, which seems to me as important here. Much can be done in the way developments are designed, not to eliminate risk but to reduce the impact. Our focus and effort is on that issue.

Q205 Paddy Tipping: I want to focus on the inabilty of the urban drainage system to cope with the event. Perhaps colleagues from Hull could help me with this. Professor Coulthard, you were very keen to tell us at the beginning of the session about the map that had been delivered for the first time. Professor Coulthard: Yes.

Q206 Paddy Tipping: Who took the lead on that? Second, there is an issue, and I have been pursuing this myself, about responsibilities. Is there an agreement on your map—I hope there is—that this bit of the system is the responsibility of X and Y? Professor Coulthard: That is a very good question.
Mr Kim Ryley, Professor Tom Coulthard, Sir Robert Kerslake, Councillor Jan Wilson
and Mr John Charlton

some ambiguity over the owner, shall we say. That partly occurs because you may have had a piece of watercourse, which is an Agency responsibility, that has then become culverted, and in some places you can have watercourse/culvert, watercourse/ culvert, watercourse/culvert, and sensibly instead of saying “Council/EA, Council/EA”, they have put a line down each end of it and put “?” That is part of the issue we are dealing with here. With regard to riparian ownership, I cannot really comment on that because I do not feel I have sufficient knowledge in this area in the context of Hull to comment.

Q208 David Lepper: I am just trying to get clear in my mind the scale of distances that we might be talking about. In the example that you gave, for instance, of an open stretch of water/culvert, open stretch of water/culvert, are we talking in terms of stretches of several metres or miles?
Professor Coulthard: In the case of the watercourse/culvert, watercourse/culvert, you are talking about distances of ten to 20 to 30 metres. In some cases you can have a piece of watercourse that is several kilometres and then it may be culverted for a kilometre and open watercourse again. The situation in Hull is complex because some watercourses flow both ways depending on what the levels of water are, and so on. It is not an amusing map but an interesting map because it has some arrows pointing in both directions and different shading in different parts.

Q209 Paddy Tipping: How are you going to sort this out then?
Professor Coulthard: It is not for me to sort out, it is for me to flag up that there is an issue here. It is encouraging that the Environment Agency, the council and Yorkshire Water are getting together and talking about this. I hope someone takes a lead and I hope they get together on this. The evidence is that is occurring.
Mr Ryley: I think our intention in the absence of any direction coming through nationally in the short-term was as soon as we have the missing piece of the jigsaw we could start to plan jointly with more confidence. A complete approach to this issue was to have a formal agreement between the three main partners that would bind us into specific actions as well as a joint liability and approach to the future.

Q210 Paddy Tipping: Can I turn to the issue of the maintenance of the gullies. I will bring the ceiling down here. There are a lot of pressures on local councils and you are asked to spend lots of money with a limited pot. People say to me that part of the problem with the flooding was the cleaning of the gullies had not taken place. Is there some substance in that?
Professor Coulthard: In Hull, as part of the Review we looked at the statistics provided by the contractor who cleans the gullies and I believe they showed that less than five per cent of the gullies when they checked them after the floods were blocked. In my opinion, it may have been a factor in certain locales but in general I do not think it was an issue.
Mr Ryley: Just by comparison, our neighbouring authority in the East Riding, which had a different frequency of gully clearing and maintenance from us, still experienced the same problems about the drainage system being over-capacity.
Professor Coulthard: There is a difficulty here in that the symptoms of a gully being blocked and the sewer below the gully being capable of draining the water away are exactly the same.

Q211 Paddy Tipping: I know colleagues from Sheffield will want to come in, but whilst you are answering let me ask you about the problem of parked cars because that is an issue as well if you cannot get to the gullies.
Mr Charlton: We have an inventory of our gullies in Sheffield. There are 72,000 gullies in the city and we clean them all once a year, some more frequently. We also monitor how many are running freely. Currently 94 per cent are running freely. The six per cent that are not running freely are predominantly due to issues such as parked cars where it is very difficult to move people. To work with the police and get a formal road closure, clamp cars and move them might cost £1,500 and it is not the best use of money, we could clean however many dozen gullies out for that. We try by persuasion, to leaflet people in advance, “We will be on your street this day, will you please move your car”. The majority of people co-operate but there are always some people who do not co-operate. It was not an issue for Sheffield particularly on the day. Prior to the main rivers overtopping the surface water drainage system—80 per cent of the gullies flow into combined sewers which are Yorkshire Water’s—was working pretty well okay until the rivers began to rise and overtop and then the rivers and the road became as one on the whole floodplain down the Upper and Lower Don.

Q212 Paddy Tipping: Finally, I wanted to ask you both about one of the comments from one of the Environment Ministers who said if we had had water butts in place and stopped people concreting over the gardens for car parking it would have made all the difference. How much difference do you think it would have made?
Mr Charlton: In the great scale of things it would have made minimal difference. It will make a difference. If it was previously someone’s garden water would soak away but when it is concreted it does not soak away, it sheds into the drainage systems and asks more of the rivers. Obviously it makes a different but in the great scale of things on the 25 it would not have made any difference at all on the day.
**Professor Coulthard:** Certainly in Hull, and I imagine in Sheffield, the ground was already pretty wet from a very heavy rainfall event on 15 June.

Q213 Chairman: You mentioned that you had a little run-out with an emergency plan, your advance warning. What was the scenario that you used because in your evidence you say: “Sheffield is an area of low flood risk” and yet quite clearly a series of events conspired to put you right at the heart of a deluge? Who designed the trial and what were the assumptions you used?

**Sir Robert Kerslake:** The assumptions were fairly uncannily close to what actually happened. It was done as a test really to test our emergency planning procedures in the same way as you might do a test using a terrorist incident or whatever, but on this occasion we happened to do a flood risk incident. It was not with any view to that happening in Sheffield, it was simply to use that as an example. We have also done one on terrorism and so on. The scenario was very much the same situation of rapid flooding cutting off the city.

**Mr Charlton:** It was called Operation Loxley. Loxley Dam in 1864 burst and 250 lives were lost in Sheffield. The dam burst and it came down the Loxley Valley, which hits the River Don in Hillsborough just near the football ground. The dam burst and there was a flood coming in from the north of the city, which was pretty much exactly what happened on the day. It was called Loxley because everybody in Sheffield is aware of the history of 1864 and the previous great flood.

Q214 Chairman: The nature of your Flood Risk Assessment was, “Here’s a scenario, now let’s see how we cope with the consequences”, as opposed to a piece of perceptive exercise where you said, “Oh, look, if this happened for real then there are some serious issues that we have to ask about the city’s drainage arrangements to actually cope with the water before it becomes a flood”? You were not in that business, you were in a “how do we cope” exercise.

**Sir Robert Kerslake:** It was absolutely about the response to an emergency, that was what we were testing through our exercise.

Q215 Chairman: On the question of prediction, in Hull’s evidence you said at paragraph 10.1: “ . . . a first key step should be a major hydraulic study to model flows in the city as a whole . . . ”. One of the things I found quite intriguing, given that you have got a very special series of drainage issues, having a pumped as opposed to a gravity based system, was that nobody had done that before.

**Professor Coulthard:** Yes, I agree.

Q216 Chairman: If that is the case, without wanting to lead you to your final conclusions, is that kind of evaluative exercise something which might more generally be applied in our major urban centres?
and Hamburg looking at the particular issues of flooding in port cities which operate a different kind of industrial complex with docks and other things. We are going to try and learn from best practice on a European level as well. That will be of particular value to a range of other UK port cities as well.

Q218 Dr Strang: You are saying that the assessment will influence your Local Development Framework.

Mr Ryley: Absolutely.

Q219 Dr Strang: In the assessment you recommended that you review flood risk management policy in relation to development and emergency planning. Do you have any changes in mind at the moment?

Sir Robert Kerslake: What I meant in terms of the Strategic Risk Assessment was that it enables us to judge the likelihood of different risk in different places and we have changed the categories of that risk in the light of the events that occurred. In terms of emergency planning, that is probably driven by a different set of issues. The thing that we did learn from this process was the need for resilience over a long period. The most important thing is to have a wide range of people trained and capable to manage emergencies because actually it is incredibly tiring over one or two days and you need to have standby and cover arrangements. If I was to go back to our own situation, a key issue would be about the capacity to manage an emergency over a longer period. That was a critical issue for us. You need to have resilience and strength in-depth, in other words.

Mr Ryley: Can I pick up the comments that were made earlier about training. Our evidence is we have had a major training exercise based on flooding within the last few years, although that again was based on tidal flooding, so it was not quite the same scenario, and that identified a number of issues which we had picked up and put in place. What we found was even within that limited window, by the time the flooding arrived there had been a significant turnover of key staff in all of the agencies involved, so we had a lot of people we had not had time to train in-depth. They learnt a lot on the job and responded magnificently at the time but it raised with us the fact that the frequency of this is crucial. Doing it every three years, which was the model in the past, probably is not enough. It is the need to have a range of people on hand to give you that resilience and also in-depth training on a much more regular basis.

Professor Coulthard: A lot of the success at the local level of Hull’s response to what happened was because they knew each other, they had each other’s mobile phone numbers, they had worked with each other before, and that kind of local networking is really important. One of the things we would like to see is that these groups get together more often, every six months or every year, and maybe not go through such a rigorous training exercise but know each other and know who they are dealing with. Those relationships are really important in this type of situation.

Q220 Mr Williams: The maps that the Environment Agency produced which show how often a flood may occur in a particular area may or may not be accurate, but what they do not show is the risk to life of a particular flooding incident. An area might flood and it might be distressing and inconvenient, but it might not present a risk to life or serious risk to property. Does your Strategic Flood Risk Assessment do that?

Mr Charlton: It does not really, no.

Professor Coulthard: I believe the Hull one does come up with a form of risk attached to it based on the depth and velocity of the water.

Q221 David Lepper: Colleagues from Sheffield, could I concentrate on one aspect of planning with you. I think the Environment Agency regards Catchment Flood Management Plans as very important, both in terms of looking at land use and planning for land use, to help prevent and mitigate flooding, but by the time you produced your Strategic Flood Risk Assessment and published that, the Catchment Flood Management Plan—I am not sure whether we are talking about one or two here, one for the Don and one for the Rother—had not been completed.

Mr Charlton: When we started preparing the Strategic Flood Risk Assessment it was originally intended that the Environment Agency would have their Catchment Flood Management Plan in place but it was delayed and it has since been further delayed. In fact, they have changed it now from instead of a whole catchment area to a River Don catchment that will take in Sheffield, Doncaster and Rotherham. They are doing a Management Plan for that floodplain for the River Don and that will inform our Strategic Flood Risk Assessment. It would have been better if the horse had come before the cart but it did not and we had to do something. As I said, it is a live document and it will be reviewed when the Environment Agency’s work is completed, which is likely to be April 2009.

Q222 David Lepper: I thought that was the date you mentioned earlier.

Mr Charlton: Yes.

Sir Robert Kerslake: It is important to say that timing for the Environment Agency is entirely an issue of their priorities and resources. Other parts of the region were at significantly higher risk of flooding and impact, so it was quite understandable from my perspective that they came ahead in this process of producing the plan.

Q223 Chairman: I think the way you put it in your written evidence was delayed “due to funding priorities”. Perhaps if we had the Environment Agency here with us they would say if they had had...
more money to do the work it might have been completed sooner, but they had to look at what they regarded as higher risk areas first.

**Sir Robert Kerslake**: Absolutely.

**Q224 David Lepper**: Could I ask how much input Sheffield City Council has had into the work that has gone on so far on the Catchment Flood Management Plan?

**Mr Charlton**: I understand that a consultant has been appointed by the Environment Agency and as yet they have not contacted us to ask for information, but I assume they will do in the fullness of time.

**Q225 David Lepper**: So throughout the whole of this process—

**Mr Charlton**: Sorry, no. They have only recently appointed a consultant to carry out a Management Plan of the River Don catchment area which will take in Sheffield, Doncaster and Rotherham and, as yet, they have not contacted Sheffield for any information.

**Q226 David Lepper**: Is that odd or is the timescale such that you are not particularly surprised?

**Mr Charlton**: If they have not asked us before Christmas I will be surprised, yes. Rather disappointed, put it that way.

**Q227 David Lepper**: Perhaps they will remember to ask you reading the evidence. It would have been helpful to have the plan in place to aid your strategic flood risk assessment?

**Mr Charlton**: Yes.

**Q228 David Lepper**: Would you agree with the Environment Agency's view that there were, not knowing what we know now, higher risk areas that needed greater attention?

**Mr Charlton**: You have just heard what my colleagues from Hull have said, and historically Sheffield has never been prone to flooding on that scale. It is now likely to be a one in 150 year event that we experience.

**Sir Robert Kerslake**: This is pretty wide really. This was the highest rate for 125 years. You cannot predict that will happen but, having happened, you have to reassess the risk.

**Q229 Chairman**: Is there any danger that we have got too many bits of exercise going on to get a coherent picture? When I started to read we had got these strategic flood risk assessments, and then I looked at what your assessment in Sheffield was supposed to cover and one of the key first paragraphs I read is, “To collate all known sources of flooding, including river surface water, local drainage, sewers, ground water, that may affect existing and/or future developments in the district,” and then I discover that you are working very closely with the Environment Agency, Yorkshire Water and a lot of other bodies, and then we have got the Environment Agency who are doing their catchment flood management plans. It seems to me that you have got one lot doing one thing, one lot doing another; whereas in actual fact what you want to plan, which then breaks down from a big thing, is how it impacts on a city like Sheffield. The main driver which seemed to be pushing your strategic flood risk assessment were planning issues—this bit which I still do not understand—the operation of something called the “sequential test” followed by the “exceptional test” under PPS25, and so the idea of coherence in planning seemed to be muddled.

**Sir Robert Kerslake**: I think the point that John made is right, which is that in an ideal world you would do the catchment management plan which would then inform the risk assessment, but, because of priorities and resources, it was pretty evident to us that we were not going to see our catchment management plan done for Sheffield any time soon, or the wider area, and we needed guidance in order to inform our planning decisions and other actions, hence the reason why we did the strategic risk assessment that was talked about. I think there is a coherent model here, but the model probably relies, in fact does rely, on the sequence of the things happening in that order.

**Q230 Chairman**: In other words, there should not be any cart before the horse situations, if you are going to get the benefit of one model informing the other?

**Sir Robert Kerslake**: I think that is right, but in the end you cannot hang around, you have to have something that guides your planning decisions.

**Councillor Wilson**: Could I just add that it would be great to do things in the order that you have suggested, but the particular corridor here is where we are doing a lot of master planning for our economic growth, making plans for the next ten, 20, 30 years, and it is necessary to have master plans of what our aspirations are, hence the work that has gone on in advance. There is significant work in Sheffield to do with growth. It would be great to have all the ducks in an absolute row, but Sheffield has not been a high flood risk area, so the planning work that was done, particularly within the regional spatial strategy that has been drawn up through Yorkshire and the Humber, gave us comfort in order to continue with our development, because the world does not stand still, does it, and that is our industrial corridor where we want our growth to take place.

**Chairman**: It raises some of the big issues as to how all the assumptions that are being made about where risk occurs react to climate change/extreme weather events. This Committee did an inquiry into the Foresight Report, which was done by the Government’s Chief Scientist, which counselled taking into account, according to which scenario you chose, the fact that there would be extreme weather events. I do not want to get into territory which is beyond my technical understanding, but I think what has happened has focused people to say perhaps we should be re-looking at what the impact
is going to be of severe weather events and then decisions are going to have to be taken as to what degree of the protection your systems can afford to provide according to what scenario you chose, and I think that is quite a difficult choice. Anyway, before we get too far into the realms of conjecture, we will move on to Roger.

**Q231 Mr Williams:** The Environment Agency has done a survey of critical infrastructure installations and found that a fair proportion of those are at risk from flooding. As I understand it, in Sheffield you had problems with power failure, whereas in Hull most of your services remained working during the flood. What critical installations have you identified in your city? Have you done that work?

**Sir Robert Kerslake:** Absolutely. We know where the risk sites are and, indeed, you are quite right, 35,000 people were without power because of the impact of the flooding. It struck me, going round the particular power station at which this happened where the step-down transformers are, that there were some fairly simple things that you could do to increase resilience. For example, two of the transformers are on the same side, so it stands to reason that, if it floods, they are both going to be out of action. You could locate one or create another one somewhere else in the system away from the flood risk area. Similarly, the thing that went when the flooding happened was all the electrical equipment, which was on the ground floor. If you put it up higher, you probably would face much less damage being done. What became absolutely evident to us is that we need these utilities—electricity and gas—more actively engaged in the analysis of prevention and then response to emergencies. They have not been round the table, basically, and I would go so far as to say they are not entirely equipped to be round the table, their capacity works in a different way, and that is a major issue that has to be addressed in any future planning.

**Q232 Mr Williams:** It brings me on to the other point, which is that within the Civil Contingency Act there is a requirement of utilities to actually plan for major problems, and I think the Environment Agency said that many of the utilities did not have in existence business continuity plans. What responsibilities do local authorities have under the Civil Contingency Act?

**Sir Robert Kerslake:** We have clear responsibilities in terms of our own business continuity, and we do that and those plans worked. I think the biggest risk came in other areas, in my view—it came in the power and related activities—and your description of the fact that there were not always plans there I think is right. I think that is one of the things that have to be addressed.

**Mr Ryley:** I would just like to confirm that. I think that is absolutely right. I think it is an urgent area to look at. I think in Hull, although our flood defences were certainly an asset on this occasion, we came close to losing key pieces of infrastructure, closer than we were happy with even then, and we were not convinced that there was the same extent of business continuity planning and even the same attitude towards the protection of those assets, which were perhaps influenced more by commercial consideration, if you like, than actually their usefulness in maintaining public order.

**Sir Robert Kerslake:** It is worth saying that you have a complexity of arrangements, here. You have the National Grid and the series of companies and they may not necessarily know themselves where all their problems are, and that was one of the key issues, John, that we had to tackle, was it not?

**Mr Charlton:** Yes. There was a gantry bridge that spanned the River Don and it acted like a beaver dam, there were trees and debris blocked there, and gas, water and electricity was suspended underneath. It took us quite a while to get someone of sufficient seniority and technical expertise to tell us whether those were live or dead. Eventually we found out they were not and removed the bridge. The danger was that it would sweep downstream where there was another bridge that was taking live cables, and that would have cut half of Sheffield off from electricity; but fortunately the beaver dam did not break and it did not destroy the bridge further down, but it could have done and it could have been because of indecision by the utilities on site that particular day who could not tell us immediately whether they were live or dead.

**Professor Coulthard:** I think there is an issue in devolving responsibility to the respective utilities to manage their own flood risk in that respect. You split the problem up. Only if, say, for example, an electricity company suddenly realises one of its substations is in real danger will it get in touch possibly with Silver or Gold Command and say, "We have got a real problem here and we need it." By then, I suspect, it might well be too late. Certainly one of the issues we found and that Yorkshire Water mentioned to us with the pumping situation, obviously were not allowed is the wrong word, but they found they were not a part of Silver Command until fairly late on the process, and they are critical. Hence, the emergency services did not actually know that there were three pumping stations in Hull that were critical to Hull remaining dry, or drier, and, when I pointed them out on a map, they were quite surprised to find they were there, and their failure, if that had happened, would have had such severe consequences. There is this issue of the utilities. By being split up they do not have the same sort of centralised strategy for dealing with this.

**Q233 Chairman:** Dams and reservoirs. You had the Ulley Dam, which I think dominated people's concerns when the television coverage of what was happening in Sheffield was on, but it has raised the rather more serious and wider spread issue, as your own evidence in paragraph 4.5.6 talks about. You said in your evidence in the issues raised that there should be clarity and responsibility for dam and reservoir over-topping plans, and you asked the...
very pertinent question: who has the statutory duty to warn and inform? I was at a seminar last week organised by a company called Logico and a gentleman there was saying that many of these dams go back 120 years. It is not clear who is responsible for them, and he said that there were not systems in place for monitoring them, either from the point of view of their ability to hold back water or physically what might be happening to them. I felt under threat at that point. What would you like to say from the Sheffield standpoint?

Mr Charlton: Within the Sheffield boundary there are 20 reservoirs, dams, and 19 of those are owned and managed by Yorkshire Water. I understand you are talking to them later. I think it might be better if you let them speak on that. The one dam that we are responsible for is a very small dam. It is checked every six months. It was checked in April of this year before the flood, it was checked at seven on the morning after the flood and there was not any safety issue to deal with. We do those checks. I understand other authorities who have got dams should be doing those checks under the Reservoirs Act, and I assume Yorkshire Water is doing the same, but in terms of—

Q234 Chairman: Let me pick you up on a bit of language there. “I assume that Yorkshire Water is doing the same.” One of the points you raised, which is why I read it out from your evidence, seemed to be that you were worried actually whose responsibility it was to advise if there were problems with dams, and you have now told us that within your area, within the city’s boundaries, you have got, if you like, a major risk in terms of these dams if something went wrong. Have you ever had as a city councillor a conversation with Yorkshire Water about what they do about dams?

Mr Charlton: I have not personally. I understand members of staff within Sheffield City Council—the land drainage engineer has regular contact with Yorkshire Water. I think the uncertainty is about who raises the alarm in terms of warnings. I think that is the issue. That is unclear. I am not sure there is a system in place for actually doing that. There is a system in place for severe flood warnings, flood warnings and flood watches issued by the Environment Agency for river flooding, but I do not think one exists for reservoirs, to the best of my knowledge.

Sir Robert Kerslake: I think our particular concern that led to that comment was the Ulley Dam. If you think about the situation here, the Ulley Dam is essentially recreational, the reservoir is a recreational reservoir, it serves no purpose other than for recreation now, and yet at one point we were under an impression that, had this dam broken, it would have taken out the M1 and taken out the power station and Sheffield would have been without power for a week. If you think about the consequences of that, you can see that there must be some system of assurance here about these dams.

Q235 Chairman: Who off the record is responsible for this dam?

Sir Robert Kerslake: In that instance it is Rotherham.

Q236 Chairman: Rotherham. So the City Council of Rotherham is responsible. It is their dam.

Councillor Wilson: Yes.

Q237 Chairman: You do not talk your next-door neighbour about their dam?

Sir Robert Kerslake: We absolutely do talk to them plenty of times, but I think the issue we are trying to describe here is the risk assessment of the consequences of the failure. I do not think anybody had thought that if this damn collapsed it might have the kind of impact that it would have had, and it is that risk assessment.

Q238 Chairman: Going back to your own strategic flood risk assessment, when you were doing that exercise was the question of dams incorporated in the work you were doing there?

Mr Charlton: Yes. Chairman: It was. Okay; Roger.

Q239 Mr Williams: Do you know from any particular reservoir owner whether they actually insure against consequential loss if there was a failure or an over-topping?

Sir Robert Kerslake: It is a good question. I do not know is the short answer.

Q240 Mr Williams: Is there any requirement under the Reservoir Act for that?

Mr Charlton: I simply do not know.

Sir Robert Kerslake: I do not know.

Chairman: Thank you very much indeed. You have certainly added some useful colour to the very helpful written evidence which you have kindly put to us. We always comment that if on the train on the way home you suddenly think, “Wow, there was something I forgot to tell them”, the door is still open for us to be told, but thank you very much for coming to talk to us today. Obviously we will reflect very carefully on what you have had to say when we come to produce our report.
Memorandum submitted by Yorkshire Water (FL 122)

1. INTRODUCTION

1.1 Many thanks for the opportunity to contribute to your inquiry into the flooding which occurred in our region in June 2007. Before providing a detailed analysis of the flooding, we would like to make the following observations:

— We would like to pay tribute to our colleagues whose efforts throughout the flooding event meant that we maintained the clean water supply to the region and that we could respond rapidly and effectively to flooding incidents.

— The flooding in Yorkshire was caused by significant and unprecedented rainfall and, as the Secretary of State at DEFRA has stated, no system could have coped.

— Our sewerage and pumping infrastructure was filled to capacity in parts of the region and overwhelmed by the severity of the storms and the concentration of the rainfall. We believe our infrastructure performed well in what were exceptional circumstances.

— Like others, we are anxious to understand if there could have been better planning and coordination between the relevant agencies and to explore whether we can help to mitigate some of the future risks by improving our infrastructure as part of the multi-agency approaches being undertaken across the region.

— In order to facilitate an inter-agency approach, there may have to be statutory changes to the responsibilities of the parties including water companies, the Environment Agency, land drainage boards and local authorities.

1.2 This memorandum is divided into the following areas:

— An overview of Yorkshire Water
— Analysis of the rainfall in June
— Emergency and contingency planning
— Maintaining the clean water supply
— Flooding
— Recovery
— Our statutory responsibilities

1.3 We would be happy to answer any questions prompted by this document and would be happy to appear before the Committee.

2. OVERVIEW OF YORKSHIRE WATER

2.1 Yorkshire Water is a water and sewerage company and serves the area comprising the historic county of Yorkshire.

2.2 Serving around 5 million people, we supply 1.2 billion litres of clean water daily and we directly employ 2,200 colleagues. We also work in partnership with a number of service partners to invest in and maintain our water and waste water network. Our current investment plan, agreed with our economic regulator in 2004 and known as AMP4, equates to us spending £1 million on the region’s water infrastructure daily.

2.3 We have been named “Utility of the Year” by our peers in the utility sector for the last three years and have been in the top two of Ofwat’s league table for operational and customer service for the last two years. Ofwat has also identified Yorkshire Water as the most efficient water company which they regulate.

3. ANALYSIS OF THE RAINFALL IN JUNE

3.1 River and surface water flooding during June 2007 was the result of exceptional rainfall events on 15 and 25 June. Data published by the Met Office on 26 July shows that May to July 2007 were the wettest months since records began in 1766. In June, over 103.1 mm of rain fell in Fylingdales, North Yorkshire. Our water gauges show that the storms in Hull were at least a “1 in 151” year rainfall event.

3.2 The Hull Independent Review Body state in their interim report that the Geography Department at the University of Hull shows that rainfall on 25 June was heavy and sustained with rainfall intensities of over 6mm an hour from 8 am to 5 pm. They concluded that it was highly likely that many areas of Hull were already significantly saturated on 25 June.
4. Emergency and Contingency Planning

4.1 On 12 June, the Met Office warned that unseasonable rainfall may lead to flooding in Yorkshire and the Midlands. On 15 June, exceptionally heavy and prolonged rainfall impacted the region leading to widespread flooding.

4.2 We established Core Incident Management Teams (CIMT) at our Regional Operational Control Centre (ROCC) in Bradford. We had teams dealing with the clean and waste water sides of our business and our liaison with the Gold and Silver commands at Doncaster, Sheffield, Rotherham and Hull was managed through these teams.

4.3 Establishing incident management teams early meant that we were well-placed to deal with incidents as they arose. It also gave the emergency command teams a clear single point of contact with the company and with colleagues who were empowered to make decisions.

4.4 Managing the event from the centre also ensured that we were able to take a region-wide approach and could ensure that company resources were focussed in the right place, at the right time.

4.5 The incident at Ulley Dam put tremendous pressure on temporary water pumping resources in the region. Whilst we do have reserve pumping capacity available for emergencies, it was difficult to source additional capacity until that situation was resolved.

5. Maintaining the Clean Water Supply—Emergency Response

5.1 Early in the incident, it was clear that supporting the effort to shore-up Ulley Dam was the regional priority. The reservoir, owned by Rotherham Council, was in danger of collapse threatening the major industrial and utility infrastructure further down the valley.

5.2 We immediately released colleagues with reservoir safety expertise to support and advise the Council on managing this incident and we identified our assets which were within the potential flood inundation area and made arrangements to isolate vulnerable sections of pipework.

5.3 This prompted us to undertake a proactive programme of visiting our own reservoirs to ensure the integrity of those structures. Whilst we were confident that the risk was low due to our proactive reservoir asset planning approach, we adopted a precautionary approach and colleagues twice daily walked the parameter of those reservoirs we judged to be most at risk to carry out visual inspections.

5.4 We also managed and monitored the impact of the flood water on our water treatment works. There were two clear priorities; firstly, ensuring that the water treatment works themselves were not inundated with water and secondly, keeping the system under positive pressure as this is essential to the integrity of the system and therefore the quality of the water.

5.5 Most of our water treatment works are located at areas higher than the areas they supply. This makes economic sense because it minimises the requirement to pump the clean water to customers and it also protects against flooding. This meant that the risk of inundation was low. Our river abstraction works are obviously more vulnerable to flooding and we did experience extremely high river levels at Elvington, Loftsome Bridge and Tophill Low. However these works did not flood internally and continued to operate.

5.6 A bigger concern was the possible loss of power to the works. Treating and pumping water is an energy intensive activity and any loss of power would have resulted in a loss of pressure, leading to possible inundation and therefore corruption of clean water quality.

5.7 The immediate issue was the loss of a National Grid supply point which meant there was a drop in capacity in the Sheffield region. Yorkshire Electricity Distribution Limited (YEDL) had to manage a situation where there was not enough power but also where energy usage was very unpredictable. The closure of businesses due to the flooding meant that their requirement predictions, based on existing demand curves, were not reliable.

5.8 Rather than risk a loss of energy supply to our water treatment works and water pumping stations, we moved to on-site generation. All of our water treatment works have stand-by emergency generation which we supplemented with more generators at key assets, including water pumping stations. We pulled together teams of three people, one from field operations, one for asset management and an electrical and mechanical manager, and they visited each water treatment site and ensured that there was a robust energy supply.

5.9 We were then able to advise YEDL that we would not be drawing power from the grid which released more capacity for other users in the region. A win-win situation—whilst switching to onsite generation was undertaken primarily to secure our treatment works doing so assisted YEDL in managing their energy demand.

5.10 We stayed on stand-by generation for about a week after which we were able to reconnect to the grid.
5.11 The final issue was the management of other physical assets. The Highways Agency advised us, for example, that a trunk main which serves around 150k customer was exposed. Water from the River Don had caused a landslide which exposed the main and made it vulnerable. We developed an engineering solution to shore-up the bank thereby protecting not only the trunk main but also the road and other utility services which ran alongside it and put this in place within two days.

5.12 Throughout the flooding event, we did not have any water quality incidents. This is to the credit of our colleagues who literally worked around the clock to ensure that the supply was maintained. Had it been lost, this terrible event would have been a true catastrophe.

5.13 We lost supply from one water treatment works, Ewden in Sheffield. We were able to maintain supplies by using connections to alternative water treatment works and to our grid.

6. MAINTAINING THE CLEAN WATER SUPPLY—PLANNING FOR RESILIENCE

6.1 Our water supply network has high levels of interconnectivity, giving high levels of resilience.

6.2 Designed to resolve the problems faced by the Company in the drought on 1996, our water grid now means that for around 95% of our customers we can switch to an alternative water supply should their usual supply be lost.

6.3 Modelling of our system predicts that our systems can maintain supplies for several days even with the loss of more than one low level water treatment works. During this period we would have time to manage down demand and put in place further emergency measures.

6.4 We believe that our approach to network development and the flexibility this gives us in terms of resilience planning is industry-leading. However we will review the position regarding those limited areas not connected to the grid to assess the costs and benefits of building further resilience into the system.

7. SEWER FLOODING

7.1 The unprecedented rainfall led to significant flooding in the region which impacted differently in South Yorkshire, the East Riding of Yorkshire, Selby and Hull.

7.2 South Yorkshire

7.2.1 In South Yorkshire, the high levels of rainfall led to river flooding. Our waste water treatment works tend to be located close to rivers so, as the Rivers Don, Rother and Dearne and their tributaries overtopped, many of our treatment works were overwhelmed by the flood water. In some cases, colleagues were stranded at the works by flood water. Our waste water treatment works at Blackburn Meadows near Meadowhall, which serves Sheffield, was under 10 feet of water on Monday 25 June.

7.2.2 During high rainfall, Yorkshire Water pumps screened but untreated flows directly into the river. This is undertaken under a strict consents regime agreed with the Environment Agency. When we cannot pump water into rivers, because the rivers themselves are overflowing, water backs up the system. This is known as fluvial flooding. In these situations, customers may see water coming back from the sewer system into streets.

7.2.3 Once the water had subsided, we could begin to pump flows into the river again and in South Yorkshire the flood waters quickly subsided.

7.2.4 The exception was Toll Bar in Doncaster, where due to its low elevation, flood waters remained for a number of days. Our pumping stations at Toll Bar worked throughout this flooding event. We actively monitored the pumping stations and were well placed to respond if they too became overwhelmed.

7.3 Selby and the East Riding of Yorkshire

7.3.1 In the rural areas of the East Riding of Yorkshire and some parts of Selby, the rainfall did cause our network to become overwhelmed and customers did experience extensive surface water flooding.

7.3.2 In these cases, the areas affected recovered quickly. Once it stopped raining, the sewers and drains could cope with the flows and the water ran away.

7.3.3 The East Riding is very flat and low lying therefore excessive rainfall will not drain away quickly. The land drainage facilities, maintained by others, and the water courses maintained by the Environment Agency interlink with the sewerage network maintained by Yorkshire Water.

7.3.4 The East Riding of Yorkshire is also dependent on drains to discharge flood waters. The high levels of the Burstwick Drain prevented emergency discharge of flood waters from the sewerage system and in the West, the Setting Dyke and the Cottingham Drain overflowed into the sewerage system. These dykes and drains are not owned or maintained by Yorkshire Water.
7.3.5 The management of flows from the drainage system into the Humber is the responsibility of the Environment Agency. We are dependent on this drainage system as sewers also discharge into it. We would like to work with them to better understand these issues and if possible to develop remedies that allow our networks to discharge effectively rather than backing up, causing our sewers to overflow.

7.3.6 Some flooding occurred to the west of Hull and affected towns including Hessle and Anlaby in the East Riding. The incidents of flooding in these areas are connected to what happened in the city of Hull and this is covered in the next section.

7.4 Hull

7.4.1 The City of Hull is below high-tide level and is therefore dependent on an effective sewerage, drainage and water pumping system to remove surface water from the city. As with the East Riding, our sewers interconnect with water courses and land drains operated by others.

7.4.2 Many of our assets in the city of Hull were overwhelmed by the sheer volume of rain fall on 25 June, including our waste water treatment works at North Ferriby and Saltend. Despite being 2ft under water, our works continued to operate at Saltend. This works serves the ½ million people in the city.

7.4.3 Our major pumping stations at East and West Hull on the A63 worked to capacity throughout the storm event, pumping over 50,000 litres of water per second into the Humber.

7.4.4 On Tuesday morning (26 June), we were alerted to a surface water pumping station failure at Bransholme in the north of the city. The foul water pumping station at this site continued to operate throughout the storm event.

7.4.5 The pumping station, which takes surface water from the Bransholme Estate, was fully operational at the time of the storms but eventually was flooded like the rest of the estate by the exceptional rainfall causing the pumps to fail.

7.4.6 We responded quickly and some pumping capacity was restored by Tuesday evening and we were able to source additional standby pumps to restore full capacity by Friday. To further assist in the clean-up, we have utilised additional capacity. The pumping station is now being repaired.

7.4.7 We have contributed to an inquiry commissioned by the Leader of Hull City Council into the flooding. We are currently developing a detailed response to the interim report published by the Inquiry.

7.4.8 We have also commissioned engineers Arups to carry out a study of the sewerage network in Hull. We want to reassure our customers in that city that we take the concerns they have expressed very seriously.

7.4.9 We believe that a substantial multi-agency review of drainage arrangements in Hull will be required. The Environment Agency, Hull City Council and Yorkshire Water will all need to contribute to this and will need to be prepared to fund any resulting investment requirements.

8. Recovery

8.1 The flooding had a massive impact on YW assets and operations with over 30 waste water treatment works, including Blackburn Meadows, and over 100 sewage pumping stations being flooded. The initial emergency response secured a return to normal operational performance albeit with the support of temporary equipment. The next reinstatement phase is now underway which will return the assets to their pre-floods status so that long term operational performance can be sustained. A dedicated Reinstatement Team involving both YW and our Partners is now well established and the programme to reinstate the YW assets in both the South and East of our region is going to plan. The scale of the work is such that it take until December 2008 to complete the programme.

8.2 Our contractors, Drainsaid worked around the clock to help with the clear-up on those homes directly impacted by flooding from our sewers.

8.3 We were able to support Severn Trent’s water business when their operational area was impacted by high rainfall in July. We contacted them and provided thirty operational colleagues to work under their direction. Our colleagues worked with Severn Trent for twelve days. We also provided tankers, continuous supply trailers, bottled water and bowser.
9.2 Water companies, local authorities and the Environment Agency all have very clearly defined areas of responsibilities and these are defined in statute. These provide the framework within which the different agency responses to the flooding event can be understood. Our remit regarding sewerage and drainage is very narrowly defined. Section 94 of the Water Industry Act 1991, states:

“It shall be the duty of every sewerage undertaker to provide, improve and extend such a system of public sewers (whether inside its area or elsewhere) and so to cleanse and maintain those sewers as to ensure that that area is and continues to be effectually drained”.

Sewers are elsewhere defined as drains serving premises, not open land. Water companies are not therefore liable for surface water and rainfall management.

9.3 Water companies are subject to strict economic regulation and the Regulator will only allow companies to undertake and therefore charge our customers for activities which are defined in these regulations with regard to the sewerage network.

9.4 Water companies are not statutory consultees for new planning applications. If we are approached by a developer or the local council, we can request conditions which the approving authority may attach to the permission when granted. We also have no powers to monitor that recommendations we have made are implemented.

9.5 We are obliged to offer all new developments the right to connect into the public sewerage system under S.104 of the Water Industry Act.

9.6 Such regulations may have to be reviewed as a result of this summer’s flooding event.

*Yorkshire Water*

*September 2007*

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*Witnesses: Mr Kevin Whiteman, Managing Director, and Mr Robert Salmon, Director of External Communications, Yorkshire Water, and Mr David Fullwood, Clerk to Beverley and Holderness Internal Drainage Board, Preston IDB and Wilberfoss and Thornton Level IDB, Dr Jean Venables, Chief Executive of the Association Drainage Authorities, and Mr David Sisson, Engineer to Lindsey Marsh IDB, Internal Drainage Boards, gave evidence.*

**Q241 Chairman:*** We move on to our second set of witnesses this afternoon and welcome from Yorkshire Water, Mr Kevin Whiteman, their Managing Director. Is Mr Salmon around?

*Mr Whiteman:*** He has just made a quick visit. He was hoping to beat you, Chairman!

**Chairman:*** We will assume he is in the building and if he comes back Mr Salmon will perform the function of being the Director of External Communications. Representing the Internal Drainage Boards, we have Mr David Fullwood, who is the Clerk to the Beverley and Holderness Internal Drainage Board and also the Preston Internal Drainage Board and Wilberfoss & Thornton Level Drainage Board. You are going to have to explain all of that to us in due course. I think you take the award definitely for the longest title this afternoon. Next to you is Dr Jean Venables, who is the Chief Executive of the Association of Drainage Authorities, and you are supported by Mr David Sisson, who is the engineer to the Lindsey Marsh Internal Drainage Board. You are all very welcome and, in the case of Yorkshire Water, can I thank you for your written evidence. David, I think you are going to start.

**Q242 David Lepper:*** Thank you, Chairman. I think it is really a question for Yorkshire Water. Sewers have obviously played an important part, particularly in what happened in Hull, and, as I understand it, the Water Industry Act provides for a right of connection to a public sewer and it allows the waste water company to adopt sewers, but, Yorkshire Water, in your evidence you say that your remit in relation to sewerage and drainage is very narrowly defined. Can you tell us: how do you define a sewer and how narrow is the definition of your responsibilities towards sewerage and is it same for other water authorities or does it vary from place to place?

*Mr Whiteman:*** The straightforward definition, if there is such a thing as a straightforward definition of a sewer, is it is an underground pipe that takes water from premises as it flows to open land. Having said that, of course, sewers are not that straightforward because they tend to take water from everywhere, and we have seen earlier this afternoon from my colleagues in Hull that very often the land drains drain into the culvert which drain into the sewers. I am sure we will come on to Hull in more detail, but Hull is an exceptional case and I do not think there is anywhere else that has that sort of system in the UK. In terms of the straightforward definition of a sewer, it is the underground pipe that takes water from premises.

**Q243 David Lepper:*** That is what you meant, or what your company meant, by its remit being very narrowly defined in terms of responsibility towards sewerage and drainage?

*Mr Whiteman:*** I think it is, yes. Although it is narrowly defined, of course, it is not so narrowly applied because of the circumstances I have just described.

**Q244 David Lepper:*** Do most or all water companies have the same view about their remit as you have?
**Mr Whiteman:** I think they move under the same statutory framework, so they will have, yes.

Q245 David Lepper: I am still trying to get clear exactly where your responsibilities start. You have, if I dare say, muddied the issue a bit by talking about water from different places perhaps all ending up in the sewer. It is when it enters what you define as the sewer that you have a responsibility for?

**Mr Whiteman:** We have a responsibility for it and, because most urban conurbations in the UK have what we call combined systems (so surface water and foul water running in the same pipes), the surface water almost inevitably finds its way into the sewers in most cities in the UK.

**Mr Salmon:** Perhaps I could expand on that with the example of Hull. In the west of the city we have a water course called Setting Dyke, which is the responsibility of the Environment Agency, that flows directly into our sewerage system. In the east of the city we have a land drain called the Holderness drain that flows into our infrastructure. Water that drains down gullies and streets and highways is the responsibility of the local authority until it gets into our sewers. What you find in our major cities is this tremendous interrelationship between all of the different drains and sewerage systems. Our definition was just to define our bit of it, which is when it goes into those underground structures.

Q246 David Lepper: How much liaison would you have as a company with those other agencies that have responsibilities about the way they are carrying out their responsibilities: because the way they do it is bound to have some impact on the service you are responsible for?

**Mr Whiteman:** The Environment Agency obviously have a huge amount of interaction, because they regulate us in many different ways. They regulate us in terms of our water resources and abstraction, they regulate us in terms of our discharges and we have a lot of interaction with them around drainage issues as well. The complexity comes because everywhere is so different. I think the Committee has seen this afternoon the Sheffield situation is very much about rivers over-topping and filling up drains. We were a significant victim of the floods in South Yorkshire. Thirty of our waste water works were completely inundated. In Hull it was about urban drainage and in Hull, almost as an accident of history, we have a responsibility for pumping out. In the height of the Hull floods we were pumping 52,000 litres a second out of Hull, which is about half the flow of the River Thames, which gives you a feel for the size of the pumping stations in Hull. These are not small pumps with small pipes, these are big stations.

Q247 David Lepper: You say “almost as an accident of history” you have that responsibility; so that responsibility would lie elsewhere?

**Mr Whiteman:** As I say, Hull is unique in that, because it is a combined system, because Hull is below high-tide level, all the drainage is pumped, whereas normally the service water would be draining straight out by gravity, but it had not done so we pumped.

Q248 Chairman: To follow on what Mr Lepper was saying, in paragraph 7.3.5, you say under the heading of Selby and East Riding, “The management of flows from the drainage system into the Humber is the responsibility of the Environment Agency. Then you go on to repeat what you have just said, which is, “We are dependent on this drainage system, as sewers also discharge into it”, and then you say, “We would like to work with them to better understand these issues, if possible to develop remedies that allow our networks to discharge effectively rather than backing up causing our sewers to overflow.” That seems to be a rather basic thing that you should have done some considerable time ago.

**Mr Whiteman:** This is particularly about Selby and East Riding rather than Hull, which is different because this area is gravity drained. We drain into the Burstwick drain, which is the responsibility of the Environment Agency. I think one of the things we have to establish is that this particular rainfall event in Hull was very, very extreme. As a result of it, the Burstwick drain was higher than the sewerage system. Therefore, inevitably, water flowed the other way. I think it was explained earlier on that the arrows on some of these drains go both ways, so the complexity is enormous.

Q249 Chairman: Forgive me, I am not an expert in your area, but do you not do “what if” scenarios, or do you sit there saying, “Oh well, somebody said this is a one in 75 year or a one in 100 year event, so we need not really bother about doing this”? When you write down something about wanting to understand better how your system and the Environment Agency’s area of responsibility interact, it seems to me from what you have said earlier to be such a fundamental activity for a water company to be doing that I am surprised to see it written down in evidence, suggesting that this is something you have just discovered you ought to be doing.

**Mr Whiteman:** I think what we have learnt from this event is that there are times, and this was one, when the rainfall is so intense that there is an issue about the drainage of this area, and we have to learn from that. This was not a normal circumstance.

Q250 Chairman: For example, in terms of, if you like, working out the risks which you as a public company have to cope with, do you have an in-house futurologist, somebody who goes through with your senior management what I call the “what if” scenarios? Putting aside the risk assessments which have been done by the Environment Agency and possibly others, is there somebody who says, “Look, we have had the Foresight Report, we are aware of climate change, we have seen before now extreme weather events, let us just play some scenarios...”
Mr Whiteman: We do exercises like that and we do exercises that occur, what does this mean? Do you do exercises like that?

Q251 Chairman: I would like to ask you on that point, because we have done work in the past about water charging and Ofwat and the Committee obviously understands, particularly in the context of water poverty, what rising charges can mean to those who have low incomes. But given that climate change, if you like, is a world phenomenon and there are national consequences that we consider, do you believe that the financial impact is something which should be distributed using the normal formula where customers effectively pay for whatever investment Ofwat sanctions, or whether there is a need for a national view for investments which may be beyond, if you like, any one company and its customers to bear but where that investment has got to be made as we learn more about the impact of climate change?

Mr Whiteman: I think the impact of climate change will be fairly universal across the country. I think it is for the body politic to decide what the priorities of the design standards should be, it is then for the companies to implement them, and, wherever the money comes from eventually, everybody is affected. So, whether it is through the water charging system or through the tax system, again, is a political issue, and I would suggest it should be through the water charging system.

Q252 Chairman: The only reason I ask that question is that if you take the south-west of England, when they had to improve their bathing water quality, because of the sparseness of the population, the people who lived there paid a disproportionately high additional amount, and one could argue the same thing in the North West for those who may have to fund the refurbishment or renewal of Victorian facilities which may be nearing the end of their life. I suppose what we are looking at is whether you spread some of the pain across the whole tax payer population, which is not necessarily the water paying population?

Mr Whiteman: I believe that one of the rationales for the privatisation of the industry in the first place was that he who uses the service pays the bill, and I think that is the way it should be.

Q253 Chairman: Let us move to internal drainage boards. I think it would be helpful if you could describe why it was you were established and what are your powers and purposes, to give us little back ground, please?

Mr Fullwood: Thank you, Chairman. Drainage Boards were established 250 years ago, and basically they were established to drain land so we could produce food to feed the population. They were formed in obviously the low-lying areas of land, which also happened sometimes to be the most fertile areas of land as well. We operate now under the Land Drainage Act, and I think the first one was 1837 or thereabouts. The latest one is the 1991 Act. There are about 180 drainage boards in the country. We do not cover the whole of the country; we cover parts of it, mainly low-lying. Having said that, there is one sat up on the Pennines, which is not exactly low-lying, but generally they do cover low-lying areas, something like 1.2 million hectares of land.

Q254 Chairman: Who appoints you?

Mr Fullwood: We were set up under the Land Drainage Act. We are a statutory body. We have elected members and nominated members.

Q255 Chairman: Who is the electorate?

Mr Fullwood: The electorate are the rate-payers within the board’s district, usually land owners. The nominated members come from the local authorities, who pay a special levy.

Q256 Chairman: So you have a sort of ballot, do you, amongst land owners?

Mr Fullwood: Every three years there is an election and any rate-payer within the district has so many votes, depending on the area of land that they own within the district. You have to own a minimum of ten acres, going back to old money, so whatever it is in new money.

Q257 Chairman: Are these elections fiercely contested?

Mr Fullwood: Perhaps not.

Q258 Chairman: It is more a question of finding the volunteers?

Mr Fullwood: They are volunteers. There is no payment.

Q259 Chairman: Let us assume that this is day one after the elections and the nominations have been carried out and the board has been formulated. How do you determine what your policy objectives are and where do you get your funding from?

Mr Fullwood: The funding comes in two main streams. One is that we levy a rate on the occupiers of the land within the board’s district, and in the case of a farm it is the farm buildings and property.
second main source of income is on the special levy, which is levied on the local authority within the board’s district. That replaced the earlier arrangement where every householder within the district used to pay a drainage rate. Going back many years, that was probably a shilling or ten pence, or something like that, and actually collecting that money was very difficult. In 1991 they changed the Land Drainage Act and gave it a statutory duty for the local authority to collect that money on behalf of the drainage board.

Q260 Chairman: So here you are, a group of enthusiasts sitting round the table, you are very knowledgeable about your own drainage circumstances, but, as we have heard, you have to interact with a whole series of other bodies. Where do you fit in the drainage hierarchy, given the sort of competing responsibilities for drainage issues?

Mr Sisson: I think I might deal with that one, Chairman. Internal drainage boards are set up, as David has said, in areas of special need, and in each of those special need areas it sits within a region of the Environment Agency, and they are our supervising authority, if that is the word that you like to use. We sit alongside and have very similar powers to local authorities have very similar powers to individual drainage boards. So you have drainage boards active in special need areas, you have local authorities sitting beside them out of that district and then you have the Environment Agency overseeing the whole of the land drainage and water.

Q261 Chairman: Help me to understand the whole range of drainage circumstances for which you actually have a responsibility, and how do you exercise that responsibility?

Mr Sisson: Our main function is literally managing water levels in the special need areas. That may well be for any call on the water environment—it may be flood defence, it may be land drainage, it may be irrigation, it may be amenity, it may be an environmental need, but that is our core responsibility. We effectively sit between the urban areas and agricultural land and transfer the water away from those areas to discharges either to the tidal regions or to main rivers, Environment Agency main rivers.

Q262 Chairman: Do you have any conflict between biodiversity responsibilities and drainage responsibilities?

Mr Sisson: There can be conflicts that impinge on operational activity. Mostly we try to work through them with our partners and other stakeholders.

Q263 Chairman: So in terms of the stakeholders you work with, when it comes to setting priorities, you mentioned, I think, principally dealing with water level issues. In terms of areas, for example, where you have got a dyke system, you have got to get the dykes full, so individual landowners have got to keep their drains in good order so that they can discharge into your dykes. I say “your dykes”—do you have something that is actually your responsibility or is it a question of you are looking at situations and then tasking others to do your bidding?

Mr Sisson: Yes, we do have dykes that are nominated to be maintained, effectively, by the drainage board at public expense, if you like, and there are many riparian water courses that rely on them for their point of discharge. They can be either open water courses, as you have suggested, dykes if you will, or they may be sections of culverts or pipes as well. Most of the IDB areas obviously, because they are low-lying aspects, rely on pumping for their eventual discharge and we maintain those structures and sluices, et cetera, as well.

Q264 Chairman: One of the issues that has come up in much of the evidence has been about the maintenance of water courses and of existing drainage systems. There has been a lot of blame being allocated between different agencies. For example, members of the public have written to the Committee saying, “If only the water courses had been properly maintained, when the floods came in our area the water would have got away quicker.” That is the kind of comment that we have had. As a situation in the way I have described it, is that something you are monitoring on a continuing basis? Do you have any disciplinary powers over riparian owners to say, “Get your drains and your water courses in good order.” How does the interrelationship work between you and others who also have a drainage responsibility?

Mr Sisson: There are two or three things that you ask there. I will deal with them if I can. First off, powers over third parties, effectively riparian owners. Yes, there are powers within the Land Drainage Act for the drainage board to act in a supervisory role, to require cleansing or maintenance works. I think the other part of your question was about possibly referring to the dykes that we maintain, or rivers maybe.

Q265 Chairman: Yes.

Mr Sisson: Okay. There are two things. In our own circumstances we have all had needs-based programmes of operation and cleansing of water courses. They are all engineered structures and have to be maintained to be fit for purpose. The action that we normally take is we annually clean weed that grows in them that can clog up flow, quite obviously, and we have periodically then removed silt that has accumulated in the dykes to restore their flow capacity and their storage capacity for dealing with what we expect to be extreme events, but possibly not as extreme as we received this year.

Q266 Chairman: In terms of flooding that we are focusing on, which obviously has arisen out of what happened this summer, were there areas covered by IDBs that were involved in this years flooding?
Mr Sisson: Most definitely.

Q267 Chairman: Have you been able to collate any of their observations about what happened and any thoughts that they may have about policy changes, responsibility changes, which ought to result from this year’s events?
Mr Sisson: Certainly David has some figures to share with you for the Yorkshire area, and I will pick up any general points.
Mr Fullwood: Certainly in the East Riding of Yorkshire, which is where I am particularly involved, and these are figures that have been verified by East Riding, there were something like 6,300 properties affected by the floods and there were also about nine and a half thousand hectares of arable land affected by the floods. Most of it was on the east side of the River Hull. That, historically, is an area called Leven Carrs, and a “carr” land is low-lying land. What used to happen in the pre-drainage days is that is where the water came from the lowland areas. Hull and the East Riding seems to be, listening to the previous people, a unique area. In the area itself there are a number of elevated water courses, which we call highland carriers, and they are generally above the normal land level and they take the water from the upland areas, from the Wold, for example, right from the east coast, and they carry it in an elevated manner across the lowlands into the River Hull, which is an EA maintained water course which gravitates down into the Humber. What was happening this time, because of the sheer volume of water, the upland water courses, the elevated water courses, were actually over-topping and flowing down into the lowland areas, as it would have done three, four, 500 years ago, and it was accumulating in the “carr” land areas. The problem then was the evacuation of that water once it got into the lowland area, and in certain instances it stayed there for three weeks or more. It is an estimate, but we estimate that on the agriculture losses there was something just short of 20,000 or seven million pounds worth of uninsured agricultural losses. That is the Beverley area, Preston, which is not Preston Lancashire but Preston Yorkshire.

Q268 Chairman: That bit I understand because part of my constituency has Preston, Lancashire in it.
Mr Fullwood: Preston Yorkshire. Lower Ouse, Market Weighton and a group of drainage boards just on the north bank of the Humber were significantly affected by the lack of the ability to discharge surface water in the water courses out into the Humber through gravity discharge points. Burstwick drain has been mentioned. That is a gravity outpour.

Q269 Chairman: Was that simply because the main water course was full, so there was nowhere for the water to go?
Mr Fullwood: I think, on the question of maintenance, had any water course been in pristine condition, flooding would still have occurred. The question is, if the water courses had been in better condition could we have got rid of it quicker, and, therefore, the duration been shorter?

Q270 Chairman: In terms of flood management messages to the Committee, you are intensely involved in your local areas of activity as drainage boards. Are there any things that you want to tell us that you think we ought to know about in terms of changing flood prevention policy in the future which you have been sitting there saying: if only they would do so and so things would be better?
Dr Venables: I will take that one. For many years now we have been saying that it is important to recognise that the water level management is taking place every day. We are rather focusing on a flood event, but every day 1.2 million hectares of land relies on active management and I think that is an important point to consider in terms of looking at risk management. We are looking at water level management as well. It is a continuum, but there is a lower end, which is the water level management every day. In addition to the land that was protected and the original reason for doing it, which was to grow food, we are now protecting extensive infrastructure. Roads, railways, utilities, water supplies, all the communications networks run through those low-lying areas, and it is absolutely vital for the country that they are kept open and working, and that is water level management.

Q271 Chairman: Do you have sufficient resources to do that job?
Dr Venables: One always needs more.

Q272 Chairman: Turn it round the other way. Are there any potential serious risks in the scenario that you have described that you are struggling to cope with?
Dr Venables: I think what would be different if we had more money would be to improve the maintenance of structures to upgrade several of the pumping stations to cope with impending climate change and to invest in renewal and repair.

Q273 Paddy Tipping: Can I come back to Yorkshire Water. You talk about Hull and Sheffield. They are pretty historic cities, big built up areas. The sewers have been there a long time. What are the conditions? What assessment have you made of the conditions?
Mr Whiteman: We do a full assessment of the condition of the sewerage infrastructure. We have in Yorkshire roughly 30,000 kilometres of sewer, which will be expanded by 50 per cent in 2010 when we take on responsibility for Warwickshire IDB private sewers, so big expansion there too, and they are not all Victorian. If you look at Sheffield, the big Don Valley sewer was built in the eighties, I think, in Hull the sewerage infrastructure was significantly improved in the sixties and seventies, but it is true to say that the vast majority of those 30,000 will be brick built Victorian sewers—there are a lot of them—and generally they are in good condition.
Having said that, because the investment requirement over the last 15, 16 years has been very much about improving things like treatment standards so that we improve the quality of the rivers and the like and investing in water quality standards as well so the drinking water quality improved, that has squeezed out the requisite capital maintenance investment that is necessary for a sustainable sewerage infrastructure over the next 100, 200, 300 years. If you look at the sewer replacement rates at the moment, you hear various quotes, but we are expecting the last five or six hundred years with current replacement rates; so one would hope that, as we for improved standards of treatment start to diminish, we can expand the capital maintenance expenditure to ensure the maintenance of the sewerage infrastructure is sustainable. At the moment, if you look at Ofwat’s assessment of the sewerage infrastructure in Yorkshire, they do it on a performance basis and it is considered to be stable; so there is no evidence that collapses are getting worse or blockages are getting worse in the overall sense that the infrastructure is deteriorating.

Q274 Paddy Tipping: Mr Whiteman, you told us earlier on about climate change, and it is hard to make predictions about the condition of the sewers, but you have also said to us that there is an investment gap in sewers because we have concentrated on water standards. What assessment of have you made of the investment gap?

Mr Whiteman: My point is not just about the investment in the water system but also in waste water treatment in general. If you look at the level of investment, if you look at Hull, in the last ten years we have spent roughly 250 million on the water infrastructure, of which 150 million is on the waste water system, the construction of a major 11 kilometre new sewer right across that carries all the flows to a new treatment works. So there is significant investment taking place, but the investment tends to be in enhancement of the service rather than maintenance of the existing service. There is no doubt that, as and when that enhancement starts to diminish, very often driven by European legislation, we will be able to spend more on the infrastructure maintenance, which is the older Victorian stock that we have.

Mr Salmon: Let me give an example of that. In the last five-year investment period one of the big drivers for quality investment has been the Fresh Water Fish Directive, which has driven investment in Yorkshire of over £200 million in improved treatment standards for waste water treatment works, but the comparable sum on the maintenance side for updating combined sewer overflows, reducing sewer flooding in properties, is around £100 million. So, I think, going forward, there are choices to be made between the level of quality investment that will be required (and of course that is an environment driver around climate change) as much as what needs to be invested in the sewerage infrastructure if we are to see repeat rainfall events of this intensity and magnitude in the future.

Q275 Paddy Tipping: You are about to start having discussions with Ofwat about the next investments, are you not?

Mr Whiteman: Yes.

Q276 Paddy Tipping: What are you saying to them and what are they saying to you?

Mr Whiteman: What we are saying, particularly about climate change, is that we should be spending fairly significant amounts of money as an industry in the next five-year period to do a real fundamental assessment of how climate change will affect us and how we should respond to it. Strangely, of course, before this summer the vast majority of the focus about water companies and climate change was about water supply. Suddenly this summer has brought into very sharp focus the issue of urban drainage too, but the numbers are huge, and when you start talking about reengineering the drainage system of a city the numbers are enormous. So rather than changing into just trying to put bigger pipes in, which is not that straightforward, we should do some fundamental research as to what exactly is required so that where the money is spent it is spent properly and spent well.

Mr Salmon: The Chairman referred to the Foresight Report earlier on. In the water industry, the focus, it is fair to say, has been largely on the water resources and supply side, so we have taken very seriously the impacts of climate change on that side. We have done long-range, 25-year modelling in terms of the water supply resources in Yorkshire and we are very confident that we have seen an end to hosepipe bans in Yorkshire due to forward planning, modelling and investment in our network. A lot of the emphasis has been on the water supply side and we have worked with national bodies like UKWIR doing climate change research, but largely, and this is true of the industry as a whole, I think, on the water resources side. Of course, if we had been having this conversation a year ago, we would all have been talking about the need for more reservoirs, more water resources, dry summers, and what we have seen this June, of course, is an incredibly wet summer, which is almost the converse of what climate change is predicting, which is wetter winters and dryer summers. The other focus for water companies, because we are big energy users, has been on carbon reduction mitigation, so the water companies are very focused on energy efficiency, carbon footprints. Just this week we have seen the opening of a wind turbine on our waste water treatment works in Hull paradoxically, and also our Loftsome Bridge Water Treatment Works, which will make those works partly sustainable from an energy point of view into the future. I think the industry is very focused on climate change, it is very
focused on these big, important issues and what we
have said to our regulator in our current 25-year
plan, our strategic direction statement that we have
put together, is that we have reached a turning point
with the sewerage network where we now need to
start to take this issue seriously and do some proper
modelling, proper research to see what the impacts
are going to be on our networks going forward.

Q277 Paddy Tipping: Tell me if I have got this
wrong. What you are saying to me is in the next
investment cycle it is going to work on what you
need to do rather than physically work on the ground?
Mr Whiteman: I think that is right, yes. Obviously
there is an on-going requirement for investing in the
sewerage infrastructure, but specifically in relation
to climate change we need to have some very clear
views on what it is we are trying to plan for, and I do
not think that is clear yet.

Mr Salmon: It is fair to say, we are already doing
things, like, for example, the design of our treatment
works. We are looking at raising up generators,
having electricity supplies higher; so there are some
levels of mitigation and adaptation that we are
putting in with the prospect of these events, but, as
Kevin said, we do not want to be rushed into any big
knee-jerk investments on the back of this. We need
to take a scientific, sober look at what the impact of
climate change is if we are going to see more of these
repeat rainfall events.

Q278 Paddy Tipping: I think that is right, but it does
not make easy listening for somebody who has got
foul sewage in their front room?
Mr Whiteman: I agree. What we are not saying is
that we will slow down or in any way reduce the level
of expenditure that we are putting into the sewerage
system, that we are putting in now, about reduction
of, in particular, flooding from sewers. In our 25-
year strategic directive statement that we have been
asked to submit by Ofwat for this, to put some
context around the next five-year investment plan,
our aspiration would be zero sewer flooding in 25 years’
time, that it will just not happen, because we
do not think it is acceptable. Please do not think
we are in any way complacent about that, but we do
think that the major decision is around climate
change investment, because there will be some major
decisions. The Chairman has already asked a
question about who pays for this; so you need to
make sure where the money is spent it is spent
properly and spent well.

Q279 Paddy Tipping: I want to come back to that
point. There has been a lot of focus on the EA’s
budget from 400 million to 600 million to 800
million. There has not been a lot of discussion that I
have seen about the amount that we are going to
invest in the sewage system, but the events this year
have shown us that that is the major cause.

Mr Whiteman: If you look in Yorkshire alone our
investment programme is not far short of £400
million a year, so we have been investing enormous
sums of money in the water supply and waste water
infrastructure. One would hope that as the quality
investment requirement goes down (i.e. we have got
to a stage where the rivers are in good condition, the
discharges are well treated), as that investment
reduces, the slack will be taken up by investment in
the sewerage system as opposed to the treatment
system. One of our big worries is that every
improvement requirement standard from Europe
does not seem to stop, and I think there is an issue
for us to consider around when is the level of
treatment good enough, because there is also the
carbon issue that goes with that. The more you treat,
the more power you have to use, the more carbon
you have to use; so there is another big question
there.

Q280 Chairman: Just before I bring Lynne Jones in,
you said that some research has got to be done in
trying to help you forecast the future demands on the
sewage system. Who is going to do that research?
Was that a plea for a national piece of work?
Mr Whiteman: No, there are bodies in place. UKWIR,
that Robert has already mentioned, which is the
UK water industry’s research establishment, is
there to do exactly this sort of thing. What we need
to recognise is that it is a combination of national
research and local research, the national being the
general decision on what we are planning for and
then the local decision: how is that applied to our
own cities and towns and the drainage systems?

Q281 Chairman: Coming back to one of the lessons
that has already come certainly from the evidence
from both Sheffield and Hull, which is, if you like,
ensuring that all the key players are round the same
table, one of the unknowns, is the question of these
severe weather events, and at the moment the
planning for capacity flood prevention is on a
probabilistic basis, depending on how risk is
assessed of a one in so many years event, and that
appears to relate back to the most extreme event that
occurred within that whatever period of time?
Mr Whiteman: Yes.

Q282 Chairman: What we seem to be seeing is that
you are having potentially such concentrations of
water arriving that they go beyond what the current
probabilistic model predicts. I am not an expert in
this field, but do we need to have some new way of
rating risk that all parties can adhere to, because at
the end of the day if you know what the risk profile
is, then you have got a pretty good idea of what you
have got to invest to meet it?
Mr Whiteman: Absolutely. I think that the risk
profile changes, not because the design parameters
change, but because the frequency of these events
changes; so what is historically a one in 30 year event
may be, as a result of climate change, in the future a
one in ten year event. So it is the frequency that starts
to change. If you want to plan for a one in 30 year
event in the future—that may be a much more severe
event than a one in 30 year event was looking
backwards, that is the big question as to what you
Q283 Chairman: True.

Mr Salmon: I think perhaps that is not just a role for water companies. The interrelationships we talked about earlier of all the different systems—the land drains, the sewers, the drains—we support the recommendations that are in the Foresight Report and in the Making Space for Water report that there should be an integrated approach to open drainage management. I mentioned the water resources. We have a 25-year water resources plan. It is currently out for consultation. We do not have an equivalent line for urban drainage. If we take this issue of risk seriously, and we do, this is something where we need a joined up approach between all the different organisations, to sit down, have that debate about what level of risk and consequence we are prepared to accept as a society and then act in a much more coherent and joined-up way in the way that we plan and take responsibility for our systems.

Q284 Lynne Jones: Could I ask Yorkshire Water: what is your policy on the adoption of different forms of sustainable urban drainage systems, which I shall from henceforth refer as to SUDS?

Mr Whiteman: I think that is all part of this integrated view going forward that Robert has mentioned. The adoption of sustainable urban drainage systems going forward is essential if we are going to even mitigate some of the problems we have had this summer. It is part of the planning regime really to ensure that that happens. We are now starting to become a team for the connections to our drainage systems, so that is very much driven through the local authority, but we would support them wholeheartedly in making that happen.

Q285 Lynne Jones: You are obviously supporting them. Have you got any evidence that they work or particular types of systems work, and what about the maintenance?

Mr Whiteman: I am not a technical expert in sustainable urban drainage systems. We can certainly come back to you with a technical answer to that.

Mr Salmon: The principle of them has got to be right: slowing down the surface water run-off to give time for the sewer systems and the surface water drainage system to cope. We have attenuation lagoons that do roughly a similar sort of job, so part of this approach we are talking about we think SUDS are going to be absolutely essential, but who pays for them, how are they maintained, who monitors them going forward? I do not think these questions have been answered.

Mr Whiteman: In Hull it probably would not make a blind bit of difference because Hull is a bowl and the water is soaking through or in the pipes. Hull was full this summer.

Q286 Lynne Jones: What do you think should be done to encourage the adoption of SUDS, because there is the right for any dwelling to discharge into the sewers, so it bypasses often any consideration.

Mr Whiteman: I think it is very much through the planning process and clearly the responsibility of the local authority. We think in this multi-agency approach in a place like Hull or a major conurbation the lead body should be the local authority.

Q287 Lynne Jones: You would adopt any system of SUDS. Do you have any concerns that you might have responsibilities for these systems?

Mr Whiteman: We would have to look at each system on its own merits and, like most sustainable urban drainage systems, it would not need adapting by us because they are self-sustaining in effect.

Q288 Chairman: Mr Fullwood, do you want to make a contribution?

Mr Fullwood: Yes. On SUDS we believe as an association that they are, in principle, a good idea but, as our colleagues have referred to, there is an issue with the on-going maintenance of them. When we as drainage boards respond to the planning application, the applicant puts in that the surface water is going to SUDS, we say, “Great, that is fine. What exactly do they mean, what are they proposing and, very importantly, who is going to maintain them?” Because the developer, rightly, quite understandably, wants to dispose of that responsibility as soon as possible, and sometimes they set up management companies which, for one reason or another, they are there for some while and then disappear, and then who picks up the responsibility. We believe that if SUDS are to be more to the fore, then there has to be a proper body made responsible or responsibility passed to an authority to maintain those systems.

Q289 Lynne Jones: Would a change in legislation such as they have in Scotland help, do you think?

Mr Fullwood: Yes, we believe so.

Q290 Lynne Jones: And Yorkshire Water?

Mr Sisson: May I add, the most successful one that an IDB in the UK has been involved was actually a multi-agency approach to providing a solution for Bedford, the Marston Vale Scheme, where all the agencies came together and provided a sustainable system that has provided for development within that area, and it seems to work very well, but it is difficult. These multi-agency approaches have to be brought about by someone.
Q291 Lynne Jones: So it can be done voluntarily but there needs to be a legislative framework?
Mr Sisson: Yes.
Mr Fullwood: There needs to be the will to do it.

Q292 Lynne Jones: The will does not necessarily require legislation though, does it?
Mr Fullwood: I do not think so, no.

Q293 Lynne Jones: What would you like to see then to promote these systems and to ensure that responsibility for their future maintenance is clear?
Mr Fullwood: It can only be done through the planning process: as part of the conditions of planning the proper arrangement is made for the maintenance of on-going contracts.

Q294 Lynne Jones: Have local planning authorities got the necessary powers?
Mr Fullwood: I could not answer that one.
Mr Whiteman: I think they have.
Chairman: Have they got the skills to understand what the issue is?

Q295 Lynne Jones: So we do not need any change in legislation. They have already got the powers if they wanted to use them?
Mr Whiteman: To impose SUDS on a development, yes.

Q296 Paddy Tipping: But what about the maintenance?
Mr Whiteman: I think they can, because they can make it a condition of the planning that there is an organisation set up and there is some sort of escrow bond situation so that that is properly financed. I think actually they can, but I am not an expert in local authority planning, so maybe I should shut up.

Q297 Lynne Jones: Dr Venables seems to be disagreeing.
Dr Venables: I think that there is a need to have a long-term responsibility for the maintenance of SUDS schemes. Obviously it varies with the scheme, but there are a lot of schemes which require this long-term maintenance, and I think it is important to make sure that it is placed with an organisation that is on-going. I think you have already referred to the fact that sometimes the arrangements are somewhat short lived. I think there is an important aspect there that needs to be dealt with and I think Scotland has dealt with it far better than we have in England.

Q298 Chairman: I want to put a point to Yorkshire Water. We seem to have got river basin management plans, catchment flood management plans, we talked earlier about strategic risk assessments and then, on top of that, we have got regional spatial strategies, all of which seem to touch in some way on somebody else’s agenda, some sit on top. Are there too many of them? Are they properly co-ordinated? Do they inform each other well in terms of tackling the issues that we are looking at? I got rather confused about all the different relationships between all these different plans and approaches.
Mr Whiteman: I think it is a complex arrangement for a very complex issue. Each time there has been a major flooding event the thing that is most commonly exposed is this lack of co-operation and agencies working together, and that is because it is very complex. You cannot escape the fact that to have one body responsible for every flow of water in a region is very, very difficult to do. Do they all relate well? Not always, but it is a very complex issue.

Q299 Chairman: Yes. I realise it is complex; that is why I asked the question; but you are part of the process and I suppose I am asking myself: how effective is each one of these planning processes? I suppose there are some people who might argue: if you have got all this planning going on, why have you got problems? Yes, extreme weather events can sometimes beat the best laid plans, but I gather, for example, the Environment Agency are now about to change their organisational structure away from catchment area or river basin management. I have not quite worked out what that means, but you would have thought the natural habitat was a catchment area for the Environment Agency. So, you have got one set of plans for that, one for another. Are you involved as a water company?
Mr Whiteman: In terms of the whole planning procedure, we are a very small part. We would try to ensure that whatever the political will was to develop these plans that we made sure our infrastructure could feed and serve those plans. That would be our role.

Q300 Chairman: But do you not as a company qualitatively assess the outcome of these procedures, because they obviously have an impact on your business?
Mr Whiteman: I am sorry, in terms of qualitatively assess?

Q301 Chairman: For example, river basin management plans.
Mr Whiteman: We would be heavily involved in river basin, yes.

Q302 Chairman: Are they good quality pieces of work?
Mr Whiteman: Yes, I think they are.

Q303 Chairman: So those are worthwhile and they are good quality pieces?
Mr Whiteman: And they have a huge impact, particularly on our waste water treatment processes.

Q304 Chairman: What about catchment flood management plans?
Mr Whiteman: They would not have such a big impact on us because they tend to be about river control rather than urban drainage.
Q305 Chairman: But they could have an impact on rivers where you have abstraction rights?
Mr Whiteman: Yes, but abstraction from rivers has very little effect on planning.

Q306 Chairman: What I am trying to get it is: you are a professional in this field. I want to know whether you think these are good pieces of work?
Mr Whiteman: I think they are, yes. I think it is the right way to do it. I think the EA, in terms of the river basin based planning that they do, it is a very effective tool and it certainly works for us, and we are heavily involved in it.

Mr Salmon: I was about to add to what Kevin said. There is also the Water Framework Directive. That is a piece of legislation which is meant to bring together a lot of these plans and studies into more effective basin water management. Our environmental experts have been contributing fully to that process around the Water Framework Directive. I think there are moves to bring a lot of these studies and work together. It is more of an holistic umbrella piece of work around the Water Framework Directive.

Q307 Chairman: You say you think there are moves. We will have to find out what they are. Dr Venables, did you want to contribute?
Dr Venables: May I ask David Sisson to comment on—

Q308 Chairman: You can ask him anything you like, but you are in public!
Mr Sisson: The whole raft of flood management, river basin management plans can be confusing. We accept that. It is right and proper that flood management should be dealt with from effectively the largest unit right down to the delivery at the sharp end, so to speak: river basin at the top, catchment flood management. Catchments often fit within flood river basins or are river basins in themselves in certain circumstances. They do deal with riverine flooding, they do deal with arterial drainage flooding that we are involved in—we are wholly involved in the process—but they also should deal with urban flooding situations as well, and the ones that I have been involved with of recent times, that is probably the bit that has been least well developed in my opinion.

Q309 Chairman: Coming back to the fact that regional spatial strategies are part of this hierarchy and that one of the key elements which the government of the day is understandably addressing—the question of the supply of housing, and one of the issues in terms of flooding are two things: (1) where you put them and do you put them in flood plains and (2) if you are going to have lots more houses and lots more infrastructure, you are going to have more run-off—is there some way in which the outcome of work in that type of planning environment is inputted to these other activities so, in other words, it joins up? Going back to Mr Salmon’s point, he said, “I hope there is something going on that will bring them together.” From your standpoint, Mr Sisson, are they being brought together?
Mr Sisson: Certainly, speaking from my experience of the ones I have been involved with, yes, urban development and potential urban development, and, quite honestly, we have already said, we are established in areas of special need—many of those special areas of need involve the industry on the Humber bank, for example, they involve quite large urban areas around East Anglia especially and through the Trent Valley, and they have to be involved with, and they have been in the ones that I have been involved with, and they are used as a tool to govern and to inform the process on spatial planning.

Q310 Dr Strang: I wonder if I could ask Internal Drainage Boards about your relationship with the Environment Agency, which is obviously the lead agency in relation to flood protection risk and, indeed, will have greater powers and responsibilities next April. How in practice do the Boards work with the Agency in the sense of how does it exercise its supervisory role over the whole set-up in relation to flood risk management?
Dr Venables: Representing the Association of Drainage Authorities, I represent all of the IDBs nationally when we are talking to the Environment Agency and that rationalises the relationship between the Environment Agency and the IDBs. The Environment Agency also relates very, very closely locally to IDPs on the ground, and there is a very good relationship there.

Q311 Dr Strang: Do they actually go to the IDB meetings?
Mr Fullwood: Generally not. Board meetings, depending on the size of the board, are held bi-monthly or quarterly, and generally we do not get a representative from the Environment Agency. Locally, just speaking for the East Riding for the moment, the water courses in the Beverley Drainage Board area eventually become the EA main river. So you have got a length of water course somewhere, at a field boundary, it stops and it becomes an EA main river. So it is important, the level of maintenance that the EA do, because that impacts on what the drainage board can do. So, we have established a fairly close relationship with the local staff and we talk about what their maintenance works are, what our maintenance works are and how the two link together. We are keen to continue that relationship and we are keen to establish, perhaps at a slightly wider level, liaison between the EA regionally with the Drainage board in that region’s area. I think it is bit hit and miss—in some areas it is good, in some other areas it is non-existent—but as drainage boards we are very keen to establish and maintain relationships with the EA because they need to know what we are doing and we, equally, need to know what they are doing and what their policies are, what
their procedures are for their future maintenance works because it impacts very much, or can impact very much, on our operations.

Dr Venables: On the issue of maintenance you have just mentioned, one area of very great concern that we have at the moment is that the Environment Agency, in order to prioritise insufficient money for maintenance, has actually put their water courses into high, medium and low priority categories and, unfortunately, a lot of their low priority categories are also areas where IDBs are active; and that means that, in effect, there is no maintenance in those areas, and that, as we have just said, can have a very significant impact on the outfall from IDBs because some of them pump or gravitate out into main rivers and that lack of maintenance in some of those areas is going to be an increasing problem. It is already a problem in some areas and this is the beginning of the process. In five years’ time we could have a very significant problem if no maintenance is done for the next five years.

Q312 Dr Strang: Where is the key maintenance issue? It is done where?

Dr Venables: The Environment Agency has split its water courses into high, medium and low priority, and it has allocated according to its priorities that order in terms of where they are going to spend money on maintenance. One of the issues that we are trying to address is whether or not the IDBs can take over some of those—. We are trying to provide a solution. We have identified a problem and, in order to offer a solution, what we are talking to the Environment Agency now about is whether internal drainage boards can actually takeover the maintenance of those low priority rivers for the benefit of the people in the IDB areas and for the benefit of people in the locality.

Q313 Chairman: Would you have the resources to make that work?

Dr Venables: We would obviously have to get funds, but we are actually more effective at spending funds than the Environment Agency, so there would be a value for money opportunity there. Again, with some COWCs (critical ordinary water courses) that were taken over by the Environment Agency, they were taken over because they were critical for flood management but have received, in some cases, little or no maintenance, and so there is some concern in those areas that the situation is getting worse, not better, because of the Environment Agency taking them over and, again, we would like to propose that we were able to take them over so they could either be de-mained or the Environment Agency could subcontract the IDBs to actually takeover the appropriate maintenance in those areas. I think there are solutions, but we have just got to be lateral thinking about finding some of them.

Q314 Dr Strang: Would the Environment Agency’s low priority ones tend to be ones where the aim was predominantly in relation to agricultural land?

Dr Venables: Not necessarily. The high priorities tend to be led by urban areas, so it is actually concentration of people, but in the less populated areas you have got important infrastructure—you have got pumping stations, you have got electricity, water, utilities.

Mr Fullwood: And you have got small villages and small towns, but they are classed as a rural area, particularly in the medium and low priorities, and that, we believe, is an issue. Just as an example, we have talked about the Holderness drain, which is a main water course. It is an EA main river. The drainage board is not allowed to do any work on it. That water course feeds down to East Hull pumping station—so this is where the link comes in. We have a major discharge into Holderness drain which goes down to East Hull pumping station, which, under normal circumstances, will gravitate out into the Humber Estuary. In the June event everything was going down, or most of it was going out through Yorkshire Water’s pumping station. We believe that there was a restriction on the ability to convey the water from the upstream end down to Yorkshire Water’s pumping station to such an extent that, where one of our major gravity inputs into the Holderness drain, there is a pumping station at the side of it, that pumping station did not run for nearly a week because the gravity was coming in. It is very complex. There is a pumping station sat there and there is a big gravity inlet at the side of it. That gravity inlet was predominant and that was pushing enough water into Holderness drain to get it down to East Hull’s pumping station where they could manage with it, but once it got to them, and this was an issue that has been raised. The level of maintenance on water courses to pass, to give them the ability to convey water down to pumping stations—we have got to link those in. There is a drainage board main water course, there is an EA main river going to a Yorkshire Water pumping station.

Chairman: A point well made. Lynne.

Q315 Lynne Jones: To finish off, some questions for Yorkshire Water. I am glad you mentioned earlier that you are huge energy users, because most people see they need to conserve water but it is on the basis of problems with the potential supply of water rather than the huge carbon footprint. We now have a code for sustainable homes, which seeks to reduce the consumption of potable water by up to 60 per cent and also reduce the surface water run-off. However, I understand you get your revenues from the amount of clean water that you sell. So are there any implications for the widespread adoption of the code for your revenues: because your other responsibilities are based on your income from the clean water supply?

Mr Whiteman: The vast majority of our customers, of course, still are unmetered, so the volume they use does not relate to the bill that they pay, the bill is still related to the property. That is changing slowly, but it is only slowly. If everyone were metered, which I guess in many, many years to come is the inevitable
consequence of the slow but sure increase in metering, then it would have an impact on us, but in effect it would start to reflect the real price of water, because volume unit costs would inevitably go up.

Q316 Lynne Jones: Do you think you are adequately incentivised to encourage reduction in water use? 
Mr Whiteman: No, it is only just the whole concept of us being---. We have a statutory duty to promote water conservation, which we do, but it is only just starting to be part of the regulatory regime that actually we should have water conservation targets.

Q317 Lynne Jones: Are there any conflicts of interest between the water supply functions and the waste management aspects of your business?
Mr Whiteman: I do not think so, because the proportion of water that gets into the waste water treatment system that comes through someone’s tap is relatively small. It is overwhelmed by service water and highway drainage. I think there is inevitably some conflict about the statutory duty for water conservation and those of our customers who pay by meter because we would like them to use more water; so there is inevitably that conflict, and we have to be honest about that.

Q318 Lynne Jones: But you generally support these measures?
Mr Whiteman: Yes, absolutely.

Q319 Lynne Jones: But you still want people to use their hosepipes.
Mr Whiteman: We believe that we are there to supply water when people want it in the quantities that they want to use it.

Chairman: Thank you all very much indeed. That has been extremely useful; a lot of food for thought. Can I again thank you for the written evidence that you have given and repeat what I said to our previous witnesses. If there are any further thoughts or blind flashes of inspiration that you have on the train going home, we are always grateful for further advice and observations. Thank you all very much.

Supplementary memorandum submitted by Yorkshire Water (FL 122a)

BRIEFING NOTE ON SUSTAINABLE DRAINAGE SYSTEMS (SuDS)

1. SCOPE AND SCALE OF SUDS IMPLEMENTATION

1.1 Yorkshire Water follow the guidance given in the ‘Interim Code of Practice for Sustainable Drainage Systems (SUDS)’ (July 2004, National SUDS Working Group, Published by CIRIA). Our experience is in the range of SUDS solutions that can be defined as those which relate to sewerage assets.

1.2 These assets are generally at the “harder engineering installation” end of the SUDS spectrum, with control of surface water run-off for a new development most commonly achieved by use of “over-sized” sewers with flow control devices.

1.3 The design and construction of these installations is carefully controlled and we have not experienced any serious difficulties to date in the operation and maintenance of these assets.

1.4 It is however relatively early in the asset life of these installations so further work is required to understand any longer term performance and potential failure scenarios. The extent to which the different SUDS solutions has been employed in Yorkshire is set out below. It is difficult to quantify the number of SUDS we maintain, since each component is simply a sewer or sewer ancillary and is, therefore, shown on our records as sewerage assets.

1.4.1 Pipes All systems installed to manage surface water are now designed with due regard to the principles of sustainable drainage, so all recent surface water sewers could be considered as SUDS. The principles of sustainable drainage have certainly been widely applied since the publication of the Interim Code of Practice and, in many cases, have been applied prior to this date.

1.4.2 Swales A small number of adoptable SUDS systems have incorporated swales (a wide, shallow, vegetated channel) which floods to relieve intense rainfall events. The design of these features is carefully controlled to eliminate future maintenance risks. The significant footprint of these features has meant that limited use of these methods has been taken up, and again it is too early in the asset life to judge the success of these assets.

1.4.3 Ponds Ponds are not recommended for adoption by sewerage undertakers in the interim code of practice. Where these have been proposed we have made it clear that adoption by the sewerage undertaker is not covered by our duties as sewerage undertaker. Ponds present significant difficulties in achieving the balance between the operational tasks required to ensure that the pond performs hydraulically, against the safety, pollution control and amenity aspects associated with them.

Local authorities and highway authorities, who the interim code of practice indicates
can consider ponds, have with few exceptions been reluctant to date to adopt ponds, citing similar concerns about the practical operation of ponds as an engineering solution.

1.4.4 Modular storage systems

A number of modular storage structures are available on the market for the storage of surface water. These are not currently accepted since they are unproven as far as the ongoing maintenance is concerned. We do not currently own or maintain any such arrangements.

1.4.5 Soakaways Source control solutions, of which soakaways are the most common example, are always recommended by YW in accordance with Part H3 of the building regulations when we are consulted by local authorities and developers on surface water control at the planning stage. However they are rarely proposed by developers as the burden of proof that they will operate effectively is generally too onerous.

1.5 We adopted the Interim Code of Practice following it’s publication in July 2004, and have continued to develop the technical approach set out above to reflect the latest best practice recommendations from the working group and other relevant sources.

2. General conclusions from our experience of SUDS

2.1 As indicated above the construction industry has been cautious in embracing many of the SUDS types available to date.

2.2 Nonetheless, the following observations can be drawn from the sites where SUDS have been employed:

— It is crucial that ownership and maintenance agreements/strategies are in place before construction.
— There is little understanding of longer term performance.
— Currently there is insufficient understanding of performance to enable accurate forecasting for capital investment planning or development of operational maintenance schedules.
— In terms of maintenance there is a need to more fully understand and propose strategies for vegetation management and sediment removal.
— The same underlying principles of hydrology and hydraulics as used for conventional systems should be applied.
— Wider benefits of amenity and environmental enhancement need to part of the undertaking for the responsible body.
— There is no single “correct” solution.
— Establishing the right balance of stormwater management, water resources, impact on society and global energy concerns is difficult to achieve
— Separation and source control are required to ensure we maintain levels of service using current practice

3. Summary

3.1 A review of relevant SUDS documentation, together with discussions with the appropriate technical experts and stakeholders, provides strong support for the principles of SUDS and there is evidence that SUDS can and do work.

3.2 However, whilst supporting the principles of SUDS, it is also important that we acknowledge and seek to address the barriers to the consistent application of SUDS which have yet to be overcome. In summary, the most significant outstanding issues are:

— As the sewerage undertaker is not able to adopt all SUDS components, the design of drainage systems that best meet the SUDS aim of control at source may be compromised.
— Issues relating to future liability for pollution from SUDS features have not been clarified.
— The mechanisms for funding future maintenance of SUDS components and the scope and scale of the maintenance are not fully defined

_Yorkshire Water_

_January 2008_
Wednesday 21 November 2007

Members present
Mr Michael Jack, in the Chair
Mr David Drew
Mr James Gray
Lynne Jones
David Lepper
Sir Peter Soulsby
Dr Gavin Strang
Paddy Tipping
Mr Roger Williams

Memorandum submitted by Gloucestershire County Council (FL 84)

Summer Flooding in Gloucestershire 2007

1. This is an initial response from Gloucestershire County Council to the Environment, Food and Rural Affairs Select Committee.

2. The flooding and associated events experienced in Gloucestershire this summer and in July in particular were both exceptional and dramatic. Indeed, the emergency that quickly unfolded from 20 July was unprecedented in its scale for this county. Not only was this an event of international significance, such was its scale that there were two visits by the Prime Minister and numerous other ministerial visits to see the impact and the effectiveness of the response. The Army, Navy and Royal Air Force were all involved, together with the emergency services, local authorities, Coast Guard and charitable organisations such as the Red Cross. Additional resources were brought in from across the United Kingdom and Europe.

3. The scale of the devastation is well documented. During the height of the flooding a number of communities were virtually cut off from access, most notably the town of Tewkesbury. The situation was seriously exacerbated by the flooding of the Mythe Water Treatment works operated by Severn Trent, leading to its shutdown and more than 135,000 homes and 7,500 businesses being without any mains water for up to 12 days. It was only on Tuesday 7th August that Severn Trent announced that tap water was safe to drink; some 17 days after the Emergency began.

4. In addition the Castlemeads electricity sub station was flooded, resulting in the loss of electricity to 25-48,000 homes for 2 days. The larger sub station at Walham was within 2 feet of flooding, only saved by the rapid deployment of temporary flood defences, its loss would have had a catastrophic impact affecting as many as 500,000 homes.

5. During the crisis 40 million bottles of drinking water were distributed and 1300 bowsers were deployed which is believed to be the total number of bowsers in the country. Around 200,000 litres of drinking water had to be delivered direct to hundreds of vulnerable people in their homes.

6. Loss of electricity, drinking water and sanitation facilities created major logistical challenges for the agencies dealing with the emergency. More than 5000 homes and other buildings were affected by flood damage. The dislocation of the road and rail network was extensive. At times major roads had to be closed creating huge problems for the agencies dealing with the crisis and people who needed to travel. For example, people living 3 miles west of Gloucester had to drive 50 miles to get into the city when the A40 and A417 were closed by floodwater.

7. At the present time the cost of the damage to the highways infrastructure in Gloucestershire is estimated to be as much as £25 million. Hundreds of local businesses have been severely affected by the flooding at one of the most important trading times of the year. It has also had a serious impact on tourism for 2007 with many people cancelling trips or holidays to the county with further major consequences for the local economy.

8. The scale of these events raises a number of serious issues and questions for a wide range of government bodies and agencies. The county council is going to use its own scrutiny process to explore some of these issues and seek action to mitigate the impact of future flooding events, in the expectation that they may become more frequent. We would also like to see these issues explored at a national level through the work of the Select Committee. The following questions are some of the initial areas we have identified, but we expect others to emerge during the course of our investigation:

a. The July floods, although unprecedented, resulted in the catastrophic failure, or near failure, of critical utilities leaving tens of thousands of homes and businesses without essential services for a protracted period of time. The Emergency highlighted the fact that the main electricity and water installations in Gloucestershire represent single points of failure in the supply system. It is not clear what, if any, specific risk assessments and emergency plans were in place to mitigate any disruption of the supply network. The question is therefore, what steps are being taken to improve the protection of those facilities against future flooding or other events?
b. The effectiveness of rivers and critical watercourses to cope with large increases of water is of serious concern. Are rivers maintained as effectively as they should be, for example through dredging, to ensure they can cope with unexpected levels of water? Can other critical watercourses, such as the Horesbere Brook that runs through Longlevens near Gloucester, where properties were flooded in both June and July, really be left to the responsibility of riparian owners to maintain them?

c. The effectiveness of large scale, multi-million pound flood defences eg in Cheltenham, needs to be examined to ensure that the defences did the job that they were designed to do.

d. How can an effective system be established that ensures land owners take responsibility for dealing with the run off of water from their land, for example through the provision and maintenance of ditches?

e. Why is house building continuing to take place in flood plains and how can both the planning system and the agencies have the knowledge and power to influence such building be improved to ensure homes don’t get built in areas of risk?

f. Why is there a lack of investment in what is widely acknowledged as a largely inadequate and outdated highway drainage system? Why does the government have targets and performance indicators for matters such as road condition, but no such targets for highway drainage?

g. What is being invested in the resilience of flood defences in Gloucestershire and how does this compare with what is actually needed to ensure we have the necessary systems and infrastructure for the 21st Century?

h. What financial protection is available for the people whose homes and businesses have been devastated by flooding, both to help them get back on their feet, but also with regards to them getting future insurance cover and, indeed, being able to sell their houses if they so wish?

i. What has been the social and economic impact of these recent events?

9. In addition to these questions, we will be also examining the effectiveness of our emergency management planning and response. We believe the local community and all the services involved in dealing with the emergency were heroic in their efforts, but we also want to learn so we can respond even better in the face of such circumstances in the future.

10. We hope that you find this initial contribution useful. Many of these questions have national relevance and don’t just apply to Gloucestershire. We would like the opportunity to provide you with further information as our scrutiny process progresses and contribute to the evidence sessions that are expected to take place from 10th October 2007 in order to help ensure that the views of the people of Gloucestershire are heard.

Peter Bungard
Chief Executive, Gloucestershire County Council
September 2007

Memorandum submitted by Oxfordshire County Council (FL 126)

LETTER FROM JOANNA SIMONS, CHIEF EXECUTIVE, OXFORDSHIRE COUNTY COUNCIL TO RT HON ANDREW SMITH MP, 17 SEPTEMBER 2007

I refer to your letter dated 24 August concerning the forthcoming inquiry on flooding and apologise for the delay in replying.

We have been involved in discussions with the Districts and the Environment Agency about lessons that we can learn about our immediate response and also thinking about longer-term issues. Drawing on our discussions can I suggest the following are considered by the enquiry:

— the ability of the Environment Agency to fund major flood defence schemes in the light of increased risks following climate change.
— the balance between major flood defence schemes and smaller local schemes, recognising the need for value for money in all cases.
— a review of the adequacy of monitoring systems available to the Environment Agency.
— a review of the usefulness and accuracy of early warnings provided by the Environment Agency (not sure about this, they are reviewing this themselves)
— assistance available to householders to protect themselves from flooding.
— implications of significant events such as the July flooding for long-term damage to Transport Infrastructure.
— review of Bellwin scheme particularly in scope and also associated financial thresholds
— whether responsibilities for local drainage (ditches/gullies, etc) are too unclear and dispersed, and whether there is need for legislative change and/or improved local co-ordination arrangements
— Assistance packages which are all run separately by different departments with individual thresholds
— Whether consideration should be given to amending the building regulations to build in new standards suitable for climate change adaptation (in particular in relation to the less obvious areas such as drainage as well as the obvious ones relating to property).
— Knock on impact on the economy in relation to agriculture and also (a particularly local issue) the residential care market.

I also attach for your information a copy of a report going to our Cabinet tomorrow which gives a bit of background on the overall impact in Oxfordshire.\(^{18}\)

This was up to date when printed but I know that the numbers affected in the Vale have gone up since then as they have gathered more information from outlying villages.

The Oxfordshire Leaders Group also discussed this last week and are particularly concerned about action that is needed to help to make sure that the city and other districts do not experience such difficulties again and they will be writing to relevant Secretaries of State shortly. I will also write to you again about this once the letters have been drafted.

I accept these points are quite varied, but as you can imagine events such as the July flooding do have wide-ranging implications.

We would be very happy to provide more detailed comments if this is helpful.

Joanna Simons
Chief Executive, Oxfordshire County Council
September 2007

\(^{18}\) Not printed.

Witneses: Mr Duncan Jordan, Group Director for Environment, Gloucestershire County Council, Mr Richard Dudding, Director for Environment and Economy and Mr Dave Etheridge, Assistant Chief Fire Officer, Oxfordshire Fire and Rescue, Oxfordshire County Council, gave evidence.

Q320 Chairman: Good afternoon, ladies and gentlemen. For members of the public who were expecting to see us begin our evidence session this afternoon with the Chief Constable and the Assistant Chief Constable of Gloucestershire, I am sorry to have to tell you that due to problems in getting here the Chief Constable, as you can see, is not in attendance, which is very disappointing. He has sent his apologies to the Committee but I gather that the traffic en route has been such that he has not been able to find his way from beyond Chiswick; that is as far as he has got. He was under some pressure to return for an appointment so I am afraid he has had to send his apologies and the Committee will do its best to try to find some way of talking to the Chief Constable of Gloucester in due course, but they have actually sent some very helpful information.\(^{19}\) I think you were to have been joined by your Chief Executive but for some reason she has not been able to make it here. If we here a story about a fast car with a chief constable and a chief executive in it we will know what has happened. Let us begin at the beginning with the responsibilities of local authorities in dealing with major events such as flooding. You are Category 1 responders under the Civil Contingencies Act 2004 and that Act is supposed to set out clear lines of roles and responsibilities for those who are involved in emergency preparations. I think it would be quite useful if the two authorities could briefly describe what you understand your responsibilities are under the different pieces of legislation. If there is one thing that is quite clear, this is a complex area—a complex web of responsibilities—wherever water and flooding matters are concerned and I think for our greater understanding if you could describe those roles and responsibilities and refer to the different pieces of legislation that would be a very good thing. The second thing you might turn your minds to is giving us some commentary as to how you think the different agencies with a responsibility to deal with flooding issues actually cooperated during the summer’s incidents. Mr Dudding, you look very enthusiastic to start so I am going to pick on you and ask you to start.

Mr Dudding: What I was going to suggest was that for the issues to do with immediate emergency and resilience if Dave spoke to those. There are also issues about responsibility when it comes to

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alleviating a flooding, making sure it does not happen so when it gets onto that I would happy to speak myself. I think on the immediate emergency that is Dave’s role.

Mr Etheridge: As a Category 1 responder under the Civil Contingencies Act the Emergency Planning side of Oxfordshire County Council has played a very strong hand in terms of leading through the local resilience forums, working with district councils in order to ascertain a plan which can be used and utilised for instances such as flooding. If there is a need to evacuate an area then there are local plans which tie in with local district councils which then can tie in with the county plans in terms of emergency planning. The Fire and Rescue Service sits within the local resilience forums and has a part to play in the creation of those plans. We also have training responsibilities within the Civil Contingencies Act as well to ensure that we are aware of those plans and are able to discharge those when we need to. I think it is fair to say that certainly within the floods in Oxfordshire the local emergency plans that came up through the districts did tie in very nicely with the county plans and certainly the fire service, when we were involved at both the silver and gold levels, at instigating those plans were very comfortable with the way they were executed within our fire authority.

Q321 Chairman: A lot has been made of gold and silver commands—gold appears to be what is described as strategic and silver appears to be operational—could you just describe for the Committee what the difference is between the two?

Mr Etheridge: Certainly. It is very difficult to actually come up with a set definition of what gold is and what silver is because it really depends on the incident that you are dealing with. If you specifically look at the floods the gold responsibility was very much looking at the forward planning side of things, making sure that we were able to look at any lessons learned and start to hand them over to Berkshire as the bore of water, for example, which went through the county. Gold was very much looking at instigating very early the Recovery Working Group side. Silver, which I headed up, was based at the Thames Valley Police at Abingdon Silver Suite. That was a multi-agency response which was very much making sure that we could do practical things there and then to make a difference to the people affected by the flooding. That does not meant that we did not do things that were hours ahead, six hours ahead, nine hours ahead, twelve hours ahead because every meeting that we had were looking at things that would slide into those timescales. Certainly the areas that gold also looked at were things like, for example, ensuring that the fire service could call upon the national assets that had come from the New Dimension programme.

Q322 Chairman: What is the New Dimension programme?

Mr Etheridge: The New Dimension programme is where the Communities and Local Government actually purchased some high volume pumps, 44 pumps which are now situated all over the UK. If Oxfordshire, which actually does house one, wish to call on additional ones that is done through a national control centre that is based up in West Yorkshire. Gold’s role within that would be to make contact with those to be able to draw down those resources and then for me to be able to feed up from silver a picture of what is going on in the county all the while, particularly concerning things like infrastructure. I was able to provide them with information that we did not have any hospitals taken out, that we were fairly comfortable with our electrical substations, with our water treatment works; there were no schools that seemed to be adversely affected; we did not seem to have any roads that were being washed away—we had some that were impassable—and I was able to feed that information up from silver so that the gold could then look at the strategic long term issue of both the resilience of the county and business continuity but also early instigation of the Recovery Working Group.

Q323 Chairman: I am not getting any message, Mr Etheridge, from you that there were any difficulties in the cooperation between all of the different agencies. Is that a fair assumption?

Mr Etheridge: I have been in the fire service for 22 years and I can honestly put my hand on my heart and say that I have never experienced such a one-team approach to a major incident like we had in Oxfordshire.

Q324 Chairman: Is that because you followed the strictures of the law and the policy in this area of regularly up-dating your civil contingency plans in a way that people were used to working together before the emergency came?

Mr Etheridge: Yes. Certainly within Thames Valley Police we have had a programme of gold, silver and bronze level training over the last two to three years and that paid dividends when it came to the floods. We were aware of what different agencies could do, but what we also came together as was as one team, for example, when we were looking at the flooding footprints within the county we were predicting where the flooding could be. I would like to pay tribute to Thames Valley Police because I worked very closely with Thames Valley Police, our fire fighters and their police constables worked shoulder to shoulder, pro-actively knocking on doors of houses that we suspected would be flooded and as a result of that the level of insurance cost. I would imagine, was significantly reduced by that action.

Q325 Chairman: Where were the problems?

Mr Etheridge: I think the timely information that could be fed into the silver control room was an issue. I think the situation concerning the Environment Agency not monitoring tributaries was a significant factor for us. The River Thames is monitored but the tributaries were not and because we had a huge amount of rain that fell over a very large area the tributaries very quickly burst their banks. What that meant was that we had lots of
I have never known so many agencies that might work out how to deal with the clean up, how to get that we had a recovery phase when we were trying to coordinated by gold and silver. Overlapping with phases, one was the immediate emergency being to reinforce what David said. We went through three communication. That was between different tiers, different ways. Not only were they all affected at the same time, but all in different ways. We had things like the closure of the M5, the M50; we had flash flooding in the Cotswolds; two days later we were in the situation where we had river flooding through Tewkesbury and down the Severn. Later on from that we had major swathes of the area affected by loss of electricity and then followed up by loss of water.

Q326 Chairman: Mr Dudding, do you want to add anything to that?

Mr Dudding: Just on the cooperation, I would like to reinforce what David said. We went through three phases, one was the immediate emergency being coordinated by gold and silver. Overlapping with that we had a recovery phase when we were trying to work out how to deal with the clean up, how to get people who had been evacuated back in their homes. I have never known so many agencies that might normally have their differences between them not having them at all. This is also so in what is known as the third phase—which for me is the most important phase which I will come back to later on—which is longer term planning to remove the risks or reduce the risks of flooding. I think there are issues about the nature of the flooding being very dispersed in Oxfordshire, largely pluvial rather than fluvial.

There are quite big lessons about how we handle that so if you do want to ask some questions later on I think there are some big issues about the nature and the way we organise for what we have discovered is quite a different type of flooding to some of the classical patterns which we were used to before. I am happy to come in later on on that.

Q327 Chairman: Mr Jordan?

Mr Jordan: To pick up on a few extra points from my perspective I also sat on the gold command myself at Gloucestershire so I had first hand experience of how that was working. We had the same experience as Oxfordshire, loads of cooperation, the agencies came together. The thing that held it together, though, as far I was concerned—and I was fairly new to this area—was the strength of the emergency planning work that had been done before: the robustness of those plans, the robustness of the local resilience forum insofar as it had looked at umpteen scenarios of different risks, different eventualities and that kept it together. Bearing in mind how many agencies came into this—

Q328 Chairman: You said that one of the things that had impressed you was the robustness of the system and the things you did together. In terms of what you planned for, had you actually dealt with something as complex as you have just described to us?

Mr Jordan: That is a really interesting question because I posed that to our head of emergency planning and he basically said to me, “If I had put something as complex as this on the table everybody would have laughed at me and said that this was not a realistic scenario and therefore we do not consider this to be a realistic training exercise”. It really was a case of: What is the next problem that we are going to be facing? And how much wider spread can the issues be that we are facing at the moment? Our plans were great, the framework stood, people adapted and responded to what they needed to do. What we now know is that we can take those plans and we can develop them further based on our latest experiences, but I think there is only so much you could realistically plan for.

Q329 Chairman: One final point before I hand over to David Drew, the Government in March 2005 published its first response to the Making Space for Water consultation document. Did anything come out of that exercise which has beneficially or adversely affected what your two respective local authorities are now doing or did from 2005 onwards to prepare for this type of contingency?

Mr Jordan: I am not familiar with this document so I cannot comment.

Q330 Chairman: This was a document which was published initially in 2004 under Taking Forward a New Government Strategy for Flood and Coastal Erosion Risk Management.

Mr Jordan: I am certainly aware that we have our major flood emergency plans in place and we would tie those up with the Environment Agency’s local flood warning system.

Q331 Lynne Jones: Could I ask you a question we were going to ask the Chief Constable, which is how satisfied were you with the rainfall forecasting and flood warnings that you received before the event, the performance of the Environment Agency? We have had Mr Etheridge commenting but in a way they had not got that information to pass on. How
satisfied are you that the information that they did have or should have had was passed on in a timely manner?

Mr Jordan: Certainly the Environment Agency played a full part in the whole emergency operation for us. I would not knock the colleagues that work around that table. I think there is a limitation which comes down to resources and the level of profiling and forward alert they can give us is only as good as the sophisticated models that they have available at their disposal. With what they have I think they did a very good job.

Q332 Lynne Jones: What about the Met Office?

Mr Jordan: Again the Environment Agency, as I understand it, had really good links with the Met Office and they were given the information they needed.

Q333 Lynne Jones: The Chief Constable was quite critical about the information.

Mr Jordan: From my experience at the actual gold session the criticism was about not being able to give a clear picture, one hundred per cent, what is going to happen and I have yet to find anyone that can do that with weather. I think what could have been slightly better was the map modelling.

Q334 Mr Drew: Moving onto the emergency itself, obviously I have a particular knowledge about Gloucestershire as Duncan knows and I went to some of the briefings so I did hear from the Oxfordshire MPs about what was happening during the actual period of time and obviously in the immediate post-flooding recovering period. What I would like to do is look at the four categorisations of organisation which to me are statutory, military (which obviously were brought into Gloucestershire; I do not know if you had much military support in Oxfordshire), private sector and lastly the voluntary sector (I know in Gloucestershire’s case that was invaluable). I just wonder what your views were very broadly—this is not a detailed analysis—on how those four sectors worked during the immediate emergency and perhaps just shortly afterwards. Perhaps we could start with Oxfordshire.

Mr Etheridge: Just to go back to the local resilience forum plans, part of the local resilience forum plans are to draw upon the third sector/voluntary sector for incidents like this. That certainly was achieved, particularly when gold made the call for the county centre to be opened because the districts could no longer cope with the volume that was coming through. There is a third voluntary sector element in that which worked very, very well. What I will say, though, in terms of lessons learned was that because of the longevity of this particular incident we need to ensure that there is the sustainability of that third sector in supporting an incident like this. Certainly from the fire and rescue service point of view we were able to draw upon assets from other fire authorities that were dealt with through that national emergency control centre from West Yorkshire. We had high volume pumps come to us from London; we had some swift water rescue teams come to us from Essex and Lincolnshire and then we worked with some charities such as the RSPCA who also sent their swift water rescue team to us.

Q335 Mr Gray: And Wiltshire also, if you do not mind me interrupting. Chippenham Fire Station too, if I may say so.

Mr Etheridge: Right, thank you. What I will say is that we were absolutely inundated with offers of assistance and one thing that we needed to do was to filter out what we needed. We actually had at one point an offer of hovercrafts from Italy and, believe it or not, my colleague in Gloucestershire benefited from them; we turned them down and they went to Gloucestershire. Whereas we thought initially it might be a wind-up, it actually turned out to be absolutely factual. To be quite honest with you, from a military point of view Oxfordshire had a very light touch with the military. We did not declare a major incident within Oxfordshire; we did actually contact the military at one point purely and simply for the provision of sand bags. They assisted in the sand bag provision; they did not actually assist in any operations to do with any fire and rescue or water rescue activity. We had a light touch with the military. That said, we did actually have two fire stations that flooded, one was in Abingdon and as a result of that we decamped the fire station to Dalton Barracks which is also in Abingdon and the military were extremely supportive and welcoming in that process.

Q336 Mr Drew: And the private sector? Water, electricity?

Mr Etheridge: Certainly through the silver control side of things we had regular meetings with the power companies and with Thames Water. They were able to confirm for us the positions of all of their substations, pumping stations et cetera. We were then able to work with the flooding footprint diagrams that we had to see whether they would be at risk. From that we came up with some control measures just for one particular substation in Oxford. Again we had a very different picture compared to our colleagues in Gloucestershire to do with the utilities in the private sector.

Q337 Chairman: Mr Dudding, do you want to add anything to that?

Mr Dudding: I would like to say one thing. It has not come up and I think it is worth reinforcing. The sheer scale of this—it is a scale for all the agencies and not a point about any particular agency—raised issues about one or two organisations at some stage being close to being overwhelmed. Those who were not close to being overwhelmed nevertheless had real issues of fatigue. The adrenaline worked very effectively for a while but I think we all learned some lessons. You need to rotate staff and that means you need to have enough people to rotate and it means you need enough people to cross all the sectors who can rotate as well. There are real lessons for us in having trained people who you can rotate. I think that arose, for instance, in the voluntary sector; it
Q338 Lynne Jones: Are there any issues about apportionment of costs when you said you had help with other organisations?
Mr Etheridge: All of the agencies that supported us did invoices for their time. Those invoices then have gone into a cost centre within the county council so from a fire service point of view we are able to identify the additional costs of support and for the fire service that sits at about half a million pounds.

Q339 Lynne Jones: Did you have to pay for the hovercrafts?
Mr Jordan: Not so far but we are keeping quiet about that.

Q340 Chairman: Duncan?
Mr Jordan: Pretty much the same in terms of the statutory organisations but the first big difference for us was the military. I do not think that it is an understatement to say that we would not have survived without the military. We had about 250 troops on the ground, those alongside our three emergency services, alongside highway staff and so on. They made all the difference. They meant that we could keep the electrical station dry, effectively, and if that had gone we would have lost power to 500,000 homes. They were also instrumental in supporting us in terms of all of the water distribution systems. The uniqueness, I think, about the military is the fact that they say they need X number of lorries and they turn up. One of the things that would be really helpful on a civil contingency basis for this country is that you need a source of resource. One of the big things we struggled with every time we needed something was where do we go for it. At a local level we can manage because we know the local issues, but it is where you get that resource from. There is one lovely story where, because we had lost water and we had sanitation issues, we found out about something called a wag bag which is basically a portable toilet which is a bag, but they only have them in America. We were trying to facilitate the delivery of these bags from America, whereas actually on the civil basis for the UK, things like that need to be available. Similarly with water bowser; we had 1300 water bowser distributed—I think we had virtually the whole of the UK stock—so if there had been another emergency of that type at the same time the country could not have coped. I think something I would recommend to this Committee is that there is something done about that provision of resource. The other big one for us obviously related to this with the private sector was that we were not aware of the risk to the utility plants and to be fair I do not think the work had been done. It certainly had not gone through our local resilience forum in the way that most other things had.

Q341 Chairman: Why not?
Mr Jordan: I think it was the case that we had never had a flood event of this nature before. The worst last flooding in Gloucestershire was in 1946. If we had experienced a similar flood again, those sites would not have been at risk. It is the scale of risk and therefore this raises a whole question of at what level do you stop planning your risk? That is a difficult one because you get into all sorts of logistical issues and also cost and economics. That is the bottom line. There had not been on record a flood of that severity.

Q342 Mr Drew: That is a key point. I was going to go on to look at that, the degree of forward planning that you had engaged with. Jack and I will share our experiences having nuclear installations either on or close to our constituencies and you both know that there is at least an absolutely top drawer, fully worked through plan where everything is tested and yet when we come to both water treatment plants and substations and distributing power that does not seem to happen, even at a more limited scale. Is that a real lesson to be learned from this experience?

Q343 Mr Drew: Does Oxfordshire want to say anything about infrastructure in the sense of have you done any contingency planning at the site of any of these major installations?
Mr Etheridge: Certainly in terms of the major installations in Oxfordshire the answer to that is yes. To echo my colleague’s comments, it is these smaller type pumping stations and the smaller type substations which are dotted here, there and
everywhere that we did not actually have a fantastic picture of when we were in the silver control room looking at the flooding footprint. I think certainly that is a lesson learned, that if we have the ability to draw upon a flood footprint which says that in 2007 it happened like this, we are then able to look at what is within that flooding footprint and therefore ensure that that information gets fed into things like the local resilience forums and different agencies’ and organisations’ plans.

Mr Dudding: There is generally a requirement upon the developer so the issues go with the developer; they bear the costs. I think there are issues around maintenance. You might have a better knowledge of the problem than me but I was certainly told of one or two instances in Oxfordshire that did not work quite as they should have worked on the day and there might well be that maintenance issues are one of the future lessons for us. I think the more we go into this, the more solving these problems in future, requires a very, very dispersed responsibility and new ways of bringing those responsibilities together to make sure they happen, and that is part of it.

Q344 Mr Drew: Can I just presume that the Environment Agency did not draw to your attention that this was something that may be in their looking at one in a 100 year flood analysis and so on. This is perhaps something you should have known.

Mr Dudding: I think we knew where all the utilities were relative to the flood plain. I think we knew experience about previous flooding and dealing with that. We had an electricity substation which we knew was in a flood plain, we knew there were issues about and we had quite a lot of experience of dealing with it and protecting it. Again one of the problems is that flooding is becoming much more dispersed so just looking classically at the map of the flood plain it does not give you all the answers, especially the smaller facilities which might be affected by flash flooding and more localised flooding. There was a change in the nature of the problem.

Mr Dudding: My own view is that in a number of respects—SUDS is only one—there are responsibilities which presently fall on individual landowners, developers, owners, which probably are not realistically being carried out fully by them and given the dispersed nature of flooding which could happen anywhere we are going to have to find new ways of either changing responsibilities or making sure those responsibilities happen. I think that rises over a whole range of things. The river flooding (fluvial) in Oxfordshire was historically only a 1 in every 30 years event, whilst the rainfall flooding (pluvial) was nearer 1 in every 500 years. The increased risk of pluvial flooding, potentially covering a much wider geographical range, means we have to build into having that dispersed responsibility to handle maintenance over a much wider area than the flood plain. I think it requires new ways of doing it.

Q345 Paddy Tipping: Can I ask you about SUDS and what experience you have of them and would it have made any difference in the situation you faced this summer?

Mr Dudding: Whether it made a big difference I would not like to say. Whether it is important and right is massively yes and it is something which we have given quite a bit of attention over time, to try to ensure the new housing estates or whatever are built with best drainage and not only in the flood plain. I think it is crucially that that happens absolutely everywhere, not just because everywhere can be flooded by flash flooding but we are learning more and more about the run off from everywhere into the flood plain. It would not necessarily have solved or avoided all the problems but in terms of the future, yes, yes, yes.

Q347 Paddy Tipping: That is interesting, is it not, the notion that the developer, who will disappear, is responsible for maintenance? Is there not an argument that the water and sewage utility should take them on?

Mr Dudding: My own view is that in a number of respects—SUDS is only one—there are responsibilities which presently fall on individual landowners, developers, owners, which probably are not realistically being carried out fully by them and given the dispersed nature of flooding which could happen anywhere we are going to have to find new ways of either changing responsibilities or making sure those responsibilities happen. I think that rises over a whole range of things. The river flooding (fluvial) in Oxfordshire was historically only a 1 in every 30 years event, whilst the rainfall flooding (pluvial) was nearer 1 in every 500 years. The increased risk of pluvial flooding, potentially covering a much wider geographical range, means we have to build into having that dispersed responsibility to handle maintenance over a much wider area than the flood plain. I think it requires new ways of doing it.

Q348 Chairman: Have you had any feedback at all about the work of the national SUDS working group?

Mr Dudding: I suspect—and I should know—that we have contributed to it because we have been quite active in it. I am afraid I cannot help you more on that.

Mr Dudding: I suspect—and I should know—that we have contributed to it because we have been quite active in it. I am afraid I cannot help you more on that.

Q349 Chairman: I am delighted about that because this is another of these Making Space for Water things. The Government say they acknowledge the valuable work of this august body of SUDS persons and that they will continue to work with the group, building on what has been achieved so far. It obviously has not quite reached Oxfordshire yet?

Mr Dudding: It has reached Oxfordshire; we have been very much part of it. We pride ourselves in actually working at national level on these issues. We have been quite active in this.

Q350 Chairman: If you have been part of it, what has it contributed to what you are doing in Oxfordshire?

Mr Dudding: It is producing best practice guidance. To take a little example—it is little but I will still give you it as something which makes a difference—an increasing number of people are paving over their...
front gardens. That has a significant impact on run off and cumulatively it is quite a big problem. Anyone in Oxfordshire who wants to apply for a dropped kerb so they can drive their car into their front garden, they will receive quite full guidance on how to actually avoid paving over their garden in a way which causes drainage problems. That is a small practical thing but quite a significant one.

Q351 Chairman: Does that apply in Gloucestershire?
Mr Jordan: It does in terms of looking at the effect of run off and so on.

Q352 Chairman: One of the bits of evidence that one member of Parliament put to us about Sheffield was about the state of the moorland, for example, around the city. They were commenting on the fact that eventually that became full of water so it could not be a SUD, it could not be sustainable, it could not absorb any more. Somebody else made an observation about heavy sheep crushing down the grazing area and suddenly you discover that what might be sustainable soakaways is a more complex subject. I just wondered if, in the light of this, there might be sustainable soakaways is a more complex subject. I just wondered if, in the light of this, there was any counting or evaluation now taking place of the potential for developing this type of arrangement and, if you were embarking on that, were you yet in a position to draw any conclusions about it? Obviously it affects the whole question of spatial planning.
Mr Jordan: I do not know the answer to that from Gloucestershire’s perspective.

Q353 Mr Drew: One of the issues in my constituency is the degree to which you try to pre-empt the threat of flooding by looking at places where you can make a balance, in towns where you may be able to hold water so that it prevents that water from flooding down into the more urbanised area where it causes enormous problems. Is this an active discussion in your local authorities? To what extend do you have the powers to do something about it? Clearly you have to work with the Environment Agency and potentially the water companies, but is this something you can engage with and should be engaging in?
Mr Dudding: If I could take that in two parts, the Environment Agency with ourselves and districts and others are carrying out a series of studies—there are 15 I think in the Thames western area of which we are part—looking at catchments, what actually happened there, what caused it to happen, what some of the micro-engineering solutions are around that and in doing so getting a lot of local knowledge because people tend to know locally how it floods and why. They are trying to develop from that some local small solutions alongside the bigger ones which people are calling for. It varies area by area, but I think some of the issues around the smaller tributaries and brooks and drainage and where there is knowledge around them there are local things which can be done. I think there is an extent to which we will always be referring to last time’s problem, but it will be different next time, but I think those local studies by the Agency are quite important. The first one was published in Abingdon last Friday and I think the follow-up around that will raise issues about the way the organisers are able to do these things because the recommendations will effectively range from the main river (which is the Environment Agency’s responsibility), to local rivers (which is the riparian owner’s responsibility), to highways, to the responsibilities of the utilities. I think again it is in that follow through from that that might need some new ways of making things happen.

Q354 Paddy Tipping: Moving to highway maintenance and highway drainage, there has been a lot of pressure on local authorities, how much do you spend on highway drainage and maintenance. Given the scale of flooding in urban areas the present system simply cannot cope and needs renewing and enlarging. There is a big cost to that, is there not?
Mr Jordan: It is a classic area because up until now drainage has not been a priority. All of the government indicators, all of the government allocation of funding is for improvement of road network and not for drainage. So straightaway you have a head-on issue there in terms of where is the funding going to come from to improve drainage systems. For somewhere like Gloucestershire we probably spend at least half a million pounds a year maintaining drains but there is not a budget for new drainage; new drainage goes in as and when we build a new road or we do an upgraded system to an existing road. On the issue of scale of drains again this comes back to what are we designing for? If we take a normal housing estate that is probably designed for a one in 20 weather event.

Q355 Chairman: Who defines the design specifications?
Mr Jordan: This is based on best practice guidance nationally so this is something coming through the whole planning system; it is built through what developers are and are not allowed to do alongside what is needed from a highways design perspective. One of the debates that we are having at the moment through joint working arrangements is do we, as local planning authorities, actually want to up those standards now? The question is, if we do, what do we want to up them to? Is it a one in 100? Is it a one in 300? Again this has to come back to risk versus to cost and practical delivery. To be fair the systems we have in place at the moment are there because historically they were adequate, which clearly they are not now in terms of climate change.

Q356 Paddy Tipping: So you would appreciate some national guidance on that.
Mr Jordan: I think it has to be because I think it has to be there for house builders as well. If you look at the pressures that local authorities are under with all of the regional housing allocations that are required, the first thing that a developer is going to do is to say, “I don’t have to meet those standards” because it is cutting directly into their profit margins. So yes, I think there needs to be national guidance on this and I think there needs to be a set standard. That
standard could vary for different scenarios, for example if you are building on the top of a hill you do not need to meet the same requirements, but where you have risk of flooding—bearing in mind there is still the main requirement on us to allow housing development in flood plain areas—there has to be better infrastructure from day one on those sites.

Q357 Paddy Tipping: That is for the new housing: what about retro-fitting?

**Mr Jordan:** On the retro-fit one of the things that we have is a multi-agency review of all 300 of our flood sites going on at the moment. I know that what will come up with. At best there will be some easy fixes but for most of those there is going to be major investment required. Again I will come back to: where does that come from? Not only major investment, but this issue that Richard was talking about in terms of enforcement because a lot of this will come back to riparian ownership because even in housing estates you will be amazed at how much of the drainage system is owned by the house owner and is not part of a communal or district system. I think we need to change the statute in this country as to who is responsible and then put the resources there to match it.

Q358 Paddy Tipping: Riparian owners is a bit of a medieval phrase, working in rural areas where there are big land owners. In urban areas, as you say, it becomes fragmented very quickly. What are you suggesting in its place?

**Mr Jordan:** I think it is an old expression because it is an antiquated system. If I am honest I have had lawyers pore over it to try to give me some guidance as to where my powers are and it is an absolute nightmare. I think there has to be a power and again I was speaking to Richard about this earlier and we slightly differ on this. I would put a power with local authorities—top level local authorities so that would be unitary or county level only—to take responsibility for us call it all localised drainage and then leave the main rivers with the Environment Agency. Within that I think there has to be recognised that the local authority needs funding to enforce those powers and to be able to go in and do work itself even though by law it is not responsible, and then recharge the landowner. That would be my approach.

Q359 Paddy Tipping: You have to be able to identify the landowner.

**Mr Jordan:** You have, but in most cases you can nail it down. If you cannot then perhaps the public purse should be able to support that.

Q360 Mr Gray: I can understand how you can bring in new standards for new housing but surely the big problem actually in many towns—I had flooding in my own area of Wiltshire—is the highways drainage is so inadequate that the existing roads take no account of new building. Do you look at that?

**Mr Jordan:** We do but we have to revisit the whole issue about where and how we allow development to go alongside. A lot of the time highway drainage will potentially become inadequate because you have increased run off onto the highway because a new development has been put in which does not cater adequately for its own drainage needs. There is also an issue whereby you can allow adequate water flow on a highway because it can be used as a drain conduit in itself. It is where do you then discharge it? We could go through the whole country, upgrade all the highway drainage and it still has nowhere to go and all you do is move the problem.

**Mr Dudding:** I think you are right, there is an issue about existing highways and retro-fitting. I reckon that generally, although not perfectly, BPS25 issued in December 2006 is aimed at the planning side of flooding. It is quite a comprehensive statement whether you are doing a regional plan, a district plan or a planning application. That in principle I think does put quite strong standards on anything new, including anything new with a highway. We are trying to build a road through Witney through the flood plain and the Environment Agency quite rightly are being extremely stringent on what we can do. That will not alter the fact that for the existing highway I think you are right, there is a considerable problem on drainage. We move money around from drainage to potholes to killing weeds and we are moving inadequate money around. We would all recognise that we are not spending as much as we would like on clearing gulleys. I do not think there is any issue about that, but we are doing it with an envelope of money which is not enough and that is the fundamental problem.

Q361 Dr Strang: A lot of the submissions which the Committee has received refer to the need of maintenance of water courses. How do we ensure that non main rivers are better maintained in the future?

**Mr Dudding:** I think there are issues around responsibility but I think you need greater clarity whatever happens. People just about understand after a crisis how the current system works; they certainly cannot understand it ahead of the crisis which is when they should be keeping things in a good state. I think also it is a rural problem as well as an urban. Even in rural areas you will find the same water course will go very rapidly through very different responsibilities. It needs simpler responsibility and it needs someone who is able to crack a bit of a whip to make things happen. I would personally probably give a bit more to the Environment Agency on this. People think they are responsible for flooding, but they are only responsible for part. At a strategic level they probably need more.

Q362 Dr Strang: What about new duties on these riparian owners to cut back their vegetation?

**Mr Dudding:** They have a duty at present. One of the problems if they are conscientious—which might not be common—and try to clear their drains you can actually fall foul of environment considerations
and habitat considerations. I think part of getting this right is not just getting responsibilities clarified but also getting the trade-off right between flood risk and environmental risk. I have environment in my job title so I am not likely to want to destroy anything, but perhaps that trade-off does need looking at especially where water courses are particular crucial to protecting people.

Mr Jordan: Coming in from a slightly different slant, I totally agree with all of that but I think we have also got to make people more proactive themselves because we are going to face more and more of these different types of crisis and I think we have to equip people to be able to defend their properties and actually educate them in terms of steps they can take so that if these events do happen—and they will—that actually the impact on their lives is not going to be as great as it is at the moment. One of the things we have done in Gloucestershire is that we have just produced the Flood Guide—I am happy to leave copies—which is designed to give people tips as to what they can do themselves, what we can do through the public purse and what are the responsibilities of private landowners and also what we can all do as individuals in our homes.

Q363 Chairman: Can we focus on this private landowner issue for a second? I do not ever like to suggest that you should have great laws and central powers, but there does not seem to be any mechanism to impose an element of responsibility. If you could say that a riparian home owner does what they are supposed to do then there might be a liability, for example, if their lack of maintenance causes somebody else loss. How do you deal with it? I think, Mr Jordan, you said that this is a very complex area in law. Without going into prescriptive solutions would I surmise from that that you would think that out of the outcome of the inquiries into flooding that we need a good hard look at how you get landlords or landowners to exercise their responsibilities over the water courses which are theirs?

Mr Jordan: Absolutely. The thing to bear in mind is the fact that let us say all the landowners did what they needed to do and they all cleared all their ditches I still think we would then have a fundamental problem because the rivers cannot cope with the volumes of water that we are talking about, so it has to be the whole package. It also has to be the package of: let us clear it from the downstream end and not the upstream end because otherwise we are in danger of just creating even more problems at the moment. To be fair though, there are some really good landowners out there. It is where you get the bits and pieces and it is not a substantial section of ditch and whatever. A simple example is highways. Often the ditch on the side of that road will not actually be part of the highway, it will belong to the landowner adjacent; let us bring it under the highway. It makes it so much simpler. The public would understand it; the landowner would understand it, but it just needs the money to then maintain it.

Q364 Chairman: The wider issue that comes out of the discussion is that we actually have not had a public debate about what level of flooding we are prepared to accept. You have made the point that there comes a limit to how much all of this good work can prevent being overrun.

Mr Jordan: Absolutely.

Q365 Mr Drew: In terms of this issue of riparian ownership, given that like you I am dealing with specific cases where it really does highlight that if an owner either cannot be discovered—as does happen—or really is completely intransient about what work they are prepared to accept and pay for, there must be some power now to really go in there and do the work and worry about how it is going to be paid for afterwards.

Mr Dudding: I personally think that is right, but I think it is not the whole answer. I can speak from personal experience. I live in a village very close to the Thames which is prone to flood, but the main danger for us is from a water course going into the Thames rather than the Thames. What is quite striking though is the way the parish council can coordinate action among all the small owners and also work with the highways authorities who then get a farmer acting on behalf of everyone and it gets done. I daresay the farmer by mistake might do someone’s who is a bit intransient as well. I know just up the road in another village called Kennington which previously got badly flooded. The parish council has worked with the main utilities to clear their drains. Action at a local level is quite important in reinforcing and acting with the big powers which you need as well. The big powers cannot reach everywhere and I think towns and parishes have quite a role in getting that reach and getting things to happen.

Q366 Paddy Tipping: I think I am right in that district councils have powers to take action.

Mr Dudding: They have but they are reluctant to use them.

Q367 David Lepper: Can I just ask about the strategic flood risk assessments? We heard last week from representatives of Sheffield City Council how helpful it was to have had their risk assessment in place. I think Hull, on the other hand, had not completed theirs yet. From what you have been saying from Gloucestershire and Oxfordshire this afternoon the impression I have had is that the local authorities, district councils in your areas had completed their strategic flood risk assessments and had them in place. Is that so?

Mr Dudding: I might not have my knowledge perfect on this, but I think the key is the timing of the local development frameworks which districts are preparing. They are all under new planning legislation, replacing the old local plans with new local development frameworks. In preparing local development frameworks one of the things they need to do is to produce a strategic flood risk assessment; that is one of the key steps in that. People will be at different stages and dependent on that. All will have
Ev 104  Environment, Food and Rural Affairs Committee: Evidence

21 November 2007  Mr Duncan Jordan, Mr Richard Dudding and Mr Dave Etheridge

to do it and we will get more and more experience if it is effective, but I think it is to do with the timing of that government framework not a willingness or unwillingness to do an assessment.

Mr Jordan: I know our timetable in Gloucestershire is spring next year for the adoption of our strategic flood risk assessment plans. Because it is about new development and how things take off, the thing that was robust here for us was the fact that we had an emergency major flood plan and that was a document that took us through this emergency.

Q368 David Lepper: Did the completion of a particular district council of their assessments play any part in helping your two authorities in dealing with the problems of the summer?

Mr Dudding: My own view is that the strategic assessments have a longer term impact. That impact is on the development framework which will affect housing will happen over five, ten, fifteen years ahead. I think the Sheffield case which was quoted quite a bit was actually on an individual planning application rather than a development plan. That had an immediate effect, it was on a proposition which was about to happen, but I think it would work through over time.

Q369 Chairman: Thank you very much indeed for your evidence; it has been very helpful. Thank you also to Gloucestershire for sending us the flood guide; I am keeping it by my bed just in case. I notice, however, it was not on waterproof paper so I had better read it fairly rapidly. Thank you very much indeed for not only your evidence this afternoon but your very helpful written submissions; we will certainly be looking at them very carefully.

Mr Jordan: I also have a copy of our completed scrutiny inquiry into flooding in Gloucestershire as well. We can get more if you want them, but we will leave that for you.

Chairman: Thank you very much.

Memorandum submitted by Severn Trent Water Limited (FL 69)

The extent of the recent flooding in Gloucestershire was unprecedented. Although, we have the normal contingency and business resilience planning, Severn Trent needed to use its full resources to deliver an appropriate emergency response.

The incident raises key issues for the national water infrastructure and the capacity of any one organisation to respond effectively to an event of this scale. We welcome the debate which, in our view, will need to consider how best to organise for an integrated response to these types of events.

We have described the incident response in some detail in our submission and look forward to providing additional commentary in October. If there are matters which we can usefully progress in the interim, we would be delighted to hear from you.

Our submission is drawn wholly from an initial Interim Report that we have prepared for the many external parties that have an interest in how we handled the incident. We do anticipate that this separate document will be in the public domain shortly.

Tony Wray
Managing Director
Severn Trent Water Limited

August 2007

1. BACKGROUND

1.1. Severn Trent Water Limited (STW) is a wholly owned subsidiary of Severn Trent Plc, a public limited company listed on the London Stock Exchange and registered in England and Wales.

1.2. STW is a water and sewerage undertaker serving over 3.7 million households and business customers in England and Wales. Our region stretches from Mid-Wales to Rutland and from the Bristol Channel to the Humber. We deliver nearly 2 billion litres of water per day to homes and businesses through 46,000 km of pipes, a further 54,000 km of sewers take waste water away to over 1,000 sewage works.

2. EXECUTIVE SUMMARY

2.1. The Gloucestershire flooding in July 2007 was a civil emergency involving major disruption to the transportation and utilities infrastructure of the region. The response was coordinated under the Civil Contingencies Act 2004 framework, led at regional level by the Chief Constable of Gloucestershire Police in his capacity as Gold Commander.
2.2. On Saturday 21 July, as river levels started to rise, our flood response procedures were activated. Additional pumps were obtained, key buildings were sandbagged and plans were put in place for partial power shut off in designated areas. Early on Sunday 22 July, the Mythe Water Treatment Works (WTW) was shut down under carefully controlled conditions due to river flooding. A timeline of how the incident developed and the mobilisation of response and recovery is set out in the appendix.

2.3. By Tuesday 24 July, there were approximately 140,000 properties without a piped water supply. Supplies were restored on a phased basis with all customers reconnected to piped water by Thursday 2 August and all water was declared safe to drink on Tuesday 7 August.

2.4. In the meantime, customers were provided with alternative supplies through use of bottles, bowser tankers. We deployed in excess of 1,400 water bowser tankers, the largest number ever used in a single incident in the UK, and delivered up to 5 million litres of bottled water per day. Up to 1,800 of our employees, together with suppliers and other agencies, worked around the clock in response to the incident.

2.5. In recognition of the impact of the incident on our customers, we have allocated a fund of £3.5 million to benefit the affected communities and are working with key stakeholders to determine how these funds will be used. We believe that a contribution such as this will be of long term benefit to all in the community.

2.6. The flooding in Gloucester has raised three broad questions for our business: first, the adequacy of flood defences; second, the extent of “redundancy” such that the failure of a key asset can be compensated by other means without interruption of service; and third, the adequacy of contingency planning should supplies fail.

2.7. We are undertaking a process to review the detailed lessons learned from the flooding incident and will produce a full and final report in due course. We are paying close attention to the feedback from our customers and are holding a series of customer road shows during September.

3. THE EVENT

3.1. The Mythe WTW is built on artificially raised ground on the bank of the River Severn close to the confluence with the River Avon. Here, water is extracted from the river for treatment and onward supply into the network. Operation of the Mythe WTW had not previously been lost due to flooding, although owing to its proximity to the rivers Severn and Avon the risk had been recognised. This was particularly highlighted during local flooding in 2000. Flood defences consisting of a land drainage system and pumping facilities were already in place and in operation at the site prior to the incident. We believed these defences were adequate given the history of the site.

3.2. July’s unprecedented rainfall in an already saturated area resulted in serious river flooding in parts of the Severn and Avon valleys, with floodwaters inundating the Mythe WTW on Sunday 22 July 2007. This resulted in the loss of piped water supply to approximately 140,000 properties in the Tewkesbury and Gloucester area.

4. OUR RESPONSE

4.1. During the week preceding the floods, the Environment Agency issued a number of general advance warnings of flooding. However, these warnings provided no indication of the full extent of the flooding. On Friday 20 July, we issued an emergency weather warning to all works managers. This triggered the normal operational response to increase standby resources and secure chemical treatment stocks.

4.2. During Saturday 21 July we communicated regularly with the Environment Agency who predicted that the river would peak at a level that would not inundate the works. As the river levels continued to increase, we invoked our Flood Emergency Response procedures for Mythe WTW. Additional pumps were obtained, key buildings were sandbagged and plans were put in place for partial power shut off in designated areas. By midnight the Environment Agency confirmed that flooding was inevitable.

4.3. Late on Saturday 21 July, as a precautionary measure we switched some areas to an alternative source of water from Mitcheldean WTW, maintaining supplies for approximately 20,000 properties throughout the incident.

4.4. We established an incident management team early on Sunday 22 July, comprising teams responsible for handling alternative supplies, recommissioning of Mythe WTW, restoration of water into distribution and managing the impact on sewerage infrastructure. In recognition of the likely prolonged nature and scale of the incident, we reorganised our command structure on Wednesday 26 July under the control of our Managing Director.

4.5. On Sunday 22 July we integrated into Gold Command at the Police Headquarters in Gloucester. We had permanent staffing at Gold Command in Gloucester throughout the remainder of the incident.

4.6. At the time the Mythe WTW was shut down the service reservoirs were approximately 75% full, which is equivalent to approximately 36 hours supply of water in normal circumstances. However, following the first news broadcast at around 0900 hrs warning of imminent loss of supplies, water usage more than quadrupled, resulting in a more rapid depletion of supplies.
4.7. The first actual cessation of flow occurred at 1800 hrs on Sunday 22 July. By Monday 23 July, there were 70,000 properties without a piped water supply. This increased to approximately 140,000 properties by Tuesday 24 July.

4.8. Our primary objective after Mythe WTW had to be shut down was to ensure sufficiency of water supplies for sanitation and health. As established by our emergency procedures, customers with special needs, such as hospitals, prisons, major commercial customers and individual domestic customers, such as dialysis patients, were contacted to confirm specific supply arrangements in each case. These were maintained throughout the incident.

4.9. A key priority was to maintain water levels in the service reservoirs so as to prolong piped water supplies to the area. This was achieved using tankers to transport water from Strensham WTW. In addition, we reviewed the potential to re-route water from other sources and by Friday 27 July 10,000 properties in Tewkesbury were supplied with non drinkable water from Strensham WTW for sanitation purposes.

4.10. During the incident, customers were provided with alternative supplies through the use of bottles, tankers and bowsers. Bowser deployment began at 1715 hrs on Sunday 22 July and was rapidly scaled up. In the initial 48 hours demand was high, suggesting that some customers were taking more water than they needed for daily use and were stockpiling. We found it difficult in some locations to match the bowser refilling requirements with the high level of demand being experienced.

4.11. With the number of bowsers deployed, it was not possible to provide permanent supervision to prevent vandalism or ensure customers did not take excessive quantities and turned the taps off after use. Damaged bowsers were returned to our depot for repair, disinfection and re-issue, straining resources. At the peak of the incident response, in excess of 1,400 bowsers were deployed to more than 1,100 locations, the largest number ever used in a single incident in the UK, with up to three fills per day.

4.12. By Monday 23 July we were already sourcing 1 million litres of bottled water per day, which increased to 5 million litres per day by Friday 27 July. This was delivered through close collaboration with suppliers and those providing logistical support, including the councils and the army.

4.13. Following initial damage assessment on Tuesday 24 July, full access to the Mythe WTW was regained on Wednesday 25 July and the restoration of the works commenced. This included the removal of flooded motors for drying and/or replacement, checking and replacing control panels, and the industrial cleaning and disinfection of treatment tanks. A review of our ten main treatment processes indicated that eight had damaged equipment. Eleven major plant items were taken off site for repair and a further four were repaired on site. Within three days water was passing through the clarification and filtration treatment processes for test purposes only. We commenced the reconnection of properties on Sunday 29 July. Half of the properties affected had non drinkable water supplies restored, suitable for sanitation purposes, by Tuesday 31 July, moving to 98% reconnected by 0600 hrs on Wednesday 1 August. Remaining supplies were restored 24 hours later.

4.14. As a precautionary measure, we assumed that the restored water supply was not safe to drink until testing could confirm that it was of drinkable quality. The depressurisation of a distribution system on this scale and for such a prolonged period was without precedent in the UK water industry. Many of our mains were under substantial levels of standing floodwaters. Risk assessments of the impacts on water quality when supplies were restored included the possibility of flood water ingress to the system with the potential for faecal or chemical contamination.

4.15. We established a direct and open communication route with the Drinking Water Inspectorate (DWI). We produced a detailed sampling and analytical strategy aligned to the distribution recovery plan, agreed by the DWI and delivered within the timeline.

4.16. In total, approximately 1,450 samples were taken and more than 13,000 test results were produced in connection with this event.

4.17. We were able to move from “Do Not Drink” to “Boil Water” advice on Friday 3 August (within 2 days of full restoration of water supplies) and then to “Safe to Drink” on Tuesday 7 August (within a week of full restoration), ahead of the anticipated schedule.

4.18. Our current estimate of the costs of dealing with the incident is in the range of £25 million—£35 million, partially offset by insurance of between £10 million—£20 million. These figures are likely to be revised as the full extent of costs becomes clearer.

4.19. We worked closely alongside many agencies including the army, police, local authorities and our suppliers in responding to this emergency. We worked effectively with them as a team and pay tribute to their help and support.

4.20. Throughout the event we were in regular contact with the relevant regulatory authorities. We discussed with the Office of Water Services (Ofwat) and the Consumer Council for Water the position regarding the Guaranteed Standards Scheme (GSS). This compensation scheme provides payments to customers in the event of a failure to meet the standards. In consultation with Ofwat, it was determined that GSS payments do not apply in these circumstances given the exceptional nature of the weather and the...
unprecedented scale and speed of flooding. However, in recognition of the impact of the incident on our customers, we have allocated a fund of £3.5 million to benefit the affected communities and are working with key stakeholders to determine how these funds will be used.

4.21. Our communications strategy was to be open, honest and direct, updating our customers through all available channels, including the media and internet.

4.22. The scale of the incident and the presence of floodwaters necessitated the use of broadcast media to communicate information to our customers in preference to individual correspondence. Daily press conferences were given by Gold Command, including our senior representatives.

4.23. Our main company website failed on Sunday 22 July due to the number of people trying to access it. We increased the capacity of the website and returned it to service by 2100 hrs the same day, although it did continue to suffer slow response times.

4.24. All customer enquiries were handled by our Customer Operations Service Centre (COSC). To improve customer service, a second customer contact centre dealing with calls specific to the incident was opened on Thursday 26 July.

5. INTERIM CONCLUSIONS

5.1. The flooding in Gloucester has raised 3 broad questions: first, the adequacy of flood defences; second, the extent of “redundancy” such that the failure of a key asset can be compensated by other means without interruption of service; and third, the adequacy of contingency planning should supplies fail.

5.2. Flood defences

The rainfall levels and the consequent river flooding were unprecedented. Prior to the event, we considered Mythe to be adequately protected. In the light of these events and climate change more generally, along with government agencies and other utilities, we should re-evaluate the levels of possible flood against which our assets should be protected. Some of the resulting additional defences may be specific to our sites. Others should be covered by government schemes designed to protect communities as a whole.

5.3. Redundancy

Mythe (WTW) is one of a group of key sites most of whose customers can receive water from no other treatment works. In consultation with our regulator, investment in redundancy (alternative supplies) has been focused on those communities judged to be at greatest risk, and those with the largest populations (for whom the provision of bowsers has been deemed to be less practical). To prevent a possible repetition of recent events, we should re-evaluate possible investments to increase the degree of redundancy of supply. We will work with our regulators and key stakeholders to develop means to ensure that we can proceed with the most effective schemes. Initial research carried out after the flood by CCW found that customers place very high value on continuity of supply, and support long term investment over short term compensation.

5.4. Contingency

The unprecedented scale of the flooding severely stretched our capabilities to provide alternative sources of water for drinking and sanitation. We do not believe any single water company would be able to cope with an incident of this scale on its own, even given effective “mutual aid” support from other water companies. While we believe that our response was effective in maintaining a supply of water to the community, we will continually review and improve our contingency planning.

APPENDIX

<table>
<thead>
<tr>
<th>Date</th>
<th>The event and subsequent mobilisation</th>
<th>Recovery of Mythe WTW and service restoration</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/7</td>
<td>STW issues emergency weather warning to works managers, triggering the normal operational response.</td>
<td>Site flooded. Preparations for return to site commence—contacting contractors, sourcing of required equipment (pumps, sandbags, spares) etc.</td>
</tr>
<tr>
<td>21/7</td>
<td>River levels rising. Flood emergency procedures implemented.</td>
<td></td>
</tr>
<tr>
<td>22/7</td>
<td>Controlled shutdown commences (0145 hrs). Mythe WTW flooded. Site evacuated (0600 hrs). Tankering operations commence. Sourcing/deployment of bowsers commences.</td>
<td></td>
</tr>
<tr>
<td>23/7</td>
<td>70,000 properties without water and a further</td>
<td>Site still flooded (18” of flood water on site).</td>
</tr>
<tr>
<td>Date</td>
<td>The event and subsequent mobilisation</td>
<td>Recovery of Mythe WTW and service restoration</td>
</tr>
<tr>
<td>-------</td>
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<td>---------------------------------------------</td>
</tr>
<tr>
<td>70,000 under threat. 250 bowsers deployed. 150,000 litres of bottled water being given out.</td>
<td>Preparations for return to site continue.</td>
<td></td>
</tr>
<tr>
<td>24/7</td>
<td>140,000 homes properties without water. 400 bowsers deployed. 3 million litres bottled water sourced per day.</td>
<td>Access to Mythe regained. Visual assessments made. Pumping out of floodwater commenced and temporary flood defences erected.</td>
</tr>
<tr>
<td>25/7</td>
<td>900 bowsers deployed. 4 million litres bottled water sourced per day.</td>
<td>Full access to Mythe regained. Work commences on drying and replacing electrical equipment, replacing and checking control equipment, industrial cleaning and disinfecting all tanks/sumps on site.</td>
</tr>
<tr>
<td>26/7</td>
<td>“Hub and spoke” approach to refilling bowsers implemented, improving the use of artic tankers and small rigid tankers. Plan to refill bowsers at least 3 times per day introduced. 1,100 bowsers deployed.</td>
<td>Key equipment off site for repair. Industrial cleaning and disinfection of tanks continuing. Preparations commence to review start up procedure.</td>
</tr>
<tr>
<td>27/7</td>
<td>1,200 bowsers deployed, 200 damaged (net 1,000). 5 million litres of bottled water sourced per day (confirmed up to 1 August).</td>
<td>10,000 properties brought back into supply using water supplied via Strensham (“do not drink”). Testing of equipment commences. Key motors returned to site following repair and installed. Work on semi permanent flood defences commences.</td>
</tr>
<tr>
<td>28/7</td>
<td>1,500 bowsers deployed, 300 damaged (net 1,200). Bowser fill rate of 3 times per day being achieved. Bottled water stocks maintained to meet demand.</td>
<td>Plant checks and repairs complete. Mythe starts pumping operations and commences refilling service reservoirs.</td>
</tr>
<tr>
<td>29/7</td>
<td>Level of bowsers (net of damaged) maintained at approx 1,200, with a refill rate of 3 times per day being achieved.</td>
<td>Semi permanent flood defences primarily complete (minor additional bolstering work required).</td>
</tr>
<tr>
<td>30/7</td>
<td>Level of bowsers (net of damaged bowsers) and refill rate of 3 times per day maintained. Reconnection of properties resulting in a reduction of use of bowsers—25% of bowsers now full when visited. Bottled water stocks maintained to meet demand.</td>
<td>Site resilience being built—testing of standby units. 65,000 properties reconnected (“do not drink”).</td>
</tr>
<tr>
<td>31/7</td>
<td>67% of bowsers now full when visited.</td>
<td>70,000 properties reconnected by 0600 hrs (“do not drink”).</td>
</tr>
<tr>
<td>1/8</td>
<td>137,000 properties reconnected by 0600 hrs (“do not drink”).</td>
<td>All properties reconnected by 0545 hrs (“do not drink”).</td>
</tr>
<tr>
<td>2/8</td>
<td>Customers given “boil water” notice. Ozone and Granular Activated Carbon Unit brought back on line.</td>
<td>Customers given “safe to drink” notice.</td>
</tr>
<tr>
<td>4/8</td>
<td>Bowser retrieval process commences.</td>
<td></td>
</tr>
<tr>
<td>5/8</td>
<td></td>
<td>Full automatic control of Mythe regained.</td>
</tr>
<tr>
<td>6/8</td>
<td></td>
<td>Customers given “safe to drink” notice.</td>
</tr>
<tr>
<td>7/8</td>
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Severn Trent Water Limited

August 2007
Memorandum submitted by Thames Water (FL 104)

EXECUTIVE SUMMARY

The rainfall of earlier this year was exceptional in terms of recent history but is regarded by observers to be indicative of the challenges likely to arise as a result of climate change. Aside from the obvious distress caused to individuals, the flooding highlighted the vulnerability of utility assets, some of which were critical in that their being disabled resulted in a protracted loss of acceptable service. It is clear that both immediate and longer-term measures are required if the impact of a similar event is to be reduced, but the longer-term measures are difficult to agree and implement due to the fragmented responsibilities for drainage and river management. We see the issues as falling under three main headings:

— Administrative (institutional): Responsibility for managing flood risk, particularly in urban areas, is spread across several authorities/bodies without an effective “overarching” body. Tackling this is very likely to involve legislative change, or at the very least, better clarification of roles and responsibilities. Conversely, the dual foul/stormwater function of many existing physical assets may make the creation of a “stormwater” authority impracticable.

— Costs and benefits: It is impracticable to completely remove all flood risk. It is therefore an issue for society to determine what level of protection is appropriate, both now and in an uncertain future. In deriving what is “appropriate”, different degrees of protection might be suitable for different types, or causes, of flooding event. Given that there is already a shortfall against current standards in some areas, an early agreement to future requirements is essential to avoid wasted expenditure.

— Funding: Linked to both the above topics is the issue of how improvements should be funded. Again, it is an issue for society to decide whether the cost of improvements fall on those who benefit directly or whether they are spread wider, either (for example) through customer water charges, or general taxation.

We are aware of, and have responded to, the recent consultation “Making Space for Water”. This consultation considered the Environment Agency as having a strategic overview for all flooding matters, and we are supportive of the principle of having such an umbrella organisation. Nonetheless, we would welcome a broader, long-term review of all flood risk management and delivery bodies. Ideally, this would establish clear responsibilities and accountabilities, and facilitate an integrated approach with solutions from a local through to catchment scale. As such it is likely to involve organisational, funding and legislative changes to the current framework. Without such changes it is difficult to envisage how better integration might be achieved.

1. INTRODUCTION

1.1 Thames Water is the Water and Sewerage Undertaker for the approximate region of the River Thames catchment. One of our duties is to provide “effectual drainage”, which is interpreted by our economic regulator (Water Services Regulation Authority, “Ofwat”) and related to “levels of service”. As Ofwat also determines our overall charge for services, there is a clear link between service level and prices.

1.2 Our area includes Greater London and other major conurbations in the south-east of England. Much of London is served by “combined” sewers—there is a single pipe for both foul and storm waters. This is a historical legacy, and to provide separate systems has been assessed but considered to be too expensive and disruptive. The threat of widespread flooding in London is linked to sea levels and surge conditions, but there are instances of local flooding related to the incapacity of the existing urban drainage.

2. RESPONSIBILITIES FOR DRAINAGE AND FLOOD RISK

2.1 Responsibility for the different elements of the drainage system is complex. Historically the system was largely under public ownership, but at privatisation in 1989 the drainage system was divided between water companies, the EA and local authorities. The below paragraphs explain current responsibilities, however it should be noted that Government is in the process of consulting on water companies adopting most private drains and sewers, thereby taking responsibility for their performance. We anticipate that this will not occur before 2010.

2.2 Public Sewers

Water companies have a general duty to allow lawful connection to the public sewer and maintain its effectiveness. Where only one pipe is provided, customers may connect both foul and surface (or storm) water.
2.3 **Private sewers**

Private sewers are the responsibility of the property/land owner.

2.4 **Main Rivers (as defined on the "main river" map)**

The EA is responsible for building, maintaining and operating main river flood defenses. Through land drainage consents, the Agency can limit the quantity of water discharged through an outfall.

2.5 **Roads**

The County Council, Unitary Authority or London Borough is usually responsible for local highway drainage. Highway drainage may connect to a public sewer or directly to a watercourse or soakaway.

2.6 **Water Courses (non main river) and Land Drainage**

Local Authorities have limited discretionary or permissive powers for dealing with non-main rivers and have additional responsibilities if land is directly owned. All landowners are responsible for ditches and watercourses that are on their land or along boundaries of their land, except for those designated as highway ditches or main rivers. Responsibility for maintaining a watercourse may be split between many individuals, which can make organising maintenance a problem. The Local Authority has certain limited powers to advise owners and carry out work as a last resort.

In addition to the above there is the major role of the planning authorities to ensure the implementation of the various codes of practice and policy guidance. However, the Environment Agency (EA) has expressed its concern that some local authorities are not sufficiently observing government policies designed to ensure development needs are met without creating unnecessary risks. Although most local authority development plans do now include flood risk statements or policies, the EA reported that, of the cases it was aware of, nearly 15% of the planning decisions taken in 2003–04 were not in line with the government’s planning policy guidance on flood risk and development (PPG25). Barbara Young, Chief Executive of the EA has commented, “There is a persistent core of planning applications being approved contrary to our advice, including a small but significant number of major developments, many of which are for homes.”

In summary, the above demonstrates that there is a fragmented approach with differing statutory requirements, and that even where guidance exists it may not be being implemented fully.

### 3. Our Current Approach

3.1 All flooding incidents are recorded on our flooding history database, this is the main tool used to determine investment in flood alleviation schemes. Whilst being flooded is a hugely distressing experience for customers, preventing flooding to all properties under all circumstances is not feasible. TW are only funded by OFWAT to resolve flooding to properties at risk from a 1 in 10 year storm, where the solution is cost-beneficial.

3.2 The problem of flooding is addressed in order of priority and in doing this, three key points are considered:

- The seriousness of the flooding
- Likelihood of a repeat flooding
- Cost of solution relative to the number of homes affected

It is necessary to ensure that when looking at a solution to any flooding issue it does not create a risk of flooding elsewhere. Depending on local circumstances, and the cause of the flooding consideration of a range of options is made to reduce the risk of flooding.

3.3 Where the flooding is caused by a blockage, sewer collapse or similar cause the solutions may be as follows

- More regular sewer cleaning in areas of known flood risk to minimise the possibility of blockages occurring
- Seeking ways to stop wastewater backing up from sewers into property or spilling out of manholes
- Correcting any minor defects

These solutions are implemented, where possible for all properties flooded due to blockages, even if this occurred due to severe weather.

3.4 If the flooding is caused by overloaded sewers (i.e. the sewers are unable to cope with the flow) different solutions are appropriate. In these circumstances investigation is made into an engineering solution for properties at risk of flooding from a 1 in 10 year storm or less. These solutions may take a number of years to design and implement, as well as being costly. They include:

- Building new sewers to increase the capacity of the local system
— Installing pumping stations to pump the wastewater away more quickly
— Providing storm overflows to allow surplus water to escape from the sewerage network without causing flooding
— Sealing sewers to stop groundwater seeping into them
— Providing storage, such as underground tanks or environmental ponds, so that storm water can overflow harmlessly from the sewers.

The solutions that we implement to alleviate flooding are designed to provide protection for rainfall events occurring up to a 1 in 21 year return period. Because the above engineering solutions can be subject to planning restrictions and take time to put into effect, Thames Water may carry out mitigation works at or near a property affected by a 1 in 10 year storm to reduce the frequency of flooding in the short term.

3.5 The key consideration is whether the current level of planned protection is appropriate, and we aim to revise our designs post 2010 to offer 1 in 30 year return period protection, subject to funding approval.

4. CURRENT INVESTMENT BY THAMES WATER

4.1 Over £130 million has been invested since 2005 to alleviate the risk of sewer flooding. This means that we have reduced the risk of flooding due to overloaded sewers at 2066 properties (by upgrading sewers and providing additional storage for floodwater) and the risk of flooding due to blockages and sewer collapses at 1381 properties.

4.2 A further £190 million will be invested before 2010 to reduce the risk of flooding (due to overloaded sewers) at a further 3595 properties, and the risk of flooding due to blockages at a further 2165 properties in London and the Thames Valley.

4.3 In total almost 6000 properties at risk of internal flooding, and over 3000 properties at risk of external flooding, will have been relieved by 2010.

4.4 We are also providing temporary measures to alleviate the impact of sewer flooding to over 350 properties where a permanent solution is too costly or not possible in the next few years. We will continue to prioritise this investment in conjunction with the Consumer Council for Water (CCW), refining the process which we have developed over the last few years which assesses the frequency and customer impact of flooding.

4.5 This means that by March 2010 there will be approximately 6500 properties at risk of flooding due to overloaded sewers at a frequency of more than 1:10 years (compared to a register size of over 11,000 at March 2005).

5. OTHER INITIATIVES

5.1 It is recognised that simply building greater capacity into our pipes and tanks cannot be the only strategy for adapting to climate change in the future, and we are participating in two Defra-sponsored Integrated Urban Drainage pilot schemes which consider alternative approaches. However, organisational, funding and legislative changes would be required to deliver these alternative scenarios. In particular, much is often made of the value of various types of “sustainable urban drainage structures” (SUDs). Implementation of some of these approaches may not be fully consistent with the “polluter pays” principle, and nor do they necessarily fit well with existing statutory duties and responsibilities.

5.2 It is critical that as well as identifying the most appropriate framework for delivering integrated urban drainage, any analysis should consider what appropriate funding and incentive mechanisms are required to enable delivery and engender change. Funding and incentive mechanisms should be transparent, equitable, and embrace the “polluter pays” principle. Thames Water is concerned that past precedent suggests that any new unfunded burden would fall on Sewerage Undertakers, without a corresponding uplift in bills.

5.3 In addition to activity to protect our customers directly, we will be reviewing the risk to our own major surface assets—such as water and sewage treatment works, which by their nature tend to be close to rivers—and the consequences for service delivery should their operation be impacted.

5.4 Lastly, there is a need to integrate climate change into the planning and regulatory framework for urban drainage. The costs associated with climate change adaptation are difficult to estimate but could be considerable, and there is a need for a better understanding of the links between risk, probability and cost. This better understanding must be extended to the wider public, if we are to gain their acceptance of the likely financial consequences.

Thames Water

September 2007
**Witnesses:** Mr Tony Wray, Chief Executive, Mr Andy Smith, Water Services Director, Mr Martin Kane, Customer Relations Director, Severn Trent Water; Mr Richard Aylard, External Affairs and Sustainability Director and Mr Bob Collington, Director of Wastewater Services, Thames Water, gave evidence.

**Chairman:** Good afternoon ladies and gentlemen.

For the record may we welcome from Severn Trent Water Mr Tony Wray, their Chief Executive, Mr Andy Smith, their Water Services Director, Mr Martin Kane, their Customer Relations Director; from Severn Trent Water Mr Richard Aylard, External Affairs and Sustainability Director and Mr Bob Collington, who is their Director of Wastewater Services. Gentlemen, you are very welcome. May I thank you in advance for the written evidence that you were able to send to the Committee. We will start with Paddy's question on SUDS.

**Q370 Paddy Tipping:** I think you all heard the previous discussion. Clearly SUDS can play a role but there do seem to be issues around who installs them, the planning system that puts them in and, most particularly, around maintenance and long term responsibility. I am not entirely clear what the law is; perhaps you would explain it to us.

**Mr Wray:** If I may comment, we certainly have the competencies to do that; we do understand the management of flows and certainly the waste treatment, the treatment of silt, sludge et cetera. However, that does come at a cost. We have finite resources and our customers bear the cost of the additional activities that we have to take on, so whilst we may have the competencies to do that, we must have the full appreciation of what the impact upon our customers would be on bills and how we would go about that in an organised manner and in an affordable way.

**Mr Aylard:** If I could add two practical problems with SUDS, one is that to be effective they require quite a lot of land and in urban areas we very often do not have that land. Secondly, to be most effective you need a permeable substrate so that they drain away. Again, if you are in London you have clay so you do not have that land. Secondly, to be most effective you need a permeable substrate so that they drain away. Again, if you are in London you have clay so SUDS in a lot of areas are not going to be as helpful as they might.

**Q371 Paddy Tipping:** What would be the legislative change that we need? **Mr Aylard:** At the moment the local authorities can insist that developers create SUDS when they build a new development; in practice they very often do not. We played a leading role on the national SUDS working group and we have issued guidance to developers for the ways in which they could create SUDS that would make it easier for us to take them on afterwards. However, there are issues with maintenance particularly because as well as collecting water they also collect silt and that silt has to be taken away. It that silt has got highway run off in it then it has to have a waste management licence so life gets relatively complicated as things go on. I think that the most important thing would be to get local authorities to insist that developers install SUDS when they build developments.

**Q372 Paddy Tipping:** Yorkshire Water suggested to us that the organisation that should take long term responsibility would be the local authority. I do not agree. I think this is your neck of the woods and it really ought to be the water and sewerage companies.

**Q373 Paddy Tipping:** Is this something that the SUDS working group has looked at? **Mr Collington:** I think the key issue is ownership once the facilities are built. At the moment there is no clarity about ownership anywhere in the country except in Scotland. In Scotland they have already solved this problem. They have split responsibility for SUDS depending on whether those drainage schemes are above ground or below ground. If they are above ground in Scotland the local authorities take them on because it is more akin to the management of parks and ponds; if it is below ground the sewerage undertakers take responsibility for them. That could be one way of working throughout the rest of the country.

**Mr Aylard:** If I could add two practical problems with SUDS, one is that to be effective they require quite a lot of land and in urban areas we very often do not have that land. Secondly, to be most effective you need a permeable substrate so that they drain away. Again, if you are in London you have clay so SUDS in a lot of areas are not going to be as helpful as they might.

**Q374 Paddy Tipping:** How do we get clarity on the way forward? What needs to be done? **Mr Collington:** I think we need definitive legislation from government.

**Q375 Chairman:** Just describe for my benefit what one of these things looks like. **Mr Aylard:** They can take various shapes but they are generally a pond of some sort—sometimes a longish pond that is called a swale—but they collect the run off and it sits there and gradually percolates through back down as ground water.

**Q376 Chairman:** It has got to be a designed system because most people do not want water draining out of ponds. **Mr Aylard:** Yes, it has to be a designed system to work properly and there are various ways of doing that.

**Q377 Chairman:** That, effectively, addresses the issue about run off and the nature of it. I had a picture in my mind of lots of green open spaces and nature taking its course, but this is a rather more constructed managed environment.
Mr Aylard: That is right. Of course the real benefit is that you are not, unlike other forms of drainage, just pushing the problem rapidly onto somebody else; you are dealing with it where it is and where you can do that that must be good.

Q378 Chairman: It is something which, if I have understood it correctly, you cannot really retro-fit in an urban environment.

Mr Aylard: Not easily, particularly if you are on a brown field site where you have perhaps got deep foundations from previous buildings or basements; you can cause more problems than you solve.

Q379 Chairman: So we should not get too carried away. SUDS might be good for new build but it is not going to solve the problem with the existing infrastructure.

Mr Wray: Absolutely. I mentioned that SUDS are part of the solution; there are many other aspects that have to be brought to play and in particular dealing with the existing infrastructure that we have and the progressive development and enlargement of that infrastructure to deal with the greater flows that we are having to contend with, including the potential separation of surface water from foul water. That is a huge, huge, civil undertaking for the UK and one that we do need to take very seriously and make a start on.

Q380 Chairman: Is there any sign that anybody is actually taking that work forward?

Mr Wray: Yes, there is. All water companies and waste companies are in the process of putting together for the first time through public consultation, 25 year strategic statements. I know from my own company—and I believe for Thames as well—these are issues that we area taking very seriously and we are making practical suggestions about how we can start that journey, how we can practically re-engineer the networks over the long period of time to start to contend with some of these issues.

Q381 Chairman: What assumptions on the weather are you making? Are you following the recommendations of the Foresight Report, for example?

Mr Wray: Not only the Foresight Report, but the Climate Change Reports and any relevant and current information that we can find. We are taking that data and trying to predict what it is we will be dealing with in the future, what does it mean in practical terms for the drier and wetter climate that we are going to be dealing with? What are the implications on how we deal with the future sewerage and water supply demands of the future?

Mr Drew: Moving onto sewerage, just a question for you. Tony, in terms of where you are with reed beds, for example. I believe Gerald Noone is known to you for some time.

Chairman: He is not well known to me. Who is Gerald Noone?

Mr Drew: Can I just ask Thames Water if they have a similar interest in reed beds?

Mr Aylard: Certainly we have, but we have the same issue as with SUDS about the space required. If you look at our Becton plant which treats the sewerage from three and a half million people you would have to fill a full-sized tanker every two seconds to cope with that amount of effluent. There would have to be a reed bed larger than anybody could possibly comprehend. Even with some of the smaller works it is very difficult to find the space. Also ideally with a reed bed you need a natural drainage through it so you have to have the right degree of landscape to make them work properly. We do have some.

Mr Collington: We have several sites that have reed beds and they are an effective method of treatment, but it tends to be for the smaller sites.

Q382 Mr Drew: Tony will say in a minute who Gerald Noone is, but there was quite an instructive dialogue going on about other ways in which we can deal with this enormous problem of sewer drainage. Can you say what your current attitude is to reed beds now that Gerald Noone has gone? You might also like to say who Gerald Noone was.

Mr Wray: Gerald Noone was a previous officer of the company who led some of the company’s research thinking about methods of treatment. Reed beds figure in our armoury of tools and techniques for dealing with sewage. We are looking at their application across a whole wide range but we have to contend with huge amounts of sewerage from large urban conurbations like Birmingham and Coventry through to very small amounts of sewerage in rural locations. The flow rates that you have to contend with there will dictate to some extent the nature of the design. The other thing that we have to deal with—and it is a feature I think of the water industry from what I can see, certainly for the past 20 years—is a huge amount of investment driven towards improving quality, quality of drinking water and quality of final effluent before it is discharged to the water courses. Because of that we now enjoy in the UK some of the highest standards anywhere in the world, but I think there is now a question to be asked about shifting the balance of that investment on from quality to dealing with quantity and the volumes that we have to deal with into the future.

Q383 Mr Drew: Could I ask about the issue of what expenditure you are prescribed to spend in the area of sewerage disposal by Ofwat? Do they give you enough flexibility or would you ask for more? I know you have to raise the money, but Ofwat have been quite difficult in terms of the amount of money they have expected you to spend on that.

Mr Aylard: We have to make a good case to Ofwat for any expenditure of customers’ money. That is quite right, they are the economic regulator and are there to protect the customer. We have to be able to show that any work we are going to do either to do either to do with essential maintenance of existing assets, or that it is an improvement to customer service which customers would support. One of the things we are doing in the strategic
direction statement Tony mentioned just now is that we are proposing that we would design waste water assets to cope with a one in 30 year rainfall scenario rather than a one in 20. Ofwat will want us to show that customers understand that and are willing to pay the extra costs of doing things to a higher standard. It is the point that the local authorities made earlier about balancing risk and cost in a sensible way.

Q385 Mr Drew: How does that compare to the previous session? Oxfordshire—and indeed Duncan from Gloucestershire—were saying they were having to prepare possibly for a one in 300 event. You are talking about one in 20 or one in 30, that is a pretty differentiated planning process.

Mr Aylard: Even that is very expensive. In Ofwat’s defence in the previous five year price round the allocated us £80 million to relieve sewer flooding in individual properties in our area; this five years they have given us £320 million. That will relieve sewer flooding in about 6000 properties.

Q386 Mr Drew: In terms of the changes the Government is now proposing for you to have as your re-adoption of responsibility, if you like, for the sewerage, how do you welcome that? You said you were willing to do it, but this is big money and you are going to end up with all those problems that I get when my sewer blocks and that is because nobody at the moment wants to take responsibility.

Mr Aylard: I am not saying that we welcome it but it is something we are geared up to do; it is our job.

Mr Collington: It is going to be quite difficult: we should not underestimate that. For Thames we currently have 67,000 plumbers of sewers. When the act changes and we get all the private sewers we are going to inherit overnight another 40,000 plumbers. It is going to be big money and what the Committee has to remember is that when we get that we have not put the Victorian sewers in they seemed to put a fair amount of spare capacity in. I would be interested if one had a sort of uniformed rainfall over London can you tell me at what level and for how long it has to rain before the sewers fill up? In other words, they are absolutely full, they cannot cope, they cannot discharge into wherever they go to? I am not certain how bad the problem is.

Q387 Dr Strang: Recognising there is a role for a small rural housing development, am I right in saying that it is only satisfactory if the reed bed does not go continuously into a stream or a river; a reed bed that was adjacent to a running river would be ruled out presumably because of the risk of pollution. That is my first question. Secondly, are people actually artificially creating reed beds?

Mr Aylard: The first thing is that they can go continuously into a river or stream provided that the standard of treatment that is provided by the reed bed is sufficient to meet the Environment Agency’s discharge standards so it has to be very carefully designed and monitored. And yes, there are people who design reed beds on this scale commercially in this country and abroad.

Q388 Chairman: Can I just try to probe, particularly with reference to a city like London, one of the things that I am totally unclear about is just how much capacity have we got in the sewer system? We have in previous inquiries had discussions about the state of the sewers and the investment that may have to be made to upgrade them, but luckily when they put the Victorian sewers in they seemed to put a fair amount of spare capacity in. I was interested if one had a sort of uniformed rainfall over London can you tell me at what level and for how long it has to rain before the sewers fill up? In other words, they are absolutely full, they cannot cope, they cannot discharge into wherever they go to? I am not certain how bad the problem is.

Mr Collington: I think the honest answer to that question is that it varies depending on the type of event, whether it is a high tide or low tide in the Thames, how long it rains for and what the pluvial conditions would be.

Q389 Chairman: Let me try to relieve you of this variable nature of your response. If we said, bearing in mind that tides run on a 12 hour in and 12 hour out, that over a 24 hour period there were three or four hours of the kind of intense rain that may be associated with an extreme weather event in a tide in situation in London, when do you reach full? How many inches of rain have to fall?

Mr Collington: Most of the time we can cope with three, four, five, six inches of rain for 45 minutes to an hour continuously. When it gets beyond an hour of continuous rain and there are five or six inches of rain then the sewerage system starts to struggle. If you look at 20 July we had three or four hours of continuous rain; we have six to seven inches in places and we had areas of London where the system could not cope. Most of the major barrels of sewer that run underneath London are nine foot in diameter; they tend to run east to west across the city. There are large pumping stations that run along the River Thames to pump out the sewerage system in times of extreme weather and there are a number of overflows from the sewerage system that act like
pressure relief valves on the system to spill sewerage into the Thames. That is the way the Victorian system is designed. We are in the process at the moment of building a large super sewer which will take 14 or 15 years to complete which will take away those overflows and provide a storage system in the base of the river for Thames’ sewerage system. We are blessed by the legacy of the Victorian system.

Q390 Chairman: If we are looking at the show stopper issue flooding wise for the centre of London—let us leave the Thames Valley slightly out—the impression I get from what you were saying is that if you carry on with your super sewer you can pretty well cope with the types of event that you have described. If we turn it into the one in so many years event, what kind of event are we talking about that you are trying to cope with?

Mr Collington: The type of events that we are funded for by Ofwat are anything up to one in 20 year rainfall return period. Ofwat do not fund companies to deal with anything beyond that.

Q391 Chairman: If we go back to the July event; what was that in so many years?

Mr Collington: In the rural areas that was a one in 150 year storm. In parts of London it was over one in 100 years.

Q392 Chairman: So if London were hit by a one in 150 year event you could not cope.

Mr Collington: There are parts of London that will cope; there are parts that struggle to cope. Those are areas where we experience flooding at the moment.

Q393 Chairman: You mentioned river side pumping stations and one of the issues that came out of Gloucestershire was the question of the vulnerability of infrastructure. I would be interested to know in a capital city like London how vulnerable is the infrastructure. Obviously in terms of the level of investment that you have to sustain to keep the capital city going, depending on what you want to sustain depends on how big a bill Thames Water payers have to bear. I think it is that scenario which I find difficult to cope with, to understand levels of investment versus levels of protection versus vulnerability.

Mr Aylard: I think it would be quite rare to get the same level of rainfall across the whole city. We tend to get these one in 150 bursts which are very, very localised. Sometimes they will hit an area with a network that can cope and sometimes they hit an area that cannot. Part of the problem is that in those circumstances you cannot get the water away quickly enough and that is why it floods. We are doing a very detailed update with all our resilience work using the Environment Agency’s flood risk data. We are looking first of all at the likelihood of flooding happening; secondly, what the impact would be on our operations, on our customers, on other infrastructure in the area (places like Heathrow for instance) and then at the cost benefit analysis of that. That will all form part of our strategic business plan that goes to Ofwat in 2009. You can be reassured that we are looking again at all this.

Q394 Chairman: If it as localised as you suggest, do you sort of take one mile square areas and say that if that kind of one in 150 year event occurred here what do you think might happen?

Mr Collington: We look at rainfall data in one kilometre squares and we look at critical assets and then we have drainage area plans which basically come down to one kilometre squares.

Q395 Chairman: So at the end of this exercise you would be able to present to your shareholders and to Ofwat and to the public a menu which says that if we want this degree of protection it is going to cost that much in these locations. Is it going to work like that?

Mr Aylard: Broadly speaking yes. I can give you an example from the 20 July flooding. Our Grimsbury water treatment works was flooded to a depth of about six feet. We knew that Grimsbury was liable to flooding; we had put in place a one in 50 year scheme some years ago which consisted of a large band around the site. We are also working with the Environment Agency to design a one in 100 year scheme but what we got was a one in 150 years. At that point we fell back on the contingency arrangement for re-zoning the network and making sure that our customers could be supplied from other works. There is a whole series of things to try to reduce the risk to customers, starting with physical measures and going down to re-zoning and ultimately to tankering.

Q396 Chairman: How does Severn Trent undertake similar scenario playing that we have just heard about from Thames?

Mr Wray: In very much the same way. We have the area drainage plans, we review those on a regular basis and keep track, from the best of our knowledge from the local authorities, where developments are going to take place, how much capacity we have (we have run hydraulic modelling for each of those areas and we try to predict where we are going to see the capacity constraints). What we then do is point our investment to those areas. For instance, this year we are completing major sewerage capacity schemes in places like Leamington, Kenilworth, Hinckely so we are keeping a constant review on the networks for where that capacity constraint may fall and trying to stay ahead of that with building that capacity into the network.

Q397 Chairman: Do you think from your respective companies’ points of view, bearing in mind that the impact of extreme weather events are very unpredictable—they may well be associated with the global phenomenon of climate change—that it is still right for the water charge payers in each of the areas that you respectively serve to bear the full cost of dealing with the impact of these matters or do you think there is any merit in looking at the collective sharing of perhaps an element of extreme weather event expense on a national basis?
Mr Wray: My personal view is that whilst there are still a lot of shades of opinion on climate change it is undeniable. Actually that is the stance we take as the company and that is embodied in our strategic direction statement. Coupled with that, certainly through the events of Gloucestershire despite the magnificent mobilisation that we have heard about from all of the agencies and customers, we have just gone through a period where we now have to deal with a paradigm shift in our thinking of what is acceptable risk. In the short term I think there are absolutely things that we can do and should do that inform our plans. In the long term I think there is potentially a huge investment burden required and we have to figure that out, how much of that comes from the consumer directly and how much of that, if any, comes from taxation. The one thing that is clear and not well understood about our sector is that every year for Severn Trent since the year of privatisation—and I do not think any other company is different to this—the net investment in progressing the infrastructure and dealing with the quality standards is far greater than the actual profit made in the year. That is likely to be the case for at least the next 20 years because of the need to continue with the modernisation of the networks. Unfortunately that cost burden will fall. I think it needs to fall in such a way that consumers have sufficient information and transparency to be able to comment on what they deem is the rate at which we do that; what is affordable at any point in time.

Mr Aylard: I very much agree with that.

Mr Collington: I think the key thing for me—and it was mentioned in the previous session—is that unless we actually take an integrated approach to this we are not going to solve the problem. There are areas of Kensington and Chelsea that flooded in July this year; they also flooded in severe wet weather events in 2004 and 2005. I know the answer to the problem for that area in London is to build a huge sewer and to take the sewage to the Counter’s Creek, but there is no way the river could cope with that. Therefore, if I solve the problem for the residents of Kensington and Chelsea I just move it somewhere else in London. Unless the Environment Agency and the companies and the local authorities work together to solve these problems, all we are going to do is shift the problem from one place to another.

Q398 Chairman: You would be very popular if you shifted Kensington and Chelsea to certain places; there would be a bit of a riot there.

Mr Collington: The cost is huge. For that one scheme we have estimated the cost to be £90 million.

Mr Aylard: It is about half a million pounds per property that would be helped by the scheme.

Q399 Chairman: You could always turn Chelsea’s pitch into a sort of SUDS; that is a possibility. Anyway, before we get too many flights of fancy let us get on the ground to the Civil Contingencies Act 2004. In terms of business continuity plans perhaps you could just describe to us what your duties are under that Act. I gather that, under what is described as the Security and Emergency Measures Direction, that puts a requirement on you to keep under review and revise your emergency plans and to ensure that you have the provision to maintain essential water supply and wastewater at all times. How do you do it? In the case of South West Water you could not quite do that really through pipes because you had a bit of a problem. My friend Mr Drew will come onto the Mythe Valley but perhaps you could comment on these overall powers and how you adhere to your legal requirements.

Mr Wray: For Severn Trent Water we have a whole range of responses to that which run not only to maintaining alternative supplies—which we do through provision of bowers and bottled water (I will talk more about Mythe and Gloucester in a moment)—but also through a whole range of measures not just for the interruption of supplies which can be from a break in the distribution because of civil activities going on—street works of some form—right the way through to disruption of supply such as, on a river intake, dealing with pollution coming down the river which is the source of water. Unfortunately we do live in a society where there are agencies who would seek to do damage to things so there are a whole range of contingencies that we have to make available there. In response to those we go to great lengths to diversify supply on the networks to provide multiple supplies, to physically protect sites and assets and, in the event of loss of supply, the ability to make alternative supplies available. The issue that we had this last summer was that we were dealing with an event of a magnitude completely outwith any experience, not just of Severn Trent, but on a scale anywhere in the industry. That presented us with huge problems which were dutifully overcome with the all agency support that we had and has presented us with a huge number of lessons which we are now working our way through and sharing them as widely as we can such that everybody can benefit from that work.

Q400 Chairman: Thames?

Mr Collington: My answer is very similar to Severn Trent. We have all of the measures in place that Tony described. We have event management procedures in the company that deal with a range of emergencies and how events are escalated through the company from local level right up to the chief executive. We have mock emergencies that we plan for each year and we engage with the Metropolitan Police and other agencies in planning for major civil contingencies. There is a major event planned for February where we are going to model a scenario of a Thames flood in parts of London. We have all those processes in place.

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Mr Aylard: Absolutely not, but we have no objection to it.

Chairman: Very diplomatic. Mr Drew?

Q402 Mr Drew: If we could turn to some specifics—obviously I know a bit about what happened in Gloucestershire as you can imagine and to be honest with you I have not yet read in detail the county’s independent report but I have looked at their summary—how do you respond (I did talk to you about this when we met and I was very grateful for you taking me round the Mythe plant) with the benefit of hindsight to the criticism which was advanced on a number of occasions that you were unprepared for the scale of the problem and you took quite a time to gear up? Subsequently I then did receive complimentary remarks made about individual people on the gold command and other lower levels of the command structure.

Mr Wray: Very straightforwardly we have cooperated through all of this and with the Gloucestershire Scrutiny Committee to a complete degree. It is a very balanced report and they point to the same things that we have seen for ourselves. I think, the sheer scale of this undertaking, and Duncan Jordan earlier on made the comment which I would agree with: if anybody had run the scenario it was unimaginable. However, notwithstanding that, we learned a huge amount about the scale. The second important thing was the whole mobilisation at scale and the gold command structure which I believe worked phenomenally well in a civil emergency of this nature. The benefit of having that structure and the command and control structure—and having all the agencies—was invaluable. We had not previously been involved at a gold level as a Category 2 responder and that is a key issue. Category 2 responders and certainly utilities we believe, now should be, if not Category 1, called to gold command from the outset. Over and above that I think we agree with the lessons and I would simplify them into three major lessons. One, the rather obvious one, the adequacy of flood defences. We have, as I mentioned before, a completely new assessment of risk to deal with and we learned that there are ways of responding and dealing with that very rapidly: flood defences, not only our own but in the broader flood plain. Secondly, the resilience of networks. Thames mentioned re-zoning of networks; we also did that, we were able to re-zone and protect an awful lot of the area but we had a single point of failure in the network. All utility networks have that; that is an endemic issue that we have and that comes back to the issue of what is the level of risk that we are prepared to take and how do we invest smartly to build that resilience? Thirdly, was the adequacy of contingency plans. We certainly learned lessons about rehearsing at that scale but also the mutual aid that we had across the industry and the all sector working. I think we have learned some incredibly invaluable lessons that I think should be embedded with the way that we work now. For instance, we learned that despite the fact that we have customer records the people who know customers best on the ground when you are dealing with a large emergency actually are the voluntary sectors—they know where Mrs Smith who is not capable of carrying ten litres lives—and that network is absolutely invaluable.

Q403 Mr Drew: I want to ask a more general question now so obviously Thames can be part of this. Since Gloucestershire and obviously Sheffield and Hull, to what extent have you now already started to put additional measures in to protect critical infrastructure?

Mr Smith: Around Mythe, as you know from your local knowledge, we have a barrier around Mythe. We have looked at all of our sites, all of our critical assets and we are working right now on those that we have designated as being at most risk of flooding looking forward rather than looking backwards at past historical records. We have already started that and the temporary engineering work will be in place this side of Christmas.

Q404 Mr Drew: Give us an idea of how many places we are talking about.

Mr Smith: We are talking about four or five places.

Q405 Mr Drew: Even though the Environment Agency said there was something of the order of 40 per cent of critical assets were in flood plain areas.

Mr Smith: What we have looked at is a combination of flood risk and resilience of our network so we are particularly focussed on those areas where the likelihood of flooding is greatest and the impact on our supply to our customers is greatest.

Q406 Mr Drew: So what you are saying is that you are going to have to go back and re-evaluate but you are doing the most urgent first.

Mr Smith: Yes, very much so. As we go forward into our next price review over the next five years that is where we will be bringing in the full engineering design, the thinking and the discussions with our regulators about the cost burdens that the Chairman has already mentioned.

Q407 Mr Drew: Thames?

Mr Aylard: Very similar. I mentioned earlier that we are doing a full scale review of the resilience of our assets based on the latest information from the Environment Agency. We have also done a very detailed—as you would expect—lessons learned exercise internally to see what went right and what went wrong on 20 July. Things were complicated for us because in the middle of this our customer centre in Swindon flooded, all the lights went out, all the computers went down so we had to deal with a full scale customer problem as well as the issues with water and waste water.

Mr Wray: To make one additional point, it is to the broader issue of planning and all of the agencies that have to be involved with that. In the Gloucester event, after the first flooding when we had the alarm for the second flood, we constructed, with phenomenal support, a one kilometre perimeter barrier around that site. It was a huge feat of engineering delivered in just short of 24 hours which
Ev 118  Environment, Food and Rural Affairs Committee: Evidence

21 November 2007  Mr Tony Wray, Mr Andy Smith, Mr Martin Kane, Mr Richard Aylard and Mr Bob Collington

gave us an extra four feet of flood protection around that entire site. To do that in normal circumstances would have taken, I believe, a number of years to achieve with the planning consent, with the investigations that have to be carried out before it goes through. That is not a criticism in any way of planning constraints but I think there is a debate to be had about a sense of urgency around protection of critical infrastructure that I think will require an all agency response in the future.

Q408 Mr Drew: Can I carry on in the same vein in terms of coordination and information. Let us look at what happened in Gloucestershire which is what I know best and is most pertinent. Was there enough information given to you by the statutory agencies all the way down from Floodline information coming from the Environment Agency? If there were weaknesses what were they and how could you improve on that?

Mr Wray: We have very good systems and contacts with the Environment Agency. We have electronic warnings systems which are manned and we have ways of getting those out to all of our managers. They were in place and working fully and we were getting a constant stream of information down there. What changed for ourselves, the Environment Agency and practically everybody that I have met in the area—and we can see this from the data—was the speed of the rise and the absolute level that the ground water and river levels came to were at a rate and a speed that nobody had previously seen. We were in a position of having regular updates and in the very, very late hours the nature of those indications indicating that it was going to overtop our works was probably late in the day. So the communication was there; it actually worked incredibly well. I think the lesson to be learned is: is there a way of us having better modelling techniques that are more able to indicate rather than the generality of flooding, the more specific location? I think that is where the effort needs to go. The communication lines were open and worked very well.

Q409 Chairman: Just a point on that, we had some supplementary evidence sent to us by an engineer, a hydrologist, and he said, “Less modelling, more qualified people who understand what is going on on the ground”. Are we short of people who can, if you like, bridge the gap between the modelling work but who understand hydrology on the ground to help with the kind of predictive work that you have just been discussing?

Mr Wray: I think there is absolutely a place for local knowledge and for visibility. Certainly internally we do not rely simply on the warnings that we have got. We have a huge distributed workforce in the network; we have a lot of eyes and ears out there assessing what is going on. I think somebody said earlier on that the broader use of information, certainly local information, would be very helpful.

Q410 Mr Drew: If I could move on then to what happened post the immediate impact of the flood, if nothing else the word “bowser” in Gloucestershire is one that everybody understands with some trepidation, as you can imagine. Again with the benefit of hindsight how well do you think that supply of water was handled? I think the thing that probably shocked most of us was that there was not a plan B for getting piped water in. You may want to say something about what you have done subsequently, but it was a tremendous episode in the sense that ways were found of getting both drinking water in the form of bottled water but also bowser to support that. However, should it have happened and can it be prevented?

Mr Wray: If I can deal with the operation first of all, it was always our intention from day one to make sure that our customers had sufficient water. We did recognise early on that despite what the SEMD plan says about ten litres a day, from the very outset we were not sure that that was going to be enough to meet needs and in fact a better figure, as it turned out when we looked at the statistics after the event, was that customers were needing about 20 litres of water which we did supply. We were clear that we needed bowser in the street but also bowser means that you are carrying large amounts of water; you need the utility of water and therefore we mobilised the bottled water stream. In normal incidents that has never been a problem for us; we have been able to mobilise bowser and bottled water on a small scale.

We were absolutely inundated with the sheer scale of this and it took us about 36 hours to get up and running. I have to say, getting up and running was with the huge help of certainly the army logistical corps with military help and some key supply chain suppliers that we have. What happened there and the key lesson for us is how to run a unique supply chain in that event. The key components for us were that we were good at sourcing; we were good at buying the bottled water; we were good through our colleagues in the rest of the industry in getting hold of bowser. The logistical help at scale from the military logistical corps was then key in handling the scale of that. The fine points of distribution we learned were really working hand in hand with the local authorities and the voluntary agencies who knew the points of supply. It was of a scale we had never dealt with before and we had to learn very, very quickly which we did and we have a better handle on how to do that in the future.

Q411 Dr Strang: You referred to the ten litres per person of water you were required to provide, how much of that was supposed to be for cooking and drinking et cetera?

Mr Wray: Believe it or not ten litres is supposed to be for everything.

Q412 Dr Strang: I realise that, but is there a rough break down?

Mr Wray: Not that I am aware of. We got to a frequency of keeping our bowser full; we got to a frequency of making sure there were about three million litres of bottled water a day. What we could
21 November 2007  Mr Tony Wray, Mr Andy Smith, Mr Martin Kane, Mr Richard Aylard and Mr Bob Collington

see for static use was that consumers were getting to a level and not being out of stock, having stores of about 20 litres a day.

Q413 Dr Strang: You are saying that ten litres was unrealistic.
Mr Wray: I believe ten litres is unrealistic.
Mr Smith: Certainly for that period of time what we found was that people were taking about ten litres a day of bottled water which we assumed was for drinking and cooking. The bowser water was for flushing the loos, washing and so on. That is how it split out in practice.

Q414 Dr Strang: So if you had a scale of emergency that forced you down to ten litres a day that would involve very real hardship?
Mr Wray: We believe it would. From what we could see we believe it would.

Q415 Dr Strang: To what extent were you using antiseptic wipes or alternatives to water?

Mr Kane: There were two things that we picked up on in terms of public health issues. One of the real concerns was that as this went on for a long time that flushing the toilet in the house with buckets of water could well lead to blockages close to the house in the local pipeline system. We looked at a couple of things. One of the things that Duncan Jordan mentioned was the provision of wag bags that were shipped in. They could be distributed to the house and used in the house as effectively a chemical toilet with a solid waste disposal route. The good fortune was that we never got to deploy those. We also looked at the alternative of bringing in ranks of portaloo s and distributing those around the street. In the end we decided not to do that; gold command decided not to do that. We did provide antiseptic and antiseptic wipes at the same centres that we put the bottled water at so they were distributed along with bottled water.

Chairman: Gentlemen, thank you very much indeed for your contribution to our inquiry. If, as a result of anything you have said, there are further thoughts that you want to impart to us then we would be very happy to have those in writing. Thank you again for your written evidence.
Wednesday 28 November 2007

Members present

Mr Michael Jack, in the Chair

Mr David Drew  Sir Peter Soulsby
Mr James Gray  David Taylor
Patrick Hall  Paddy Tipping
Lynne Jones  Mr Roger Williams
David Lepper

Memorandum submitted by the Association of British Insurers (ABI) (FL 114)

ISSUES RAISED BY THE RECENT FLOODING IN ENGLAND AND WALES

SUMMARY

1. Prolonged heavy rainfall led to extensive flooding in June and July 2007 in the Rother, Don, Trent, Great Ouse, Warwickshire Avon, Severn and Thames catchments. The inability of drainage systems to cope with intense rainfall contributed significantly to the floods, which were the most extensive since flood insurance became a standard feature of property policies in the 1960s. We estimate that the total insurance cost will be in excess of £3 billion, the largest natural catastrophe insurance loss ever recorded in the UK.

2. The insurance industry has responded quickly and well to the floods. 20% of household claims and 10% of business claims were settled by the end of August. In total the industry is handling some 60,000 claims (45,000 household, 15,000 businesses). This is equivalent to four years of normal claims experience. Building services will be in short supply, and repair will often not be simple. Some properties were flooded for long periods and will take months to dry out. Complete reinstatement is therefore likely to take 12 months or more in many cases.

3. This insurance response is a vital part of the recovery process. The UK is unique in having flood cover included as standard in household policies and the vast majority of business policies. It is essential that the Government responds to these floods effectively so that the insurance industry is able to continue to provide this protection. The alternative would be substantial and irresistible demands for taxpayer-funded assistance—to date the UK Government’s contribution has been just £46 million, a small proportion of the £3 billion to be paid by the industry. But the floods have shown that there is scope and a need to promote insurance so that take up is more extensive and the exposure of the taxpayer is further reduced. We particularly find the under insurance of some public authorities hard to understand.

4. The floods have shown up serious shortcomings in spending on flood risk management at national and local level. Flood defence expenditure has a very high payback and yet key projects, including protection of major city areas and public infrastructure, have been delayed for want of money. Maintenance of existing facilities has also been neglected. The ABI is calling for the Government’s commitment of £800 million for 2010 to apply from 2008 and for £150 million to be spent in addition on the backlog identified by the NAO.

5. The floods also demonstrated the need for flood risk management to be properly coordinated, including those responsible for surface drainage. Too many bodies deal with the issue without adequate coordination. Previous “lessons learnt” reviews led to the development of a comprehensive government strategy, Making Space for Water, in 2005, but as well as not being funded, the necessary organisational changes have not been made.

6. Throughout the recent flooding, it has been apparent that risk awareness and contingency planning are frequently inadequate, particularly in local authorities and businesses. The provisions of the Civil Contingencies Act 2004 and duties on Local Resilience Forums have not led to improved preparedness or resilience across the country. Critical infrastructure remains woefully exposed, despite the lessons of previous flood events, resulting in social and economic impacts far beyond directly affected areas (for example, loss of electricity and water supplies).

7. The assessment of risk is in some respects inadequate or inconsistent. The inadequacy of data in particular makes it hard for insurers to assess risk. The Environment Agency and the industry need better data on the likelihood of flooding in particular areas and on the impact of new schemes, so that the industry can price more accurately for its customers. We also need greater consistency in decisions on what level of risk is appropriate in different locations: 1 in a 100 year river defences sit alongside 1 in 30 year drainage systems.

8. The floods also showed the folly of building in high-risk areas. The insurance industry will oppose such developments in future and make clear the implications for insurance cover and premiums both for new and adjoining properties.
9. The UK’s approach to flood defence is inherently short term. Money is found in three-year tranches even though some projects have much longer lead times. And climate change is eroding the level of defence provided by new projects at such a rate that we need a new approach to flood defence investment. It is nonsense to adopt a design for a defence to protect against a 1 in 100 year flood if it will only protect against a 1 in 50 year flood in 20 years time and will need early rebuilding. We have proposed that our approach to adaptation becomes genuinely long term and strategic. The Climate Change Bill needs to be strengthened by giving an equal weighting in the Bill to mitigation, as part of a single process.

INTRODUCTION

10. The Association of British Insurers (ABI) is the trade association for Britain’s insurance industry. Our 400 member companies provide over 94% of insurance business in the UK. We represent insurance companies to Government, regulatory and other institutions and are an influential voice on public policy and financial services issues.

11. The insurance industry has played a major role in promoting understanding and pressing for improvements in public policy on climate change in the UK and, in particular, the risk from flooding—both inland and coastal. In our evidence to this Committee’s enquiry into the draft Climate Change Bill earlier this year, we said that the science shows that some climate change is already inevitable: it is built into our world. Urgent action is needed to manage better the current risk of flooding and to prepare for the impacts of climate change. The reports on previous floods showed us what to do to protect our economic and social interest. Few, if any, new lessons have emerged from the latest beyond the need to implement these earlier reports.

THE EVENTS

12. The Flooding occurred in Northern Ireland and Kent in mid-June, followed by dramatic flooding in parts of Yorkshire, the west and east Midlands and Wales on 24–25 June. Further flooding occurred across many areas of the UK (England, Wales, Scotland and Northern Ireland) in mid to late July, with particularly deep flooding experienced in the Severn valley.

13. The Environment Agency has reported two defence failures, neither of which affected urban areas, but river defences were overtopped at many locations as design standards proved inadequate for the task. There were widespread failures of urban drainage systems. At some locations these difficulties were exacerbated by failures of pumping stations, due to direct flooding or flooding of power supplies, or by an inability to discharge into river courses due to high river flows. Local blockages also contributed.

INSURERS’ RESPONSE

14. The scale of the flooding across the UK was massive, exceeding all events since flood cover was introduced as a standard feature of property policies in the early 1960s. The industry has responded to around 60,000 claims in all, with around 45,000 household claims and 15,000 commercial claims requiring specialist responses. The cost to insurers will exceed £3 billion, the largest natural catastrophe insurance loss ever recorded in the UK.

15. The insurance industry responded well, both in mobilising the initial response and the re-housing and re-instatement challenges which were greater than those faced by the emergency services or any social housing provider. Thousands of additional staff were brought in from across the UK and overseas to handle claims calls and visit customers’ premises. Equipment was also bought in from abroad. Loss adjustors visited all claimants, including the most complex cases, within two weeks of notification. By the end of August many less complex claims had been settled, representing 20% of household and 10% of commercial claims.

16. Rapid deployment of additional equipment and specialist drying and decontamination services has ensured work started on as many properties as possible, as early as possible. Mobilisation of insurer repair networks has ensured the availability of the additional resources necessary to deal with such widespread damage, together with quality and financial assurance measures needed for extensive and complex reinstatements. In view of the very high numbers of claims normal procedures were adapted: for example customers being allowed to use their own builders, and in some cases competitive estimates not being required.

ACTION NEEDED FROM THE PUBLIC AUTHORITIES

17. Two types of measure are needed to minimise social and economic losses from flooding: action in anticipation, such as flood defence investment; and, action in response, such as emergency rescue and implementation of contingency plans. Both have been considered extensively in previous Lessons Learnt reviews.
18. The ABI has consistently pressed for the following immediate measures in anticipation:

**Increased funding**

Increased investment in flood defences, rising to £800 million in 2010–11, must start in April 2008. The Environment Agency have a backlog of planned schemes that can be implemented quickly. The defence maintenance programme identified as necessary following the Autumn 2000 floods, but still outstanding1 needs to be funded in addition to this and completed as a matter of urgency.

**Integrated flood risk management**

Flood risk management needs to combine measures to manage coastal and river flooding with surface water and drainage management. Properly integrated catchment plans are required, as well as changes to the CAP so that farmers can be funded for contributions to catchment management and attenuation and temporary storage measures for rivers and urban drainage systems.

**Protection of critical infrastructure**

Around 13,000 homes were without electricity in Sheffield and people without water supplies in Gloucestershire as a result of flooding of key infrastructure sites. Humberside Police Headquarters was flooded, along with numerous schools, leisure centres (some intended as evacuation centres), and key transport routes. On the east coast 15% of fire and ambulance stations, 40% of electricity sub-stations and 15% of petrol stations are at risk of flooding in a storm surge2 and similar exposures may well occur inland. Full risk mapping and contingency planning is needed, nationally and locally, considering all forms of flooding, the likely impact on local communities and the regional and national economy.

**Land use planning and building standards**

While current planning policies3 and recent guidance on building standards for flood risk areas4 set out a generally acceptable approach to further development in relation to flood risk, it is not clear that the former will be implemented effectively, or the latter at all. The Code for Sustainable Homes is voluntary and developers need not address risk reduction measures at all to qualify for the designation.

19. In addition, there is a need for long-term commitments on:

**Further development in flood risk areas**

National and regional spatial strategies need to take account of the long-term development of climate risks. Housing allocations, regeneration funding and flood risk management strategies need to be aligned.

**Long-term flood risk investment strategy**

Investment and funding needs over at least a 25 year period need to be set out, for example, £8 billion needs to be invested over 25 years on east coast defences. Those areas where decisions have been made not to maintain existing defences, or where these will be deliberately removed for strategic risk management reasons, must receive early indications, with this information being included in Home Information Packs and/or via solicitors’ and conveyancers’ searches.

**A statutory duty on flood protection**

The Environment Agency and water and sewage utilities should be given statutory duties to reduce flood risk to people and property. This could be achieved through the proposed Climate Change Bill. The Environment Agency should be given an overarching strategic role across all flood risks5. This should include risk mapping, and could require the Agency to convene local drainage boards to address identified problems6.

20. The recent flood events have highlighted the need for improvements in the arrangements for large-scale emergencies. These should include clarification on the respective roles of response agencies (fire, police, local authorities, Environment Agency and utilities companies); co-ordination of responses at regional or

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1 Building and maintaining river and coastal defences in England. Report by the Comptroller and Auditor General, June 2007
2 Coastal Flood Risk—Thinking for tomorrow, acting today. Summary Report. ABI, November 2006
national level, including regional rescue service control centres; full implementation of local authorities' duties under the Civil Contingencies Act to promote business continuity planning and the role of insurance within these plans; implementation of protocols to bring in the assistance of non-statutory partners.  

21. Many businesses, particularly small and medium enterprises, did not have adequate flooding or business interruption insurance in place prior to the floods. Clearly there is much the insurance industry itself can do to promote this, but Regional Development Agencies and other public agencies which promote business and enterprise also have an important role in ensuring business takes responsibility for its own risks and does not look for taxpayer support where it has failed to take adequate precautions. 

22. Similarly, local authorities need to ensure that their own contingency plans deal realistically with flood risk and that their insurable risks are covered adequately. Neither the Bellwin scheme nor the EU Solidarity Fund should be used to pass insurable costs onto taxpayers.

Conclusion

23. While the public services provided much of the immediate response to the flooding, the Government funding of post-flooding reinstatement and repair has been limited to £46 million to date, compared with in excess of £3 billion of insured repairs. Taxpayer funding is most effectively used in investing in risk reduction measures which protect communities and the economy, as well as people and properties. In a recent YouGov survey commissioned by the ABI, 84% of people agreed that the Government should be responsible for protecting the UK from the effects of climate change. In the same survey 64% of people thought local authorities should also be responsible for protecting them against the impacts of climate change.

24. Adequate investment in and management of flood risk measures would enable flood insurance to continue to be widely available, as envisaged under the Statement of Principles for the Continuation of Flood Cover. Insurers need to see significantly greater commitment from the Government, or substantial areas of the country will face much higher premiums and deductibles in the near term, and become uninsurable over the longer term. 

ABI
September 2007

Supplementary memorandum submitted by the Association of British Insurers (ABI) (FL 114a)

ISSUES RAISED BY THE RECENT FLOODING IN ENGLAND AND WALES

You asked me to send you some questions for consideration, in addition to our written submission to the Efra Select Committee Flooding Inquiry, which I include below.

— Is enough being done to ensure that homeowners understand the risk and are aware of the immediate danger (ie low uptake of the Environment Agency’s flood alerts)?
— Businesses (mainly SMEs) seemed often unprepared for the flooding and did not have adequate contingency plans or insurance cover in place—how can this be addressed?
— Did it come as a surprise to see drainage problems being the main cause of the summer floods?
— Is our approach to flood risk management integrated (ie looking at all potential sources of flooding) and joint-up or is there a need to review roles and responsibilities?
— Local authorities responded to the floods differently—how can “best practice” be encouraged, how can we make sure that lessons will be learned at local government level?

Additionally, please see attached our response to yesterday’s announcement of flood defence spending in the Comprehensive Spending Review. The statement sets out our disappointment that Government spending for the next three years is less than we were asking for, even before the devastating floods this summer. It does not begin to address the major issues, including drainage and has completely failed to grasp the importance of improving Britain’s flood defences.

ABI
October 2007

ACPO/CFOA/ABI/CILA/LGA protocol for dealing with emergencies, launched 20 September 2007
UK Government submission to the EU Commission for funding under the EU Solidarity Fund, 20 August 2007

Not printed
Memorandum submitted by Norwich Union Insurance (FL 06)

Norwich Union were heavily involved in the response to the recent floods, with the total claims received from the June and July floods resulting in a combined total of approximately 30,000 claims. The overall cost to Aviva is estimated to be around £340 million.

We believe that the EFRA Select Committee should look into the following points as part of their review:

— The recent floods—Could they have been prevented? What measures should be taken to prevent this happening on such a widespread scale in the future?
— The Government’s future Planning Policy: What measures will be introduced to prevent houses on flood plains from flooding? Will future Planning Policy take into consideration the adequate infrastructure of drainage systems in the UK? How successful has PPS25 been in its implementation?
— Annual Government spend on Flood Prevention: What are their long term plans (i.e. past the 2007 Comprehensive Spending Review)? Where, and how, will the extra money allocated up to 2010–11 be spent? How many people will benefit from this extra spending?
— The UK flood risk: Are there any plans to make data and information relating to this more widely available to insurers and the general public?
— The state of UK flood defences: Can the general public be confident that these are being adequately maintained?
— Home Information Packs: Are there any plans to introduce a flood search as standard?
— Long-term Flood Prevention plans from Government: What does the Government have in place? How will they take the effects of climate change into consideration?
— The quality and maintenance of dams in the UK
— Protection for essential infrastructure, e.g. power plants, water supplies
— Urban flooding: How can this best be avoided? Who should take responsibility for managing this?

Norwich Union Insurance
August 2007

Supplementary memorandum submitted by Norwich Union Insurance (FL 06a)

About Norwich Union

1. Norwich Union is the UK’s largest general insurer with a market share of around 14 per cent. With a focus on insurance for individuals and small businesses, Norwich Union insures one in seven motor vehicles, 15 per cent of UK households, and around 800,000 businesses. Norwich Union is part of Aviva, the world’s fifth-largest insurance group.

2. The recent floods had a significant impact on many of our customers. In total, Norwich Union received approximately 30,000 claims from the floods in June and July, with the overall claims cost to Aviva estimated to be around £340 million.

3. Norwich Union has long played a pro-active role in raising the profile of flooding and its impact on insurance; we have developed a digital flood map to help accurately assess levels of risk at an individual property level, as well as working on the development of the UK’s first flood-resilient house in Lowestoft, Suffolk.

The 2007 Floods

4. The UK experienced above average rainfall for June and July 2007, leading to significantly higher than average river capacity and subsequent flooding. In addition, the ground became saturated in many areas, creating floods as a result of surface water run off, such as the flooding in Sheffield. This was exacerbated by foul flooding, with drainage in towns and cities unable to cope with the huge increase in water.

5. This summer’s unseasonal weather has been well documented; however it is important to emphasise that this rain was not unexpected. Rain was forecast with plenty of advance warning from the Meteorological Office and severe flood warnings were put in place by the Environment Agency (EA).

6. A key question which needs to be addressed is whether the response by the authorities to the floods could have been better handled. Moreover, the prospect of ever increasing development, particularly on flood plains, means it is a racing certainty that ever more communities will experience widespread disruption from flooding, with its associated emotional and financial costs. It is therefore essential that these certainties inform our future planning and response to floods.
ISSUES ARISING

7. While many of the floods occurred in recognised high risk areas (such as Hull, Worcester and Gloucester), some areas that suffered the most damage were not marked as high flood risk. In cities such as Sheffield and Leeds, rivers do not run through the city, nor are they close to a coastline. In these situations, the floods were caused by a combination of a huge level of surface water run off, and the failure of the local drainage system to cope with the impact of extraordinary high levels of rainfall.

8. It is essential that storm water drains and treatment stations, particularly in areas of high population density are able to cope with sudden downpours. Drains need to be maintained to a high standard and checked on a regular basis, and new housing developments need to have adequate drainage systems in place. Norwich Union urges Government to encourage a review of the drainage system, and the capacity of our drains to cope with weather conditions such as those experienced this summer.

9. This summer’s floods once again illustrated the importance attached to the creation and maintenance of flood defences. Flood defences can, in many circumstances, provide a barrier against rain/river water influx, and can protect people’s homes, businesses and possessions.

10. However, a failure to react quickly to changing weather conditions resulted in two instances in which moveable flood defences were not in place. In June, a decision by the EA not to erect temporary flood defences in Worcester resulted in severe flooding in the area. Furthermore, there were problems in Upton-upon-Severn where flood defences were unable to reach the area in need, as they were delayed whilst being transported to the region. This undoubtedly led to some residents being flooded and losing some of their personal possessions. Norwich Union acknowledges that in some areas, flood defences would simply not have kept the water out.

11. The recent floods also highlighted that while the EA has overall responsibility for flooding, no single body has responsibility for urban flooding. The UK also lacks a single body to provide impartial consumer advice for those affected by flooding, and whilst the National Flood Forum provides a marvellous support mechanism for victims of flooding, recent cuts to their budget meant that following the recent floods they were extremely overworked and unable to help as much as they would have ideally liked.

12. From the perspective of Norwich Union, we are confused by the number of different Whitehall bodies with a stake in flooding. The Department for Environment, Food and Rural Affairs (Defra), the Department for Communities and Local Government (DCLG), the Department for Transport (DfT), and the Cabinet Office all share responsibilities, in some part, for flooding and the response to flooding.

13. The floods also highlighted the problems that can occur when essential infrastructure is affected by the floods. The general public and businesses need assurances that amenities such as power stations and pumping stations will be adequately maintained and are protected to enable them to cope with significant increases in rainfall. Utilities need to be defended appropriately, with comprehensive emergency plans in place to deal with the threat of flooding. The potential for social breakdown and further damage to life and property should power supplies fail cannot be overestimated.

14. Concerns have been raised around the sustainability of UK dams. Research by David Crichton of the Benfield hazard research centre revealed that 69% of the 5,000 dams in the UK are unsafe11. Norwich Union urges Government to look into this claim as a matter of priority. It would be helpful to see information relating to the quality of UK dams in the public domain. We would also like to see maps published, outlining the risk of each area and which geographical locations would be affected if the dam was breached, to enable us to accurately understand the levels of risk that UK dams pose.

GOVERNMENT SPENDING ON FLOOD PREVENTION

15. It is essential that the Government has a clear strategy for flood defence spending, and that these plans are publicly available. At present, Defra’s budget for flood management is not accompanied by any clear rationale to justify allocation of flood defence resources in one area as opposed to another. i.e. how many properties will be defended, and to what extent. The UK’s flood defence budget must be spent appropriately and directly relate to the flood risk posed. A clear assessment of flood defences is a key element in understanding underwriting flood risk for insurers.

16. Norwich Union welcomes the announcement that the Government will increase annual spending on flood management up to £800 million by 2010–2011. However, specific details of this annual spend have not been released, and we would call on Government to provide further details as soon as possible. We would also like to see detail of the annual spend leading up to 2010. The flood defence budget needs to be increased year-on-year, in order to deal with the ever increasing threat posed by climate change.

17. We would like to understand what part of the flood defence budget is spent on new defences and what is spent on maintenance of existing defences. As noted by the National Audit Office (NAO) Report, “Building and Maintaining River and Coastal Flood Defences in England” (published 15th June 2007), an average of 10 percent of the annual spend maintaining flood defences is spent on grass cutting. Resource allocated to flood defences, both in terms of time and money, needs to be spent appropriately.

11 Insurance Times, 28th June 2007: “Flooding makes case for more defence cash”.

Environment, Food and Rural Affairs Committee: Evidence  Ev 125
18. Norwich Union is also concerned that, in many instances, planned flood defences are either subject to delay or not being built at all. Earlier this year, the Environment Minister was forced to concede that many flood defence projects planned for construction in 2006-07 had not even begun. In light of recent events, it is essential that the government be aware that, under the terms of an agreement between the insurance industry and the Government, our willingness to continue to price for flood risk is determined by a proactive flood defence spending programme and transparency from Government and its agencies over the whereabouts and scale of individual defence projects.

19. The UK faces a considerable challenge in terms of deciding where to allocate flood defences. Under the terms of the points system that currently exists within the UK, some communities, such as Upton upon Severn and Lewes which are regularly flooded, do not have flood defences in place, and it is unlikely that they will receive them in the future. Whilst Norwich Union appreciates that the flood defence budget is limited and it is impossible to cover everywhere in the UK that requires flood defences, we would urge a review of the system, to ensure that the allocation of flood defence spending is transparently fair, if it is not already.

20. Government needs to take a holistic approach to future planning for flood defences—there will be a natural reaction to this year’s floods but defending properties in areas affected in June and July should not be undertaken at the expense of other high risk areas.

Availability of Information

21. The recent NAO Report also points out huge weaknesses relating to the availability of data over the UK flood risk held by the EA. “The Agency has substantially increased the number of assets recorded on its database, but records are not yet complete and other operating authorities are reluctant to use the system due to cost and technical difficulties. The database...cannot hold data on the maintenance history of each flood defence or clearly link the inspection results to records of maintenance carried out.”

22. The EA has granted insurers access to its information on the UK flood risk; however, this data is often delivered to insurers late, is difficult to interpret, and is inconsistent with the data provided in previous years. Norwich Union believes that the EA data set urgently needs improving, and should be made more widely available to both insurers and consumers.

23. While Norwich Union welcomes the introduction of Home Information Packs we strongly believe that a flood search in respect of river and coastal flooding should be a required document in the Pack. The inclusion of flood risk at present, through Home Condition Reports, is only voluntary, which we argue discourages transparency between buyers and sellers. We believe that there should be an urgent review of this situation.

Planning for the Future

24. Norwich Union’s flood mapping data helps us accurately assess the risk for individual properties across the UK. It is different from the EA map in that we assess the height of an individual property; however, we would like to stress that both serve different purposes.

25. We do, however, need a better way of modelling flood risk in the UK. This should take into account a number of factors which are not yet considered in terms of flood risk management, such as the history of a region, local knowledge, planned flood defences, risk at an individual level, surface water run off and the quality of local drainage systems.

26. As climate change becomes an ever-increasing threat to the UK, it is likely that flooding will occur on a more frequent basis. It is essential that our future plans take this into account.

27. The Government has stated its intention to build on flood plains in the Housing Green Paper, published in July 2007. Norwich Union accepts the high demand for affordable housing in the UK and acknowledges that building on flood plains may be necessary in some areas. However, these properties need adequate protection, either through defences, or through an innovative approached to design, such as Norwich Union’s flood resilient house.

28. We welcomed the introduction of Planning Policy Statement 25 (Development and Flood Risk) and the decision to make the EA a statutory consultee as part of the planning process. However, the insurance industry needs assurances that the EA are being listened to and that inappropriate developments will not be built contrary to EA advice.

29. Norwich Union believes that householders need to be aware of the increased risk from flooding from surface water run off that is associated from block paving gardens, outside decking, and building conservatories. The high cost of parking in some urban areas has led to more and more front gardens being paved over to supply off-road parking spaces.
30. As Norwich Union’s Flood Resilient Home\textsuperscript{12} has proved, flood resilient measures are an extremely effective tool in helping to combat the trauma, distress and uncertainty that being flooded can bring. Simple measures such as installing plug sockets mid-way up the wall, and/or replacing carpets with tiles, can make a huge difference in the clean up operation after a flood and significantly reduce the cost of home and contents insurance.

31. However it is important to stress that these measures are used to mitigate the effects of flooding and are not provided as an alternative to local flood defence schemes.

32. DEFRA is currently exploring how the take-up of flood resilient measures can be increased, and Norwich Union welcomes this initiative. There needs to be a greater awareness of the benefits of these measures, especially in areas where flood defences are not in place. Government should consider providing grants for those at risk.

LOOKING AHEAD

33. The recent floods have illustrated the importance of effective communication and working together. Central government, local authorities, the emergency services, insurance companies, water companies, and relief agencies have a vital role to play in the relief efforts associated with flooding.

34. Norwich Union recommends that there needs to be a full review of the responsibilities allocated to each organisation and Government departments, to ensure that each body involved is fully prepared if, and when, such floods happen again. Those affected by flooding need to be safe in the knowledge that essential services will still be available when it is most needed.

35. The Government should consider the long term threat and how it aims to deal with an increased incidence of flooding, (including flooding in areas not necessarily marked as high risk) in the context of flood relief efforts.

36. Long term spending plans, post 2011, need to be considered early and carefully. The focus on the 2007 floods will soon have disappeared from the public consciousness (apart from those householders who have yet to move back into their homes) but it is essential that the severity of the issue is not forgotten. Carefully thought out plans for dealing with the long term threat need to be produced, with appropriate budget allocated, will reassure the public that flooding remains high on the Government’s agenda, and reassure the insurance industry that flood risk is being managed in a satisfactory manner.

Norwich Union Insurance
September 2007

Memorandum submitted by Royal & SunAlliance (FL 73)

1. INTRODUCTION

1.1 Royal & SunAlliance (R&SA) is the third largest general insurer in the UK, providing over 1.3 million private homes with household insurance. In addition we also cover many thousands of businesses, from small enterprises through to large multinational companies against risks including flooding.

1.2 Our commercial interest in flooding has meant that we have been closely involved in policy debates around flooding for a number of years. Our experience in mapping flood risk and handling claims from customers who have suffered from flooding, means that we have been able to provide useful input and insights to those debates. We have previously given evidence to the EFRA Committee as part of your inquiry into the Environment Agency and since then have been closely engaged in discussions with Government about the need to increase investment in flood defences in order to mitigate flood risk.

1.3 Following the devastating flooding events of June and July, we have worked hard to ensure our customers are able to return to their homes as quickly as possible. As soon as the floods occurred, we sent emergency response teams to the affected areas to provide help and assistance to our customers. This process was greatly helped by the use of our Geographical Risk Assessment (GRA) tool, which enabled us to identify areas of greatest risk and ensure that our resources were targeted at those customers in most immediate need of assistance. Since the floods have subsided, we have worked to settle claims as quickly as possible, making emergency payments where appropriate.

1.4 Whilst a full analysis of the implications of the recent floods for our assessment of flood risk across the country and indeed for the insurance market as a whole will take time, our initial analysis of events this summer has highlighted four key areas of concern:

\textsuperscript{12} In November 2005, Norwich Union launched the UK’s first flood resilient demonstration house to show the steps people can take to limit the impact of a flood. As part of Norwich Union and Norfolk County Council’s FLOWS project, a Cotman House Association-owned house in Lowestoft, Suffolk, was installed with various flood resilient alterations. Measures installed included replacing vinyl flooring with ceramic tiles, replastering the walls with Limelite Renovating Plaster (to limit the dampness seeping into the walls), and new internal doors, frames and linings to make them easier to remove in the event of a flood. For more information, please visit www.floodresilienthome.com.
— Problems in the management of the UK drainage system—This summer’s flooding has highlighted real weaknesses in the current drainage infrastructure. This highlights the importance of effective drainage management, alongside investment in flood defences, if increased flood risk is to be effectively managed.

— Lack of access to Flood Defence Data—In the light of the extreme events of this summer, it is critical that insurers are provided with access to the Environment Agency’s National Flood and Coastal Defence Database, in order to allow them to continue to properly assess flood risk and maintain effective cover for homeowners.

— Need for investment in flood defences in the near term—Though we welcome the Government’s commitment to increase annual expenditure on flood defences to £800 million by 2010–11, the severe flooding events of this summer highlight the need for this increased investment to come on stream as soon as possible in order to minimise the risk of a repeat of these floods. The scale and severity of this summer’s floods must also raise questions about whether this level of investment is going to be sufficient.

— Ensuring the planning system prevents building in areas of high flood risk—in the light of the flood events of this summer it is even more important that planning permission is not granted for land where there is severe flood risk.

2. MANAGEMENT OF UK DRAINAGE

2.1 Drainage has emerged as a new risk that is potentially equal in importance to the state of flood defences. Our experience of helping customers in flood hit areas in Yorkshire and Hull has been that in many cases their properties were exposed to flooding as a result of drains over flowing, rather than a failure in flood defences, or rivers bursting their banks.

2.2 The monsoon type rainfall that is becoming more common in the UK presents a different type of flood risk, and one that Royal & SunAlliance is currently considering how we can best assess the level of risk when setting the premiums and terms we offer to our customers.

2.3 In order to minimise the flood risk posed by drainage, and provide essential reassurance to homeowners and the insurance market, we believe that the Government should prioritise work to look at ways in which the strategic management of drainage systems across the UK could be made more efficient. At present the way in which drains are managed seems to vary widely and there is a lack of information about who owns the various drains, who is responsible for their upkeep and the frequency of maintenance. The recent independent report into the Hull flooding was critical of the difficulties caused by having multiple agencies responsible for different parts of the drainage system with little cooperation on operation, investment and design.

These are all issues that need to be resolved urgently both in order to manage the risk of future flood events and in order allow insurers to properly assess flood risk.

3. ACCESS TO FLOOD DEFENCE DATA

3.1 It is our understanding that the Environment Agency’s National Flood and Coastal Defence Database (NFCDD), contains information about where defences are, what level of protection they provide and when they were last inspected. However, at present this information is not available to the insurance industry, in spite of the important role the NFCDD could play in helping insurers provide cover to as many customers as possible.

3.2 Following the flood events of this summer, R&SA, alongside other insurers, will have to carefully reassess areas of high flood risk to ensure that we have an accurate understanding of where at-risk properties lie. This task will be greatly complicated by a lack of up-to-date information on flood defences, with the result that homeowners may find themselves paying higher premiums than they might otherwise need to.

3.3 Under the Statement of Principles agreed with the Government, insurers have undertaken to continue offering flood cover to properties where there are plans to complete flood defences during a five year period. At present, the Environment Agency is unable to provide insurers with information about building plans beyond their current annual budget period, so in effect insurers are covering properties outside of the parameters agreed within the Statement of Principles.

4. INVESTMENT IN FLOOD DEFENCES

4.1 Whilst R&SA recognises that flood defences will never offer a complete solution to the problem of flooding, we know from our experience, that strategically placed and well-maintained defences can have a substantial impact in mitigating flood risk. It is for this reason that we have argued for the last two years that the Government should significantly increase investment in flood defences. As such we welcomed this Committee’s recommendation in your 2006 report on The Environment Agency (to which we gave evidence) that investment in flood defences should be increased over time to £1 billion per annum.

4.2 In the wake of this summer’s floods, the Government did indeed announce an increase in flood defence investment to £800 million per annum by 2010–11, however in light of the previous recommendation of this Committee and given the level of increased flood risk highlighted by the flooding of June and July, we believe that it is critical that:

- Increased investment is made in the immediate short term and not delayed until the end of the forthcoming Spending Review period;
- Spending must be allocated appropriately across river, coastal and drainage systems;
- Given the increased level of flood risk exposed by this summer’s floods and in the light of the Environment Agency’s statement that they already have a £150 million per annum backlog of repairs, the overall level of investment needs be re-assessed upwards.

4.3 Whilst we think these points add up to a case for increased flood defence spending to take effect as soon as possible, there is a wider issue of how strategic thinking on flood defence spending operates. One of the reasons that the Environment Agency cannot tell insurers where they plan to complete flood defences over a five year period is because they are only allocated the budget for this work over a twelve month period. This prevents them being able to plan ahead beyond twelve months.

4.4 It is notable that in recent years, increases in flood spending in Spending Reviews (SR) have only been made after significant flood events have taken place, for example in the SR02 (following the Autumn 2000 floods) and the CSR07 (following the recent flooding). In the SR04, where there had been no serious flooding events in 2001–2003, there was no increase in flood defence spending, and indeed with no inflationary increases applied the result was a decrease in real-terms. We feel that it would be better to put a holistic flood management programme in place for the longer term and that budgeting should be set over a longer time frame, with flexibility for it to be increased should events require it.

5. ENSURING THE PLANNING SYSTEM PREVENTS BUILDING IN AREAS OF HIGH FLOOD RISK

5.1 The floods of this summer demonstrated the potentially disastrous effects of building on floodplains. R&SA would question whether it is feasible to adequately defend such properties from flooding. It is also very important to understand the knock on effect to existing surrounding properties where the flood risk is increased because the protection they previously enjoyed by the floodplain holding the water has been removed.

5.2 R&SA has welcomed the new PPS25, which makes the Environment Agency a statutory consultee for all planned developments in flood risk areas. We see PPS25 as a critical tool in preventing inappropriate building in areas of high flood risk. Should the EA’s objections/requirements be ignored, we believe it is essential that the Secretary of State make effective use of their powers and to be prepared to call in all such applications.

5.3 It is also worth noting that new building puts pressure on existing developments. The floods of summer 2007 impacted many homes and properties in low flood risk areas because of the pressure put on the drainage systems from newer properties. All new building should take account of its impact on existing drainage systems, which may lead to increased flooding in the local area.

6. CONCLUSIONS

6.1 The flood events of 2007 have given added momentum to a longer-term process of strategic thinking about flood management in the UK that originated with the floods of 2000. During this period, there has been much valuable work carried out by Government, the Environment Agency, local authorities, industry and scientific bodies and NGOs. Progress has been made in raising the profile of flooding as a challenge for the UK and in seeking to find solutions to manage it.

6.2 However, we would point out that these key milestones have occurred over a period of seven years since the original floods of 2000 indicated that serious action was required to manage flooding and coastal erosion across the UK. Some initiatives are yet to take real effect, such as future work on the Thames Barrier to ensure London remains protected, or DEFRA’s resilience pilots which are only now being launched.

6.3 The events of summer 2007 show that there is no time to be lost, and that immediate action must be taken to increase flood defence spending, clear the backlog of repairs, build new defences, better manage our drainage systems and prevent potentially disastrous and unsustainable building in high flood risk areas. In addition, there must be clarity for the public and the insurance industry about the Government’s plans, and insurers must be allowed access to publicly-funded databases.
We welcome the Committee’s work on this important subject, and are happy to offer further help to the Inquiry.

Royal & SunAlliance

August 2007

Letter to the Chairman of the Committee from the Chief Executive, Royal Sun Alliance,
27 July 2007 (FL 73a)

Thank you very much for your letter of 17 July, and for the update you provided about the potential work programme of the Environment, Food and Rural Affairs Select Committee. I would also like to take this opportunity to respond to a couple of the issues you raised in your last correspondence, regarding flood risk modelling and the importance of factoring urban drainage systems into calculations of flood risk.

As you note in your letter, situations will always occur in which it is impossible to eliminate flood risk entirely. However, these recent floods illustrate two deficiencies with the system of flood management in the UK—insufficient investment in the flood defence infrastructure, and inadequate consideration of the interaction between extreme weather events and the capacity of the built environment to cope with these events. At present, the insurance industry is unable to access what information the Government and Environment Agency might have regarding the capacity of the UK drainage system. Whilst recent events have shown that we cannot predict where rainfall will occur, access to a comprehensive and up-to-date record of the complete flood management infrastructure, including the condition and nature of the drainage network, would help us plan in the short-term where best to locate our emergency response units to ensure our customers are provided with quick and effective relief. As we discussed during our dinner last year, we would also call on the Government to provide insurers with complete access to the Environment Agency’s National Flood and Coastal Defence Database (NFCDDD) as part of its review into the recent floods.

Another issue which this latest round of flooding has raised is that the development of the flood plain in the south east is likely to exacerbate the problem of more frequent and severe flooding, involving as it does around 200,000 properties being placed in areas of high risk. We welcome the reassurances in the recent Housing Green Paper that flood risk will be enshrined as key factor in planning decisions, as well as the future inclusion of climate change predictions in planning policy. However, as we told the Efra Select Committee during its inquiry on the Environment Agency in 2005, we would strongly advise that all possible planning should be relocated to areas of lower risk in the first place. We would also urge the Government to facilitate a frank and open discussion between all stakeholders involved in development policy, about how buildings in all areas in future can be designed to cope with extreme weather events.

R&SA are committed to engaging actively with the Government’s flooding review over the upcoming months, and hope that the Government moves quickly to clarify how and where the additional money it has committed to flood defences will be spent, and what the profile for this increased investment will look like over the next four years. In the interim, should you find any extra information from us useful, we would be more than happy to meet with you to discuss this important issue further.

Bridget McIntyre
Chief Executive
Royal & SunAlliance

July 2007

Witnesses: Mr Stephen Haddrill, Director-General, Association of British Insurers, Mr Igal Mayer, Chief Executive, Norwich Union, and Mrs Bridget McIntyre, UK Chief Executive, Royal and SunAlliance, gave evidence.

Q416 Chairman: Good afternoon ladies and gentlemen. My apologies for the slightly late start this afternoon to our further evidence session on the Committee’s inquiry into flooding. Just a little bit of housekeeping before we begin. Somewhere between four and possibly four-thirty the division bell will go, the Committee will be adjourned whilst we go and vote and I would hope colleagues would be able to turn round and get back within ten minutes to continue our session. If the bell goes, that is what that is all about. We are delighted to see so many people here this afternoon and at the fact that, once again, we are being televised. This inquiry is rapidly becoming cult viewing. People are riveted by everything that you say, so this could be your moment for stardom! Those who are going to be subjected to this process formally, on behalf of the Association of British Insurers, Mr Stephen Haddrill, their Director-General, from the Norwich Union Company Mr Igal Mayer, their Chief Executive, and from Royal and SunAlliance, Mrs Bridget McIntyre, who is their UK Chief Executive. You are all very welcome and thank you for the written evidence which you have put before the Committee. One of the things that intrigues us is that in the United Kingdom, I will not say uniquely in Europe, but, unusually, you as representatives of the insurance industry are prepared to cover the risks associated with flooding, whereas in other major European countries they are not. Why do you do it?
Mr Haddrill: Shall I kick off with that and then my colleagues can follow on? Firstly, I think that we have got a good arrangement with the Government that produces a win-win, providing it continues, because the British Government has committed to increasing levels of flood defence expenditure and that enables the insurance industry to provide cover at a reasonable price, to make it available to quite a high proportion of the market and, as a result of that, you have got people taking personal responsibility, if you like, for the risk and not falling back on the taxpayer when a flood happens. So I think you have a virtuous circle in the UK that we want to see continue. One alternative, for instance, in France and in Spain, and so on, is the idea of compulsory insurance, which, frankly, does not work. The take-up, even though the insurance is supposed to be compulsory, is often lower than it is in the UK and, of course, it is only achieved with the state actually backing the risk, in effect, being the reinsurer. So, from that point of view, the alternative seems to produce a worse result for their countries than a voluntary system does for the UK.

Q417 Chairman: What about the situation for people who, for all kinds of reasons, do not insure? Sometimes their personal priorities mean they spend their money on other things than insurance products, but sometimes they just may just plain not be able to afford it. If we are in a situation of climate change, more extreme weather events, one could conjecture that more people might be affected by flood situations and, therefore, what do we do about it? Should you have a complete re-look at the way the risk is covered or just accept that you are going to have two classes of individual?

Mr Haddrill: At the moment we have a very high proportion of home owners covered. About 90 per cent of people who need cover on the buildings are actually covered. The figure is a bit lower for contents. It is about 75 per cent. So the class that is covered is actually a large proportion of the population. There is a proportion of the population who probably do not feel they can afford it, or do not really understand it, and there our answer has been that we need to find better ways of getting access to those people, of encouraging them and of enabling them to pay, and that is why we have always supported, and my colleagues on the left here have very much supported practically on the ground, the “insurance with rent” scheme in the social housing sector.

Q418 Chairman: Have you designed any products which, if you like, are solely flood risk products as opposed to being part of a more comprehensive household policy?

Mrs McIntyre: Currently no, we have not. It is interesting, because I am chairing the Social Inclusion Workforce that is looking at insurance and insurance with rents and looking at how we can widen the offering, and we are looking at insurance that is about £1.50 a week—that is the kind of cost of the insurance. So, when you look at the total cost of £1.50 a week, if you were starting to have a product that was purely flood risk, it would start to not work in terms of probably the economics, and the £1.50 to cover everything for all eventualities, I feel it kind of works better.

Q419 Chairman: I would not mind household insurance for £1.50 a week. Can I come and see you afterwards. It sounds a very good deal.

Mrs McIntyre: It is a very simple product.

Q420 Chairman: You have argued, and we are going to probe that in some detail, the burden share between what the Government ought to do to and the risks that you are likely to have to take, but just to put it into context, because insurance people always say you cannot just look at only one year, you have got to look at it over a long period, if I arbitrarily select the last ten years and we talk about household insurance as a generic product, has it been profitable business for insurance companies or not?

Mr Mayer: The line of business has been a profitable line for, I think, just about every insurer in the UK and, if you look at the last decade up until the floods, it has been profitable. I think the proof is if you look at what has happened to household insurance rates. They have largely been flat for over a decade where we have seen home values and the values that are being insured go up substantially in that time period. That suggests to me two things: (1) that the companies are making money and (2) that we have a competitive and dynamic market place that is working that has been able to keep that price stable and affordable for citizens.

Q421 Chairman: Is there any way you can try and quantify premiums in and payments out? I suppose it must be quite difficult to split out of the premium what the bit is for flooding and what you have actually had to pay out. The reason I ask that question is that you have made some demands, which we are going to come on to later, about what the Government ought to be spending in this area, and obviously, if that means a risk reduction or stabilising a risk position, it means effectively that you are having a potentially “profitable” business.

Mrs McIntyre: In terms of understanding the cost of flooding, it is something that we absolutely do. If you look at our household insurance premium and how we analyse that, we absolutely make sure that we track the cost of flooding. It is one of those things where you talk about a one in 75 event, which the events were called in June and July. One in 75 suggests one in 75 years. It is not; it is a one in 75 probability of it happening. What all insurance companies really do is we analyse that flooding cost the whole time and try and trend it forward using a variety of data to get a view of how flooding cost is trending and try and make sure that we put those into our base rates to understand how the risk is going to be charged into the premium.

Q422 David Lepper: You mentioned the idea of insurance with rent in social housing, et cetera. Is there any assessment of the number of households affected by the floods this year who were not insured at all?
Ev 132  Environment, Food and Rural Affairs Committee: Evidence

28 November 2007 Mr Stephen Haddrill, Mr Igal Mayer and Mrs Bridget McIntyre

*Mrs McIntyre:* Within that particular category?

Q423 David Lepper: Or generally, yes.

*Mr Haddrill:* Yes. I do not have the number to hand, but we could certainly give it to you. I have a figure of something like around about 20 per cent.

*Mr Mayer:* I was going to say, the anecdotal evidence, and speaking to local city authorities, they were estimating, certainly on my visit to Gloucestershire, somewhere in the 25 per cent range, which I have to say, as a newcomer to the UK, I find quite surprising. I think there is a real education issue here. We have a product that is largely, I think, a very affordable product for the amount of protection provided, and you can go well beyond flood. You talk about the other perils that are protected and you also have to put that into the context that this is, for most people, their single largest asset. As a newcomer to the UK, I find it surprising that that many people are taking the position to essentially not protect against all perils.

*Mr Haddrill:* Especially, actually, as it is supposed to be a requirement of the mortgage agenda; so there might be something going on there that requires looking at.

Q424 Mr Drew: The problem with that is that not everybody could either achieve insurance, and that is an issue which I hope you might look at the very seriously, or, more particularly, some of the people who were flooded in my part of the world in Gloucestershire (I am a Gloucestershire MP) were in rented accommodation and there was some argument about the degree to which the landlord was covering buildings and the tenants were covering the contents. It sounds easy, but it is never quite as easy as one would pretend, and certainly it is not just education amongst the tenants. I have to say, yourselves have got to do some work to really know who your audience is because it is not as straightforward as it used to be.

*Mr Haddrill:* I think the rented issue is a well-made point. When I went round Hull and Doncaster one of the things that was concerning me was that in the tenanted sector the landlord was not responding very quickly. They had insurance but it was two or three weeks down the track, maybe longer, before they were putting in the claim, and so that was an issue. Yes, confusion about who is responsible for the contents and sometimes actually confusion about who owned the contents as well, because often some of it is furnished.

Q425 David Taylor: If a week is a long time in politics, two years is quite a long time in the area of climate change, and in the last two years we have seen some very significant events indeed. I guess the Statement of Principles, whose second birthday is January 2008, will be having substantial change when the review concludes. We will come on to the review in a moment, but could you very briefly summarise what you believe the insurance industry’s commitments are in terms of the Statement of Principles?

*Mr Haddrill:* The principal commitment under the Statement of Principles is to make sure that we renew insurance, or offer to renew insurance where someone is already insured, for those properties where the risk is one in 75, as Bridget was talking about, or better. Where it is worse than that, we do not say no insurance, we say we need to have a discussion with the householder about whether there is any remedial action that can be taken to make it insurable. One of the things we have found during the summer is that the insurance industry is doing more than the strict letter of the Statement of Principles requires. So that is our side of it. On the other side there was a commitment from the Government to increase the level of flood defence expenditure, which they did. I think, to our mind, quite satisfactorily after the statement came in, but we are now more concerned that it is not keeping pace with climate change and not keeping pace with the additional risks that we have seen emerge in recent months and years.

Q426 David Taylor: Where the risk is more than one in 75 and no investment in flood defence is planned, you as an industry reserve the right not to renew, do you not?

*Mr Haddrill:* Yes, although some people, in fact, it seems quite a lot of people, are still able to get it in the market.

Q427 David Taylor: This magic figure of one in 75, surely they are being reclassified by the events as we experience and endure them, and it must be extraordinarily difficult to come to any precise assessment of what the real flood risk is with the climate that we are seeing change almost before our eyes. Is that what is happening? Mr Mayer, do you agree that these maps are artificially precise in terms of the flood risk to which properties are exposed?

*Mr Mayer:* Yes, I do agree, and you are getting at the crux of our business. We have to always estimate what we think is going to happen, to assess the exposure and the risk, and all we can do is always add new information to that process. If I bring it down to layman’s terms, all the evidence that we have would suggest, as you have said, that the risk is increasing, and certainly one of the things that we are advocating, both as a company and as an industry, is the sharing of as much information as possible, the gathering of new information, so that we can all assess that risk better. I think that will then, obviously, help government guide how it spends to defend and it will guide us as an industry in terms of how we assess price risk. I think in many ways sometimes people are afraid of information. We have found that actually information helps you be more certain and therefore provide more coverage to more people.

Q428 David Taylor: In Mr Haddrill’s opening comments, he started with approval for the extra investment in flood management, and so on, which was one of the Government’s key actions, which were prerequisites, almost, for your continued support of the Statement of Principles. Could any or
David Taylor: Where planning approval is given in flood risk areas, do individual companies, through the ABI, come up with some sort of collective approach to the offering of flood insurance to those new properties?

Mr Haddrill: What we have done previously is submit our own evidence to planning inquiries. Basically we discuss and we consult with the Environment Agency and we tend to support their position. I think that one of the challenges for the industry is to promote and get clearer the consequences for insurance if that development goes ahead. We have perhaps been a little bit sotto voce and we need to raise our voice on that. I would accept that. Another area of the Government’s commitment is about having a kind of strategic, joined up approach to the whole flooding area, and that is something else where we do not think sufficient progress is being made. It certainly has come—

David Taylor: I am sorry to interrupt. Strategic approach in relation to communications and things like that, or in terms of integrated urban drainage?

Mr Haddrill: In relation to making sure that the flood plain as a whole is understood, that there is more certainty about what the risk is through the sharing of information between various organisations, and then an integrated approach, as you rightly say, to drainage, because that is certainly one of the things that has come up over the summer.

David Taylor: How much progress has it made, do you think, in the two years since the statement came into force?

Mr Haddrill: I do not think it has made really any progress at all in producing an institutional change to deliver that strategic focus. That is certainly one of the things we are looking for much more rapid progress on in the future.

David Taylor: So not a very positive score card so far, is it?

Mr Haddrill: I think there is a lot that needs to be done. I think the Government has got the message and some of the provisions that seem to be coming through in the Climate Change Bill reflect that they are now placing much more weight on sustainability through adaptation as well as sustainability through mitigation, but at the moment I still feel that mitigation is the much bigger story for the Government and more needs to be done on the adaptation side.

Chairman: I just want to ask one or two specific points on this statement. You said that it is conditional on the Government making progress on these five key action areas, one of which is reducing the annual probability of flooding. By how much do you want to reduce the probability?

David Taylor: For which properties? It is not a global one.

Chairman: What do we mean by that phrase?

Mr Haddrill: What we want to do now is to take a look at each of the high-risk areas, reassess them to find out, in the light of what happened in the summer, what a realistic probability is in those areas and then take look at what level of investment in flood defences, and so on, is required to get us as close as possible to that one in 75, one in 100 year risk.

Chairman: You are not answering my question. You said that the statement is conditional on Government making progress. The question I asked was: what is the probability that you are seeking? In other words, you describe what needs to be done. I am interested in knowing what the Government said to you they are actually going to do. What is the level of probability of flooding you have asked them to get to?

Mr Haddrill: It depends upon the area. We are broadly looking for a one in 100 year probability to be covered in most of the towns in the country.

Chairman: So we have got the probability of one in 100. You also asked for implementing reforms to land use planning in the context of flood plains, and the Government still seems to be equivocating on that. Have you had any cast-iron statements from them that give you comfort in that respect?

Mr Haddrill: Not yet, no, we have not.

Chairman: A not yet and a possibly. Okay; David.

David Taylor: I mentioned earlier, as did you, I think, that the Statement of Principles is under review. At what stage are we in that process? Are there any interim conclusions or findings which allow you to predict the shape of some of the changes that might be made?

Mr Haddrill: We are at the very beginning of the process. It has to be a very thorough review this year, and I was pleased that the Government agreed to bring forward the three-year review from 2008 to 2007. We expect the review to go on into the spring, we need to be able to take account of the Pitt Review in that, and we are at the early stages of looking at these high-risk areas and trying to reassess the risk as a result of what we have learnt over the summer.

David Taylor: So is it at least possible that the review will produce a situation where you will expect, as the Chairman said a moment or two ago, much tougher and more specific commitments to be
delivered by the Government and you on your part may be reshaping the commitments that you have given in relation to the one in 75 and one in 100 year risk?

Mr Haddrill: Yes.

Q438 David Taylor: Could both of those areas be outcomes from the review?

Mr Haddrill: Yes.

Q439 David Taylor: Tougher expectations of Government and tougher attitudes from yourselves?

Mr Haddrill: I think it is absolutely right that we need more from the Government, but we will be reviewing our own position in relation to what comes out of the Government; so the two have to go hand in hand.

Mrs McIntyre: We certainly want to work in partnership to solve this issue. Michael asked earlier: why do we want to continue to insure? We believe that if we can work in partnership with the Government we can actually provide a great service to customers when floods do happen, and if I look at the way that as an industry overall we have worked to deal with some of the flooding issues, we try to provide an holistic service to customers to help them cope with what is a really unpleasant situation. That is what we want to achieve through the work that we are doing.

Q440 David Taylor: You say that, and I am sure you are genuine in saying that, but there are cynical observers, none of whom are members of this Committee, who believe that the industry is looking for a get-out and wanting, in some circumstances, to abandon their commitment to provide broad-scale flood risk insurance. In what sort of circumstances could you envisage the industry starting to backtrack? How fluid are your intended principles?

Mr Mayer: I have got to clarify that. From our perspective some of these comments are being taken out of context. Very simply, we entered the perspective some of these comments are being taken back track? How fluid are your intended principles?

Mr Mayer: Yes, the industry was not looking to back track and the industry was not looking, when we signed the original Statement of Principles, for an over-night solution, but we were looking for progress to be made and I think it is appropriate to review how much progress has been made and, in the context of changing weather patterns, whether the plans are sufficient. Mr Haddrill is promoting that on behalf of the industry, that we want that review and we want that transparent discussion.

Q444 David Taylor: One final question from me, Chairman. There is regular reference to homes and small businesses. What is your upper limit on small business definition?

Mr Mayer: I am sorry “upper limit”?

Q445 David Taylor: There is a reference in the commitments to continued offers of flood insurance to “homes and small businesses”. I wondered what is the upper limit of small businesses, or is that just a phrase that is meaningless and you threw in because it sounded good?

Mr Haddrill: The Statement of Principles we see applying to homes, not to commercial insurance.

Q446 Mr Drew: The issue of types of payment that you made, as I say, there is a background to this. I went to a conference, which was very useful, a couple of weeks ago now, which was organised by ABI and the statement by one of the insurance companies represented—it may have been SunAlliance—was that you currently have cross-subsidised the payouts in the sense that you have not recouped that money. You are currently allowing that money to sit there until you come to an eventual calculation of what the true cost is. Is that true? You have not sought to recoup yet all the moneys from the cost of the floods.

Mrs McIntyre: When you say “recoup”, recoup from?

Q447 Mr Drew: I am not making it very clear. What I am saying is that in terms of the payouts you have made, you have had to accept that you have done that at a loss. There is no way at the current time—

Mrs McIntyre: No, no, no. Yes.

Q448 Mr Drew: —that you have managed in any way to put up premiums that would recoup that money. That is true?
Mrs McIntyre: In the way that we look at our pricing, we price in flooding. So within the risk premium that we charge customers we already have a loading for flooding costs and the statement that we have made accompanies that we will not be putting any blanket increases in as a result of this.

Q449 Mr Drew: What I am trying to say is, in terms of the cost of these current summer floods, is that way beyond the money that you put aside?

Mr Mayer: In any one year, that is correct.

Q450 Mr Drew: Is there any ball park figure that you can give us? How much has it cost you and how much of that would you expect it to cost you, roughly?

Mrs McIntyre: We have declared as an industry the cost is three billion, and we have as a company talked about a cost of 120 million net, the cost of the insurance—so that gives you an idea of the scale. Is that the kind of number that you are thinking of?

Q451 Mr Drew: The actual breakdown of the ways in which the money you have paid out has been distributed, to what extent have you looked at the distribution of the costs? For example, how much has been paid out in terms of what I would call natural flooding, as against flooding from sewers, as against flooding from third-party incidents? Have you done that level of work yet at a collective level? Obviously you have had to do it at an individual level. If so, I think it would be quite useful for the Committee to see that, but, again, give us a feel for those figures and what you think you have learnt from that.

Mr Mayer: I do not believe at this stage we have the kind of granularity that you are looking for and, frankly, that would be useful for us as well.

Q452 Chairman: They are available as consultants, you know. These are good questions.

Mr Mayer: They are great questions.

Q453 Mr Drew: Have you any idea when that will be done?

Mr Mayer: Let me make a couple of broad statements to see if this is what you are looking for. When we look at the two events, I think there is some insight to be gained and really two different stories. If we look at the June event that hit Hull and Sheffield and the surrounding areas, that was an event that we would not have typically expected and the flood mapping would not have accounted for because that was essentially a massive downpour of rain and overland water with the drains not being able to cope with it. So, broadly speaking, I think you can look at the first event and say that was due not to rivers flooding, it was due to just a huge amount of rainfall and the drainage system not being able to cope with it. The event in Gloucestershire, Tewkesbury, that was more what we would have expected, it was more what the flood mapping and all the work that we have done and you have done would have predicted. I do not know if that helps.

Broadly speaking, Stephen, if we take the two events, I think we are roughly close to 50:50 on the three billion.

Q454 Mr Drew: I suppose what I am trying to get at, not very clearly, is the degree to which you now will break down the real causes of the floods which will then mean that you will do the numbers and say, “We have under estimated the risk of this type of flooding but we were able to meet the costs of this other type of flooding”, and to what extent do you then go back to government in particular and say, “Look there is a gap here, because there is no way, unless we are going to put premiums up for certain categories of people dramatically, that we can meet that shortfall”?

Mr Haddrill: It is that sort of analysis that we are aiming to do. Perhaps I should say, it cannot be a perfect science. As we have seen over the summer, we will never know exactly what is going to happen in any one flood area, but that is the intention. I do not think I should let the word “dramatically” pass in terms of premiums. Some people were worried that we were looking at very high percentage increases, and I do not think that is what I have heard from any part of the market, so I do not want to be alarmist about that.

Mrs McIntyre: You asked the question around lessons learned, for example, around Hull. I think we have had across statistics of about 75 per cent, and if you would like further information on the breakdown, I think we could provide it, because as companies we are doing that analysis. The drainage issue clearly has come out as something that we did not predict, as Igal said, and I think the question we have around that is what can be done. Would storm drainage work? Would storm drain work be something that could be a solution? What is the solution to that to deal with these heavy monsoon type rains, and that is the climate change effect that we are seeing. If I look at some of the events we have had over the last two years, it has been that monsoon type rain through the summer that has surprised us in terms of our drainage systems’ ability to deal with it.

Q455 Mr Drew: Can I deal with the issue of premiums and then I will come back with a final question. How much will you try and spread the cost of this as against realising that there are some properties that either you would prefer not to insure at all or, if you are going to insure them, then the premiums will have to be substantially higher? Is that something that you are as yet discussing? You have done it in the past, but this has got an added piquancy because of the amount of properties and the level of disruption there was. I wonder where you are in your stage of discussion of those issues?

Mr Mayer: I think it is an individual company decision. David, I think you have two elements. You have got, in our view, a need for the overall pool of premiums to be sufficient, the premiums of the many to pay the losses of the few. So, there is no doubt that there is an effect overall.
Q456 Mr Drew: That is the principle of the shared risks?  
Mr Mayer: Yes, and that is insurance, that is what insurance is about, but I would expect certainly our company and other companies to look at specific actions in specific areas. I would emphasise Mr Haddrill’s point. I think we have got two things. We have got a dynamic and competitive market place and, as of yet, we have seen no one take dramatic action.

Q457 Mr Drew: Could I add one rejoinder, which is another issue that we have not really looked at but I think we need to, and that is, of course, you do insure a number of the public utilities in one way or another. Without going into too many details, I have got an issue at the moment where someone is trying to take legal action against BW over a breach in the canal. Give us a feel for how you would approach that from the perspective of being an insurer of BW, and is that something that could in its own way have got an issue at the moment where someone is trying another. Without going into too many details, I have a number of the public utilities in one way or another. Could I add one rejoinder, which is another issue that we have not really looked at but I think we need to, and that is, of course, you do insure a number of the public utilities in one way or another. Without going into too many details, I have got an issue at the moment where someone is trying to take legal action against BW over a breach in the canal. Give us a feel for how you would approach that from the perspective of being an insurer of BW, and is that something that could in its own way have got an issue at the moment where someone is trying another. Without going into too many details, I have a number of the public utilities in one way or another. Without going into too many details, I have got an issue at the moment where someone is trying to take legal action against BW over a breach in the canal. Give us a feel for how you would approach that from the perspective of being an insurer of BW, and is that something that could in its own way have got an issue at the moment where someone is trying another. Without going into too many details, I have a number of the public utilities in one way or another.

Mr Haddrill: Certainly it is absolutely true that we were concerned that some public authorities seemed to be self-insuring rather more than we would think was wise. Self-insurance for a public authority is perfectly reasonable if you have assessed the risk properly and you feel that you can then bear that risk in almost any circumstance. Public authorities, I do think, need to revisit that question. I also think you are absolutely right, particularly about what happened around the West Country area where we had massive interruption of business, if you like, as well as of people’s lives, as a result of actions that have been identified in previous reviews. The need to protect electricity substations, and so on, have not really been taken. We have seen time and time again in these floods that police stations, ambulance stations, schools and so on have been flooded. They are there in the flood plain, they are essential parts of the local community.

Q458 Mr Drew: You are in a slightly difficult position in the sense that where on the one hand you have customers who you would like to recoup money from, a negligent authority, if you are also the insurer of that so-called negligent authority, you are in a lose-lose situation and you have to be very careful that you are not seen to be taking sides. That is real problem, certainly in my part of the world. Mr Mayer: I do not think it is unique to the flood situation. In our business we take care of our customers first, but then there is often a dispute over the negligence of which party is responsible, and that is what the legal system is there to take care of. We often find ourselves on both sides. Mrs McIntyre and I will be on either side of many disputes in courts or we will settle among ourselves. I think that is normal. I do not think it is a feature of the flood specifically.

Q459 Mr Williams: In 2005 the Government published Making Space for Water, which is bringing together recommendations from previous flood incidences. I think you have said that the recommendations there were not only unfunded but the organisational changes that were required to address those issues had not been made. I think Baroness Young said that the Environment Agency was making progress but was not moving fast enough. Do you believe that the recent floods have given us any new lessons to be learned or is it just the same lessons from the previous flooding incidences? Mr Haddrill: I think some things have gone up the agenda. Flash flooding has clearly gone massively up the agenda. It is not something we were unaware of before, but it now looms very large. Therefore the organisation of public authorities and the water companies and so on around flash flooding needs serious attention. I would say that is the big thing that has come about.

Mr Mayer: For me, Mr Williams, another big one that I think is the sooner we take the lessons learnt and apply them, as Mr Haddrill spoke about, on the planning side. We have a government that is committed to increasing the housing stock and I think there are sensible things that can be done. Obviously our first priority would be to avoid flood plains, but we are not naive. If we have to build on flood plains we think there is action that can be taken, for instance, to strengthen the building codes, to insure some simple measures around making homes more resilient to flood and reducing the damage; really simple stuff to me like electrical sockets being placed halfway up walls in new construction that would avoid electrical damage seems sensible, easy, low cost, and I think there are a number of other things that we can do and should do to address the issue of the increased exposure while at the same time meeting the needs of increasing the housing stock.

Q460 Mr Williams: Have we been too slow in implementing the previous recommendations of the report Making Space for Water? Mr Mayer: Often in our industry it is very hard to predict the impact of a trend at the beginning of a trend. I think really that is where we are. Global warming and climate change is a changing trend and, yes, you can look at June and July as a bit of a wake-up call, but this is the beginning of a trend and I think we should be reflecting on the events of the summer and looking at how we can put co-ordinated plans across all fronts: making the insurance affordable, the defence spending, building code changes to make the future stock more resilient. I think we are at the beginning of a trend and it is human nature to almost deny that the trend is as big as it is going to be.

Q461 Mr Williams: Whose fault is it that these previous recommendations have been too slow in being implemented? You have said that they are too slow. Whose fault is it?
Mr Haddrill: We do not really want to get into a blame game here; so I think probably I would quite like to duck that, because actually what we need is to—

Q462 Chairman: That is disappointing. We like to know who the guilty parties are. In all seriousness, if we do not have some candid comments about where there are areas where there have got to be policy improvements, then all the information that we hoover up in inquiries like this is less relevant; so could you think again about being a little more candid, Mr Haddrill?

Mr Haddrill: What I would say is that we have identified some very serious shortcomings in the way that a strategic approach has been put together, i.e. it has not been put together yet. It particularly has not been put together around drainage—that needs to be changed. The bodies that would have to do that are the Government, through legislation, and the Environment Agency. The other thing that I think needs to be resolved is the relationship between creating a national strategic body, giving it oversight, enabling it to look at flood plains in the whole and having all the information, and so on, but then not riding roughshod over the ability of local government, people on the ground who understand the micro-risks, to have some money to do something about those. We always know that the integration of a national framework and local delivery is a difficult thing to do, so I think that action needs to happen on that, but actually it needs some pretty careful thought as well.

Q463 Mr Williams: Can you tell us what the necessary organisational changes that have not taken place yet are? You said that the organisational changes have not taken place. What are they?

Mr Haddrill: The principal one is to create an authority that can oversee the flood plain as a whole that brings together local governments, water companies and the Environment Agency. It could well be, and I think it should be, the Environment Agency that does that. Secondly, a body, probably the same body, that makes sure there is co-ordinated action on drainage and also on the coastal issues as well. I think it is possibly the Environment Agency that needs to be given this authority and then needs to get on and use it.

Q464 Mr Williams: If somebody has been too slow in following up these recommendations, could you pinpoint the most urgent recommendations to put in place as soon as possible?

Mr Haddrill: I think the urgent issue is this drainage issue. If we just step aside from the floods this summer, 6,000 houses end up with sewerage inside them every year anyway, and that is a totally unacceptable situation. We have towns generally reaching a protection level against that one in 100 year event and yet the drainage system is one in 30 years. We have planning authorities giving approvals to big developments all over the place, and then the drainage system is just expected to take that extra effluent on without any upgrading. These are real practical problems, not problems that are normally regarded as very exciting until something goes wrong, when it is absolutely disastrous, and we need that body that will bring about some energy and co-ordination to sorting those issues out.

Q465 Chairman: Before we move on from this, do you think the Government has been candid enough with the public about the level of flood protection which the nation can actually afford to buy?

Mr Haddrill: I think that the Government needs to get over the message—and I do not think it has yet because I do not think it has fully accepted it or understood it itself—that this is going to take a long time to sort out, that we are going to have to put money in year after year as the climate changes, that we must aim to get not today's level right but the level that we expect to be at in 30 or 40 years: because after all the mitigation benefits are not going to come through for 40 to 50 years, so we are going to face a rising curve and we have got to aim at that. So, no, I do not think that message has been got over.

Q466 Mr Williams: In the Statement of Principles you talk about the one in 75 year risk. I have looked at a number of flood maps and they vary between the Environment Agency and Norwich Union, for instance. Which one is going to be the definitive one in telling somebody you are a one in 75 possibility, or above it, or below it, or whatever? How is that going to work when there are so many different interpretations of the data?

Mr Mayer: Broadly speaking, I do not think our data is very much different than what the Environment Agency has, but to bring to it life for you, the EA maps will pinpoint to a 100 metre area. We have invested in mapping technology that looks within that 100 metres and will identify individual homes that may be sitting at a higher elevation and therefore lower risk. We have shared that data and we are quite happy to continue to share that data.

Q467 Mr Drew: Who do you share it with?

Mr Mayer: With the EA and with any government authority that would like to have that data. I think it is useful data. Again, some of the flooding that we saw this summer, as I said earlier, happened exactly as we expected, particularly in Tewkesbury in Gloucestershire, but what our flood mapping did not predict, as Mrs McIntyre has said, is the monsoon type rainfalls that happened in Hull and Sheffield, and that is where Stephen has rightfully said that we need to take a look at the drainage, because if there is new information that has come in that suggests an additional urgency, then we need to look at it.

Q468 Mr Drew: You mentioned the issue about time and that this is a long-term commitment, and that is something, from what we have already drawn evidence upon, we would agree with. The problem is when you go and talk to constituents the one thing they say to you is, “There is no time. We cannot go through this again.” I have had constituents who have been flooded five times in seven years and time
is on their side. Next time it comes down, literally when you look out of your window at a heavy day’s rainfall--- That is not a life that is fair for anyone to live.

Mrs McIntyre: You only have to visit people’s homes and experience the effect of it, not just on the day of the flooding, but go there two months later and experience the stench of flooding and the period of discomfort that the family feels from flooding, to know that getting flood defences and investing flood defences is the way that we need to move forward, and we have talked about the amount of money we believe initially needs to go into that.

Q469 Paddy Tipping: Mr Haddrill, you have been pretty robust in your criticism of the Government’s £800 million by 2010-11 for flood defences. Why is that?

Mr Haddrill: We felt that a larger figure was needed. We were talking actually about £750 million a year for three years plus £150 million that was identified by the National Audit Office as being needed for repairs that were required to the existing infrastructure, and that produced a figure that was larger than the Government’s profile which went up to 800. That is the first point. The main point is that my understanding from the Environment Agency itself and from Barbara Young is that 800 million figure that was announced, I think, at the time of the main floods, was really the figure that the Government had in mind before the floods. I think that, as a result of what happened during the floods, we know that the number has got to go up if we are going to deal with those things that came, particularly the drainage issue. The third thing is that we do not really think it is an adequate response to the problem of coastal flooding in particular, where we have been asking for the last two years for expenditure over a 25-year period—so quite a long period—of eight billion pounds to protect the towns on the east coast.

Q470 Paddy Tipping: What calculation have you done of the real need?

Mr Haddrill: We will do the calculation as a result of this risk assessment that we are doing. I do not want to say 800 is not good enough, it should be something else, until we have sat down, done the risk assessment, done the gap analysis, and then we will come out with the new number, but I know it should be higher.

Q471 Paddy Tipping: I am concerned with your statement that the Government is letting down thousands of householders. That is exactly what you have said. You have asked for 750 a year over three years. It has gone up to 800 million by 2010-11. It steps up. The actual margin of difference is pretty limited, is it not?

Mr Haddrill: The margin of difference between us was still about 400 million, for the reasons I gave, and it is now 400 million plus whatever we need to deal with the lessons for the summer, plus the coastal defence. I think that is quite a wide margin.

Q472 Paddy Tipping: So what schemes are being dropped?

Mr Haddrill: Firstly, we know that the maintenance programme was delayed.

Q473 Paddy Tipping: This is capital.

Mr Haddrill: I cannot give you a specific list.

Q474 Paddy Tipping: So why are you upsetting householders and saying, “We may not be able to insure you in the future”? This sounds a bit like scaremongering to me?

Mr Haddrill: In fact I am not really saying we are not going to be able to insure you in the future, I am saying—

Q475 Paddy Tipping: That is the perception of some people.

Mr Haddrill: It may be the perception, but everything I have said I have started off by saying that we want to carry on doing this business, looking after people, and so on; so that is our starting point. There have been delays to major projects, including in areas that flooded. I know that the Environment Agency is very worried about having had to delay projects around the Leeds area, for example, which hopefully they will now be able to go ahead but were put on hold. I would be happy to come back to you with further examples, but really, I think, the Environment Agency might best answer that.

Q476 Paddy Tipping: It would be helpful if you could come back with schemes that you could point to being delayed. Turning to the two companies: my impression is that you are more than happy with the step up arrangements. That is what you have both said in your evidence. Capital money needs to increase over a period of time.

Mrs McIntyre: We are supportive of the ABI in terms that we need to increase our expenditure. If you look at the facts, 564 million was the amount allocated at the end of 2002 and then it was frozen in 2004. If you look at something like the Foresight Report, which said you needed to increase the spend between ten and 30 million per annum for climate change, and you took claims inflation at about five per cent per year, you would be looking today at a spend of about 775 million, assuming no additional changes, and that is taking the low end view of the Foresight Report. Our view is let us do the analysis that we are doing today, let us learn and really understand what has happened through the June and July floods, let us have a look at the Pitt Review and see what that says as well, and then let us come out in partnership with government on a sensible view of how much is needed to be spent; but just by taking the pure fact of the amount of money that has been frozen, we believe that identifies a gap in addition to the National Audit Office saying there is 150 million required to spend.

Q477 Chairman: How refined can you get this number? When we did our Foresight Report you came and told us it needed to be a billion a year, then the Government came out with 800 and you said,
“Yes, jolly good, we applaud the Government”, and then, shortly after that, when the Comprehensive Spending Review came out, you immediately issued another press release saying, “It is not enough, a billion pounds is required.” I am getting the impression this is plucking a nice, big, round number without a great deal of precision. I did a little calculation over the three years of the Comprehensive Spending Review by simply upgrading the 650 million where it starts by a three per cent inflation rate, which maybe somewhat under, for the construction industry, and you come, believe it or not, at the end of the comprehensive spending period to a figure of £689 million. So, that leaves £111 million of net extra activity. You say to yourself: “How much is this extra really worth?” and, coming back to your point, which is why I asked you what probability of flooding you were trying to achieve and you said a one in 75 year figure, what I find is that there are lots of disjointed bits. Is that one in 75 everywhere or is it under certain circumstances, only in the high risk areas, and where should we be spending the money and how much extra over and above the continuing works that are in the pipeline? I apologise if it is a slightly disjointed analysis, but it does show some of the complexity in actually arriving at a number that is realistic. Is your review going to be more realistic?

Mr Haddrill: The reason we want to do a thorough review of all the high-risk areas is exactly to produce a realistic number. Actually the construction index is quite a bit above the retail price index, and we do not think that the 800 million does a great deal more than stands still. It does some more than that. As I was saying, there are also gaps in terms of the maintenance of the existing infrastructure that we were concerned about.

Q478 Paddy Tipping: So what figure are you asking for in 2010?

Mr Haddrill: I am not specifying a figure now.

Q479 Paddy Tipping: You say 800 million is not enough but you are not prepared to say what you want the figure to be!

Mr Haddrill: We will say that when we have done this review. I do not want to say, or we cannot say, what is an evidence-based number today. Actually the construction index is quite a bit above the retail price index, and we do not think that the 800 million does a great deal more than stands still. It does some more than that. As I was saying, there are also gaps in terms of the maintenance of the existing infrastructure that we were concerned about.

Q480 Paddy Tipping: Sure. I am not sticking up for the Government, but you told them in the summer, in June, that 750 was enough, now you are saying 800 is not enough and you are not at this stage prepared to speculate what really is needed in 2010-11.

Mr Haddrill: I think we have learnt the lesson from the summer that we actually do not know as much as we ought to know. We are going to take that learning and produce what we believe is a better evidence-based figure.

Chairman: I am going to adjourn the Committee, because we are two minutes before a vote. My colleagues will get a two-minute start, but could I ask them to come back as quickly as possible and, Paddy, would you like to carry on thereafter about Sustainable Urban Drainage Systems. The Committee stands adjourned until we can get back as quick as we can after the vote at a quarter past four.

The Committee suspended from 4.15 pm to 4.25 pm for a division in the House

Q481 Paddy Tipping: We have talked quite a lot about urban drainage problems and flash flooding and it has been said that SUDs, Sustainable Drainage Systems, can make a difference. Is that your view?

Mr Haddrill: I think it is an idea that has merit. We are very happy to explore any option that can be put in place efficiently and effectively in terms of cost and which will work, so we are quite open to that suggestion.

Q482 Paddy Tipping: And are there insurance issues around that, or you would just take that as mainstream business?

Mr Haddrill: I am not aware of any insurance issues but obviously companies would want to assess the risk in each individual case.

Q483 Paddy Tipping: Earlier on we were talking again about urban flooding. It is not entirely clear, because there is a multiplicity of different agencies involved, who is responsible for what. I got the impression at one point, Mr Haddrill, you were suggesting the Environment Agency ought to have an over-arching view on this, is that right?

Mr Haddrill: That is our view, yes, that there should certainly be an agency that can take an over-arching view, and be responsible for bringing all the parties together. It does not necessarily have to control all the systems but it has to be able to co-ordinate action.

Q484 Chairman: Mr Haddrill, just to conclude on your evidence, I think you wanted to correct a small fact from our earlier exchanges.

Mr Haddrill: Yes. I am not so sure it is that small actually. I said that the statement of principles did not cover small business—it does, although it does not cover it in the same way as it covers the householder. In particular the difference is that if the business changes hands then there is not a commitment necessarily to continue the cover to the new businessman as there is to a new householder, and that is because the nature of the risk around what the new business is going to do and what the record of the business person is, is taken into account. But what we do not have is any standard definition of a small business.

Chairman: We touched briefly on the question of mapping, and it might just be helpful for the Committee if you were able to write to us with a little more detail about some of the differences between
the Environment Agency’s mapping and the mapping you have developed for your own specific uses, and the integration of that, for example, with better meteorological information, taking into account not just the probability of the one-in-so-many-years event but the point you referred to, namely the current intensity, which seems to be a factor that is missing in delineating potentially risky areas, because it seems that we are getting perhaps one-in-a-thousand-year events when you get a month’s rainfall in two days; it does not fall into the normal probability prediction model. So something to help us have a better understanding of mapping would be very much appreciated. Thank you very much indeed, and thank you for your written evidence.

Supplementary memorandum submitted by the Association of British Insurers (ABI) (FL114b)

The Committee asked for additional information on a number of issues, detailed below.

It may also be of interest to the Committee to note that in December 2007, the ABI published its own assessment of lessons to be learnt from the summer floods, a copy of which is enclosed.14 The report called on the Government to develop a 25-year strategy to manage Britain’s growing flood risk. We argue that this should be based on:

— An investment programme that reflects climate change and the real flood risks from rivers, coasts and drainage.

— Improved national leadership and coordination with national targets for reducing flood risk. A single national body should be responsible for flood management strategy to replace the current piecemeal approach.

— Stronger planning controls to ensure that new developments are not built in high flood-risk areas.

The ABI also commissioned an exclusive opinion survey, carried out by Populus in the areas affected by the summer flooding (Yorkshire and Humberside, Gloucestershire and Worcestershire). One of the main findings was that residents of the flooded areas say that an overhaul of drainage systems is the most urgent measure now needed to reduce the risk of future flooding.

The recent floods highlighted how vital the insurance response is to the recovery process. The UK is unusual in having flood cover included as standard in household policies and in the vast majority of business policies.

Adequate investment in, and management of, flood risk measures would enable insurance to continue to be widely available, as envisaged under the Statement of Principles for the Continuation of Flood Cover. Insurers need to see significantly greater commitment from the Government, or substantial areas of the country will face much higher premiums and deductibles in the near term, and become uninsurable over the longer term.

SELECT COMMITTEE ADDITIONAL QUESTIONS

Q1: The amount of uninsured households flooded in the summer of 2007

We do not have data about uninsured households flooded in the summer. However, using various Government statistics, including The Household Expenditure Survey (HES) plus evidence from our members, we estimate the number of uninsured households in the UK is as follows:

— 93% of all homeowners have Home Buildings insurance in place, although this falls to 85% of the poorest 10% of households owning their own home. This insurance is a standard condition of a mortgage.

— 75% of all households have Home Contents insurance in place.

— Half of the poorest 10% of households do not have Home Contents insurance.

14 Not printed. Available at http://www.abi.org.uk/BookShop/ResearchReports/Flooding%20in%20the%20UK%20Full.pdf
Q2: Flood defence schemes that have been delayed or postponed due to the level of Government expenditure announced in the Comprehensive Spending Review 2007 settlement

The Environment Agency and Defra hold the specific information about flood defence schemes and the funding status. Whilst the ABI does not have this information, we do assess the cost benefits of flood defence improvements and the effectiveness of investments.

Flood defence projects yield benefits of around seven times the amount invested—meaning for every £1 spent, £7 would be saved in repair costs.\textsuperscript{15} For individual projects, the benefits may be as much as sixteen times the investment. This level of return is much higher than for other areas of public sector spending, like roads and railways.

This demonstrates both the excellent value of such investment choices and the level of harm done to the economy if we fail to invest. The Government’s estimates (not including the Summer 2007 floods) suggest that flood management reduces the cost of damage by about £3 billion each year. Additionally, improvements to flood management could reduce the costs of a single major coastal flood event by between £3.7 billion and £6.8 billion.

In our East Coast of England research project\textsuperscript{16} we looked at the effectiveness of improved flood protection in the light of rising sea level scenarios. The number of properties at risk of flooding in eastern England rises by 48\% from 270,000 to 404,000 following a rise in sea levels of 0.4m. (This assumes no new building between now and the middle of this century.)

Assuming current levels of flood defences in eastern England are not improved, the financial cost of a single major coastal flooding event will rise to between £7.5 billion and £16 billion once sea levels rise by 0.4m.

This is a cautious estimate, since it does not include the long-term economic effects of this major level of disruption, nor the impact on essential public services such as hospitals, schools and emergency services.

Investment now in improvements to coastal flood defences could reduce the number of properties at risk from 270,000 to 170,800. A rise in sea levels of 0.4m would then increase this to 287,400 properties, roughly the same as today.

Q3: The differences in the flood mapping of the Environment Agency and the insurance industry, and to what extent the industry's maps incorporate meteorological information such as possible rainfall intensity

Our members are using the Environment Agency’s Nafra data to assess flood risk. Some insurers have developed their own models, which they use in addition to the Nafra data. The ABI does not directly use these and it would not therefore be appropriate to comment on these individual maps.

Please don’t hesitate to contact me if you require any further information.

Stephen Haddrill
Director General

Supplementary memorandum submitted by Norwich Union Insurance (FL 006b)

1. The differences between the Environment Agency flood mapping and the mapping Norwich Union has developed

<table>
<thead>
<tr>
<th>Norwich Union flood map</th>
<th>Environment Agency map</th>
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<tbody>
<tr>
<td>— Can differentiate between different flood risks within a postcode and assign a unique flood risk to individual properties, ie goes down to address level.</td>
<td>— Assesses flood risk in 100m squares—not at an individual property level</td>
</tr>
<tr>
<td>— Uses height data that is accurate +/- 0.5m in the South east and +/- 1m for the rest of the UK. This is the best national height model available.</td>
<td>— Uses the same height data as the Norwich Union data, but does not produce the same results as flood risk is mapped in generic squares, and it does not incorporate claims data.</td>
</tr>
<tr>
<td>— Was specifically designed for use in the insurance industry and benefits from the use of claims data</td>
<td>— Designed to be a first step for insurance purposes, but is too generalised to assign flood risk to individual properties.</td>
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\textsuperscript{16} ABI: COASTAL FLOOD Risk—Thinking for tomorrow, acting today, November 2005
Norwich Union flood map  Environment Agency map

- Using the NU flood map, we believe there to be 241,000 properties at “significant” risk (worse than 1 in 75). This figure is significantly lower than the EA’s estimate, due to the fact that we are more accurately able to assess risk in individual areas (ie not 100m squares).
- Recent EA estimates suggest that there are 518,000 properties at “significant” risk

A visual example of the difference between the two maps is included below.

Environment Agency National Flood Risk Assessment (NaFRA) data

Environment Agency maps split the flood risk into 100m squares assigning each square low, moderate or significant risk. This method assigns all properties in each square the same risk, which is not always realistic.

Norwich Union Flood Risk map

Norwich Union’s flood map assigns flood risk to individual properties. In the below map, 75 = significant, 100 = moderate, 250 = low.
Can only assess flooding from natural watercourses, ie from rivers and the sea. Much of the flooding that occurred in Summer 2007 was due to intense rainfall over urban areas (ie pluvial flooding) which neither the Environment Agency or Norwich Union maps account for.

— Do not provide information on flood depth, speed or volume of flow. Local Environment Agency offices may have more detailed local knowledge that is not fed into national data.

2. The extent to which Norwich Union’s flood maps incorporate meteorological information such as possible rainfall intensity

Norwich Union’s flood map does not directly incorporate meteorological data; instead we use data which gives us the flow in each river, for various return periods (eg a 1 in 75 return period). This is the same method as used in the Environment Agency models.

Our maps show which areas will flood, given a certain volume of flow in the river. If we were to include meteorological data to model river flooding, it is unlikely it would make much difference to the areas that we predict are at risk of river flooding.

However, what may change in the future, if we see more of these extreme, intense downpours as a result of climate change, is the frequency of flooding. If these rainfall events become more frequent, we may find for example, that what was a 1 in 100 year event becomes a 1 in 50 year event, but the area at risk will remain the same.

This year’s flooding was caused by some quite unusual meteorological conditions, leading to intense rainfall over many areas of the country at once, rather than the more usual isolated downpours that can lead to flooding. It is notoriously difficult to assign a return period to a particular flood event, but from information we have seen we think the recent events are probably nowhere near as extreme as a 1 in 1000 year event.

Norwich Union Insurance

January 2008

Memorandum submitted by Ofwat (FL 111)

Executive Summary

1. Ofwat’s role as the economic regulator of the water and sewerage sector is to protect consumers, promote value and safeguard the future. The recent floods have clearly impacted consumers of both water and sewerage services, as well as highlighting the importance of planning and investing in infrastructure in the context of climate change.

2. First, looking at how the floods impacted on consumers, we will review water and sewerage companies’ role and performance in managing the 2007 flood events. If we find shortcomings we will take regulatory action where appropriate and require companies to demonstrate what they are doing to rectify the situation.

3. This review will look at three main areas:
   — how sewerage companies managed the extent of flooding given their responsibility for effluent drainage;
   — how companies limited adverse impacts on consumers or the environment in terms of water or sewerage services; and
   — companies’ processes for reviewing experience and identifying lessons for the future.

4. We will publish a report later this year focusing on the issues that fall within our regulatory remit.

5. Second, we will take the lessons learnt from our review and feed these into wider reviews, including this one. We consider that the implications of these lessons for future policy is of fundamental importance. And all parties must take a consistent, evidence-based approach to the development of such policy.

6. A key focus of these reviews must be how to deliver more integrated and sustainable solutions to flooding, having regard to climate change and weather patterns. While the sewerage system may be part of this solution, to focus only on upgraded sewers would be enormously expensive, will not stop all future flooding events and would distract attention away from other more sustainable methods of managing flood risks. Future planning needs to be informed by proper cost benefit analysis and requires a multi-agency response with wider thinking about urban design, design standards and land use planning such as using green spaces to receive flood waters.
7. Also, with a view to future planning, the evidence around climate change and the impact this will have on emergency planning, protecting assets and design standards for sewerage assets must be carefully considered. We will, through our review and our ongoing work, continue to ensure that our regulatory policies promote proper long-term planning by water and sewerage companies, including identifying best value priorities for adapting to changes in flood risk arising from climate change.

INTRODUCTION

8. Ofwat (the Water Services Regulation Authority) is the economic regulator of the water and sewerage companies in England and Wales. The industry comprises 23 regional and local monopoly companies. Ofwat has been in existence since 1989 and became a corporate body with a Board structure from 1 April 2006.

9. Our main duties are to protect the interests of consumers, wherever appropriate by promoting effective competition, and to enable efficient water and sewerage companies to carry out and finance their functions. The price limits we set, every five years, allow the companies to maintain water and sewerage infrastructure, meet growth or changes in demand and reduce the incidence of sewer flooding to properties from overloaded or damaged sewers.

10. The companies’ price limits enable them to invest in maintaining and improving both the sewerage and water networks; but we ensure consumers pay no more than necessary for the service they receive. We set outputs, as part of the price review, and monitor each company’s performance. This includes monitoring the long-term service capability (or “serviceability”) of each company’s assets for water and sewerage, the number of properties at risk of sewer flooding as well as customer service measures. Where a company’s performance is inadequate we require it to take action to put it right.

11. Ofwat seeks to protect consumers, promote value and safeguard the future. So as the economic regulator we will review water and sewerage companies’ role and performance in managing the flood events. We will be working with companies, and technical auditors, to review this to provide independent oversight. If during our work we do find shortcomings we will look to the companies to demonstrate that they have put this right and consider other regulatory action.

BACKGROUND

12. The flooding events of this summer were exceptional, with some areas seeing two months’ worth of rainfall in just 12 hours. They also highlighted the multiple agencies responsible for drainage and for handling the response to extreme weather events. Each sewerage company is largely responsible for ensuring that its area is effectively drained. Consumers pay for this through their sewerage bills. Each water company is responsible for providing a water supply to its consumers. As part of its responsibilities each company must have contingency plans to maintain essential water supplies in all circumstances, even when the piped water supply fails.

13. The floods brought disruption to many people’s lives. They followed exceptionally heavy rainfall onto already saturated catchments, with Yorkshire, East Anglia and the Midlands as some of the worst-affected areas. In some areas the rainfall events would be expected to occur less frequently than once every 150 years. Such events would far exceed the current normal design standard for newly installed sewers at 1 in 30 year return periods and the Environment Agency’s 1 in 100 year return period design standard for flood defences.

14. Flooding occurred because of a combination of rivers overtopping their banks, sewer flooding and surface water flows. Where rivers burst their banks, flood defences were insufficient and storm drains submerged. Sewers could not relieve this level of flooding. The precise sources of flooding and their relative importance in different locations will reflect the complex interactions between rivers, overland flows and drainage infrastructure as well as the topography of specific water catchments.

15. Gloucestershire was one of the worst affected areas with widespread flooding throughout the county. Flooding of the Mythe water treatment works in Tewkesbury resulted in water supplies being cut off for 140,000 properties in Gloucestershire. Severn Trent Water implemented its emergency plan to maintain drinking water supplies by deploying 1,200 bowsers and distributing bottled water supplies while it restored the piped supply.

16. We need to understand the implications of this summer’s events for water and sewerage services. Building a sewerage network that is robust to weather events of this magnitude would be prohibitively expensive and could still not address flooding from sea, rivers or overland flow into storm drains. We need to understand whether the companies did all they could, and should have done with the information and plans they had available. Perhaps more fundamentally we need to review what we mean by extreme weather events and what type of events we should plan for in the long term.
OFWAT’S FLOODING REVIEW

17. In the aftermath of these events it is clear that service for many consumers was adversely affected, as was the ability of water and sewerage companies to carry out their functions. In view of our statutory duties to protect consumers’ interests, we are carrying out a review focusing specifically on water and sewerage companies’ role and performance. Our review will look at three main areas:

— how sewerage companies managed the extent of flooding given their responsibility for effluent drainage;
— how companies limited adverse impacts on consumers or the environment in terms of water or sewerage services; and
— companies’ processes for reviewing experience and identifying lessons for the future.

18. We will publish a report later this year focusing on the issues that fall within our regulatory remit. This will also feed into wider reviews and consideration of any implications for future policy which we consider should be a key focus for all players.

19. We believe it is premature to draw conclusions on the recent events, or to make any assessment of the response by individual companies. In addition to our own review, we will review closely the work being done by individual companies to understand the implications of the flooding events. We will also liaise closely and feed into the Flooding Lessons Learned Review, chaired by Sir Michael Pitt, and the Environment Agency’s own review work. We will take appropriate action on behalf of water and sewerage consumers if necessary.

RESPONSIBILITY FOR WATER AND SEWERAGE INFRASTRUCTURE

Sewerage

20. Each sewerage company has a legal duty to provide a sewerage system to ensure that its area is and continues to be effectually drained. We enforce that duty.

21. However, sewerage companies are only part of the picture in terms of responsibility for drainage infrastructure. This can be complex and is shared between different organisations, including water companies, local authorities, highways authorities and the Environment Agency. This complexity reflects the different types of drainage and the way they interact:

— Sewerage companies (which we regulate) are responsible for the public sewers. In most cases these are in roads or public open spaces but in certain circumstances they may run through private land. Sewerage companies are legally obliged to provide connections to the public sewer for foul and surface water drainage from properties.
— The drains and any private sewers which carry household waste are normally the householder’s (or the landlord’s) responsibility. This applies whether they are within the property boundary or beyond the property boundary and up to the point they connect with the public sewers.
— Local authorities including highway authorities are generally responsible for the drainage of surface water from roads and public spaces and the operation of highway drains.
— The Environment Agency has responsibility for maintaining some water courses, and general supervisory duties over all matters relating to flood defence.

22. The current practice is to design sewers to handle a 1 in 30-year storm event. However, some older sewers which still function well in general, may have been built to different design standards. In addition, the demands now being placed on the infrastructure may well have changed since they were commissioned, because of further development and changes in the catchment. However, even if the entire sewerage system were designed to a 1 in 30-year standard it would not have been able to drain the stormwater associated with the extreme rainfall events observed this summer.

23. Sewerage systems can become ineffective when rivers are in flood, as sewer overflows are unable to discharge. During extreme rainfall events, underground drainage systems can fill up quickly. Once the drainage system is full to capacity, then surface water flows cannot enter it. This backs up the entire drainage system inundating low-lying areas. In these circumstances the question is how to manage “exceedance” of the system, creating pathways for flows to direct floodwater away from homes and properties.

Water

24. Each water company has a legal duty to develop and maintain an efficient and economic system of water supply within its area. We enforce that duty. Water companies are also responsible for making sure that their assets are protected to the right standard on the advice of the Environment Agency for flooding and on the advice of the security services for protection against security risks.

25. Under the Security and Emergency Measures Direction 1998 (SEMD) water companies must have independently certified plans in place to deal with any emergency, which are produced by the companies under guidance from Defra. In the first instance, water companies should try to maintain a piped water
supply to the requirements laid down in the Water Industry Act 1991 for as long as possible. In the event of the piped supply failing they must provide at least 10 litres of water per person per day to all those affected within the first 24 hours and maintain the supply until the piped supply is restored.

THE CURRENT INVESTMENT PROGRAMME IN ENGLAND AND WALES

Sewerage

26. When we last set price limits for all companies in December 2004 we required water companies to invest between 2005 and 2010:

- £1.25 billion in maintaining their underground sewerage infrastructure assets (plus £3.8 billion for above-ground assets such as treatment works);
- £0.95 billion on improving their underground sewerage infrastructure assets (plus £3.25 billion for above-ground assets) to meet environmental standards;
- £679 million on their sewerage assets to accommodate changes in demand and new development; and
- almost £1.2 billion, in total, specifically on containing and reducing the risk of sewer flooding incidents. This includes those parts of the investment in capital maintenance and accommodating new development and growth (set out above) targeted on reducing flooding.

All these costs are presented in 2006–07 prices.

27. The price limits should enable companies to resolve or mitigate every high-risk, internal sewer flooding problem caused by overloaded sewers identified in the companies’ plans where they propose to take action by 2010. This will help some 9,200 householders whose homes could be at such a risk.

28. We assess each company’s performance every year. This includes looking at each company’s ability to maintain their asset systems over the long term (“serviceability”) each year. This year (2006–07), our assessment for sewerage service assets, indicates some adverse trends for both above-ground and underground assets. Six companies have adverse trends in sewer collapses or pollution incidents and four companies report adverse trends in compliance at sewage treatment works, albeit against environmental standards that have become much tighter over the past decade. We will be monitoring companies’ performance closely to ensure that they deliver for consumers and if companies fail to improve by the time of our next price review in 2009 we will make appropriate financial adjustments so that consumers are not disadvantaged. As noted earlier the sewerage system could not have stopped this year’s floods. But we will review its performance as part of our work with the companies.

29. We do not yet know what, if any, the implications of the flooding will be for the investment on sewers at the next price review in 2009. Companies will need to assess future planning standards and the likely impacts of climate change in developing their long-term plans. We will work with the companies, the Environment Agency and others to take forward the lessons that can be learnt from our own review and those of others.

Water

30. All companies are required to have contingency plans in place to maintain clean supplies of water in the event of emergencies affecting their ability to maintain piped supplied. Each water company is responsible for its contingency plan. And the plans are agreed with Defra. At the last price review in 2004 we assumed in price limits proposals to increase stocks of mobile plant such as tankers, bowsers and works to protect key sites offering good value for money.

THE RECOVERY OPERATION

31. The floods that disabled the Mythe water treatment works in Tewkesbury leaving consumers without a supply of water across large parts of Gloucestershire were well publicised. Following warnings from Severn Trent supplies began to be cut off on 22 July. Meanwhile, Severn Trent implemented a recovery operation to provide alternative water supplies. Bowsers provided water for hygiene and sanitation and bottled water was provided for drinking and cooking purposes. By the end of 24 July 140,000 properties were affected. After the flood waters receded, Severn Trent put in place plans to restore the piped supply from the treatment works. Supplies were restored incrementally as the necessary drinking water quality standards were reached. Full supplies to all properties (safe to drink) were restored on 7 August.

32. In Gloucestershire, Yorkshire, East Anglia and elsewhere life has begun to return to some form of normality, although in certain areas it will take much longer. We are concerned for consumers and others and it is important that lessons are learnt. This is why we will play our part by carrying out our review and contributing to the review of others. We will also ensure that the industry plays its fair and proper part in learning lessons from these events and planning for future events of this nature.
WHO WILL PAY FOR THE COSTS OF THE FLOODS?

33. Water and sewerage companies’ consumers should only pay the costs necessary to improve infrastructure to maintain their water supply and adequate drainage of their properties.

34. The companies cannot seek an increase in consumers’ bills to pay for the additional expenditure arising from the response to, or recovery from, flooding events. The costs of the floods for water companies will be met to a large extent by companies’ insurance policies. Any additional costs will be met by the company, as a business risk. If however, at the next price review, a company can justify the need to enhance its assets or its contingency planning in anticipation of more frequent flooding in future this additional cost would be borne by consumers.

35. Consumers affected by flooding in their own homes will be able to claim on insurance for meeting the cost of any damage from the floods. Most will not be entitled to compensation from companies, even where their water supply was affected.

36. Under normal circumstances, consumers of all water companies in England and Wales are protected by a Guaranteed Standards Scheme (GSS). The GSS are minimum standards of service established by Government. The GSS includes provisions for the continuous supply of water for public consumption. These are legally set standards of service. Where the level of service provided to a consumer falls below the GSS, the company concerned must make a payment in recognition of this. In the case of unplanned interruptions to supply, the regulations state that the standards do not apply where the interruption is caused by severe weather. This summer’s flooding represents such an event. Companies must ensure that their infrastructure is robust to the challenges of climate change. However, if we required companies to invest to prevent failure in every eventuality the cost to consumers would be huge. Therefore we believe that it is appropriate that the GSS exemption remains and that the companies, with Defra, continue to agree upon contingency plans under SEMD for exceptional weather events.

37. The Consumer Council for Water and Severn Trent have held a number of focus groups, in Gloucestershire, to find out the views of people affected by the flooding. The Consumer Council for Water reported in August that, rather than compensation for individuals, consumers want companies to act to protect their infrastructure against severe weather events in the future. Severn Trent has donated £3.5 million as a gesture of goodwill to communities affected by flooding in Gloucestershire and Worcestershire. The company is also carrying out a full investigation of the circumstances surrounding the inundation of its treatment works. We will contribute to the company’s investigation as appropriate.

PLANNING FOR THE FUTURE

38. Flooding is a natural phenomenon, and it will never be possible to prevent it entirely. There will always be exceptional events that exceed the capacity of underground sewerage systems, and other parts of our drainage or flood defence infrastructure. Climate change may also increase the incidence and intensity of storm events. This means that we need to keep the emerging evidence on climate change under close review, and indeed, we consider this to be a focal point for all of the reviews under way.

39. Planning to protect and mitigate against flooding is not just a matter for water and sewerage companies. All of the agencies involved must examine the lessons from these flood events for their own role (and assets), as well as the potential impacts of climate change.

40. We expect companies to take a strategic and proactive approach to the challenges they will face over the next 25 years while recognising that investing to deal with storm events that occur every 150 or 200 years would be unrealistic, as well as enormously expensive to consumers. In the longer term, bigger sewers are not the necessarily the answer.

41. Such long-term planning is crucial. At our instigation each company is preparing, and will publish, a 25-year strategic direction statement (SDS) by the end of 2007. This is the first time such documents have been prepared and they are intended to show us, and other stakeholders, how each company plans to develop its business over the long term. This includes how they plan to run their business more sustainably and how they plan to tackle the challenges posed by climate change. Then, during 2008 and 2009 each company will develop a business plan which is consistent with its SDS. We will use each company’s SDS and its business plan when we next set price limits for the period 2010–15 for all appointed companies in 2009. The SDS will provide us with the longer-term context for companies’ business plans which we will review as part the price setting process. This will enable us to set price limits that enable companies to deliver for consumers both now and in the future including mitigating against, and planning for the effects of, climate change for water and sewerage.

42. A coherent approach to long-term planning is essential. A rush to invest in upsizing sewerage assets, as well as being enormously costly to build and maintain, would not eliminate the risk of floods and indeed may not be the most sustainable or cost beneficial way to tackle flooding problems. Future planning needs to be informed by proper cost benefit analysis looking at the full range of measures to handle flood risks. That is why we believe the lessons learned from this summer’s events should be about how to deliver more integrated solutions to flooding. The challenge for the industry is how it adapts in the long term in a range of areas including planning for new development, promoting more sustainable urban drainage systems
(SUDs) and ensuring drainage is planned in an integrated way. Much of the latest thinking in urban drainage is around how to prevent water from entering the sewerage system, and how to manage and retain surface flows so that they do not result in flooding and damage homes and properties. This requires a multi-agency response with wider thinking about urban design, design standards and land use planning such as using green spaces to receive flood waters.

43. The water industry also needs to examine the evidence around climate change and the impact this will have on storm return periods and planning standards for sewerage assets. The industry needs to build a robust understanding of climate change and the long-term implications for its assets. In our role to protect consumers we will continue to ensure that our regulatory policies promote proper long-term planning by water companies, including identifying best value priorities for adapting to changes in flood risk arising from climate change.

Ofwat

*September 2007*

**Witnesses:** Ms Regina Finn, Chief Executive, and Mr Jonathan Hodgkin, Director of Network Regulation, Ofwat, gave evidence.

Q485 Chairman: We welcome now Ofwat in the shape of Ms Regina Finn, the Chief Executive, and Mr Jonathan Hodgkin, the Director of Network Regulation. What exactly does that mean? It sounds like you are in the wrong inquiry, and should be dealing with Network Rail!

Mr Hodgkin: It means lots of different things --

Q486 Chairman: I was right!

Mr Hodgkin: — but there is a big network of pipes and sewers out there that need regulating.

Q487 Chairman: So you are Mr Regulator for the pipes and sewers?

Mr Hodgkin: Indeed.

Q488 Chairman: Good. You are very welcome. Just give us a few moments’ background of the responsibilities of Ofwat in terms of dealing with the issue of flood risk. How do you do it?

Ms Finn: First of all, thank you for the opportunity to talk to the Committee and we are inputting to a number of these reviews, including the Pitt Review right now. As you have heard from many other people this is obviously a multi stakeholder issue; there is quite a lot of cross-stakeholder responsibility, and in our area as the economic regulator, very broadly speaking, the legal responsibility is with the water and waste water companies, particularly the waste water companies clearly, to effectively drain their areas, and it is our duty to ensure that they do that. That is clearly not an absolute duty in that it is countered or softened by issues where there are severe events, but our job is to ensure that the companies do that to the appropriate standards, that customers receive the service they pay for, and that is done in the most cost efficient way, and that the bills of customers in particular reflect only the amount that the companies need to spend in order to achieve that. That is broadly speaking where our responsibility lies.

Q489 Chairman: In the report on the floods in Hull last week there was a suggestion that your powers to look specifically at drainage systems should be reviewed, and that is not surprising bearing in mind what happened in Hull. How do you react to that observation?

Ms Finn: I think the report is not explicit as to how, and I think first we need to take account of the recent events that did happen, and I think it is common cause that we have seen exceptional weather and an exceptional event and that we all have something to learn from that. One thing we can learn is that the water and waste water system in many cases was quite resilient to what happened during the summer and that the system worked quite well, so there were more than 600 sewerage assets affected by the floods but the vast majority of those recovered quickly and effectively, and customer service was not significantly interrupted.17 Similarly a number of water treatment works, apart from the Mythe Treatment Works, were affected by the floods and were shut down and service to customers was not affected, so the first thing to do is to learn about what went well and effectively as well as what we can do to improve the future. Particularly in relation to drainage and flooding we already have quite a strong role in relation to protecting customers from flooding by sewers. There is a significant programme in place, for example, in the current five-year investment period by the sewerage industry, 1.2 billion is being invested in protecting and reducing the risk to customers from sewer flooding; we take that very seriously. That money is being invested and being done on a risk based assessment, and being done by identifying where customers are at risk and ensuring that is the work that is prioritised and done, and we do have the power to enforce that and are enforcing it. Companies are carrying out that investment to the required level, and notwithstanding that it is terrible for anybody to suffer sewer flooding really, it is an awful experience and we want to reduce it as much as at all possible, since 2001/2 the number of properties at risk from that have reduced by half down to 0.03 per cent at this stage. We need to go further and investment is earmarked to do that, but the system is in place to

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17 Note by witness: The 600 sewerage assets: over 300 Sewage Treatment Works and over 300 Sewerage Pumping Stations.
ensure that we can address these issues, and a lot has been done successfully. What we need to do with all stakeholders now is to look at what the effect of the exceptional events that we have seen is and what that means for the future.

**Q490 Chairman:** But how are you going to conduct that fact-finding activity that you have just described?

**Ms Finn:** From the point of view of the future we have a role, along with a number of other stakeholders that you have already heard from, and we will play our part in that, but our particular role is to look to investment for the future and how that should be targeted and best be spent and used by companies to protect customers. In doing that our role is to assess what the companies bring to us in their business plans and to ensure that the right investments are made each five-year period when they come to us looking for price limits to be set, and what we are working on is developing an appropriate analytical framework that will allow companies to take a systematic look at, in particular, critical infrastructure, the degree to which there is a probability that that critical infrastructure might be more vulnerable than we may have thought, the degree to which there is a likelihood that that critical infrastructure might be affected by any future weather events and the impact, crucially, of anything that might happen to that infrastructure, and thus allow companies to prioritise what is the best area in which to invest and then to set out and evaluate the options for achieving the best results and apply a cost benefit analysis to ensure that the things they do are cost beneficial for customers. So that is part of our role that we will be playing.

**Q491 Chairman:** Obviously at that particular stage it is quite difficult for you to comment on how water companies have used the investment monies that they, if you like, had your approval for in the current spending round, because that is a done and dusted job, and we are not far away from you starting the process all over again. But one of the characteristics of that process which concerned me was the almost seeming horse trading that went on. Companies lobbed in huge bids at the beginning, you had a Secretary of State direction letter, you looked at that, you looked at their bids, and roughly halved them, and there did not seem a great deal of logic in what you were doing last time in coming to a conclusion. It was how far can we go so that the customers can bear it versus the demands of the company for what, in an ideal world, they wanted to invest and spend. Now, you have talked a lot about looking at things and learning lessons and doing cost benefit analysis. Are we going to have a more structured approach as far as the 2009 review is concerned to cut out the horse trading and try and get down to a bit more objectivity?

**Ms Finn:** You will understand I would not necessarily agree with your analysis of the last review—

**Q492 Chairman:** But you thought there was an element of truth in it, did you not? I could see you smiling!

**Ms Finn:** What I would say is that in planning for the 2009 review we are very conscious of the need to take a long-term approach to this sector and ensure that we plan for not just the next five years but for the next generation of consumers of water and waste water services and, indeed, the water environment. We have already required all the companies to develop a 25 year vision, a strategic direction statement of how they are going to do that, so we can set the business plans within that longer term framework when we evaluate what they need for the five years. Other things we have introduced or built on from previous reviews is the need to use cost benefit analysis across all of the investments that the companies propose, that is something we are proposing to use in PR09 more widely than last time, which will allow the best solution and not just the obvious solution, and I think one of the particularly interesting things for us is to see how we can take that longer term view and make sure that companies invest, as your previous witnesses were saying, not just in the short term but for the longer term future to protect customers, so that is a new direction and a new approach in how we are dealing with this.

**Q493 Mr Drew:** On the issue in Gloucestershire as you are aware we are meeting tomorrow in a private setting but I think it is fair enough that I rehearse the arguments. The degree of ill feeling towards the way that the floods were coped with by Severn Trent was not because they did not try of their best eventually, and I took that up with them last week when they gave evidence to us, but they were unable to secure a supply of fresh drinking water through the first two weeks of the post-flood crisis, and it was felt locally that there should be some reccompense, not in the sense that there was a great demand for bills to be just eliminated or huge compensation to be paid to individual householders who were without water for much of that time, but that there should have been something given in terms of monetary support as a statement to people who had suffered quite badly. Now, as you know, Severn Trent decided they would absolve themselves of their debt, if you like, to the population by the £3.5 million payment to the Gloucestershire flood fund, and we wrote to you subsequently, as you know—when I say “we”, Parmjit Dhanda, MP for Gloucester, and myself wrote to you—to say this was insufficient and this was a neglect of their responsibility, yet you supported them in what you thought was a reasonable gesture. Would you re-think that now given that, with the benefit of hindsight and even what Severn Trent said, the level of suffering that people had to endure was such that some greater statement of responsibility should have been made by the company? What are your feelings now with respect to that?

**Ms Finn:** Firstly it was clearly a terribly distressing situation for people to be in, to be without a piped supply of water for that period of time, although the supply of bottled and bowser water was put in place and was a huge operation, clearly. We are conscious that there are statutory obligations on the company through guaranteed service standard regulations...
which are put in place by Defra\(^ {18}\), but they are not absolute and the company is right in saying that in severe or exceptional weather events it is not obliged to pay statutory payments that it would otherwise have to pay if customer supplies were interrupted, so that is fact. One of the very interesting things is that we have been working closely with the Consumer Council for Water as it carries out research with customers in the area, and unquestionably individual customers have suffered significantly, and there seems to be a strong view among customers that rather than compensation directly to them their key concern and focus is that the company rectify any weaknesses in its system and invest to ensure that this does not happen again. That is where customers would like to see most effort going. Certainly it is Severn Trent’s responsibility to pay for the clean-up and fixing the assets and repairing what happened and customers’ money will not go towards doing that; that is something that the company has to bear. It is a matter for Severn Trent as to what, if any, gesture it wished to make to the community, and it did make a gesture of paying £3.5 million or making £3.5 million available. There is no obligation on them to directly compensate customers, and the view that we have received so far from customers is very much that on aggregate they would most like to see the system being made secure which brings us back to the key issue of identifying critical infrastructure, because Mythe was a critical piece of infrastructure, a single point of failure, where a lot of customers suffered, whereas with other water treatment works that went down customers could continue to be served by alternative supplies, and that is the focus customers wanted to see Severn Trent focusing on.

Q495 **Chairman:** What is the definition of ‘exceptional’?

**Ms Finn:** Exceptional weather events are not clearly defined and that is something that is part of the focus for the future. You have heard other people say this, I think, but we need to evaluate what ‘exceptional’ means, and certainly the 1:150 event that happened this summer was exceptional in any 150 years. We need to consider whether standards are changing or we need to evolve standards around what has happened this summer, but in the case of Severn Trent what we would be reluctant to do would be to ask the company to do something that the majority of its customers are saying is not the primary thing they want the company to do; they want the company to focus on investment to ensure this does not happen again. So we think there is a significant challenge to Severn Trent to tackle this.

Q496 **Mr Drew:** Where do you get your evidence from in terms of knowing that, because that is not what my constituents are saying to me?

**Ms Finn:** I fully appreciate that individuals will have different views; that is absolutely right.

Q497 **Mr Drew:** I am talking about whole communities.

**Ms Finn:** We get our evidence from work that the Consumer Council for Water has done, both qualitative and quantitative research with focus groups.

Q498 **Mr Drew:** Did they hold any sessions?

**Ms Finn:** Yes, a number.

Q499 **Mr Drew:** I hope there were more there than at the Severn Trent session because I had to persuade the chairman of my parish council in the area it was being held to go to it, and we doubled the numbers, so it was not a great success in terms of going out to listen to the public because the public did not know about it.

**Ms Finn:** I think the research did have enough people to make it valid. Certainly we had Ofwat team members attend it as well, but it was attended by enough people for it to be valid.

Q500 **Mr Drew:** Could we see that? Would you send us the evidence?

**Ms Finn:** Yes\(^ {19}\).

Q501 **Chairman:** Can I ask for clarification? You have numbers in terms of the type of events that you sanction investment for in terms of, for example, sewer investment but, in terms of protecting the infrastructure to which Mr Drew has just been referring, are there any statutory or factual obligations in terms of what kind of weather event water companies should be securing their assets against?

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18 Note by witness: The GSS scheme is encapsulated in statutory instruments which are sponsored by Defra as the responsible Government department.

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Ms Finn: The simple answer to that is that there is not a clear standard across the board for everything. There is a risk-based approach, particularly around the sewerage network, to ensuring that service to customers.

Q502 Chairman: Sewerage, yes, but I am talking about the other assets. 

Mr Hodgkin: The answer would be no. Their asset is next to a river and it is a question of the river flood defences.

Q503 Chairman: So are you going to be asking water companies to refine this approach in light of the lessons learnt?

Mr Hodgkin: We are going to ask companies to go through an analytical process which we are developing for them which first starts with identifying critical assets. We have spoken about the Environment Agency flood map; 57.6 per cent of water assets appear at risk of flooding on that map but not all are critical in the sense that if they were to flood there would be an impact on the service. The first task is to work out which of these assets are critical in the sense they are at risk of flooding and that if they flood there is a significant impact for customers. The second stage is, once such an asset has been identified, to identify options for addressing that and those options could crudely be building a wall around the asset or they could be improving the resilience of the system by increasing interconnection between water treatment plants and systems, so that if a plant were to flood it could be supplied from another source. The third step is then to evaluate those options to ensure that companies select options which offer the best value for money for customers. That is a process which we will put in place so companies can reflect and include that in their business plans for the next price review period.

Q504 Paddy Tipping: You have already talked to us a bit about sewer flooding, and that was helpful. In your evidence you said it would be too expensive to bring the sewers up to date or renovate them to cope with this summer’s events. That is right, is it not?

Ms Finn: That is fairly accurate. We are talking about an extensive legacy network nationwide; this was a 1:50 year event and redesigning the entire sewerage network to cope with that type of event would be enormously expensive and may still not achieve the best results.

Q505 Paddy Tipping: So what should we do? As you said, having the sewage in your house is pretty appalling. What is your perspective for the future?

Mr Hodgkin: There are two ways of answering that. The first is to recognise that the issue is sewers are for sewage, if I can put it that way. The fact is that they are designed for a purpose and a lot of the problems arise when we have uncontrolled rainfall entering sewers, so one issue is how to manage rainfall into sewers, and I think you touched on that previously in terms of sustainable urban drainage systems which could play a role there. More specifically, as you know there are no set standards for the sewerage system but a standard has evolved of 1:30. We do facto maintain that standard through our focus on sewer flooding, so we require the companies to maintain registers of properties that are at risk of flooding, either 1:10 years or 2:10 years, and then we fund the companies and, as we said earlier it was £1.2 billion in this price review period, to focus on the highest risk of flooding properties to reduce those numbers, and those numbers have been reduced to approximately 7,300 properties at this point.

Q506 Chairman: That is a 1:10 year event?

Mr Hodgkin: No. These are properties that have a risk of flooding either once in ten years or twice in ten years. So we are trying to get the companies to focus on the pinchpoints in the sewerage system and focus on reducing sewer flooding through those mechanisms, rather than spreading the same amount of money thinly over the entire sewerage system which would not offer such good value for money for customers.

Q507 Paddy Tipping: So £1.2 billion in the present price review period. Just speculating forward, would you expect to see that increase in the next period? The reason I ask is that there is a view around that we have very high water quality standards, and we are making marginal improvements on them and it costs an awful lot. Would we not be better putting that investment into the sewer system?

Ms Finn: The total capital programme for this five-year period is 16 billion. Of that £1.2 billion is specifically related to sewer flooding, another £2.2 billion is related to the maintenance of the sewerage network, and there are different priorities in the water and waste water sector, including maintaining drinking water quality, including environmental quality—and the environmental quality programme is quite significant—and under the Water Framework Directive there is a challenge to Defra, to Government, and to water companies and ourselves as to what investment will be needed over the coming three five-year periods to meet the obligations we have under the Water Framework Directive, and at the same time over that period we will clearly need to be planning for the future that involves adaptation for climate change and mitigation. So there is a balancing act to be had here. What is important for us in the longer term framework for planning here is that we want companies to look at the long term, at all of the demands on the services that they provide to their customers, and to choose the most cost beneficial ones and use economic tests that will deliver the best benefits for customers for the least costs across the total package. So there are a lot of challenges to balance all of those in the future.

Q508 Paddy Tipping: I guess I am saying that, if you put in more money, the balance ought to change in the direction of sewers?

Mr Hodgkin: The increase on the sewerage system in this period is 17 per cent, so a significant amount of money is going in that direction already. One can always spend more, I guess, but the focus on cost
benefit analysis is to try and ensure that money is spent where it delivers the value that customers are willing to pay for.

Paddy Tipping: You told us a minute ago that sewers are built generally to a 1:30 year standard, but river flooding is 1:75. Why is there that disparity? Would it make sense to equalise it a bit?

Q509 Chairman: Who chooses which one you are going to have?

Mr Hodgkin: The sewerage flooding standards have developed over time, and all new sewers are built to a standard for adoption which specifies a 1:30 standard, but it is very difficult because even if you start with a 1:30 system once you start adding things on the capacity of the system changes —

Q510 Chairman: But why 1:30? Why not 1:50?

Mr Hodgkin: We did not choose 1:30; this is my point. It has grown up over time.20

Q511 Chairman: Somebody must have made a decision at some stage to have done it. How did it come about?

Ms Finn: It is a voluntary standard agreed by the industry, and if you remember this industry has come from being a state-owned provision of a service and evolved into a private industry, and through industry associations and groups this standard has been developed, and we effectively enforce that by our flooding risk management approach. So it has been used as a de facto standard and that is what it is built to in future. So it has not been chosen specifically, but what is important from our point of view is what is the level of service that is delivered to the customer by that 1:30 planning standard. We think, of course, that what 1:30 means may change over time, particularly as we see the sort of events we have seen recently, so there is a question in the future as to whether and how that has changed for future planning purposes. But in relation to the flooding we had in the summer, many of the assets did cope quite well with that flooding. For example, small sewage treatment works were allowed to flood but the effect of that was very diluted, they recovered very quickly, particularly the smaller ones using natural processes, and services to customers were not affected, so it is not necessarily inappropriate in those circumstances. The particular focus we need to think about is where the assets are critical, and therefore we might want to protect them to a higher standard.

Q512 Chairman: It is quite difficult, with all these different weather event probabilities, to rationalise because from the water companies’ point of view they are not going to exactly rush to get the numbers changed to a higher number because that means potentially more expense and potentially lower returns to their investors. They are going to always err on the side of caution, are they not?

Ms Finn: I do not think that is necessarily the case. We do think all stakeholders need to work together to get this right but there is an argument that says water companies would be incentivised to build bigger and larger assets because they make a return on their significant capital base which would be a different incentive from the one you have suggested. Because of the multi stakeholder nature of this issue and the number of parties involved there is a need to work together, and particularly to work with the scientific community to help evaluate these standards and how they are changing over time.

Q513 Chairman: How precise is the investment? We had a paper which our expert advisers put to us that said that in terms of picking the right size of pipes to fulfil these standards it is a bit haphazard and that people can over-engineer because there is not a pipe that exactly meets the 1:30 year standard so they spend more on a bigger pipe and some people might go under on a smaller pipe. Is it hit and miss or is it precision?

Mr Hodgkin: It is not really our area of expertise but there is the Flood Estimation Handbook produced by an engineering consulting company, which is widely accepted in the industry as the guide for how you translate a one-in-whatever standard into an engineering configuration based on modelling and simulation, and no doubt there are errors or variances around the results that come from that. But, to be honest, that is not our area of expertise.

Q514 Chairman: One thing that still concerns me in terms of development is the seeming ability for anybody to hook up to an existing sewer system. We do not seem to have a point at which somebody says—and this is important against, first of all, the extra housing which the Government, understandably, wants to build with all the implications that has not just for infrastructure but also for run-off—"Stop, you are overtaxing the system".

Mr Hodgkin: Currently there is a right to connect to a public sewer and we think it is appropriate for that right to be looked at again. At the moment, as you say, developers do not face the full costs in terms of the loading they are placing on the system and that influences the decisions they make, be it SUDDs or other options for dealing with drainage. So we would encourage and welcome a review of that.

Q515 Chairman: And that is a review to be undertaken by the Government?

Ms Finn: Yes. We suggest that there is an opportunity to consider this along with a wide range of measures in the context of the development of the Government’s water strategy because this is exactly

20 Note by witness: No statutory standards are set down for the frequency of flooding from public sewers and there is no absolute requirement for no flooding from combined sewers and surface water drains. Where a developer provides new sewers for adoption by the sewerage company, the water industry guidance contained in ‘Sewers for Adoption’, published by WRC, is frequently applied to ensure new public sewers are designed to a minimum standard. This guidance includes the requirement that the sewer should not cause flooding at less than 1 in 30 rainfall events. This is in line with a similar requirement in European standard BS EN 752 ‘Drain and sewer systems outside buildings’.
the type of thing that we think should be considered and would feed into choices, not just by water companies but also by developers, as to the best infrastructure and drainage system to put in place for a new development rather than the automatic right to connect to a public sewer.

Q516 Mr Williams: In my experience some of the problems with flooding appears to be surface water that gets into sewerage systems. Have you any targets for the different water authorities for solving that problem and segregating run-off water from sewerage?

Ms Finn: We do not have targets but I think you are right, as was mentioned earlier, one of the significant issues this summer was the amount of run-off and water going into the sewerage system, and it may well be that one of the possible solutions in the future is how to divert that water rather than just build bigger sewers. We were mentioning earlier that we are asking companies to develop long-term plans to look at how they propose to manage this and to use cost benefit analysis to come up with the best option and not necessarily the obvious one. So before the next price review period and before companies submit their business plans to us we are going to develop an analytical framework to help them consider these issues and prioritise and make choices around what is the best investment, precisely around those issues. Clearly it may well vary from area to area. We heard earlier about the issue between sometimes the local nature of this compared to one-size-fits-all standards, and we think companies need to tackle this in their areas to make sure they get the better choice for their customers.

Q517 Mr Williams: I often advocate to Welsh Water, which is a not-for-profit company, that instead of paying a dividend to its consumers they sort this problem out first, because most consumers would rather have these problems sorted out than a six monthly dividend. Is that something that Welsh Water could address?

Mr Hodgkin: It is worth saying that all the companies have been asked to prepare 25 year strategic direction statements plotting out, if you like, their vision for the company and how they will develop service for their customers, and I would say all of them have set themselves fairly stretching targets on things like sewer flooding, so none of the companies is complacent on this issue. All are committed to driving it down and some are reducing it altogether. It is very much on their minds.

Q518 Mr Drew: Going back to Gloucestershire, and this is borne out by the evidence from Gloucestershire Constabulary in particular, in the immediate aftermath of the flooding crisis when it was obvious the Mythe was going to go, it is fair to say that Command turned to Severn Trent and said “What’s Plan B?”, to which the answer was “There isn’t one”. With that experience, how seriously do you think water companies in general and Severn Trent in particular take their obligations under the Civil Contingency Act and indeed the Security and Emergency Measures Direction?

Ms Finn: In both of those areas we are not the lead agency.

Q519 Mr Drew: But you should be monitoring how they performed.

Ms Finn: The standards that the Civil Contingencies Act and the SEMD measure, the ones that the companies are required to comply with, are not ones that we set, but we have funded all the companies to meet their obligations in terms of bottled water and bowser. Clearly, as I think you have heard from Severn Trent, the scale of the failure in this instance was beyond their plans under those particular provisions, and that leads us back to the issue of the critical infrastructure, the probability and the impact of that one piece of infrastructure going down not being anticipated. So there are issues about protecting the critical infrastructure in the future. The SEMD measures in particular are designed in relation to potential terrorism impact, and our view is that the kind of resilience and investment and infrastructure protection issues we are talking about because of natural disasters or weather effects do not necessarily sit with SEMD, because the SEMD is quite closed—naturally—and secret for obvious reasons. We think this future work in terms of resilience, because of weather impacts, needs to happen more transparently so it can be enforced and supervised as the companies develop their plans to cope with it.

Q520 Chairman: Could I close by asking you a question about who will pay in future? In our last report in this area we obviously acknowledged the challenge of water poverty, and whatever anybody says it is going to cost more in future for water and sewage services to be rendered; whatever you think about the water standard side of it there is going to be more expense. Given also there is quite a differential around the country about the state of the system and taking into account the potential that extreme weather events are going to become a regular rather than irregular part of life over this 25 year scenario, is it right that we maintain the current pricing formula that sees individual water companies effectively visiting upon their customers whatever costs are incurred in meeting their forward plans, including taking into account extreme weather events, or is there a need to think of another model where you say that 10 per cent—and I pluck that number purely for illustrative purposes out of the air—of future investment is going to be required to proof the system against extreme weather events so we have to deal with that in a collective fashion, whereas there are other types of investment, the replacement of breaking down sewers, new water systems, curing leaks—all the other things—which, if you like, pertain to a particular company’s area? Does the current formula make an easy bedfellow for these potentially high levels of spending, or do we need another model?
Ms Finn: There are two aspects there. One is the more general flood defences for society as a whole, and certainly our view as the economic regulator would be that water customers should not be asked to pay for that; that the costs borne by water customers should reflect the efficient and fair costs of ensuring that those water and waste water customers receive a service that they are willing to pay for. That is the broad equation that we would see as being fair and equitable. I think the issue of water poverty is a separate social issue, and it is an issue for the United Kingdom as a society, and there is a question as to whether or not issues around water poverty should be dealt with like fuel poverty or through the benefit system or mechanisms like that. So our view broadly would be that the investment needed to protect the continued service to water and waste water customers should be funded by water and waste water customers to the degree they are willing to pay for the services they receive, but that water customers should not bear the costs of extra work outside of what is delivering the service for them.

Q521 Chairman: That is a very interesting statement but it is going to be quite difficult to define the difference, if you like, between what I would call the normal service of delivering and taking away waste water and the protective element that has to be built into the system to cope with potentially more extreme conditions. You counselled us that, if you like, the norm has grown up on 1:30 year events; you counselled us that a massive rebuilding of our sewer systems might not be the best value for money, but it is clear that there may have to be some expenditure over and above the norm of keeping the system turning over to cope with potential extreme weather events, and what I cannot quite work out is how we are going to differentiate in the future about who pays for what under that kind of scenario?

Ms Finn: I would caution against an automatic assumption that there has to be a huge leap in investment in the infrastructure. I think there is a job for us all to sit down and critically appraise what infrastructure needs to be protected, prioritise it, and figure out how much it will cost and then test whether customers are willing to pay for that level of protection, and I would not jump to the assumption that that would be huge. I think we are at the stages of developing the framework to get the industry to do this critical evaluation, and we need to see what the impact of that would be before making any assumption around what it would do to bills, and I certainly would not assume it would be a massive hike.

Q522 David Lepper: Are you confident that, within the timeframe that we have here of 2009 for companies submitting their proposals for the next five-year period, the kind of work that you have been describing to us this afternoon can be done by the water companies? I do not mean the capital work being carried out; I mean the planning, et cetera.

Mr Hodgkin: Insofar as water companies are responding to the changing challenges arising from global climate change this is a long-term issue, and maybe it would be wrong to rush in and commit to capital works in the first five years without having thought through a lot more about what really needs to be done. It is the beginning of a long-term programme. But it is worth remembering that in this event the vast majority of the sewerage system was very robust and resilient. There were occasions where critically focused assets, in this case pumped drainage of sewage, caused issues, and they need to be addressed. The Mythe flooding was, if you like, a river flood defence issue. There are issues of resilience but we are not looking at the whole sewerage system and saying the whole system is not fit for purpose.

Q523 Chairman: Thank you very much indeed for a thoughtful contribution. I am sure when it comes to looking at what you are going to be doing about pricing in 2009 the Committee may want to probe you further on that, but against this background this session has been very useful. So thank you very much indeed.

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**Supplementary memorandum submitted by Ofwat (FL 111a)**

During my appearance in front of the Committee on the 28 November, I agreed to send the Committee a copy of the research carried out by the Consumer Council for Water’s (CCWater) on the views of Seven Trent’s customers following the outage of piped supplies at Mythe water treatment works during the flooding this summer.

Please find enclosed the first of two customer research reports conducted by Accent on behalf of the CCWater.21 This report is based on qualitative research and, given the limitations of such research, CCWater are following this up with a second report, based on quantitative research which will be published in due course. We will send a copy of the second report when it is available.

If there is any further assistance we can provide please let us know.

Regina Finn
Chief Executive
Ofwat
December 2007

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21 Not printed. Available at: http://www.ccwater.org.uk/upload/doc/Final.doc
Wednesday 12 December 2007

Members present

Mr Michael Jack, in the Chair

Mr David Drew
Patrick Hall
Lynne Jones
Dan Rogerson

Dr Gavin Strang
David Taylor
Paddy Tipping
Mr Roger Williams

Memorandum submitted by Richard Benyon MP (FL MP 13)

Thank you for your letter of the 24 July. I am delighted that the Committee will be looking into this important issue when the House returns. There are a multitude of unanswered questions, with which I am wrestling, but I do believe there are two areas that need looking at. I concede that they may take your remit away from the precise area of interest with which the Committee is concerned.

The first is, the impact of planning decisions on flood risk. Much has been said about building in flood plains, but I am principally concerned with the impact of in-fill developments. I can find no evidence of any survey that attempted to calculate the loss of “green” areas in our towns and villages. There has been much debate in Parliament about the definition of “brownfield land”, which includes gardens. It is this policy that has seen a great number of in-fill developments in and around towns in West Berkshire. When you add to this the propensity for tarmac drives, patios and decking, the resultant loss of ground to soak up storm water is an important factor.

The second area of concern is the way in which the Environment Agency manages our river systems. In the floods on Friday, 20 July, the villages of Eastbury and Great Shefford on the River Lambourn and the village of Bucklebury on the River Pang, flooded because of weed congestion in small chalkstream downland rivers. The inhabitants of these villages and others that have suffered similar experiences in the past, ask why these river systems are not kept clear of weed to allow flash flood water to follow the river bed and avoid the flooding of so many houses. The Environment Agency points out that, had these rivers been cleared in the way that they were in the past, a severe head of water would have been created, causing much greater flooding lower down. This is of little comfort to the communities I mentioned above. If it is an accepted policy by the Environment Agency to slow water in this way, surely it must be necessary to create flood release schemes such as bunding or storm drainage channels, which allow water to escape when these flash storms occur, particularly in summer months. I am more than happy to provide more information on this if it would be helpful.

I look forward to seeing the Committee’s report.

Richard Benyon MP
Newbury
July 2007

Memorandum submitted by the Rt Hon David Curry MP (FL MP 12)

I am grateful to the Chairman for his letter of 24 July concerning the Committee’s future inquiry into flooding.

Two issues have been raised by events in my constituency.

The first is the disconnection between formulating flood relief plans to the point at which everything is ready for implementation and the implementation itself. In Ripon the flood defence scheme for the rivers Skell and Laver was approved four years ago. But the Environment Agency’s assessment of risk means that this scheme does not go ahead because its score is not high enough. If the score is high enough to justify the preparation of a complete scheme how can the score then not be high enough to justify its implementation? It is very difficult to explain to the people whose homes have now been flooded twice within seven years, and have been on the verge of flooding on a number of other occasions, that their case is important enough to plan for defences but not important enough to put them in place.
The second issue flows from the first one. The Environment Agency has a scheme of prioritising risk. It is about to introduce a more sophisticated programme. I think the Committee could very helpfully look hard at the prioritisation process and the factors which are included into it. There will always be “once in a lifetime” events but there are plenty of cases around the country of communities exposed to persistent risk and of installations like electricity substations in vulnerable areas which justify a hardheaded analysis of the whole process of prioritisation.

I hope this is helpful.

Rt Hon David Curry MP
Skipton and Ripon
August 2007

Memorandum submitted by Martin Horwood MP (FL MP 02)

Seven questions resulting from the aftermath of the severe flooding event in and around my constituency:

1. Why did critical facilities such as the Mythe pumping station and the Walham electricity substation not have adequate flood defences in place?

2. Why, when we had nearly a week’s notice of the rains, were those homes and businesses at risk of flash flooding still not protected with sandbags or diversionary trenches?

3. Why has so much damage in Cheltenham happened on uphill areas where culverts and drains seem to have been poorly maintained making brooks and streams normally a few inches deep rise up to 15 feet to inundate nearby homes?

4. Why have houses in the centre of Cheltenham been flooded twice in a month when our brand new flood alleviation scheme costing £23 million was supposed to protect against a once in 100 year flood?

5. How will the government and the insurance industry respond to those people whose houses have never flooded before but who now face falling house prices and spiralling insurance premiums?

6. With climate change promising many more events like this, will the government rethink its plans to plough ahead with hundreds of thousands of new homes on Greenfield sites in flood risk areas like Gloucestershire regardless of the environmental impact?

7. Ofwat have already conceded that the loss of water supply was beyond Severn Trent’s control, meaning that they will not be liable for compensating those customers who went without water. I would like to know how they have reached this decision before the review has taken place. It is not impossible to conceive that Severn Trent might have been able to prevent the inundation of the pumping station, in spite of the unprecedented nature of the floods. Those in charge at the Walham electricity substation were able to do this, for example. Is the Ofwat decision therefore not a little premature?

Martin Horwood MP
Cheltenham
August 2007

Memorandum submitted by Laurence Robertson MP (FL MP 08)

Thank you for your letter dated 24th July regarding your Committee’s inquiry into flooding.

I am pleased that your committee is to look into this matter and I should be pleased to help in any way I can.

For now, as requested, I enclose some ideas which my Assistant had compiled. If you need any more help or clarification please do not hesitate to get in touch.

Headings for inquiry

1. Flood Defence by:
   a. The EA
   b. Local Authorities
   c. Riparian Landowners
   d. House Holders
Why not dredge the Rivers, should there be stiff penalties for non maintenance of ditches, drains and watercourses. Does EU regulations for farmers and set aside policies make matters worse, and should farmers in floodplains be exempted? Why are not drains adopted immediately, and any faults rectified and billed to developers afterwards.

Why are developers allowed to tap into existing drains, which are unable to cope with the extra demand.

Is the EA too big to deal with often localised issues of this nature, do their own policies conflict, ie conservation and defence. Is the balance of policies correct?

Why flood defences were not kept on site or close to instead of miles away, and thus prevent installation. Keeping the Public Informed.

How have the public authorities and media both local and national coped and kept local people informed. Are flood warning systems adequate, why telephone messages, why not as in Lincolnshire sirens.

Did the projected flooding as per EA models match with the actual? If not why not and what lessons have been learnt?

Does top down planning from Government and the regions ignore the serious issues of floodplains and washland area, will current proposals in such areas make matters worse? Is flood alleviation plans the right way to deal with such things?

2. Emergency Response

How did the local authorities cope? Will regional control authorities make matters worse? How did individual councils cope with such things as water distribution. How did Parish Councils cope? What lessons can be learnt, about having very localised emergency planning as part of a wider county/district framework. Why was the response of Severn Trent so inadequate at the beginning when the water went off? Why was the Army only called in after the situation had become untenable? Have the utility companies got adequate emergency plans in place, how do they co-ordinate with the government local and national? Why did they give wrong information on the website as to Bowser locations, and indeed give out that bowser were in place when they were not. Why did they not give accurate information as to parishes, eg Twigworth as being city centre when not even in the city? What lessons did they learn about vulnerable people, health provision etc. In some cases vulnerable people were unknown and went without for periods of times. Were plans made to ration water to prevent some from being greedy, ie emptying bowers to keep businesses open and deprive vulnerable people of basic drinking water?

3. Infrastructure

What lessons can be learnt about the fragility of major infrastructure plant such as water and power, and not being part of a national network. Did the authorities have plans in place early enough? Were/are the authorities fully aware of potential issues and do they have plans in place? Should the national network for electric/water be able to be “trunked” in order that if one part goes the system will still supply an area with minimum disruption? Why did the M5 come to such a halt, and caused extra problems for the emergency services and therefore put lives at risk?

RECOVERY

Does the Belwin scheme adequately deal with such emergencies? What support do small businesses get? What about the uninsured who cannot get reasonably priced insurance because of where they live? What other packages could and should be put in place to help an area recover quickly?

Laurence Robertson MP
Tewkesbury
August 2007

Memorandum submitted by Angela C Smith MP (FL MP 07)

Many thanks for the request for input into the terms of reference for the Flooding inquiry.

The experience in Sheffield was devastating, of course. Many of Sheffield’s watercourses are fed by rainfall from the Peak, and indeed the river Don itself has its source in the Peak. At the moment the blanket bogs of the Peak are badly degraded by pollution, over-grazing by sheep and drainage work. The net impact of this is ecological failure, with the bogs unable to hold water as they should. Consequently, this water comes down off the Peak District hills into the rivers, etc.
It is of course true that the rainfall of early June was such that flooding was probably inevitable in Sheffield, but it is the view of many that the severity of the flooding would have been reduced if the blanket bog of the Peak had been in better condition. If you like, nature's own defences failed because of their degradation at the hand of man.

I would like the committee to look at this issue. I know that DEFRA are co-funding work to restore the bogs with water companies such as United Utilities, now is the time I believe to press home the need to prioritize programmes such as this because of their contribution to effective water management.

Hope this helps

Angela C Smith MP
Sheffield Hillsborough
August 2007

Witnesses: Mr Richard Benyon MP (Newbury), Rt Hon David Curry MP (Skipton & Ripon), Martin Horwood MP (Cheltenham), Mr Laurence Robertson MP (Tewkesbury), and Ms Angela C Smith MP (Sheffield, Hillsborough), gave evidence.

Q524 Chairman: Good afternoon ladies and gentlemen and welcome to a further evidence session in the Committee's inquiry into flooding. Between now and whenever this session finishes, or four o'clock when we anticipate that there will be a vote, we are going to be taking evidence from some of our colleagues in the House whose constituencies were affected by flooding and who were kind enough to send in evidence to the Committee. May I formally and for the record welcome Richard Benyon, the Member of Parliament for Newbury, David Curry, the Member of Parliament for Skipton and Ripon, Martin Horwood, the Member for Cheltenham, Laurence Robertson, the Member for Tewkesbury, and Angela C. Smith, the Member for Sheffield, Hillsborough. Colleagues, what we plan to do is to ask each one of you if you would be kind enough to speak for, say, five minutes and give us the benefit of your thoughts. I know that you were kind enough to send in some written evidence, and I am sure, on both what you have to say and on the basis of the written evidence that you have sent in, we will then ask you some questions. In the case of Richard, I know that you have to go in a little while, so I am going to start with you and then just run down the table and ask colleagues if you would be kind enough to make a short presentation to the Committee. Richard, would you like to start?

Mr Benyon: Thank you, Chairman. I will be very brief. My constituency experienced the worst flooding in the south-east on 20 July. Around 2,000 houses were flooded in my constituency. In the small unitary authority of West Berkshire, which looks after about 144,000 people, just over two and a half thousand homes were flooded in all. There were two distinct types of flooding that affected this area. Firstly, there was surface run-off, overwhelming drains and flooding into houses, and, secondly, there was impeded flow in small chalk streams in the Berkshire Downs which affected four or five villages in that area. Very quickly running through the areas I would really hope that your Committee might be able to look at, Thatcham is a town of around 20,000 people sitting in the Kennet Valley just to the east of Newbury. A huge quantity of rain fell that day—you are all aware of that—but it fell sodden fields to the north and on a ridge to the north of the town, and it ran off that, down roads, through gardens and just overwhelmed the drainage system.

The drainage system was completely unable to cope, and I think there is an issue with companies like Thames Water. Thames Water is an issue here in Thatcham but also in Newbury, where I spent a lot of time on the twentieth with families who were being flooded. The drainage system was completely unable to cope, and, I think there is an issue with companies like Thames Water. They go in there and deal with it when there is a problem but I do not think there is an on-going maintenance programme which is able to help with these situations, and I might come back to that very quickly. There is another issue relating to soakability. We have built over our towns, we build over gardens, we are infilling on precisely that hill I was just talking about above Thatcham on estates that were built 15 years ago, the local authority is being overruled on planning applications that have been refused and we are still building in gaps. Roofs and tarmac driveways are now adding to this problem, and I think this is a major issue. There is also the issue about who owns the problem: whether it is Thames Water, the local council and in one case Network Rail is responsible for the culverts that could possibly have blocked and caused some flooding in certain areas, and, of course, there are local community issues. I had a school in a village called Aldermaston that was flooded by this sort of service run-off and 10 years ago they had suffered similar flooding and the headline in the local paper said, “Aldermaston suffers once in 2,500 year floods.” Ten years later the same thing has happened. We need to know how to live with these floods as well as mitigate them. Finally, to deal with the impeded flow issue, the Pang and the Lambourn Valleys are down and chalk stream river systems, both SSSIs, and have management plans which are a mystery to me, frankly. The Environment Agency requires levels of weed growth to be left, for environmental reasons, but this, undoubtedly, caused flooding in these villages. The local communities on some occasions
took those matters into their own hands and cleared the river themselves, and the water level in their houses dropped immediately. We have got to sort out with the Environment Agency who is taking responsibility for this. If they are going to have these environmental requirements on the whole river system, particularly around villages such as Bucklebury, Stamford Dingley, Eastbury and Lambourn and Great Sheffield in the Lambourn Valley. These places are where people live, these are their homes and they have to understand that environmental factors have to be balanced against people’s needs in the houses in which they live. I could go on and talk about my dealings with the Environment Agency on this and what the community, particularly the community in Bucklebury, have done, which I would urge your Committee to look at. There is a very good website—I will give you the details—showing a very proactive approach which involves assessing the cause of the floods, producing a high-level design solution and trying to implement the scheme working with partners such as the Environment Agency and the local authority. I will come back and answer any questions you have on those matters, but that is a very quick gallop through a really awful experience for thousands of people in my constituency, and there are a lot of lessons that can be learnt and that must be learnt from these experiences.

Q525 Chairman: Thank you very much for giving us such a dramatic word-picture. I think some of the most beautiful named villages are now seared into the parliamentary record as a result of what you have said. David.

Mr Curry: Chairman, I would like to focus on ways in which we can accelerate the flow of funding to schemes and the timescale for schemes, and I take as my example the flooding in the Ripon, which sits at the confluence of three rivers: the Ure, the Skell and the Laver. In 2000 the Ure and the Skell flooded 43 properties—so nothing like the scale of my colleagues but for those who live in them dramatic—and three peaks of water passed through the village. On 14 and 15 June 2007 more than 70 millimetres of rain fell in a 12-hour period, 96 millimetres in 24 hours, which is one month’s average rainfall, and 142 millimetres in 72 hours, and this was a week before the big floods in South Yorkshire, so we were the sort of aperitif for the main course! Flood warnings were issued to 350 properties out of 442 which were registered to receive warnings, but some of them did not receive a warning because the river which was flooded was not the river which was expected to flood at the end of the day; so 40 properties and businesses were flooded. Then, one week later, the big floods hit South Yorkshire, and Ripon escaped, literally, by half a millimetre from its third flooding experience, as the Environment Agency calls it, within seven years. The flood frequency prediction for Ripon has moved from a 100-year flood to a 75-year frequency, and this has lifted our priority score from to 17.3 from 16.3, and this is the nub of the issue. A flood relief scheme was approved in Ripon in 2004, consisting of flood walls and an upstream dam. It has got planning permission, it has got a cost to it—£11 million—but because Ripon’s score is only 17, it has no chance in the foreseeable future of being carried out because the score needed to trigger schemes is around 30 at the moment, and the score is based on economic return—that is properties and businesses spared—some environmental factors and the feasibility of the scheme. Ripon now sits at number 160 in the list of Environment Agency schemes and, of course, higher priority schemes can come in at the top, not just at the bottom. So the people of Ripon who have had these experiences (and some houses are still evacuated as a consequence of it) know that there is a recognised risk, know that there is a scheme to deal with it, know that the scheme has got planning permission but have not got the faintest idea when it will happen. What can we do about it? Could local contributions advance the project? Local authority parish rates, for example, or regional flood defence committees. Just to give you an indication of that, the Yorkshire Regional Flood Defence Committee last year levied the rate of 34p per Band E property per year. This yielded £518,000. You could hold a precept at below two pounds per year for a Band E property and still raise three million pounds. The biggest levy in the country, just out of interest, was Wessex, at £2.92p.

But the problem is that none of this makes any difference at all because local contributions do not influence the Environment Agency/Treasury calculation of the priority of the scheme or the eligibility of the scheme and, what is more, locally raised funding through council tax or precepting authorities counts against the capping totals. So there is not only no incentive to try to bring local funds to address the problem, there is a positive disincentive to try to bring local funding to address the problem. Will it change? The answer is hopefully. The Environment Agency is intending, from next spring, to introduce what it calls “outcome measures”, which would permit local contributions to influence the cost benefit ratios, which themselves would trigger the public funding. So if Ripon could “find” contributions towards its scheme, the Environment Agency contribution would reduce, its value for money would increase and we would stand a chance of moving up the league table of eligibility. Ripon is the second oldest city in the country, but it is still a parish council constitutionally. It does not have the resources to make more than a token contribution. The yield of 1p on a Band D property in Ripon is the magnificent sum of £65.92, and so you would have to be pretty heroic to raise the sort of sums which would make a meaning, but larger conurbations could certainly raise significantly more funds from a relatively modest increase in the council tax. So, we do need local funding which is raised by councils or by precepting bodies (and the regional flood relief agencies are also precepting bodies);
they must fall outside capping purposes for recognised defence schemes for which planning permission has been obtained, which would limit the eligibility to schemes which are capable and ready to be taken forward immediately. So you could envisage a package of contributions being put together, something from the local council, something from the regional flood defence committees and perhaps use a business improvement district mechanism to raise funds from business to deal with specific schemes. That would increase the value for money, it would improve the score and it would be for schemes approved and with planning permission. We have been flooded twice in seven years and, as I said, escaped a third time by a millimetre and yet there is no prospect of the present scheme being implemented that I can see in the immediate foreseeable future, unless we can tap new forces of funding which both lower the Environment Agency cost and improve its scores. Even in areas which could not lever in funds themselves readily, the fact that other areas might be able to do so would (a) help them and (b) would help us in that it would get schemes accomplished higher up the league table from us and give us a better chance of getting our scheme done. So, I hope, Chairman, you will find, by the constructive contributions, possible ways in which we might be able to accelerate funding into the schemes, not only for those who are relatively precept rich, as it were, but for other areas well.

Q526 Chairman: Thank you very much indeed. I was interested that you identify that the magic number in this case was 30 and not 42, as in the Hitchhiker’s Guide to the Galaxy.

Mr Curry: That comes from my local environment. I contacted my local Environment Agency offices in preparing this and that is the number they gave me.

Q527 Chairman: Excellent. Thank you very much indeed for that very positive contribution. Martin. Martin Horwood: Cheltenham is, I suppose, a little different from some of the other places that you will have seen on the TV in Gloucestershire, because we are actually on relatively high ground. We are just nesting beneath the Cotswold Hills. It is very scenic, but it meant that there was a crest of hills around the town, all of which fed flood water into the town; so we had flash flooding and surface water flooding but we did not have the kind of scenic standing water for reporters to stand in while they did their reports. We were flooded twice. On 24 June, the Environment Agency tells me, we had a once-in-80-year flood event. On 20 July we had, variously estimated at a once-in-120 years to once-in-330 years. Broadly speaking, we had two and a half months’ rainfall in just over a day, and that was an enormous quantity. It was above the specification of the other interesting feature of Cheltenham, which is our brand new £20 million flood alleviation scheme, courtesy of the Environment Agency. That was only designed to cope with a once-in-100-year flood, so in a sense you could not have expected it to cope with what happened on 20 July, but it did not actually entirely cope with what happened in June either, and well over 100 properties flooded in the centre of our town due to weaknesses in the design of the scheme. Having said that, it is right to recognise that, had that scheme not been there and hundreds of thousands of gallons of water not been held back, the devastation in Cheltenham would have been much greater, but it does point out, from a budget point of view, that just because a scheme has been completed it does not mean to say all the money has already been spent, because there may be refinements to these schemes. Once tested in real life, they may have to have more money spent on them, and there are various places where the Environment Agency has accepted more work needs to be done even in Cheltenham, where we have already spent a lot of money. We had two crises. We had the initial flooding, which although it was rapid devastated the town just as much as it would have done if it had hung around, but we also had the water shortage. I am going to treat those separately, because there are different questions to be answered on each. In terms of the basic flooding, I think the Government does have some questions to answer about critical infrastructure, which I know you have already talked about on the Committee, about the kind of house-building issues that have been referred to by colleagues already, and I endorse those, about the adequacy of the overall flood defence budget, which I would agree with the ABI in saying is inadequate, and about clearing up this tangle of legal responsibilities for who maintains especially things like culverts and the minor streams as well as the main rivers. The most extreme example I had was a long culvert, which runs for about a mile underneath various housing estates in Cheltenham, where I was seriously told that ultimately the responsibility for maintaining that culvert lies with each household that lies above it, which is clearly a complete fiction in practice, and the Environment Agency and other authorities simply step in when they feel the community need is great enough; and we need to clear up that legal tangle and, I think, act on the Making Space for Water report in 2005, which said you need to give clear responsibility to one agency, and I would say the Environment Agency is the one to give it to. There are some issues for the Environment Agency, particularly in its liaison with the Met Office and how specific and useful the flood warnings it gave in advance were, because we seemed to have a lot of advance notice of the July flood—we were getting the flood warnings for about a week—but nobody realised they were going to be on the scale that would devastate us in the way they did. The main issues, I think, are around the response of Severn Trent. I know they have already been before you, but I think you perhaps let them get away a little lightly. In terms of the response to the crisis, the critical thing that they failed to do was to let Gold Command in
Gloucestershire know in sufficient time to do what National Grid did with the Walham Substation, which was to warn Gold Command and Gold Command basically brought into the Army and protected that critical piece of infrastructure, not with much time to spare, but they protected it. Severn Trent, essentially, according to the combination of their report and the constabulary’s reports to the Pitt Review, really called in a fire appliance to pump water out but never let Gold Command (which had been convened on the Friday) know until nine o’clock on the Sunday that they, in fact, had lost the Mithe Water treatment Works. They had actually evacuated it at six o’clock that morning and they only told Gold Command at nine o’clock, three hours later. There are reports in their submission to the Pitt Review of their local staff being worried about the flooding, and they kept on phoning the Environment Agency to see how high the water levels were going to go but they never actually joined up the dots, and I am afraid in a couple of other respects it does rather imply that they had not got their resilience and their emergency planning sorted out. As David will know from his constituency, the distribution of bowisers was patchy at best. They missed out entire parts of Cheltenham. Bowser hotlines were set up. There was a bowser that was still there in one of the central shopping streets in Cheltenham in mid August because, clearly, Severn Trent did not realise it was there, and I think there were weaknesses. To be fair to them, it was an event on a scale that they perhaps could not have predicted, but their response did not seem to me to be very adequate, and they did not even supply people with ten litres of water a day. I was a volunteer on water distribution duty and I was handing out strictly ten litres per person. Since the bowisers were at that stage largely empty, they were not meeting that ten litre target. The blame game with respect to the Mithe is quite important, because Severn Trent had used the fact that there were circumstances beyond their control to escape from the Guaranteed Standards Scheme, which is supposed pay compensation at a set rate to anyone who loses water supply. They have claimed that circumstances were beyond their control and so they do not have to pay that money, and Ofwat, in advance of all the results of the inquiries, of your inquiry and the Pitt Review, has let them off the hook. I actually think that is very wrong. I think there are, at the very least, questions to be asked about whether they were really responsible for the loss of water supply and they should not have been let off the hook so quickly.

Q528 Chairman: Thank you very much indeed. I cannot think it will have done you a lot in the popularity stakes to see that you were “Mr Nine Litres”!

Martin Horwood: We were all told, very strictly, that we could only hand over nine litres. It was interesting. The volume of water actually, nine litres, was quite adequate in the sense of drinking water, and there were houses in Cheltenham, to be honest, that had gallons of water for months afterwards. The problem was the amount you needed to flush the loo. If we had all had rain water harvesting and perhaps access to less clean water, it might have solved some of those problems a bit faster.

Q529 Chairman: The water hoarders can now come clean, and we will move on to Laurence Robertson.

Mr Robertson: Can I thank you for the invitation to give evidence. I am very pleased that the Committee is carrying out an inquiry. If I may, I would like to go through it in three stages: what actually happened in Tewkesbury, where we are now and where I think we need to go in the future. It was very interesting. In June there was actually quite a bit of flooding in my constituency, and I visited people who said, “We have lived here for 40 years and we have never before been flooded”, and it struck me as being very odd. There were areas of the constituency which flooded all the time but not to this scale; there were areas which flooded in June which had not flooded before; and so when we collectively say the rainfall in July was a complete surprise, I am not entirely sure that it was, given what had happened earlier the previous month. As everybody knows, there was tremendous heavy rainfall on 20 July. One of the very quick, clear, noticeable things was the mobile network went down pretty quickly. Everybody is obsessed with their mobile phones these days, including me. It was not actually possible to use them after a certain time. People were stranded in council offices, in their own offices, on the motorway. People actually slept on the motorway; some people stayed in the pub or the hotels where they were, which was probably the preferable option but not necessarily what they would have chosen. People had to start being rescued. Part of the hospital in Tewkesbury was evacuated and the town of Tewkesbury became cut off, as everybody saw on the television screens across the world in fact. Other areas, as well as Tewkesbury town, were affected, which form part of my constituency. Some people’s gardens actually collapsed into rivers, 350,000 people lost their water supplies across the country, we almost, as everybody knows, lost the electricity supplies and, in fact, some people in my constituency did lose the electricity supplies for about two days. The Emergency Services, the Armed Forces, the councils and very many volunteers got involved in distributing bottled water. It was a very successful operation. The bowisers operation was impressive but not quite good enough. There were not enough bowisers quickly enough and they were not filled frequently enough. Nevertheless, there was a tremendous effort. The sort of tragic story, though, in Tewkesbury is that three people lost their lives as a direct result of the flooding and possibly some more as an indirect result, but three people actually died as a result of the flooding. Where are we now? People are still living in caravans on their own.
drives or they are otherwise displaced from their homes. I think the figure is in excess of 800 in my constituency, which is quite a lot of people, and as we get towards Christmas it is an awful situation, and I am told that they will be displaced for probably another three or four months yet, or even slightly longer. Business in the town of Tewkesbury has been affected badly, of course. People get the impression that it is like New Orleans and it is not open for business. It is not that bad, it is recovering, and the shops are open, but they are suffering and continuing to suffer because of the effects of the flooding. It is a very long process getting insurance assessments, getting the building work done, of course. We are involved in trying to get the drains and the ditches and culverts sorted, which is a massive job, and one of the fears for the future is will people who have been flooded or live in the area be able to get insurance at all and, if they can get insurance, will that mean inflated premiums? Anybody living in the GL20 post code area is seriously worried about the future with regards to getting insurance. What about the future? I would like to put forward one or two suggestions as to how we may avoid similar difficulties in the future. Obviously Tewkesbury, sitting on two rivers, is going to flood sometimes—people accept that—but I think there are things we can do which make things better or at least reduce the risk of a very bad effect from heavy rainfall in the future. I mentioned about clearing ditches and drains and repairing culverts. We are having great difficulty establishing who is responsible for what. It could be the Environment Agency, it could be the Highways Agency, it could be the county council, it could be the borough council, it could be the riparian owners, and I suspect that the reason we are finding difficulty in identifying who is responsible is because, when it is identified who is responsible, they actually have to find the money to fix these things and they are all complaining that they do not have the money to do that work. What I really think we need to do is form some kind of agency, maybe a new agency, which has an overarching responsibility for these kinds of problems. I have to say (and this is not the first time I have said this, I have said this for many, many years), I believe the Environment Agency is an inadequate agency. I think it either needs more powers and more responsibility and possibly more money, but if it is to be left as it is, I really do not see the point of its existence. It is not a good agency to deal with and I think it has showed itself to be very ineffective over this issue and many, many other issues. I think we have to look where we are building houses. There are a number of examples I could give in my constituency where we have built houses and either they have flooded, or they have caused the water to go into other estates where they, in turn, have flooded. One particular housing estate is not quite finished yet and it flooded and there is a proposal to build another 100 houses on that site. That in itself is bad, but it would also have to link into the existing drains and sewage system, and I really do shudder to think what would happen if that goes ahead. There is an appeal on the desk of the Secretary of State at the moment for a project at Longford in my constituency. Part of that land flooded, the access road flooded, and yet the Environment Agency has withdrawn its objection to building on that site for 600 houses. The Regional Spatial Strategy is proposing something like 8,000 houses just north of Cheltenham and just north of Gloucester, the very areas that are vulnerable. This simply cannot go on. We had a very, very good performance from the Tri-Service at Quedgeley, but there is a proposal to regionalise part of that service. I hope that does not happen, because they were able to respond straightaway, they knew the local politicians, they knew the local people who deal with water and electricity and so forth, and it was really a great advantage, the fact that they could work together locally, so I really do hope that is retained. We need a priority list of vulnerable people and vulnerable buildings should such an occurrence happen again. I myself stumbled across a number of people, old people, people who were disabled or in wheelchairs, and number of us had to literally push them out of their premises in wheelchairs. The water was coming through the floor. We could not get ambulances because they were evacuating the hospital and yet that building did not appear on anybody’s radar screen. Goodness knows what would have happened to those people if we had not stumbled across them. I do not say that to bull myself up in any way, Chairman—a number of other people did similar work—but it was just a matter of coming across these people who were in very difficult situations. We also need, of course, to protect the Mithe Water Treatment Plant, which is just down the road from where I live, and, indeed, the electricity substation at Walham. Both sites now have HESCO bastions, which are another two words I had never come across before the flooding, but as well as protecting them I think we need to network the system so that, if we have a situation like this again, electricity can be obtained from elsewhere and water can be obtained from elsewhere. I think it is very important that we do learn these lessons, because although people say this is just a once-in-a-150-years flood or 100-years flood, firstly, how do they know that and, secondly, we are forever, and probably quite rightly, talking about climate change. Does that mean that it is going to happen next week, next year, ten years’ time? We do not know. I do not think we can assume that we will not see rainfall like that again. Can I finish, Chairman, by very briefly paying tribute to the Emergency Services and the Armed Forces, the media, who did a tremendous job, Tewkesbury Borough Council, the parish councils and very many individuals who worked so very hard. It was actually the biggest peace-time operation in Britain. As I say, my constituents know they live in a vulnerable area but what is of primary concern to them is that the lessons are learnt. That is what we are talking about today. We
owe to it those who died; we owe it to those who worked so very, very hard; we owe it to those who are still displaced from their houses to learn those lessons.

Q530 Chairman: Thank you very much indeed. I do not think anybody will ever forget the very dramatic pictures of Tewkesbury when it was cut off. Thank you for filling in some of the detail behind those unforgettable pictures. Angela.

Ms Smith: Thank you, Michael. I would just like to take this in two parts. First of all, I would like to talk about the nature of my constituency in order to explain why the flooding in Sheffield took the form of a raging torrent rather than a static flood, as we saw in some other places, and, secondly, to draw attention to one or two other things that I think need to be done. My constituency is in the north, north-west of Sheffield, which was actually the source of the flooding in the city, and 55–60% of the land mass in the constituency to the west is in the Peak District National Park, so it should come as no surprise to find out that there are ten reservoirs in my constituency, I think about nine of which are in strings across, feeding three of the rivers or, in effect, by three of the major rivers in the area. I have got half of Howden Reservoir, which neighbours Tom Levitt’s High Peak constituency. The electorate is concentrated on the eastern flank of the area, which should not surprise anyone, and, as a result of this, the majority of the population live very close by to moor land such as Broomhead, Howden and Bradfield, so it is characterised by urban density and surrounded by Peak District moor land. The River Don rises at 1,500 feet in the Dark Peak and flows through Penistone, then Stocksbridge in the Upper Don and then flows through the city and on bordering the Lower Don Valley with Rotherham. The river is fed, as I said in my letter, by a number of tributaries. The Porter, or Little Don, which I omitted to mention in the letter, is one of those, and the Ewden and Loxley are two others. As I have said earlier, they all feed a series of reservoirs and flow into the Don as it moves into what has been described as a deeply entrenched course through its steep, wooded upper reaches, and it is the very wooded, steep nature of the valley and of the Ewden Valley as well and the Little Porter in the Don Valley, which helped to create, I think, the conditions which we saw in Sheffield that terrible Monday evening. Sheffield, of course, built its industrial strength on the basis of the sheer power of its rivers, including the Loxley, which flooded in 1864. The Loxley flooded then in the course of two or three hours. Twelve hundred homes were flooded, not just in my constituency but across the city, and a thousand businesses were affected, including Corus steel works in my area (and Corus’s move back into profitability, I think, has been delayed because of the flooding, quite frankly), Georgia-Pacific, a paper-making plant at Oughtibridge and Hillsborough Stadium—Sheffield Wednesday is a business at the end of the day—went under six foot of water. Lots of jokes went around about how Wednesday were probably better at water polo anyway than they ever were at football, but we have got over that one as well, as you will all be aware. What do we need to think about for the future? I think the point made about the better co-ordination of the management of the waterway courses is a good one. Whether it is the Environment Agency that should take that overview role, I would not like to say. I think that

12 December 2007 Mr Richard Benyon MP, Rt Hon David Curry MP, Martin Horwood MP, Mr Laurence Robertson MP and Ms Angela C Smith MP
is for the Committee to make a judgment on. All I would say is that, whoever agency takes responsibility for co-ordinating the management of our waterways, it needs to have the necessary powers to do the job. I think that is the critical point. My understanding is that Yorkshire water, for instance, works to a different standard to the Environment Agency. That is not good enough. Yorkshire Water is incredibly important to my constituency. You would expect me to say that, with ten water storage reservoirs. It owns a lot of the land in the area. It is incredibly important that the utilities are made to work to the highest possible standards and that the agency responsible has the power to deal with that. Sustainable urban drainage systems, I think, have to be a part of the way forward. The problem in Sheffield was not the state of the gullies in the end. We thought it might be, I think everybody in all the areas thought it might be, but actually the drainage system had been maintained as it should be; it just could not deal with the amount of water that fell over those two occasions and, in a sense, whichever drainage system you used, we may well have had a problem that weekend anyway because the rain was so unprecedented. Nevertheless, I saw rivers forming outside my house, my home, down the sides of the valley. It is a very steeply sided city. We have seven hills, numerous steeply-sided valleys, seven rivers in our city. Sustainable urban drainage systems have to be part of the answer, because I do not think traditional drainage and sewerage systems can deal in the long-term with the new climate that we appear to be having to live with. Catchment: the catchment for Sheffield, as I have explained, is the Peak District, and nature’s natural flood defences are the blanket bogs for our area. They are not working as they should do, and I do believe that Defra is going to have to commit properly to funding programmes that will help to restore the blanket bogs to their proper function. It is not just about reducing flood risk—I accept that the incidence of flooding may only have been reduced if the blanket bogs had been working properly—but they also work to help absorb carbon, so they could play an important part in helping to reduce carbon emissions in the atmosphere. I have read somewhere that the blanket bogs of Britain absorb more carbon than all the forests of France and Germany. That is a pretty incredible statistic. I really do feel that the softer end of our flood defence system needs as much attention as the provision of more hard flood defence on our river banks and so on. I think it is an equally important consideration. Finally, economic development. I have mentioned 1864. I have just found out today that the last recorded big-scale flood of the River Don was in 1536, when it effectively arrested the progress of an armed Catholic rebellion against Henry VIII. You may want to thank him for that or you may want to thank the River Don for that, or not. On a serious note, what I am trying to say is that the fact that we have had one major flood this year, probably for the first time in three or 400 years, is worthy of attention. Does this mean that we are going to have this flooding at this level more frequently now, or is it just a one-in-two, three, four-hundred-year event? It is very difficult to judge, but I do not think we can afford to take the risk of assuming that it is a rare one-off event; I think we have to prepare. Most of Sheffield is developed on the valley floors. It puts before us some very difficult choices, because if we do not continue our economic growth in terms of redeveloping brownfield sites on the valley floor, if we do not take account of our increasing population by making good use of brownfield sites, then we are going to have to build up the sides of the valleys and on the tops of the valleys, and if you do that, we are encroaching on our open spaces, our green spaces, our green belt. They are very difficult choices and I do believe we have to make the best use of developing design solutions. I have read about some of the design solutions that are being applied to South Yorkshire now, and I really do think we have to look at these issues properly, on a case by case basis, taking note of the advice of the Environment Agency. I do not believe, however (and I will finish here), that the Environment Agency can be given a veto over planning and economic development. I do believe that if the Environment Agency are going to have a major say on planning decisions, it needs to be on the basis of a very rigorous set of criteria and that they need to be able to justify any of their objections to planning applications on the basis of absolutely rigorous evidence that they can justify in front of a planning board and in an appeal process.

Q531 Chairman: Thank you very much indeed. Richard, I know you may have to depart.

Mr Benyon: I naively stuck to my five minutes. I must learn better that MPs never stick to the time. Can I leave you with one vignette?

Patrick Hall: Could I ask a question?

Chairman: You can ask him a question, but he might want to give his vignette as well.

Q532 Patrick Hall: I was interested in the comment about aquatic vegetation in streams and rivers, because it reminded me of the practice of maybe 30 years or so ago when river authorities used to regard rivers and streams as an open drainage channel and they stripped them bare of vegetation, of shallows, of islands and all sorts of things that give us biodiversity, et cetera. I was very interested in the comments that Richard made about residents taking action themselves to clear aquatic vegetation from a flooding river or stream. That would be quite telling evidence, because the Environment Agency today denies that its policy towards biodiversity actually contributes to an increased flooding risk. I have checked that point, it so happens. The Environment Agency says that changing the old practice to what they would say is a better practice does not increase the risk of flooding. You have got evidence that intervention by residents has led to an instant reduction in
floodting. I could ask, though, how on earth did these people do that? How did they have access to whatever length of river? How did they get into the water? How did they remove the vegetation? What did they do with it in order to get this dramatically improved effect? That is evidence that the Environment Agency must, surely, have.

Mr Benyon: I was disappointed when we raised this at the meeting with the Secretary of State in the Moses Room two days after 20 July. The reaction of Barbara Young when I told her this—a number of MPs talked about this sort of thing—she put her hands over her ears and said, “I am not hearing this. I do not want to hear this.” This is people’s homes. In Bucklebury 22 out of 24 homes were flooded. The water was pretty static in the residents’ sitting rooms. They went down and, with a neighbouring farmer with a JCB, they literally just cleared the weed which had blocked the river, which was about six foot wide and was running about two foot because of it. I forget the name, it is not ranuncules, which is what you want, it was the other thing that fishermen do not want but conservationists do; there is a bit of a conflict. Anyway, that disappears in the winter; it is a summer weed. They cleared that, and it instantly dropped. That is in the Pang Valley. Another village, Eastbury in Lambourn, had precisely the same experience. The issue is that the Environment Agency produce work gangs which come and clear this in accordance with a protocol which has been agreed. That protocol has slipped and these work forces are under threat. Some of these villages are putting together working parties who want to learn from the Environment Agency what they can and what they cannot do, and that is an on-going process, but the experience of the people in villages such as Bucklebury is there to be seen on their website—I will give you the details. If I could leave you—

Q533 Chairman: Your vignette.

Mr Benyon: Yes. Mr and Mrs Campbell-Murray, who live in Craven Road, at the convergence of three drainage systems, have been flooded three times in as many years. If you stand and look at the Edwardian street scene, you will see that interspersed into that street scene are modern, infill developments and you have an Edwardian drainage system trying to cope with a 21st century, much more congested street scene. The point is that Thames Water will look at it, have looked at it and any day now are going to come back and say whether or not they are going to do something. It is entirely up to them whether they do something, and that is my first point. They are a commercial organisation and can make a decision: “This is too much money. We have got other priorities.” The second point is that Thames Water (and they would try and make this point to you, I know) are not statutory consultees, as I am sure Severn Trent and other water authorities are. When it comes to large housing developments, I think they should be statutory consultees. Can I leave?

Chairman: Thank you very much for that. Paddy Tipping has caught my eye.

Q534 Paddy Tipping: I just wanted to comment about the priority score, the ranking that occurs. It is the case, is it not, that big urban schemes, because of the number of properties involved, are always going to get priority over smaller villages and hamlets. David, your solution was to build partnership schemes. The other way of doing it would be to tackle the criteria, and one way you might do that is to look at the proportion of houses as part of the settlement that is liable to flooding. It seems pretty clear to me that a lot of rural communities who are in danger of flooding under present schemes are never going to get any work done.

Mr Curry: I agree completely. The reason why I focused on trying to find a way of accelerating the flow of cash in the schemes is because I recognise that in Ripon 40 odd properties flooded on both of the flooding events compared with Sheffield, Doncaster and South Yorkshire. Nobody is suggesting that we should be bumped ahead of that. The problem is that there is sufficient risk both to have a scheme and to get planning permission, and people cannot understand that, if the risk is there, and if it mattered enough to put something place, why does it not matter to it do it? As you say, quite rightly, there are two ways of doing it. One is to revise the criteria and, indeed, the Environment Agency is doing that—we are getting the new schemes—but as far as Ripon is concerned our best hope, it seemed to me, was to try and assemble a package, and the Yorkshire Regional Flood Defence Committee at the moment has got a precepting power and precepts literally a third of a loaf of bread a year per Band D household. It could even be less than that, given the price of wheat at the moment. I do not exclude individual businesses—Wolseley, in my constituency, was severely affected in the floods of the year 2000 and might be willing to make individual contributions, the local authority through business improvement district schemes may be in a position to be able to make a contribution, but none of this will work unless that money is accepted as a way of improving the priority, because it releases funds for the Environment Agency and so gives it a bigger bang for the buck. Knowing that this is a self-contained scheme in Ripon, and the remedy is agreed by everybody and not in dispute, it seemed to me the sensible thing was to try and find a way in which we could make it feasible for the Environment Agency to get the scheme done by lowering that £1 million cost before inflation starts sending it upwards again. The capping criteria is an important element to that.

Q535 Mr Drew: If we are to make a recommendation to our sister committee or Department for Communities and Local Government regarding what areas are inappropriate for development now as a result of
the possibility of more regular flooding, what sort of things should we be saying to them? We have got Angela’s point that there should not be a complete ban on development, even in flood risk areas. My Gloucestershire colleagues may have some slightly different views on that.

Martin Horwood: If you take the flood risk areas, I have got one in Lakeshaw—they are actually in Laurence’s constituency but it is right on the edge of mine—where we have an application outstanding for 360 houses on an area that was under water in July. The thought of those houses’ insurance premiums is enough to make you go pale, I should think, and they may even, in fact, be unsaleable because the ABI are clearly threatening that, unless enough flood defence work is done, they may be withdrawing insurance in some respects from flood defence. They point out that it is a fairly unusual thing that British insurance covers flood defence. So, clearly, I think planning has to respond to the floods but, as we all know, the nature of the regional spatial strategies that are being handed down from DCLG via the regional authorities to local authorities in Gloucestershire, are, if anything, putting the numbers up now after the floods, not putting them down, and that cannot be right. Somebody must stop and think about this area of research, where these sites are being looked at and whether it is still appropriate to have the numbers that are being handed down.

Q536 Chairman: Am I not right that local authorities in that context have got to identify the land areas that are suitable for housing as part of this process?

Martin Horwood: No, the regional spatial strategies define the areas of search for new housing; so local authorities can try and challenge, but they do not actually have the right in the end to turn that round.

Mr Robertson: I think the RSS is area-specific, not necessarily site-specific. The problem is, when companies take the issue to appeal, again it becomes out of local hands. To answer Mr Drew’s question directly: “What would you recommend?”. I would recommend that planning should be a local matter and not a regional matter, and if the local council build on a flood plain, they are democratically accountable, at least, whereas the RSS is not democratically accountable. We have to build policy on philosophy. If the philosophy is to build in safe areas, it means that when a decision has to be taken sometimes the answer to the developer has to be, “No.”

Q537 Chairman: David wants to come in on this, and Angela as well. We have got a little bit more time before the vote, we have got about another 15 minutes, so do not panic. David.

Mr Curry: Can I make a suggestion for a couple of bits of joined up government. We discussed a planning bill earlier this week in Parliament. A planning bill provides for infrastructure levy. There is an opportunity there to say that no development can take place unless it is associated with adequate infrastructure measures which protect it from flooding. The Government has moved away from the planning gain concept—that is now a roof tax to all intents and purposes—enshrined in a 106 agreement, so not just a site-specific thing like for social housing, which would be the characteristic one for a site-specific scheme, but for the broader infrastructure measures which, it will insist, will be new infrastructure. So that is one element. Another bit of joined up government which would help is when Defra does its environmental schemes for farmers. At the moment if a farmer’s land is flooded, his first cry is, “How quickly can I get the water off this land?” What we want is for him to say, “How long can I keep this water on the land to stop the run off?” So, if some of the environment schemes were tailored to water retention, that might take some relief, and that goes back to a point about the bogs, it goes back to the moor land, which is a great repository of water, and so the more we can get the land to retain the water, the more control there ultimately is. It is not entirely outside government control.

Ms Smith: On that point, one of the stumbling blocks in terms of schemes to put farmers funding into that kind of work rather than the stray Pillar 1 cap funding is Ofwat. Ofwat object, or have objected, to schemes in the Peak District, and their objections have been overcome because the utility companies are involved in the investment and they do not see that as good use of water customers’ money. I do. It has an impact on water quality as well, it improves water quality, and I think Ofwat also have to be brought more clearly on board. I do not think I said entirely that I think we should just build in flood risk areas, David, we have to be sensible about this, but for the record, what I said was that it has to be on a case by case basis, and infrastructure and designing to cope with risk is an important part of it. In fact there was a scheme announced today in Rotherham, South Yorkshire, which is a partnership between a private enterprise, the Environment Agency, and Yorkshire Borwood for a 1.5 million office project which involves a big contribution from the property developer towards dealing with the flood risk. That is potentially a way forward: the involvement of the private sector and the public sector and coming up with the design solutions necessary in order to enable us to get round some of these issues. Incidentally, in Sheffield we are not experiencing this insistence that the regional spatial strategy overcomes any local consideration of where and where we should not build. That is not the case in Sheffield. The local development framework is being developed locally in consultation with local people. I have had my say on that and, if it works properly, it should actually be people at a very local level who have a major input into what is decided for a particular area.

Chairman: Right.

Q538 David Taylor: I think for most of us the most enduring picture that we carry in our minds of these floods is the one at Tewkesbury with the abbey?
Mr Robertson: The abbey stood out strong.

Q539 David Taylor: Myself, David Drew and James Gray went as a sort of advance guard of rapporteurs to Gloucester and we went to Tewkesbury and, as we were leaving Tewkesbury, I vividly recall seeing a sign, something like, “Come and visit our river view” or “Riverside development”. You talked earlier on about having planning decisions taken more at a local level. Do you know the development I am talking about and how many of the newer developments in your town, your constituency, were built in the teeth of opposition from the town council, the district council, even the Environment Agency’s advice? Do you recall?

Mr Robertson: Some of them go back a while. The one that I am referring to, I think, is possibly the one you mean, at Bredon Road, as far as I know was a council decision. It is an area which was built on what was previously allotments. When I say things should be decided at a local level, I am not for one minute suggesting that every decision taken locally is the correct one, it may not be, but if it is taken at a local level, the local people have a chance to influence that decision. I think, the one you are referring to on the Bredon Road, there is now an application to build another 100 on that site, which, yes, overlooks the river. The difficulty now is that, but there are alternatives as well, of permitted development: people tarmacing over their front gardens, making space for the car rather than making space for water, and I wondered whether you had any thoughts whether there ought to be changes in permitted development? For example, if you wanted to tarmac over a soft area, then that would require planning permission, and space for the car would only be permitted without planning permission if it did incorporate sustainable urban drainage!

Q540 David Taylor: A final question, Chairman. Were there any or many more recent developments in Tewkesbury that were flooded where you have the opportunity to go back and see what the Environment Agency had to say about the flood risk and whether or not they ever urged a refusal on the grounds of flooding or operational issues?

Mr Robertson: That one is the most obvious one. There are another couple of developments called Stonehills-Wheatpieces which in themselves did not flood, but if they had been green fields they would have soaked up all of the water which went onto the nearby estates at Priors Park and Newtown where people are still out of their houses. I have raised this with the council. I have had the response, “It did not flood. There you are; it is okay to build there.” To me that is complete nonsense. The water just goes somewhere else. The water gets deep, and that is the point.

Mr Horwood: It is important to emphasise that flood plains are not the same as flood risk, and it is probably the same in Sheffield, but where we were flash-flooded, sometimes there were very dramatic examples. There was one at Brookvale in Charlton Kingsley, in my constituency, where the stream is normally about an inch deep and it turned into a 15 foot deep river, it returned to the natural course of the river, and in the meantime houses had been built on the path of that river and gardens had been culverted over the original brook. So it is about intelligent planning, even on uphill areas, as well as on flood plains, and we just need to get much smarter about this.

Ms Smith: I think your point, Lynne, is well made. In my area when I talked about the river forming at the side of my house, it is in a very recent development, it is a brownfield site, but it does already contain quite a large area of green space and woodland. What has been suggested is that they may plan wet woodland as a means of draining the water off more successfully, and it is a problem in that it is very steep either side, but I think as well, when we are talking about whether or not people should be allowed to tarmac or concrete over their soft green spaces, I tend to think that, if there is an established problem in an area with drainage, maybe we ought to seriously consider that, but there are alternatives as well, such as the use of gravel, which allows the water to sink through and allows the water to be
permeated and pollutants taken out before it joins the water system. So there are other alternatives as well which still allow us to create the spaces necessary for people to live their everyday lives without necessarily becoming draconian.

**Q542 Lynne Jones:** How do you ensure that people opt for such measures rather than perhaps the cheapest measure, which is just getting somebody to tarmac over their drive?

**Ms Smith:** That is where the planning law comes into effect. I think planning law always has to be flexible and—

**Q543 Lynne Jones:** Apparently the consultants who drew up the consultation for the Government on permitted development recommended that one of the options should be that planning permission should be acquired if more than 50% of a porous area was to have hard-standing on it. But the Government rejected that suggestion and it did not even see the light of day.

**Ms Smith:** I would be sympathetic to more consideration of that, but I do think the planning always has to be as flexible as possible when looking at local circumstances as well. Whether or not the same guideline would be the right one, I could not, obviously, give an opinion on.

**Mr Curry:** Chairman, that would quite a big battle to pick, because the whole spirit of the planning bill which is now in front of us is to have far fewer decisions passing through local planning authorities and to give much greater discretion. One can understand the reasons for it. The Committee, I am sure, is aware that it would be sort of counter-cultural, given the sort of mood at the moment.

**Q544 Patrick Hall:** I am struck by the sentence in David Curry’s brief presentation that reads, “If the score is high enough to justify the preparation of the complete scheme, how can the score then not be high enough to justify its implementation?”

David, can you just run through the process that applied in Ripon? Who asked for the flood defence scheme and who then agreed to prepare it and pay for that preparation? I gather it got planning permission and then along comes the Environment Agency to risk-assess that approved scheme. Your sentence implies that the Environment Agency was there at the beginning to say, “Okay, let us go ahead and prepare it?”

**Mr Curry:** That is right. Who asked for it? The answer is me, I think, but that was hardly a stroke of brilliant political intuition given that I had umpteen houses flooded. I talked to the Environment Agency, they agreed that a scheme needed to be prepared, they drew up all the plans, they were subject to all the usual consultations in Ripon, it achieved planning permission and, of course, planning permissions only last for a certain number of years, we must remember, but they also attribute a score to their own project. I can understand that they need to have schemes ready to be moved into the programme as the funding becomes available; the difficulty is we are now about to embark on our fourth year and almost a millimetre away from our second flood since the scheme was originally prepared, and that is a difficulty. So the Environment Agency both prepares and scores the scheme, and it is the Environment Agency which, because it adjusted the productive frequency of flooding, then increased the score but only from 16.3 to 17.3 and at least the information regionally is that the score of about 30 is what would put you on to the sort of real shortlist. Given what has happened in the southern part of Yorkshire, one simply cannot foresee that happening without something changing the equilibrium.

**Q545 Patrick Hall:** Resources will always have an influence, but are you saying, David, that in terms of flood risk the Environment Agency accepted the merit of the case to prepare the flood defence scheme?

**Mr Curry:** Yes.

**Q546 Patrick Hall:** But then, in terms of assessing priorities, in terms of the resources available, it did not score highly enough; and that was purely a resource-based assessment rather than a flood-based assessment?

**Mr Curry:** The assessment in terms of the score is based upon economic factors, environmental factors and factors of feasibility. The feasibility, by definition, poses no problem because the scheme has been prepared, but the element of properties affected, a relatively smaller number in Ripon compared with South Yorkshire, relatively few business affected, keeps it relatively lower on that score sheet. The only way we are going to move it up the score sheet is to make it easier for the Environment Agency to carry through that scheme within a finite volume of resources.

**Q547 Patrick Hall:** But it is using its limited resources to prepare a scheme that it knows it cannot implement?

**Mr Curry:** Yes, it is.

**Martin Horwood:** Can I say, the economic case will start to change with climate change. The Environment Agency gave us evidence on the Communities and Local Government Select Committee that once-in-100-year floods could be happening once every three years by 2080, based on the Foresight Report. These numbers start to become meaningless in a while, but for these floods this summer I think the insurance cost is in excess now of three billion pounds, so the economic case for bringing more and more schemes forward is going to be very strong.

**Q548 Chairman:** One of the issues we are going to be taking with the Met Office is this whole question of the relationship between probability and intensity, because I think it is a dimension that does not seem to rate in terms of the flood risk analysis.
Memorandum submitted by the Natural Environment Research Council (NERC) (FL 112)

1. The Natural Environment Research Council (NERC) is one of the UK’s seven Research Councils. It funds and carries out impartial scientific research in the sciences of the environment. NERC trains the next generation of independent environmental scientists. Its three strategic research priority areas are: Earth’s life-support systems, climate change, and sustainable economies.

2. Details of NERC’s Research and Collaborative Centres are available at www.nerc.ac.uk.

3. NERC’s comments are based on input from the British Geological Survey (BGS), the Centre for Ecology and Hydrology (CEH), the National Centre for Atmospheric Science (NCAS), the Proudman Oceanographic Laboratory, and Swindon Office staff.

INTRODUCTION AND SUMMARY

4. NERC welcomes the opportunity to contribute to the Committee’s inquiry into the issues raised by this summer’s flooding in England and Wales, and what steps public authorities should take to address them. NERC and its Research and Collaborative Centres endeavour to ensure that their research findings reach potential users to facilitate appropriate decision-making, and the area of environmental hazards is a particular concern.

5. Several NERC-funded scientists have been examining the factors involved in the recent flooding, particularly scientists at BGS and CEH, and other scientists involved in NERC’s Flood Risk from Extreme Events (FREE) programme. NERC issued a briefing note on 27 July summarising its contribution to flooding research in general and to immediate analysis of the summer’s events.

6. The first section of this memorandum covers BGS’s and CEH’s analyses of those events.

7. The work conducted by BGS is described, supported by Annexes 1–7. The response of BGS to the 2007 flooding events represents one part of its long-term surveying and monitoring role. This has involved the production of detailed geological and geohazard map and Geographic Information System (GIS) series for the whole of the UK, with two sets of information especially relevant to flooding issues: “Geological Indicators of Flooding” (Annex 1) and “Groundwater Flooding Susceptibility” (Annex 2).

8. CEH conducted a broad-scale appraisal of the floods. The text is available on the CEH website, but it is reproduced below because of its high relevance to the inquiry (the web address is provided for publication purposes).

9. The second section of this memorandum outlines research that BGS, CEH and others pursue or intend to pursue that will help to improve our understanding and prediction of future flooding events and our ability to quantify risk.

10. Annex 7 contains further details of BGS’s research into the processes involved in groundwater flooding, and some information about the NCAS Weather programme. It also contains specific contact details for BGS and NCAS scientists.
SECTION 1: ANALYSIS OF THE 2007 FLOODING EVENTS

Activities and observations of the British Geological Survey (BGS)

BGS response to the June/July 2007 flooding

11. The BGS Geohazard Rapid Response Team conducted aerial photographic surveys that acquired more than 500 photo images and 87 minutes of video footage. On June 26th, the team recorded the extensive fluvial (river) flooding along the valleys of the Derwent, Don (Sheffield) and Rother (Catcliffe-Bentley); smaller catchments, in Nottinghamshire that had experienced sudden rapid flooding ("flash-flooding") were included. A photographic record was also made of the devastation in Hull, caused by flooding from land (pluvial flooding) unable to cope with the large volume of rainwater. A second flight, on July 24th, monitored the extent of fluvial flooding in the Cherwell and Thames rivers (Banbury, Oxford, Abingdon areas), and the Severn and Avon rivers (Gloucester, Tewkesbury, Worcester, Stratford and Evesham). Ground surveys of flooded areas were also conducted, around Oxford (see below), and in Nottinghamshire.

12. The flood extents recorded by aerial survey will be digitised and compared with the Geological Indicators of Flooding dataset. Preliminary results show that in the majority of cases, the June—July inundation limits correspond well with the distribution of "natural" floodplains, as defined geologically and depicted in the dataset (see Annex 1). The digitised flood extents will be incorporated within a sub-project of NERC’s FREE programme, providing a record that can be used for future flood modelling.

13. Oxford was one of the urban areas most severely affected by flooding in southern Britain. In the few days prior to the peak of the recent floods the existing network of automatic water level recorders measuring on a 15-minute interval (see Annex 7) was expanded by BGS to monitor other key flooding locations. In addition to the collection of these data, BGS undertook walking surveys of the floodplain areas of the city to make observations of the flooding processes. These observations and the data collected will be collated, written up and incorporated into the overall documentation on the floods in Oxford being prepared by the Environment Agency.

BGS assessment of the issues raised

14. Important insights were obtained in Oxford about the complex interaction of river overbank flooding, groundwater flooding and the role played by subsurface drainage. Observations have confirmed that a significant number of properties in Oxford were flooded by groundwater alone. This occurred due to the emergence of groundwater above ground level but also due to the inundation of basements. Where both groundwater and overbank flooding occurred, groundwater flooding significantly extended the overall period of flooding. It is clear from subsequent discussions with the Agency’s Oxford Flood Risk Management Team that understanding these interactions is key to developing effective risk management measures.

15. Some of the information provided to local residents in Oxford about the timing and nature of the flooding was incorrect and confusing and resulted in unnecessary distress. The inability of the Environment Agency to accurately predict the timing of flood peaks shows that significant work is required to be able to understand and adequately model flood events. This should include, where appropriate, incorporating the groundwater dimension into flood prediction models.

16. Further evidence bearing on the “lessons learned” debate is provided by studying geological maps showing the natural extent of floodplains (ie before human modification) in relation to building, construction and infrastructural development placed on them over the past decades and centuries. Such developments are potentially at risk from flooding, and examples from the 2007 summer floods included the damage to industrial and commercial properties sustained along the River Don floodplain (e.g at Meadowhall, Sheffield, Annex 3). Similarly, the floodplain of the River Rother is now extensively covered by raised-up made ground, possibly exacerbating flooding at places such as Catcliffe (Annex 4). In southern England, the function of vital installations such as the Walham substation and Mythe water treatment plant (Annex 5) was compromised by their location on the natural course of the Severn floodplain.

BGS provision of flooding-relevant national geological data

17. The two sets of data referred to earlier: “Geological Indicators of Flooding” and “Groundwater Flooding Susceptibility”, now form part of the Survey’s digital geohazard information system. The Geological Indicators data set (Annex 1) shows the extent of natural floodplains in the UK and is therefore considered to complement (though not to replace) the flood maps produced by the Environment Agency. It has been shown to the EA (Eastern Area), who have found it to both justify, and refine, their flood outlines in places where ambiguity formerly existed. More such meetings are planned, at local and national EA level, and it is possible that the Geological Indicators dataset will eventually be incorporated into the EA flood mapping programme.
18. Geological data can reveal the vulnerability of areas that may not be included in conventional flood risk mapping. For example, in parts of the UK settlements are developed on relatively higher ground formed by alluvial fans. These features lie off the floodplains, but as they may be prone to debris flow and flash-flooding, they have been incorporated into the “Geological Indicators” data set.

19. Research at BGS has involved the construction of 3-dimensional models of floodplains and estuaries; for example, showing the relationship between different types of substrate and shallow water table rest levels in the Manchester area (Annex 6 and 7). These methodologies are likely to be prime tools for resolving issues such as “sewage flooding”, and the sustainability of urban drainage systems during severe rainfall events of the type recently experienced in Hull and parts of London.

20. In areas such as Toll Bar, near Doncaster, there has been a history of mining-induced subsidence that may, in places, have exacerbated the extent and duration of flooding. Such issues could be clarified by satellite ground movement surveys (radar interferometry technique), of the type undertaken by BGS across London and other parts of the UK.

21. BGS has developed groundwater flood susceptibility maps for the UK based on process-based models of groundwater flooding. These currently include models of typical “Chalk valley” type groundwater flooding and groundwater flooding in alluvial environments. The susceptibility map is produced using the permeability characteristics of mapped geology (at 1:50,000 scale) and groundwater level data. It will be possible to upgrade this map on the basis of observations made during the recent floods. BGS plans to continue to refine these process-based maps by including additional groundwater flooding scenarios and to improve the base data upon which the maps are produced. Links between these maps and those required by the Environment Agency for flood risk management are being explored.

22. In addition to the groundwater flood susceptibility maps, BGS continues to undertake process-based research into groundwater flooding, as detailed below.


23. The weather conditions experienced across much of the UK throughout the summer of 2007 have been exceptional. The jet stream (which influences the paths taken by weather systems in the North Atlantic) has followed an abnormally southerly track and the extension of the Azores high pressure cell across the UK—which brings settled weather conditions in most summers—has failed to become established. Correspondingly, a sustained sequence of rain-bearing low pressure systems has produced outstanding 12-week rainfall totals, and a series of flood events culminating in widespread severe flooding in late July.

Rainfall

24. The combined May and June rainfall total is the highest on record for the UK (in a series from 1914) by a considerable margin and the exceptional weather conditions continued into July. Provisional data indicate that the May-July period is likely to have been the wettest for England and Wales in a series from 1766 with many areas registering more than twice the long term average.

25. As warm and very moist air moved north from France, the volatile July weather patterns culminated in an extremely wet episode on 19–20 July. Outstanding storm rainfall totals were reported across much of southern Britain. These included:

- 145 mm in Pershore (Hereford and Worcestershire)
- 111 mm at Chieveley (Berkshire)
- c120 mm at Brize Norton (Oxfordshire).

26. Statistical analyses confirm the extreme nature of such storms—on the basis of historical data they would be expected to occur, on average, only once in several hundred years (longer in the case of the Pershore event). Thundery interludes contributed to substantial spatial and temporal variations in rainfall intensity but catchment rainfall totals were exceptional over wide areas. Localised storms of tropical intensity are a feature of many English summers but a distinguishing characteristic of the July 2007 storms was the spatial extent of the extreme rainfall totals.

Characteristics of the flooding

27. Normally, flood risk during the summer is substantially diminished by dry soil conditions. Following the record late spring and early summer rainfall, accompanied by widespread flooding in June, soils were close to their wettest on record (for mid-summer) in early July across much of England. This rare circumstance left many catchments vulnerable to further significant rainfall.

28. The exceptional rainfall on 19–20 July triggered a sequence of relatively distinctive flood episodes: localised (mostly urban) flash floods, extremely high flows in small responsive (impermeable) catchments and, subsequently, extensive floodplain inundations as the runoff concentrated in the major rivers of southern Britain (including the Severn, Warwickshire Avon, Bedford Ouse, Trent and Thames).
29. Initially, the intense rainfall overwhelmed many urban drainage systems producing localised but severe flash floods. The emergency services were widely deployed to rescue stranded individuals and organise evacuations from the most severely affected localities. These contributed to massive and extensive transport disruption across southern Britain, exacerbated by the volume of holiday traffic. Subsequently, floodplain inundations caused extensive crop damage and the need to move livestock to higher ground. The sustained high levels in the major rivers also hampered the drainage of flood waters away from the urban areas inundated on 19 July.

River flows

30. Preliminary data suggest that a significant minority of rivers across southern Britain exceeded their previous maximum recorded flow and many eclipsed previous maxima for the summer half-year (April-September)—often by very wide margins. In the worst affected areas (e.g. in the lower parts of the Severn and Warwickshire Avon basins and some upper reaches of the Thames catchment), flood flows may have exceeded those of March 1947—the most severe flood in southern Britain in over 100 years (note however that the 1947 event was primarily the result of rapid snowmelt over still-frozen ground and its overall impact was substantially more severe than the current flooding).

An historical perspective on the July floods

31. An indication of the rarity of the hydrological conditions experienced this summer is provided by the recent increases in groundwater levels in some parts of eastern and southern England. Generally, groundwater levels decline over the May to September period, due to an absence of natural replenishment (recharge). This summer, groundwater levels in the Cotswolds rose rapidly in mid-July and by 24 July stood above normal winter levels; this is reflected in the exceptionally high recent flows reported for many spring-fed streams. In the 19th century, significant summer recharge was recorded in a number of years (e.g. 1860 and 1879) but examples of significant and widespread summer recharge in the 20th century are very rare.

32. Episodes of extensive summer flooding may be found in the historical record (e.g. in 1875)—particularly in the nineteenth century when summer half-year (May-October) rainfall often exceeded that for the winter half-year. There are, however, no close modern parallels to the scale of the summer flooding experienced this year. It has served to underline our continuing vulnerability to very exceptional summer rainfall and to, as yet poorly understood, changes in the position of the jet stream.

Outlook

33. In the medium term (2–4 months) it is likely that soil conditions will remain wetter than the seasonal norm. This will encourage an early onset of the seasonal recovery in river flows and groundwater levels in the autumn. Correspondingly, an extended flood season throughout the autumn and winter of 2007–08 may be expected.

How influential is climate change?

34. By their nature, individual extreme flood events cannot be linked directly to climate change. If they form part of a developing pattern or emerging trend, then a causative association becomes more plausible. In England and Wales, evidence for long term increases in fluvial flood magnitude is elusive—one factor here is that in a warming world snowmelt (a primary cause of the 1947 flood) is very likely to decline as an exacerbating factor as temperatures increase. Warmer, drier summers would also tend to produce very dry soil conditions which, unlike this year, should help moderate fluvial flood risk. On the other hand, more intense summer rainfall would increase the risk of localised flash flooding—with associated drainage problems, particularly in urban areas.

SECTION 2: ONGOING AND FUTURE FLOODING-RELEVANT RESEARCH

BGS

35. Further upgrades will be made to the Geological Indicators and Groundwater Flooding Susceptibility data sets as increasingly accurate data become available through the BGS survey and monitoring functions. The upgrades will also take account of the examples provided by flooding events as they occur. Further projects examining groundwater flooding processes in a range of hydrogeological settings will contribute to the national flood risk management programme. The expertise gained from this work, and also from studies into the sustainability of urban drainage systems, are directly applicable to issues such as pluvial flooding of the type experienced in Hull and London.
**CEH**

36. Hydrological research is carried out at CEH on a continuous basis: the organisation has extensive and long-term experience of processes of inland flood generation, the development of quantitative methods and modelling systems to predict river flows, and analysis of how any current conditions compare with the historical record.

37. Major aspects of research at CEH which have been initiated and which it is CEH’s intention to pursue include:

- quantification of the separate effects on inland flood generation of land use practices and climate drivers, in both rural and urban river catchments
- analysis of inland flood risk from river, pluvial and groundwater sources on a true spatial basis (that is, extending beyond the quantification of arrays of point risks)
- quantification of the relationship between magnitudes of river, pluvial and groundwater flooding and their frequencies of occurrence for very extreme events (in excess of 1000 years average return period)
- quantification of inland flood risk under transient conditions of changing natural and man-induced conditions
- extending beyond the quantification of uncertainties in flood generation systems to their reduction in flood management.

**POL**

38. As mentioned in NERC’s briefing note of 27 July, POL is collaborating with the Met Office Hadley Centre in a project that forms part of the Environment Agency’s Thames Estuary 2100 programme. Using computer models the project will address the issue of how to protect the Thames from flooding this century by indicating whether or not extreme water levels will change in the future.

39. This summer’s flooding events did not have a (significant) coastal element, but on occasion, fluvial flooding of low-lying areas can be made worse if outflow to the sea is impeded, at high tide or by sea-level raised above the predicted tide by low atmospheric pressure and/or strong winds, and POL will be able to contribute to predictive analysis in this area.

**NCAS**

40. NCAS funds a Weather research programme which contributes to improved weather prediction, particularly concerning small-scale processes and severe weather (e.g. flash floods, thunderstorms). It is also used to better represent small-scale processes in global climate models. Further details appear in Annex 7.

*Flood Risk from Extreme Events (FREE)*

41. NERC’s FREE programme aims to improve the prediction of pluvial, river and coastal flooding occurring as a result of extreme events. BGS, CEH and POL, as well as a number of university-based researchers, have all received funding through the programme.

42. A dedicated fund allows the programme to support research in the event of an extreme event during the lifetime of the programme. The Steering Committee has decided to use the fund to support a project gathering and processing data from the summer’s flooding events, with the aim of making the data freely available and producing a report regarding the lessons learnt.

43. The report may address issues such as the management of risk through joined-up modelling, the importance of land use in rural areas, and the need to reconsider infrastructure-design-specifications in the context of a changing climate.

*Flood Risk Management Research Consortium (FRMRC)*

44. NERC is a member of the FRMRC Consortium led by the Engineering and Physical Sciences Research Council (EPSRC). The research priorities of the Consortium are coincident with many of the issues raised by the summer’s flooding events.

Natural Environment Research Council

September 2007

3 [http://www.nerc.ac.uk/research/programmes/free/](http://www.nerc.ac.uk/research/programmes/free/)
Annex 1

Extract from the BGS digital “Geological Indicators of Flooding” database. The dark shaded areas are the geologically-defined floodplains, light shaded areas denote coastal plains and estuaries.

Annex 2

Extract from BGS Groundwater flooding susceptibility map showing the Oxford area. Low unsaturated zone thickness indicates higher groundwater flooding susceptibility.
Annex 3

The Meadowhall Retail Centre, Sheffield, developed on the floor of the River Don floodplain.

Annex 4

The River Rother floodplain, showing raised-up made ground that has been placed upon it. The former course of the floodplain is shown within the made ground. Water in the present river channel, flowing northwards, is unable to occupy and be absorbed by its former floodplain, and this may have contributed to the flooding seen at Catcliffe.
Mythe plant

The Mythe water treatment plant lies within the “natural” floodplain as defined geologically, at the confluence of the Severn and Avon rivers.

3-dimensional cross-section showing the influence of geology on near-surface water table rest levels beneath Manchester and Salford.

FURTHER DETAILS OF ONGOING WORK; CONTACTS

BGS

Process-based research into groundwater flooding

(Additional to BGS’s groundwater flood susceptibility maps.)

BGS has been jointly funding a study with the Environment Agency over the past three years which aims to assess the role groundwater flooding plays in the overall flooding story within the city of Oxford. This study is linked with the Agency’s Oxford Flood Risk Management Study. As a result, an extensive network has been developed to monitor river, stream and groundwater levels. Groundwater levels rise during flood events as a response to high river and stream levels which force water into the highly permeable underlying gravels.
The Oxford study provides a case study of groundwater flooding in a shallow alluvial setting. Recommendations from recent Defra Making Space for Water scoping studies have identified this as a key project for the Environment Agency in assessing how to address groundwater flooding as part of the overall flood risk management measures in such environments; how to address groundwater in early warning systems; and how to develop integrated river and groundwater models for flood prediction.

A European Union INTERREG IIIa project on groundwater flood prediction in northern France (Somme) and Brighton UK (http://www.flood1.info/) is due for completion in Autumn 2007. This process-based study led by the French Geological Survey (BRGM) in partnership with the University of Brighton and BGS has undertaken extensive field work to characterise unsaturated zone processes in the Chalk related to flooding and will lead to the development of early warning systems for groundwater flooding events in the INTERREG regions involved.

Imperial College London, BGS and the Centre for Ecology and Hydrology (CEH) are undertaking a three-year project funded by the NERC FREE Programme to develop a suite of integrated modelling tools to help assess and manage risk from groundwater flooding on the Chalk of the UK. The approach will be to combine process-based atmospheric, surface water, unsaturated and saturated zone flow models that capture the key heterogeneities in the aquifer that affect groundwater flooding.

To investigate the sustainability of urban drainage systems, the BGS took part in a collaborative study of the Manchester urban area, which was jointly funded with the North-west Region of the Environment Agency. The study produced a three-dimensional (3D) model of the superficial deposits (Annex 6), in order to examine potential groundwater-surface water interactions. Hydrogeological (groundwater) pathways were identified, and it was demonstrated that there was potential for lateral migration of groundwater to occur in perched (near-surface) aquifers. Studies of this type will be key to developing a predictive model for “sewage flooding” by understanding the interaction between permeable substrates and rising water tables, and how this may influence the function of artificial drainage systems.

**BGS flooding research contacts**

Dr J N Carney, British Geological Survey, Keyworth
Dr A Gibson, British Geological Survey, Keyworth
Mr D. Macdonald, British Geological Survey, Wallingford
Dr J Bloomfield British Geological Survey, Wallingford

**National Centre for Atmospheric Science (NCAS)**

**Weather research programme**

Part of NCAS Weather works in collaboration with the Met Office feeding in observation-based and numerical modelling research to develop and improve the Met Office's numerical weather predictions (weather forecasting). In addition, NCAS provides the core instrumentaion and facilities (ground-based and airborne) to support the Weather programme.

For a very recent example of NCAS work (campaign still ongoing) which is particularly relevant to improving predictions of flooding in the UK weather see:


"Weathering the Storm! Eight Nations, Nine Research Aircraft and an Airship—Top UK Weather Scientists Join Massive International Campaign to Investigate Storms and Flooding. The Convective and Orographically-induced Precipitation Study (COPS) begins (11/07/07)"

The COPS project above is building on results from the Convective Storm Initiation (CSIP) project. CSIP was/is an extremely successful project which took place in summer 2005—the data analysis, results and knowledge transfer are now well underway. News item and relevant links: http://www.ncas.ac.uk/news/stories/csip_05_news.htm

**Main NCAS contacts**

For the Weather programme and similar work:

Professor Stephen Mobbs (NCAS Director and weather expert)
Ev 178  Environment, Food and Rural Affairs Committee: Evidence

Professor Geraint Vaughan (Director of NCAS Weather Programme):
Professor Alan Blyth (NCAS Head of Ground-based Observation Facility and Head of specialised aircraft instrumentation)
NCAS PIs who are UK leaders in the field of cloud research: how they form, their properties and how this affects the type of rain that forms and falls:
Professor Tom Choularton (microphysics): University of Manchester:
Dr Martin Gallagher (microphysics); University of Manchester
Professor Hugh Coe (aerosols)

Memorandum submitted by the Met Office (FL 120)

EXECUTIVE SUMMARY

1. Exceptional summer precipitation was well forecast. Individual rainfall events over this summer were exceptional while the accumulated totals over the period were unprecedented. The weather events were well forecast, indeed the weather forecasts leading up to the major July flooding event were the most accurate and detailed provided for any major flooding event in the UK.

2. Current warning mechanisms and structures have led to confusion. Responsibility for issuing severe weather warnings lies with the Met Office, while river (fluvial) flood related warnings are a matter for the EA. There has been some confusion amongst user groups particularly when severe weather events and consequent flooding occur at different times and places. This communication issue has been identified in some regional lessons learned exercises.

3. Improved weather forecasts will lead to improved flood forecasts. Advances in probabilistic forecasting techniques combined with the operational use of higher resolution models will give higher confidence in the broader pattern of weather and the precision in the detail. Although a very high resolution model was used to significant effect during the July flood event, this is not an operational system. Operational implementation awaits enhanced supercomputer power.

4. Integrated models will increase the effectiveness of warnings. The Met Office is developing its range of ensemble based forecasting techniques to provide a probabilistic framework within which to deliver enhanced decision support tools to government agencies. Development of these tools will require close cooperation between agencies. Integration of ensemble weather forecast and river models would provide more reliable river flood forecasts at extended lead times.

5. Climate change may mean we see more intense severe weather events. Any specific individual weather event cannot be attributed to climate change. Broadly speaking, climate change in the UK is predicted to produce wetter winters and drier summers with the potential for increasing intensity of severe weather events.

6. The past is no longer an adequate guide to the future. There is significant uncertainty over the impact of climate change on flooding events and the probability of them occurring over any given period. As climate research develops, and higher resolution models can be run, there will be increased certainty about regional scale impacts and its effect on flooding. This is important because, under a changing climate, the use of return periods (based on previous climatology) for deciding on national infrastructure may not be the most appropriate mechanism; decisions should draw heavily on the best available regional climate predictions.

INTRODUCTION

7. The Met Office is a Trading Fund Agency owned by MOD. It is a world leading organisation, both in the field of weather forecasting and climate prediction, operating on a 24/7 basis with the highest standards of operational resilience. Responsible for providing forecasts on all timescales (from an hour ahead to 100 yrs), the Met Office is uniquely positioned to support the UK’s response to changing incidence of severe weather events due to climate change. It is responsible—through its Public Weather Service—for providing the National Severe Weather Warning Service for the whole of the UK.

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5 A number of studies are taking place to evaluate options for expanding the scope of flood warning services as well as using probabilistic and higher resolution forecasts.
6 Current flood modelling techniques rely on observed (rather than forecast) precipitation, but rainfall forecasts could be used to better effect, particularly for rapid response flooding events.
7 A return period denotes a recurrence interval. It is a statistical measure of how often an event of a certain size is likely to happen. For many of the recent rainfall events return periods were greater than 200 years.
8. Unlike many other nations in Europe where weather and flood forecasting and warning are integrated into a single meteorological and hydrological agency, the Met Office has no direct responsibility for river or coastal flood forecasting.

9. In England and Wales, river and coastal flood forecasting are the responsibility of the Environment Agency with whom the Met Office works closely, providing to them storm tide warning services, weather forecast information (daily) and weather warnings (6 hours before an event). Currently no agency provides warnings of localised flash flooding (also known as pluvial flooding), although the Met Office will give an indication of such risks alongside its weather forecasts.

10. Similar responsibilities for river and coastal flooding apply to SEPA in Scotland. There is neither a system nor single delegated authority for issuing flood warnings in Northern Ireland.

CLIMATE PREDICTION AND FORECASTING CAPABILITY

11. The Met Office routinely utilises three atmospheric forecast models over land: a Global model at 40 km resolution; a North Atlantic and European (NAE) model at 12 km resolution, and; a fine scale UK model at 4 km resolution. The regional models are deployable and can be run for any location in the world in support of military and commercial customers.

12. In addition, the Met Office can also run a model at 1.5 km resolution, which provided significant benefit during the July flood. However, given current supercomputer power, this must be restricted in frequency and carefully scheduled to avoid impacting on both the capability required to run the operational models and on computer time allocated to research in weather forecasting.

13. The Met Office has also introduced a probabilistic system of forecasting using multiple model scenarios to simulate and quantify uncertainty. This system currently has a 24 km resolution.

14. The data used to initialise numerical weather models comes from various sources—including direct observations of the atmosphere, oceans and land surface conditions, as well as previous model runs. Both the Met Office and the EA utilise information from rain gauges and from radar observations in rainfall and flood modelling respectively. However, ownership and responsibility of rain gauges across the UK is split between the agencies and consequently not all of the information is available to either party in real time.

15. The Met Office leads and hosts the National Centre for Ocean Forecasting (NCOF) and utilises a suite of models, including a surge model and a wave model, to provide forecasts of tides and storm surges to Government agencies, particularly the EA and Marine Coastguard Agency, as well as to commercial customers.

16. The Met Office Hadley Centre, funded through Defra and MOD, provides the best climate prediction science in the world which supports the UK Government’s high profile policy role on Climate Change issues.

EXPLANATION OF SUMMER WEATHER PATTERN

17. The unusual pattern of weather experienced this summer occurred as a consequence of the location and strength of the jet stream combined with unusually high Atlantic sea temperatures. For much of this summer the jet stream was further south and stronger than is typical, resulting in many weather systems crossing southern and central parts of the UK. These depressions have been more intense with some interacting with the very warm and moist air to the south, generating exceptionally heavy rainfall events.

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8 An independent review of the Met Office Hadley Centre from Risk Solutions, commissioned by Defra and MoD, was published by Defra on 15 May—it concluded that the Hadley Centre was at the pinnacle of world climate science. The review is available on the Defra website: http://www.defra.gov.uk/environment/climatechange/research

9 A ribbon of very strong winds in the upper atmosphere which largely determines where the weather systems that bring rain to the UK will develop and move across Western Europe.
Record-breaking Rainfall Figures

18. The cumulative rainfall total in the UK for May, June and July 2007 was unprecedented; Met Office records show that 414.1 mm of rain fell across England and Wales, making it the wettest May to July since the England and Wales Precipitation record began in 1766.

Precipitation (mm) 1 May–31 July 2007
Rainfall amount 1971–2000 Anomaly

19. The exceptionally heavy rain culminated in two severe, disruptive flooding events.

a. On 24–25 June, a deep and slow-moving area of low pressure brought a prolonged period of heavy rain causing widespread flooding in parts of Yorkshire and the Humber, Derbyshire, Lincolnshire and Worcestershire. The flooding was a result not only of the heavy rain during the 24–25 June, but also the antecedent conditions of a wet May and June, especially the heavy rain during the 12–14 June, which caused the ground to be saturated and water levels to be high prior to this event.

b. The second flooding event was the result of exceptionally heavy rain which moved northwards across the UK from late on 19 July throughout 20 July, the heaviest being reported at Pershore College (Worcestershire), with Met Office data showing 157.4 mm recorded in the 48 hour period. Widespread flash flooding occurred on the morning of 20 July across Southeast England, and later in the day across the Midlands as the system moved north-westwards, causing widespread disruption to the motorway and rail networks. River flooding followed over the subsequent days along the Severn and its tributaries in Gloucestershire, Worcestershire, Herefordshire, Shropshire, and along the Thames and its tributaries in Wiltshire, Oxfordshire, Berkshire and Surrey. More detailed rainfall statistics are at Annex A.

Early Warnings of Rainfall Prior to Floods of June and July 2007

20. The Met Office issued an Early Warning through the National Severe Weather Warning Service (NSWWS) on 22 June which gave 3 days notice of potential disruption. An update issued on 24 June focused correctly on the worst hit areas and provided highly accurate estimates of rainfall totals correctly forecasting that 50–100 mm of rainfall would fall within 24 hours of 2200 BST on Sunday with the worst affected areas being Yorkshire and Lincolnshire.

21. Forecasting of the 19–20 July rainfall event was perhaps the most detailed and accurate ever achieved by the Met Office for a high profile severe weather event. To be able to accurately forecast 100 mm of rain at county level with 24 to 36 hours lead time is an indication of the process wide improvements that have

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10 As opposed to likelihood of rain—confidence of heavy rain time of issue was 100%.
recently been made. Significant use was made of multi model probability forecasting techniques, while the “on demand” high resolution (1.5 km) forecast model was run for parts of the affected area to give more detailed forecast information. The potential for excessive amounts of rain on Friday 20 July was communicated to the EA and other customer groups, together with the uncertainties. Confidence was considered high enough to issue an NSWWS Early Warning on Wednesday 18 July.

More detailed timelines of Met Office activities prior to the flooding events on the 24–25 June and 19–20 July are at Annexes B and C.

22. During the most intense rainfall on 20 July, a technical fault arose with the radar rainfall measurement system. The result of this was a degradation in the quality of the quantitative rainfall estimates issued to the EA for the areas of heaviest rain. The fault has now been corrected, and re-analysis of the data is underway to confirm the scale of the impact, in consultation with the Environment Agency and other users of the data.

SEVERE WEATHER WARNINGS TO MET OFFICE CUSTOMERS

23. As a Trading Fund the Met Office places a strong emphasis on meeting customer requirements. Its core mission is to use the best science to develop and tailor services that allow them to make the best informed decisions possible. Due to its role as the National Weather Service and the body responsible for the National Severe Weather Warning Service it has very strong links with UK’s emergency response infrastructure, its customers (both government and private sector) and the general public. It has well established and trusted mechanisms for communicating warnings in particular through its website and its partnership with the BBC. During the flooding events the Met Office provided support to numerous organisations including the EA, HPA, HA, Network Rail, local authorities and Gold Commands, as well as attending Civil Contingency meetings at COBR.

24. Although communication of warnings did take place successfully, there was evidence that the underlying message was confused. This occurred for a number of reasons:

   a. individuals and agencies can confuse severe weather warnings and flood warnings;
   b. some organisations or individuals look to one organisation for warnings—on occasions customers expected flood briefings as well as weather warnings from the Met Office;
   c. although severe weather and flooding are linked they do not necessarily occur at the same time (for example the Met Office web site showed no weather warnings at a time when parts of the UK were experiencing severe flooding).

25. Although lessons learned exercises undertaken by regional authorities highlighted Met Office forecasts as being of high quality, it was generally acknowledged that the fragmented responsibilities for warnings hinder understanding and therefore response.

PLANNED DEVELOPMENTS IN FORECASTING AND THEIR IMPACT ON FLOOD FORECASTING

26. Research in the Met Office is focused on improving all aspects of our forecasts, primarily through improvements to the performance of our numerical weather prediction models. In line with our understanding of public and customer requirements, work is currently focussed particularly on two major areas of research:

27. Higher resolution forecasting. The purpose of high resolution modelling is to enable forecasts to become more precise about the weather expected in any locality. The results of our research are extremely promising. The graphic below shows the potential benefit of higher resolution models by applying them retrospectively to the major flooding event in Carlisle in January 2005. The figures show how an increase in forecast model resolution from 12 km (b) to 1 km (c) provides a much increased improvement in accumulated precipitation when compared to observations (a).
28. Probability forecasting. Due to the chaotic nature of the atmosphere, the further in advance forecasts are made, the more small scale weather features become unpredictable. How severe this unpredictability becomes is dependent on the particular weather pattern and location. Consequently, although we can provide a “best” forecast it is not possible to indicate how likely this really is. This is particularly important for severe events where the chosen response is likely to vary with the confidence associated with the forecast. In response to this problem we have a research programme aimed at forecasting the probability of certain weather events occurring—through running “ensembles” of individual forecasts. We are now looking towards combining this approach with the high resolution model to look at forecasting the probability of intense local rainstorms.

29. Both of these research advances will lead to significant improvements in the information available from Met Office forecasts. Greater use of probabilistic forecasting techniques in principle allows more informed decision making—particularly for emergency response organisations. For example, a 25% chance of an event occurring may require a different response to a 75% chance. In reality, probability increases as an event gets closer, so the customer response process should be able to react to changing uncertainty. We will continue to work closely with customers and other Government agencies to ensure the additional information available is used to the best effect.

30. These research advances require substantial increases in computer power before they can be implemented in routine operational forecasting. In 2009 we expect to be able to purchase a new supercomputer with sufficient power to implement a UK scale 1.5 km high resolution forecast model and a small ensemble model with a 12 km resolution. The combination of high resolution modelling and probabilistic ensemble forecasting is very important—neither approach alone will give both confidence in the predicted weather nor the precision in the detailed location.

31. Further funding would be needed to fully realise the benefits (better pinpointing of areas at risk) that can be delivered through operational use of a 1 km ensemble.

Flooding and Climate Change

32. With the recent severe flooding in the UK this summer, climate change and what this may mean for extreme rainfall in the future, is very much at the forefront of people’s mind. Although any specific individual event cannot and should not be attributed to climate change, we are able to make statements about the risk of such events altering as a result of climate change. It seems likely there will be a greater risk of heavy rainfall across the UK in the future, particularly in winter.

33. The rainfall that caused the flooding in the UK this summer was as a result of weather systems occurring as part of the natural variability of the climate. The overall weather pattern is broadly consistent with conditions during previous La Nina events, although with the low pressure situated slightly further south. This weather pattern is not associated with climate change. Nevertheless, the amount of rainfall could have been larger because of climate change. In particular, warm sea surface temperatures in the vicinity of the UK this summer probably contributed to the high levels of atmospheric moisture.

34. A change in the proportion of summertime rainfall falling as heavy downpours would be likely to have a significant impact on flooding; short period intense events tend to cause local flash floods. However, for flooding over larger areas, longer period rainfall is required, with antecedent conditions being very important. In general, models suggest that a possible signature of global warming may be relatively greater increases in rainfall for those extremes which are rarest and of shortest duration (ie the most intense).

Confidence in Climate Model Projections

35. Although there is a general consensus on the broad features of expected climate change, there are still uncertainties, particularly when considering how the climate may change locally. Although climate models capture the key processes identified as important for climate change, it is not possible to represent the full complexity of the climate system. Generally we use the ability of a model to reproduce the climate of the recent past as an indicator of its likely skill in predicting the future.

11 The opposite of El Nino, which occurs naturally every 3–7 years.
36. Natural variability of the atmosphere is a further source of uncertainty. Natural variability leads to our familiar daily weather patterns and on longer timescales to phenomena such as El Nino. Future projections will in part reflect natural variability and it is important to distinguish this from an underlying shift in the climate caused by increased greenhouse gases. In addition, natural variability is a significant factor when considering extreme events on a local scale.

37. Although we are able to make confident statements about increases or decreases in extreme precipitation in some regions, the magnitude of these changes remains uncertain. This is particularly pronounced over central Europe and the UK in summer as these areas are in a transition zone between increased and decreased precipitation.

REGIONAL IMPACTS OF CLIMATE CHANGE

38. Under a warming climate the probability of extreme heavy rainfall events—and hence flooding—is likely to change, and this will become evident over the coming decades. In an ideal world investment in flood defences would be derived from accurate models of future climate. However currently there is a great deal of uncertainty about the regional impacts of climate change—particularly at the local scale and with regard to precipitation. For example, although we may be confident of increases in extreme rainfall across the UK in winter, the actual magnitude of these increases is uncertain. Understanding how extreme rainfall may change in detail locally in the future remains a key challenge for climate scientists. In time, with the ability to run higher resolution models, improved science and the investment of resources in large ensembles of models sampling uncertainties, improved regional scale predictions will be available.

39. The development of a national flood defence infrastructure has, to date, placed a heavy emphasis on return periods derived from historical records. However it is crucial to understand that the past is no longer an adequate guide to the future; large-scale investment in flood defences and other parts of the critical infrastructure would be much better derived from improved regional scale predictions. In the context of recent flooding events, increased supercomputing power beyond that currently planned would also lead to improved weather forecasts, better regional detail, better input to flood models and improved warning lead time.

FUTURE SUPERCOMPUTER REQUIREMENTS

40. Against this background, the Met Office has prepared a proposal for increased supercomputing power for consideration within the context of the Comprehensive Spending Review (CSR). The proposal would provide around 20 times the current computing capability by 2009 rising to around 40 times by 2012.

Met Office
September 2007

Annex A

Table 1

<table>
<thead>
<tr>
<th>Area (record length back to)</th>
<th>May–July 2007 precipitation (mm)</th>
<th>May–July 71–00 Average (mm)</th>
<th>May–July 2007 anomaly</th>
<th>Wettest May–July in series</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>England &amp; Wales (1766)</td>
<td>414.1</td>
<td>186.3</td>
<td>222 %</td>
<td>New record-2007</td>
<td>Previous wettest May/Jul was 349.1 mm in 1789. Wettest 3 month period in the series is Oct/Dec 2000 with 512.3 mm.</td>
</tr>
<tr>
<td>Central England (1873)</td>
<td>364.2</td>
<td>153.9</td>
<td>237 %</td>
<td>New record-2007</td>
<td>Previous wettest May/Jul was 296.9 mm in 1879. Also the wettest 3 month period in the series.</td>
</tr>
<tr>
<td>SW England &amp; S Wales (1873)</td>
<td>422.1</td>
<td>178.3</td>
<td>237 %</td>
<td>New record-2007</td>
<td>Previous wettest May/Jul was 345.1 mm in 1879. Wettest 3 month period in the series is Nov 1929/Jan 1930 with 672.7 mm.</td>
</tr>
<tr>
<td>NE England (1873)</td>
<td>379.2</td>
<td>170.2</td>
<td>223 %</td>
<td>New record-2007</td>
<td>Previous wettest May/Jul was 307.5 mm in 1879. Wettest 3 month period in the series is Sep/Nov 2000 with 462.5 mm.</td>
</tr>
<tr>
<td>SE England (1873)</td>
<td>314.7</td>
<td>153.4</td>
<td>205 %</td>
<td>New record-2007</td>
<td>Previous wettest May/Jul was 292.5 mm in 1903. Wettest 3 month period in the series is Oct/Dec 2000 with 442.6 mm.</td>
</tr>
<tr>
<td>NW England &amp; N Wales (1873)</td>
<td>386.8</td>
<td>197.6</td>
<td>196 %</td>
<td>New record-2007</td>
<td>Previous wettest May/Jul was 353.6 mm in 1920. Wettest 3 month period in the series is Oct/Dec 2000 with 553.3 mm.</td>
</tr>
</tbody>
</table>
A1. During June, In excess of 150 mm of rain fell over most of Wales, the Midlands, northern England, Northern Ireland and parts of Scotland, with over 250 mm locally. This represents over 3 times the normal June rainfall over most of Yorkshire, Lincolnshire and the West Midlands and about 4 times the June average at places in the North York Moors and south Pennines. High anomalies were also recorded elsewhere, such as parts of Northern Ireland. In July, in excess of 150 mm of rain fell over most of Wales, the western half of England and parts of the Scottish Highlands, with over 200 mm in places. This represents over twice the normal July rainfall over large areas of England and Wales, over 3 times in most of the south Midlands and SE Wales and over 4 times the July average locally in the south Midlands.

Table 2
EXAMPLES OF WETTEST LOCATIONS IN THE UK DURING JUNE 2007

<table>
<thead>
<tr>
<th>Weather Station</th>
<th>June rainfall (mm)</th>
<th>% of 1971–00 average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emley Moor, W. Yorks</td>
<td>294</td>
<td>435</td>
</tr>
<tr>
<td>Bingley, W. Yorks</td>
<td>283</td>
<td>401</td>
</tr>
<tr>
<td>Fylingdales, N. Yorks</td>
<td>269</td>
<td>406</td>
</tr>
</tbody>
</table>

Table 3:
EXAMPLES OF WETTEST LOCATIONS IN THE UK DURING JULY 2007

<table>
<thead>
<tr>
<th>Weather Station</th>
<th>July rainfall (mm)</th>
<th>% of 1971–00 average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pershore College, Worcs</td>
<td>252</td>
<td>588</td>
</tr>
<tr>
<td>Great Malvern, Worcs</td>
<td>189</td>
<td>448</td>
</tr>
<tr>
<td>Little Rissington, Glos</td>
<td>189</td>
<td>378</td>
</tr>
<tr>
<td>Brize Norton, Oxon</td>
<td>178</td>
<td>438</td>
</tr>
</tbody>
</table>

A2. For the counties of Gloucestershire, Herefordshire, Oxfordshire, Radnorshire, Shropshire, Worcestershire and Warwickshire the July areal rainfalls were the highest for July in series starting in 1914 (Table 4). The July 2007 values for Warwickshire and Worcestershire were also the highest for any month and that for Gloucestershire was the second highest for any month.

Table 4:
JULY 2007 AREAL RAINFALLS FOR COUNTIES EXPERIENCING THEIR WETTEST JULY IN AREAL SERIES STARTING 1914

<table>
<thead>
<tr>
<th>County</th>
<th>July rainfall (mm)</th>
<th>% of 1971–00 average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloucestershire</td>
<td>197</td>
<td>411</td>
</tr>
<tr>
<td>Herefordshire</td>
<td>189</td>
<td>427</td>
</tr>
<tr>
<td>Oxfordshire</td>
<td>150</td>
<td>339</td>
</tr>
<tr>
<td>Radnorshire</td>
<td>222</td>
<td>363</td>
</tr>
<tr>
<td>Shropshire</td>
<td>165</td>
<td>330</td>
</tr>
<tr>
<td>Worcestershire</td>
<td>208</td>
<td>453</td>
</tr>
<tr>
<td>Warwickshire</td>
<td>201</td>
<td>417</td>
</tr>
</tbody>
</table>
Annex B

TIMELINE OF ACTIVITIES PRIOR TO 24–25 JUNE RAINFALL EVENT

17–20 June

Localised torrential downpours continued with many Flash Warnings issued.

Thu 21 June

News Release issued to highlight unseasonable weather over the midsummer period.12

Fri 22 June

Two potential disruptive heavy rainfall events identified for the weekend and early part of the following week: Scotland on Saturday/Sunday and a developing low later Sunday and into Monday. NSWWS Early Warning issued.

Sat 23 June

Flash messages issued for downpours across E/NE England. Long period Flash message (> 25 mm/24hr) for Scotland. Updated Early Warning for later on Sunday and during Monday with highest probabilities for disruption in southern and eastern areas of the UK, still some doubts about the exact track of the low.

Sun 24 June

Early Warning updated with highest probabilities for disruption in an arc from Yorkshire and Humberside to the Welsh Borders, with rainfall totals of “up to 100 mm or so”. Confidence in the track and depth of the low had increased, with model solutions converging and strong signals from high resolution models for 80–100mm. All EA flood forecasting duty officers contacted.

Mon 25 June

Flash Warnings issued for heavy and persistent rain across the high risk areas during the day.

Annex C

TIMELINE OF ACTIVITIES PRIOR TO 19–20 JULY RAINFALL EVENT

Mon 16 July

Medium Range guidance indicated potential for a heavy rainfall event on Fri 20 July but confidence was moderate. Informal contact between the Met Office and the Environment Agency.

Tues 17 July

Potential for an extreme rainfall event across England and Wales identified and discussed at Chiefs brief. Model solutions remained variable but risk estimated as 40% based on available evidence. EA informally notified of likely event.

Wed 18 July

NSWWS Early Warning for heavy rain issued at 1013BST, covering the period 0000 Fri 20 to 1200 Sat 21 July. Potential for 60–90mm of rain mentioned but with uncertainty regarding where highest totals would occur. Southern and eastern areas of England considered most at risk (60%). Chief forecaster briefed EA National Flood Warning Officers via audio conference in afternoon.
**Thurs 19 July**

Localised heavy downpours were covered by Flash Warnings. Update to Early Warning issued at 1006BST, mentioned this aspect before focusing on the more widespread heavy rain for Fri/Sat. Potential for 75–100 mm of rain mentioned with focus shifted towards southern and central parts of England and Wales. Chief forecaster provided further brief to EA in afternoon, mentioning totals exceeding 100 mm locally in high risk areas defined in Early Warning. Excessive hourly totals (30–50 mm/hr) also highlighted.

**Fri 20 July**

Flash Warnings were issued for many southern/central counties early in the day, with further issues/updates through the day. Large hourly totals were mentioned in addition to longer timescale accumulations. Highest hourly total recorded near Haywards Heath late morning—42.8 mm. EA National Flood Warning Officer was embedded in Met Office forecasting Operations Centre.

**Sat 21 July**

Localised Flash Warnings in force across SE England and NE Scotland. EA national flood warning officer remained embedded within Ops Centre during daytime hours.

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**Memorandum submitted by the UK Climate Impacts Programme (UKCIP) (FL 100)**

1. **Executive Summary**

1.1 The UK Climate Impacts Programme (UKCIP) welcomes the opportunity to provide comments to the Environment, Food and Rural Affairs Committee on the recent flooding events. Our response focuses on the increased risk of flooding as a result of climate change and the responses to reduce this risk.
2. INTRODUCTION TO UKCIP

2.1 UKCIP is a boundary organisation that was established in 1997 by the UK Government to help UK organisations assess how climate change might affect them and how they might adapt to the unavoidable impacts. We co-ordinate and integrate stakeholder-led assessments of climate change impacts and adaptation at a regional and national level, and provide tools (such as the UKCIP02 climate change scenarios; a risk, uncertainty and decision making framework; and a costings methodology) and guidance throughout the process for both stakeholders and the researchers. Within the UKCIP framework, regional scoping studies on climate change impacts have been undertaken for all parts of the UK, and regional climate change partnerships have been established. Sectoral studies focused on a number of areas of activity have also been undertaken. Further information on the UKCIP tools and studies is available from our website (www.ukcip.org.uk).

3. RESPONDING TO INCREASING FLOOD RISK

3.1 A number of studies have examined the changing flood risk in the UK and found that it is likely to increase as a result of climate change. The most recent large-scale study of the risk was the Foresight Flood and Coastal Defence Report published in 2004. UKCIP would like to remind the Committee of this changing flood risk and encourage them to bear this increasing risk in mind when considering the lessons learned and how we can better respond to flooding events.

3.2 UKCIP also believe the enquiry should include a focus on solutions that are informed by concerns related to climate change. It is important that the options considered to better manage flood risk do not increase the risks for others or the vulnerability from other non-climate risks. By this we mean that there is a need to recognize that the spatial and temporal nature of flood risks and the implications of adaptation options both in the location they are intended to protect and the surrounding areas. The approach needs to be consistent with adaptation as part of a sustainable development approach.

3.3 We would also encourage the Committee to consider the applicability of how other countries respond to flood risk. For example, we are aware that New Zealand has a much more structured approach to responding to natural disasters and suggest that there could be lessons to be learnt from how other countries respond to such events.

UK Climate Impacts Programme (UKCIP)

September 2007

Witnesses: Dr Ann Calver, Head of Site, CEH Wallingford and Mr Terry Marsh, Leader, National Hydrological Monitoring Programme, Centre for Ecology and Hydrology; Professor John Mitchell, Director of Climate Science and Mr Steve Noyes, Director of Operations and Customer Services, Met Office; and Dr Chris West, Director of UKCIP and Ms Jacqui Yeates, Deputy Science Team Leader, UK Climate Impacts Programme, gave evidence.

Q549 Chairman: We move on to the second part of this afternoon’s evidence session. May I welcome the star-studded cast before us. We are very grateful to have you with us and also for your written submissions. Are you able to help us at the Met Office because we would not mind knowing what the forward forecast is in terms of winter and summer. It might just give us a way of evaluating your forward forecasting techniques. In your written evidence, and indeed in some of the material you have been sending to Members of Parliament, you give a mouth-watering array of different forms of forecasts that you are involved in, even up to trying to forecast 100 years ahead, which seemed a bold challenge, bearing in mind that some people say you cannot even tell us what is happening tomorrow. Just give us a flavour for the winter period and summer. Are we in for a good one or a bad one?

Mr Noyes: In terms of the winter ahead, it looks as though it is going to be colder than last year but not colder than normal. We do issue a seasonal forecast for the winter and then again for the summer. For the coming winter, it looks like being colder than last year—remember last year as particularly mild—but not colder than normal and in terms of rainfall, round about normal rainfall amounts. We have not yet produced our seasonal forecasts for the summer; that will be something to look forward to in the spring.

Q550 Chairman: At least it sounds like normal. I think one of the problems about the science in meteorology obviously which underpins some of our discussion is this question of deviation from what you describe as “normal” and over what kind of time periods “normal” is established. Looking at the factors which you describe that affected the summer’s weather, I think you were indicating the opposite of the El Nino effect had occurred this summer and we had things blowing in from further south than they should have been and therefore we had an atypical condition in the United Kingdom. Of course, as a result of that, you will have heard a lot of discussion as to whether this is the beginning of some kind of stream of predictable or unpredictable weather, extreme weather events: is this climate change? Perhaps you could just set the scene for us on the question about normality and whether you need something abnormal, like the events to which you referred, to occur for us actually to get the
severity of flooding which has occurred. One of the points that we want to pursue later in our inquiry is the difference between the probabilistic effect of predicting flood events and the severity with which they are occurring. Perhaps we could start with the Met Office but others can pitch in if you want.

Professor Mitchell: You have alluded to the wide range of timescales that we cover, so the daily forecasts that you see on the television for the next few days is very much what we call a deterministic forecast. We would expect to see those events unfold as they are forecast. We do take into account uncertainties by running a set of forecasts from slightly different initial conditions, and that gives a range of forecasts that allows for uncertainty, but for the daily forecasts, we would expect things to evolve very much as directly produced by the model. When you go to seasonal forecasting, what we are looking at is much more on a statistical basis. You cited El Nino as being one of the world-wide, global variations in climate that we see on anything from a three to seven year timescale. Certain phases of that are associated with more common frequencies of certain kinds of weather. This is particularly strong in the tropics, so for seasonal forecast in the tropics, we will look at sea surface temperatures. That is a very powerful indicator, particularly of how rainfall around the tropics will be distributed. But for our latitudes, the signal is much weaker, and that is why I think Steve was quite right to be slightly more cautious in making a forecast for winter, where we are looking very much at a statistical approach. What we are saying is that this is what the most likely outcome is. The third timescale you alluded to is forecasts for 10 to 100 years and there we are looking very much at the long-term effect of increases in greenhouse gases and other factors. There is an uncertainty there and we have to decide what the concentration of those gases is going to be over the next 50 to 100 years, and that is a socio-economic forecasting problem. Given a scenario of greenhouse gases, we can then put those in our models and see statistically how that changes the distribution of rainfall and rainfall extremes into the future temperature and so forth. As you go to the very long scales, they are very much statistical in nature. We are not forecasting that on Christmas Day in 2055 there will be a particular temperature; we just say, “This is the range of temperatures that we would expect at that time”, and the range of rainfall and so forth.

Q551 Chairman: Can you help me to get weather forecasting timescales into some perspective? When are you satisfied that a new norm has been established, because obviously normal is made up of a series of short-term events against a previously determined trend. At what point do you say: “We are now in a new weather scenario”?

Professor Mitchell: Traditionally, we have taken a period of 30 years. That tends to be the norm specified in the World Meteorological Organisation, and of course if you have a climate that is not moving, is not changing, it is not very critical what period you choose. Now that we have strong evidence that we are influencing climate on a decadal timescale, it then becomes important to reconsider, as you have noted, what period you do use. So the current normals are from 1971 to 2000. Previously we used 1961 to 1990, so we do tend to move them on. Where it has really become an issue, again as Steve has alluded to, is that in giving our seasonal forecasts, we now have to say, “It will be a cold winter but not as cold as the previous one”, and the meaning of “cold” has changed in people’s minds. People tend to remember the last few years. So if we have had a succession of mild winters, and that is part of an underlying warming trend and we predict that the next winter will be colder than perhaps the last few winters but not colder than average, you have to be very clear that because of the long underlying trend, what was a mild winter will appear as a cold winter. However there is no particular methodology for choosing what the reference period is.

Mr Noyes: If I could add to that, this is a particularly important point in the context of how we communicate our forecasts because traditionally, as John says, we would refer to the 30-year period from 1971 to 2000. If you take the recent summers and recent winters, all of them have been above the average for that period, or most of them have. So, whilst in communicating our forecasts to the public and to our customers, we might well say that it is going to be warmer than normal, one might say that is the most likely scenario in an environment where climate is gradually warming up. What we find, in terms of making it much more relevant to the people who use our seasonal forecasts, as John implies, is that we have to really link it back to the most recent summers and most recent winters so that people can put that into context. The reason for that is partly because people’s memories are relatively short and a 30-year mean from seven years ago does not mean an awful lot, particularly for people who have not lived that long, and also because the climate is changing, so the backdrop is changing. It is becoming quite difficult to explain what a warm summer really means if you refer back to a 30-year period of some time ago.

Dr West: Could I add something to what you said about a normal climate? I think we fail to appreciate what is normal. Even without the fact that climate is changing, we have short memories, so that in this room I guess some of us can remember the 1962 winter, which was very cold, and rather fewer of us the 1947 winter, which was very cold, and yet it is those extreme hot and cold, wet and dry years that describe and define “normal”. What we perceive in the climate we are familiar with is only a subset of the true range of what is normal.

Q552 Chairman: Part of the reason why I think this is an interesting area is that the investments which have to be made in flood defences, or shall we say “response to flooding”, are of a very long-term nature. What you have to deal with in terms of capacity is, by definition, related to the weather
events which cause the flooding. Just give us a hint as to how much you can contribute to that debate in the UK, in which you feel comfortable rather than just taking a punt, bearing in mind it could affect the expenditure of many millions of pounds.

Professor Mitchell: Certainly in terms of looking at longer-term infrastructure, one would be prudent to take future climate change into account. I think there are a number of points to make on that. The first is that in terms of the size of the projected changes over the next 100 years relative to the year-to-year variability, in terms of temperature we have quite a strong signal to noise; in other words, the trend and the change over 100 years is large compared with the year-to-year or decade-to-decade variability in temperature. With rainfall that is much less true. I think in England/Wales rainfall, if you look at the year-to-year totals, they can be anything from an average of about 60 mm, varying from 10 to 100, so there is huge variability from year to year. Defining what happens in the future, particularly in terms of extremes, is quite difficult because of what in statistics we would call a low signal to noise ratio. That is the first point to make. The second point is that there are some seasons over the UK where we could have a fairly good idea of what the changes are going to be. In winter we expect increases and precipitation; that is true of all the models that we looked at in the Hadley Centre, but also going to the recent IPCC report, that of the Intergovernmental Panel on Climate Change, pretty well all the models show increases in rainfall over the UK in winter. The difficulty comes with the summer, and it is particularly relevant to this committee, and there we find about half the models get an increase over the UK, particularly the southern UK, and half the models get a decrease. The reason for that is that when you look globally, you find at high latitudes there is a consistent increase in rainfall and snowfall. Around the Mediterranean region in particular, there is persistent decrease, and in summer that divide just happens to fall in the middle of the United Kingdom. That is why we are unable to give particularly clear indications of what is going to happen in summer. I think the other thing that we should bear in mind is that an event such as we had in the summer was certainly quite a large anomaly in the large-scale circulation and the ability of models to simulate those anomalies is limited. For example, in UKCIP 08—this is a series of scenarios which we are producing in conjunction with Defra for UKCIP—those will certainly be very much the best available predictions that we can make at the current time, but there is still room for improvement. Essentially, as to where we are on climate change, we have established that climate change is happening; what we are unable to do at the moment is to make reliable, accurate predictions on a regional scale, and that is something which unfortunately will need more investment.

Mr Marsh: It is clear that the models are strong in relation to temperature and there is a fair degree of confidence about where we will be moving. The uncertainty in rainfall is particularly important in relation to flood risk, and that uncertainty in a sense is at its broadest in relation to extreme events. I would make the point that modelling is very much a complementary activity to monitoring and what we need to capitalise on is the information that we have in the field, not just contemporary but historical, to see if there have been any tendencies or trends over time which are sensitive to climatic variations.

Q553 Chairman: Can we move to what did happen this summer. Perhaps you could give us the official version of the events that led to these by our standards—and I suppose by normal standards as well—quite extreme weather conditions.

Mr Noyes: The meteorology at the time during the summer period from late spring through to July was atypical in the sense that there were the sorts of weather conditions in terms of the way that the atmosphere was established over north-west Europe that one might find, for example, at this time of the year. In that regard, it was not what one normally would expect. The particularly heavy rainfall events of 25 June and 20 July fell on top of a particularly wet period. If you look at the period from May through to July, across many parts of England and Wales there was three or possibly four times as much rainfall as would normally fall during those months, and so the ground was very wet. Then we have had these particularly intense rainfall events on those two particular days. In terms of trying to explain a little bit about the atmosphere and what was going on, at this time of the year (December) in this part of Europe most of our weather comes typically from frontal systems that come in off the north Atlantic, bringing with them cloud and rainfall and sometimes snow and sometimes heavy winds. During the summer months, what tends to happen more is that those frontal systems tend to sit further north and west, often affecting parts of Scotland and Northern Ireland but less so the southern parts of the UK where our weather is affected more by continental Europe. In that regard, what we were seeing this summer was that the frontal systems were much further south. Why do we not get those sorts of rainfall amounts in the winter if that is the norm for winter? It is because typically in the winter the air is colder, the sea is colder. To try to create, if you like, a context in which one can think about the rainfall, in the tropics the atmosphere is very warm and the seas are very warm; there is lots of energy and the air can hold much more moisture when it is hot. In the summer, if you get these frontal systems coming further south over the UK, as we saw consistently week after week during those months, then you have warmer seas and warmer air and more moisture that can be put into the atmosphere and the atmosphere can hold more, and therefore you get more intense rainfall. We have done a bit of investigation in terms of these sorts of events. If you go back to the last century, when do we get most exceptional rainfall? What we discovered, and what we really knew but we made sure we double-checked on that, is that the summer months are when you get most exceptional rain. On the one hand, the systems
we saw this summer were atypical in the sense that we would normally see them in the winter months, but getting very heavy rain is normally, yes, a summer phenomenon, and that is linked to the fact that the atmosphere can hold more moisture. There is more energy in the atmosphere, so you get larger raindrops and more rainfall falling.

Q554 Chairman: One of the things that is very interesting is where rain falls. One of our colleagues who gave evidence earlier was talking about, for example, Sheffield, the sodden nature of the uplands and the fact that when the second deluge came the uplands were already full and therefore the water ran off very quickly. Are you required or do you as a matter of course inform anybody, any organisations, about the amount of rain that has fallen in key areas like that, so that they might be aware of the fact that areas that traditionally had acted as soak-aways were filling up rather rapidly? Mr Noyes: We do a number of different things in that context. On the one hand, we have a weather radar network, which we operate jointly with the Environment Agency, and the equivalent in Scotland, with SEPA, and that radar network is able to make an equivalent estimate of the rainfall that is falling at any moment in time. That data is passed in real time to the Environment Agency that uses that to make an equivalent estimate of the amount of rain that has actually fallen in river catchment areas. They then use that in their own models to understand what is happening to the rivers. Some of our colleagues will be able to explain a little more about that in detail afterwards. The Met Office’s primary role is to provide forecasts of how much rainfall is going to fall and then in the context of any warnings that we issue, we certainly take account of what has happened before. So we modify our advice in the context of the prevailing conditions. Our forecasters are very much aware of saturated ground when rivers are at a higher state of alert and they are in regular dialogue with their colleagues in the Environment Agency. In the run-up to both of the major events of this summer, we have, for example, initiated daily conference calls with our colleagues from the Environment Agency each morning when we would ask them about the states of the rivers and the state of the ground and understand what they think is going to happen from a flood point of view, and we would be talking to them about the amounts of rainfall that is likely to fall. Clearly, as I think you are implying, 50 mm of rain at this time of the year (December) probably would not be an exceptional thing. However, 50 mm of rain falling a day or two after what we saw on 25 June and 20 July would be significantly important. Indeed, with regard for example to the COBR environment which we were involved in, we were asked with the Environment Agency to run some “what if” scenarios because, in the context of probability, we were forecasting that there was a small risk of a high rainfall event for the weekend following the 20 July event. It was not the most likely forecast. The most likely forecast was for around 20 mm of rain to fall, which the Environment Agency believed would not lead to any further flooding. However, we were indicating that there was a small probability of a heavier rainfall event. Together we worked out whether if we got 50 mm of rainfall, which was a 15% probability of happening, that would lead to more over-topping of the banks in the Severn area in particular. We were able to advise the Gold Commands in Gloucester and also the COBR community that this probability of further high rainfall was unlikely to lead to further flooding. That is how we do it.

Q555 Mr Williams: During that period of time, in Wales we did not get much flooding. Was that because the intensity of the rain was less or was it because actually Wales has got better resilience in terms of flood prevention than the areas that did experience flooding?

Mr Noyes: Could I deal, first of all, with the rainfall that actually fell and then perhaps colleagues from CEH could deal with what then happens to it on the ground? You are right that if you look at the difference from normal, Wales had significantly less difference from normal in terms of the amount of rain that fell on both occasions. Further east from Wales, particularly if you take the July event, the Worcestershire and Oxfordshire area had a much greater than normal amount of rainfall than you experienced in Wales. Perhaps I can pass to my colleagues and see what happens on the ground.

Mr Marsh: I would agree with that. The rainfall in Wales was less and, relative to the long-term average, Wales is a wetter country obviously than the lower Severn basin and the Avon itself. It was principally a function of the rainfall. I can say a bit more about what happened to the rivers in 2007 if it is appropriate. Localised intense downpours in the summer are not rare in this country and localised severe flooding is not that rare. We remember Boscastle, which was extremely damaging. In 1952, the Lynmouth flood in the summer sadly took 34 lives, so that was a disaster, and that was a summer event. What distinguished this year’s flooding was its regional character—indeed, its multi-regional character. That just does not happen in the summer. What is the reason for that? We have heard the synoptic background in terms of the weather, the weather patterns being unusual. It is often reported that the May to July period was the wettest on record. That is true but it under-sells the wetness of that period. The May to July period registered 400 mm for England and Wales. That may not mean too much but the highest in the 20th century was about 100 mm less than that. What you got this year was seven weeks additional rainfall, if you like on top of the highest rainfall in that period, and only in that period, in the 20th century. This rainfall was outstanding. With rainfall of that magnitude, you are going to get extensive flooding. If you look at the rivers of the country as a whole and try to estimate the outcomes for England and Wales in June and July of this year, then as a reasonable estimate it was twice what we have ever had in June and July before. That is only over a period from 1961. We have data
over that successive period. It really was outstanding. In those areas in a broad belt from Yorkshire down through to the Bristol Channel embracing much of the rivers and the upper Thames catchment, many rivers registered their highest flow on record. Again, that is remarkable for the summer period. For much of the rest of the country, the experience of river flows was very notable for the summer but not outstanding in relation to winter flows. Just to pin a couple down, in the Thames for example where the flooding was severe in the headwaters and not so severe lower down, the flow was the highest since 1903 for this summer whereas where the flows were most severe, in the Doncaster area, south Yorkshire, Sheffield and in the Warwickshire/Avon and the lower Severn, the flood magnitude there matched or exceeded that of the 1947 event. The 1947 flood was the largest; it was flood magnitude there matched or exceeded that of the 1947 event. The 1947 flood was the largest; it was the most extensive flood in the 20th century in England and Wales. It was entirely different in character to the summer flood we have now, but in a few areas, 2007 exceeded that. We are talking about a very singular event.

Q556 Chairman: Let me try to put together, if I may, the scenarios that you have painted. Mr Marsh, you have given me what I call a forthcoming attraction picture. Here in the spring and the summer there was this increasing amount of rain. You guys in the Met Office are being asked to make certain predictions. As a layman looking at this and with the benefit of hindsight, I am thinking to myself: if they knew that the volumes of water that had been falling in various locations was so far above the normal level, should not bells have started to ring somewhere that if it carried on like that, there might be some problems? One of the parts of the analysis that we are looking at is: how did authorities react to the flooding? One of the factors, for example, was: should the Environment Agency in the specific circumstance have moved flood defence barriers to a certain location? No, they could not because the flooding had already started; the roads were blocked and they could not get the kit in the right place. I think what I am asking is: do we learn any lessons from that? Could the Environment Agency in the specific circumstance have been more proactive? Mr Marsh so succinctly described, that there is a step-change in capability over the last five years. If we go back five years, it would have been much more difficult for us to have given so much confidence to that early warning as we were able to do this year. We have seen an improvement in our capability. There is still more improvement that we want to be able to deliver to enable even earlier warning.

Chairman: Forgive me for interrupting. Coming back to Mr Marsh’s very interesting picture, the message I get, hearing him describe if you like the run-in to this, for the first time in a very objective way is that if the kind of accuracy of forecast that you were dealing with was visited upon the scenario that Mr Marsh has enunciated, you might have said, “If we are going to get this amount of rain and we are forecasting it just a little bit ahead here, it is going to come on top of what Mr Marsh says is already a pretty serious abnormal situation and it will amplify the effect on the territory where this rain is going to come down.” The question I am groping towards is: should those who had access to this information have spotted what was coming earlier than they did? Patrick Hall wants to follow up on that.

Patrick Hall: I understood Mr Marsh to be describing the events after they had taken place. I was tempted to think that one might say, in the face of the very exceptional nature of those events that Mr Marsh so succinctly described, that there is a limited amount one might be able to do anyway. That does not mean you do not try. That was the message I received. He was talking about what had happened after the event. That, he said, did not contribute to forecasting. It is the Met Office’s job to forecast.

Q557 Chairman: I appreciate that. Let me ask this question. At what point could you have, if you like, produced the data which said: we have already had an awful lot of rain and it is above the norm? Mr Marsh: I should stress that we have no operational role here, and so it is correct that this is post hoc after the event and after the event you can see that it was extraordinary. If during the event it was possible to recognise a synoptic pattern which tells you something about how the condition is likely to evolve, clearly that is something that has been capitalised on, but it is not my area of expertise.

Q558 Chairman: You are not saying, as an expert who looks at the way that rainfall and rivers interact, that during the course of the spring and the early summer when this lot is starting to build up you could not have said, “Something unusual is occurring”? Mr Marsh: I would not run with the term “build up”. I was describing the period as a period. With that totality of rainfall, you would get extensive flooding.
Q559 Chairman: I am leaping ahead in my analysis of where you can contribute. I accede to Mr Hall's cautionary tale that I should not build too much on what Mr Marsh has said.

Mr Noyes: I would not accede too much in the sense that I think there is more that could be done. I think the Environment Agency will probably have to answer for themselves in terms of how much they were aware of the situation that was happening on the ground. Because they monitor the rivers in real time, I am sure they were very much aware of the state of the rivers during those few months. What we were able to do during the summer, which we would not perhaps have been able to do so effectively a number of years ago, was work much more closely with the Environment Agency to look further ahead to what might be going to happen a week in advance. The difficulty we have is that at the moment, if you think of the environment as being a system in itself—and you are probably familiar with the water cycle where the water falls from the atmosphere, lands on the ground and goes back up again—is that typically at the moment we model that system in two different parts. We forecast the atmosphere and then forecast separately what is going to happen to the water once it has landed on the ground. At the moment, with the way that we are able to forecast a long way in advance and from that produce early warnings, the way the Environment Agency system works is that they then model the rainfall once it has fallen. So their models are dealing very much with more of a real time nature rather than a long-term early warning. Where I think there is room for gaining on capability is to integrate those two capabilities much more into a whole system where you are extending the longer range ability to project what is going to happen to the rivers when the rainfall falls five days hence.

Q560 Chairman: Let us move on to the question of probability versus intensity. One of the phenomena, again looking at it as a layman, is that all of our flood protection work is done on a probabilistic basis, preparing for 1:10, 1:30, 1:75 and so on but what this summer seemed to suggest was that we had the amount of rain in these probability possibilities visited in a very short space of time. I think what I am trying to understand is: do we have to adapt our thinking about the way that rainfall arrives? Are we going to see more intense events? Should that, therefore, be built into the probability calculation, which in our earlier session for example has an impact on the ranking order of flood protection schemes? I am going to guess now. I do not know what 1:10 is but if a 1:10 arrived in five minutes instead of 24 hours, at that particular point there might be an awful lot of water to shift. It is just trying to understand the relationship between the two and do we need to change our predictive models to take this into account. Perhaps you could give me a little synopsis or education on that subject?

Mr Noyes: I will deal with how we use probabilities in weather forecasts and I will hand over to John about what that means in a climate change scenario.

I am sure colleagues on my left will also chip in. When we issue a forecast for the coming days, we use probabilities increasingly. That is particularly useful for exceptional weather events because it is helpful to convey to the people who have to respond—the emergency services, Environment Agency and so forth—a degree of confidence about what is going to happen. That could be snowfall, high temperatures, severe rainfall events. That is slightly different I think to where you are coming from in regard to return periods and probabilities of whether this thing will be more frequent in the future. I think it is useful just to clarify the difference. They are both used in the context of these events.

Professor Mitchell: Just to clarify, I think the question you are asking is slightly different from the one I am going to answer, so please forgive me, but it is relevant. In terms of weather forecasting, the way we deal with uncertainty is to run a set of forecasts. The reason we need to do that is that we know both our models are imperfect and our initial data is imperfect. What we do is to run a set of forecasts or we can do a set of forecasts for slightly different nascent conditions, and that gives you a spread of outcomes. The usefulness of that is, I think, two-fold: it identifies if there is a small possibility of a very extreme event which will allow advance warning; and also whether the spread is narrow or wide gives you an indication of how confident you are in the forecast. Those are close to being related to the actual probability of those outcomes happening. It is a probabilities forecast in a very real sense. When it comes to climate change, we have uncertainties in models and we have no way of actually ranking those. What we tend to do is look, as we have for example done in UKCIP, and Dr West will say more about that, to using a variety of models and look at the spread those models give. That is really just a frequency distribution because we have not been able to assess which is a better model and which is not a better model. The way we use probability in climate change is different to the way we use probability in weather prediction. I think the question you were asking is whether in a 24-hour period it makes a difference if a given amount of rainfall falls over 24 hours or it ends up in 20 minutes. In terms of the model’s ability to forecast in very short timescales, that will certainly stretch the model. The time-step in the model is typically 20 minutes to an hour and so you could actually evaluate rainfall totals, but I think you would have to question whether on that timescale the model is accurate enough. We do routinely keep six-hour totals, so we can look at a finer timescale. As you go to the finer timescale, I suspect the accuracy becomes more suspect just because of the shortcomings in the model and the fact that the model resolution is limited. If you can indulge me just a bit more, one of the issues that we have, I think, with the Environment Agency is in looking at rivers, and some of these are in quite small catchments. The forecast models at the moment are run at 12 kilometres and 4 kilometre resolution; 12 kilometres is much too coarse for a lot of the catchments and for
some catchments a 4 kilometre scale is still not fine enough. We plan in the next two years to run a 1.5 kilometre model over the UK, which would allow for directly coupling in rainfall forecasts to the sorts of models that Dr Marsh’s unit produces. You could actually have those combined rainfall and riverflow forecasts running in real time. There is still a question of scale but one could then, hopefully in the five years or so and after that is we get the enhancement to computing, run ensembles at this very fine resolution which would allow the Environment Agency to look at the risk of very high rainfall in small catchments. In the future, there are things that we can do better, both through better modelling and coupling that modelling into the river routing models and the flow models where the expertise is not in the Met Office but probably it would have to be done on the operational side. There is the potential in the future to bring those two things together. That would allow us to look at shorter timescales because I guess the timescale of Dr Marsh’s model is hours. You could look in real time into the future at what the potential river flow was.

**Dr West:** I think there is an issue with return periods and probability in terms of the threshold or the description of the event you are interested in. For a Boscastle-type event, it is a matter of perhaps in less than an hour how much rain falls in a small catchment. What I think we looked at last summer was the combination of that heavy rainfall over a long period, some months, and very intense rain. It is that combined probability that we need, if you like, to quantify. Different scales of event require different combinations of thresholds. For temperature, a threshold may be important if the temperature goes over a threshold for 20 minutes, or in terms of heat build-up it may be over several days. One of the ways we anticipate that users will interact with the next set of climate scenarios is that we want them to be able to describe what is an important threshold. For a seaside town, it may be sea level. For a flood management, it may be the amount of rain over four days. When they can define that threshold, and that requires them to look back in time probably at what has happened in the past to consider where they are vulnerable, then they can interact with these probabilistic scenarios and interrogate them in a way that gives them an answer to a question that is relevant to them. While not downplaying the value of increasing the accuracy and the amount of information in the climate scenarios, we feel it is very important that somehow we train decision-makers to interrogate these more intelligently than they perhaps do at the moment.

Q561 Chairman: Do I interpolate from what you have said that you could have, if you like, a double probability; you could put two bits of probability together—the probability of a one in 75 year event or a one in 100 year event—and say that that event occurs with, if you like, a Boscastle intensity? In other words, you can say that we will have one of these every 100 years but there is a probability number that we can give to indicate whether it is going to be intense or not. Hopefully, I am not muddling the two things up too much there.

**Dr West:** I think the answer is “yes”. I think the probability is of your defined event, and in defining the event you will have to talk about intensity. If you are interested in how heavy the rainfall is at this instant, we can probably tell you that, but for any flood situation, it is how long it takes to get there.

Q562 Chairman: When you define these one in some many year events, over what time period is the rainfall defined or measured?

**Dr West:** I am going to ask the Hadley people to help with that. If we look at last summer’s event, in terms of rainfall it is how much fell over a couple of months.

Q563 Chairman: The thing that is still niggling at my mind is: if the events measured out over a 24-hour period but what we actually had was an event over two hours, it is still a 1 in 100 year event but it occurred over two hours and that is the bit that has put so much pressure on the existing systems to deal with the flood. What I am trying to understand is whether that compaction of the timescale of the 1 in 100 year event occurring is something which can also be modelled with any degree of accuracy?

**Dr West:** I would suggest that so much rain falling in 24 hours may be a one in five year event. If it all falls in an hour, that is much more unlikely and therefore has a much longer return period.

Q564 Chairman: True, but if we come back to the fact that the reality was that in these summer rains we had this very heavy concentration, when you look at Sheffield, an area of low flood risk probability, it was overwhelmed because a very unusual event occurred. Everybody is now casting round saying, “Can we predict when such events occur?” At the moment we have something that says a one in so many year event. I am not quite clear over what time period the rain is measured in terms of these. Professor Mitchell, you are nodding like a man who could give me an answer.

**Professor Mitchell:** In terms of statistics, I think one can look at shorter-term rainfalls in observation. There are records of shorter-term variations than a day. A day happens to be a convenient unit of time which people use. I think the observational record exists for us to check on that. In terms of weather prediction models and whether they can predict on those shorter timescales, that is an interesting question. High resolution models of the sort that we have used on occasions recently, are certainly in a better position to do that than present-day weather forecast models. Where I would question it is when one starts looking at the models that we use for future climate, which are at 25 kilometre resolution at best, is whether you are smoothing out intense rainfall over the 25 kilometres squared, and so it may tend to underestimate those totals.
Q565 Chairman: Dr Calver, did you have a contribution to help me?

Dr Calver: With regard to recurrence intervals in hydrology, we associate that with the time period and so we would talk about the peak flow having a particular recurrence interval or we would say that it is a rarity event based on a 30-day period, or something like that. The time is an integral part of the number we come up with. There are one or two other comments that may be helpful to add on to the meteorology. Hydrology follows from meteorology but it also brings in other things like the ground surface, the type of surface, the antecedent conditions there, the topographic configuration and of course not least the flood defences. So the recurrence interval of a rainfall event when it becomes a hydrological event can be enhanced or reduced by the nature of the surface, the condition of it. If it is very wet, it may well be a higher recurrence interval event and vice versa. What do we do if we do not do real-time forecasting? Some of our research goes into the Environment Agency real-time forecasting, but we do a lot of hydrology based on Met Office and other output longer ahead into the future. We take the meteorology of climate models and they can, if you like, be used to “drive” hydrological models to derive possible future outcomes. In this case, there is that difficulty that John mentioned earlier, the difficulty of rainfall extremes. There is more accuracy expected of models in the future than now. For example, at the moment Defra’s plus 20% allowance on peak flows for schemes over a 50-year scheme lifespan is based on that sort of hydrological modelling, following on from meteorological modelling. We can do it transiently (i.e. our model gives a time series through time) or we can jump to a future scenario for a certain date and we can do that in an ensemble set of model runs as well. I think in this context what is going to be a good analysis shortly to tell you about is river flood frequencies under climate change when we have the downsampling of UKCIP 08 scenarios—

Q566 Chairman: I am sorry; downsampling of what?

Dr Calver: It is to make the scale of the outputs for the hydrological models so that we can take into account some of the surface variability. Hydrology works in a very variable domain in space and in time. The advantage over what Defra is working from at the moment for its project appraisal guidance will include that we may—when I say “we” I mean the hydrological community—and I stress may, be able to make distinctions in different parts of the country. We will include some sort of quantitative analysis errors. They may arise from emission scenarios, from climate models, from hydrological models, et cetera. We would probably call them uncertainties, if you understand what I mean. What we also hope to do is compare those flood frequencies in the future with what one would expect anyhow from natural variability. An important point to make here is that many errors in assigning recurrence intervals, flood frequencies, et cetera, are not that different in percentage terms from some which are predicted in climate change.

Q567 Chairman: Just to interpret this flow of future hydrological information in terms of outputs, in other words I am a decision-maker and I am salivating at the thought of the interrelationship between hydrological models and meteorological information, and I am sensing that I am going to get some better information about what might happen on the ground in the future, what kinds of things can I expect from this improvement?

Dr Calver: May I just say that it is better in the sense that more things will have been taken into account, but we often find when we quantify uncertainties that that does not automatically mean that they are narrowed. The sort of outcome you get is a time series of flow in various rivers across the country. One could interpret that as what we call a flood frequency curve and say the magnitude of the peak flow in the river against how often on average you are likely to get that flow. Hydrology and meteorological models are intimately linked. They are done in different ways in a real time sense, but please ask the Environment Agency for details in the longer planning sense. There is also feedback from the hydrology of the surface into meteorological models.

Dr West: I think it is helpful to recognise that climate models deal with average values over perhaps 25 kilometres squared and very often the decision-maker is interested in that point, that time of day. What Ann referred to as downsampling is using the current relationship between the current climate and current weather on very short timescales, on very local timescales, and saying, “We assume that that relationship will be the same in the future”. So you can produce a simulation in the future from which you can say, “Yes, if this river rises at this rate, this piece of land will be flooded”, but is an abstraction based on assuming that the relationship between the weather and climate stays the same as it is now. So that will be available, but it requires somebody with the sense to take that information to hydrologists and convert climate information on a grid square basis into real flow information.

Q568 Chairman: Who is going to do that?

Dr Calver: There are various potential people who can do that, whether in the public sector research establishments or universities.

Q569 Chairman: Is it something that should be done?

Dr Calver: I understand it will be done, as far as I know.

Dr West: It will not be done as part of what is described as UKCIP 08, which we will launch in October, but it allows people who want that done—Defra flood management, the Environment Agency, any consultant—to take that information and apply it to a particular situation. For example, Leeds City Council might want to know about the local flow.
Somebody has to do that; it is not going to be provided for free as part of UKCIP 08 but the tools to do that will be the best available.

Q570 Chairman: What does UKCIP 08 stand for?
Dr West: Our programme is the UK Climate Impacts Programme. Working with the Hadley Centre and funded by Defra, we are producing in October a new set of future climate scenarios for the UK which, as John described, for the first time will have probabilistic type information. Instead of saying, “That is the number at that time period in that place”, here is a range of numbers. What you do with those numbers requires you to have some knowledge of what is important. If you just want to report what the climate is at that time, you might pick a mid-value. If you are very risk-averse, you might want to know what is the level that might be exceeded at a 90% probability. Your attitude to your own threshold will determine how you look at the data. If you do not have that attitude to risk and knowledge about a threshold, the information is still there but you will not be making maximum use of it.

Q571 Patrick Hall: If I understood what Dr Calver was talking about, it was about river flood risk.
Dr Calver: It is, and I am totally aware that there are other types of flood risk.

Q572 Patrick Hall: I just want to ask about another type of flooding which we have called earlier today flash flooding. Because of the likelihood of greater and more often intense rainfall episodes due to climate change, does it matter what the condition of the ground is in terms of flash flood risk? I have heard people say that the ground is so dry, it just ran off; and I have heard people say in other circumstances that the ground was absolutely soaked so that it had nowhere else to go and it just ran off. Does it matter what the ground is like in terms of intensity and flash flood conditions?
Dr Calver: Yes. It is probably the rainfall intensity coupled with the duration that is more important but, yes, because otherwise a potential flood will not happen. Things like the ground conditions are modifiers beyond that.

Q573 Patrick Hall: But both have been cited as explanations as to why a particular—
Dr Calver: I am sorry, the wet and the dry. I think it is a bit like dry blotting paper that is very difficult to blot but, once it gets a little bit wet, it sucks up ink better. I am going to ignore the very dry conditions and say that if it is very wet, any rain will flow off; if there is capacity to take the water in, some of it will go into the soil. I believe there is an analogous position to the very dry blotting paper case, to do with soil pore water pressures.

Q574 Patrick Hall: I think I can follow that.
Mr Noyes: If you happen to live in a clay area, in the summer months if you have had a dry summer, the clay will form a very hard surface, which is almost like concrete, and so the water will run off quickly.

Equally, if the clay is saturated in the winter, then the same thing is going to occur. There is an intermediate state between the two.

Q575 Patrick Hall: That shows how complex these matters are.
Dr Calver: The science is the spatial variability of what the rainfall is falling on and therefore the hydrological response. Of course, when you come to urban areas, there are other complexities and perhaps—others may wish to comment differently—these very intense rainfalls might be most danger in urban environments.

Ms Yeates: It very much depends on the urban environment: the height of the gutters, the shape of them, the size of the sewers, how much has been paved over, how much green space there is. There are people that do this sort of modelling and this work looking at both what happens in the current situation, particularly focusing on areas that have already been affected where they have data, and then taking the climate information and looking forward to what might happen in the future, but it is very much dependent on the site and what the area is actually like in the first place. They have examples where what currently is a road or somebody’s backyard suddenly becomes a very fast-flowing river during the rainfall period. If the rain stops a couple of hours later, it just becomes a pile of mud which is what was left after that rainfall.

Q576 Paddy Tipping: What are people doing about it?
Ms Yeates: The Pennine Water Group has I think moved to Sheffield University now.13 They are one of the key researchers in this area. I believe Richard Ashley is still leader of that group.

Q577 Paddy Tipping: So they are doing work on the natural environment and the interaction with the built environment?
Ms Yeates: They are very much focused on the built environment and looking at what happens when the rain falls on to that built environment, recognising that if you have a road, obviously you are not going to get rainfall soaking into soil but you are going to get it running off into gutters, and looking at those sorts of aspects of it. Instead of saying, “We have a river basin and we have these areas to soak up water”, they have different types of areas to soak up water and they are looking at how to manage that instead.

13 Note by witness: The Pennine Water Group (PWG) is an EPSRC funded Platform Grant centre dedicated to research into water and wastewater. It is based at the Universities of Sheffield and Bradford and is headed by Professor Richard Ashley as Managing Director and Professor Adrian Saul as Research Director. The PWG aims to advance engineering and scientific knowledge across all aspects of potable water, stormwater and wastewater service provision and management of associated assets. See http://pwg.group.shef.ac.uk/ for further information.
Mr Drew: I am sorry I missed the early part of your comments. Can I look into the world of science fiction? There is something that I wanted to ask you. Is it complete science fiction at the moment actually to believe that one day if we were to get prognosis of a real threat to an area then we could either move that weather front in some way or possibly dilute the water? There would have been no problem if the rainfall that we had in Gloucestershire had either been slightly moved off over areas where there was not the same level of population or, more particularly, diluted so that the rainfall came down over a greater area.

Chairman: That is climate modification.

Q578 Mr Drew: That is a good term.
Professor Mitchell: Climate modification or weather modification: I am quite sceptical about our ability to do that. I have just come back from China where I was told that there is something like 20,000 people employed to modify weather. They shoot something like silver iodide into clouds to modify the cloud structure. I think, even if we could do it, it is a very risky procedure because if you get it wrong—

Q579 Mr Drew: If you get it wrong, you are sacked.
Professor Mitchell: If you move it from Gloucestershire and it lands in Warwickshire, you can imagine all sorts of lawsuits occurring. Scientifically, I think the jury is still out. Why the Chinese invest so much in it, I am not sure. They obviously believe it works, but I think other countries are much more sceptical.

Q580 Paddy Tipping: Coming to your work, Dr Calver and Mr Marsh, in your evidence you suggest that fluvial flooding is going to get less because there is going to be less snow around and the soil is going to be drier. We have had a prolonged discussion today about urban flash flooding. As policy makers, do you think we ought to be investing in the urban environment and taking measures in the urban environment rather than flood defences?

Mr Marsh: There is an issue there on the point we made in our notes to the committee. In terms of fluvial flood risk, we did not say that it would reduce. We said that there were factors that would moderate flood risk in the future. In terms of fluvial flooding, there are two elements and a separate feature which I will come to. The 1947 flood, the largest of the last century, was primarily the result of snow melt. There was some rainfall but it was a major snow melt event. The largest event in the 19th century was probably the 1809 flood, and that was in fact rainfall running off frozen ground, with some snow. These are frozen ground and snow melt events. In a warming world, climate change is seen as the villain of the piece too often, but, in a warming world, that type of exacerbating factor will be less important. The other issue is in relation to the dry warm summers that we are likely to get. Under those circumstances, the soils will be drier for a longer period. One would envisage the reason that we have so few summer floods is that dry summer soils are able to absorb a substantial proportion of the rainfall. In the future, it may well be that the flood season, if you will, is contracted. Those two elements could come together to reduce flood risk. There is one final point in relation to fluvial flooding, because there is a good deal of public fear out there that flooding is going to increase very rapidly. The Thames is an interesting example. It has one of the longest records in the country for flooding. There is no trend in the flood magnitude on the Thames, and that is over a period of 130 years. You could go further and say that flood risk has actually declined, not vulnerability to flooding because of development on the flood plain—there is no change in flood magnitude through time—but the capacity of the channel of the Thames has increased. The Thames is a more efficient river, less romantic but more efficient, than it was 100 years ago. The weirs have improved. There are flood relief schemes. Dredging has created a more efficient channel. An amount of flow, an amount of water, that would have produced a flood in the 1930s and 1940s is now readily accommodated in the lower Thames. These issues are important. Some relate to potential climate change and some relate to river management. If you also look at the Warwickshire Avon where there was a staggering magnitude of flows, there is no compelling long-term trend in flood magnitude there either. Things may change but you have this relative stability through a period when temperatures have increased, not as much as they are likely to increase in the future, and the rainfall patterns have changed from a situation where in the 19th century summers were quite often wetter than winters and now we have wetter winters. You do have this stability through periods of climatic variability. I am not saying that these are grounds for being sanguine at all. It may change but you can see that it is relevant to the discussion, particularly in relation to the public’s perception of how bad things could be and how quickly. I am not sure I am best placed to answer the question about—

Q581 Paddy Tipping: Stick with that for a minute. There are reasons to be cheerful?

Mr Marsh: There are reasons to be cheerful in the sense that there is some resilience to flood risk, which perhaps is not discussed. If we get wetter winters and more intense storms, then that resilience will be tested but there is a degree of resilience.

Dr Calver: There is just a quick point on whether we should invest in urban areas. In Environment Agency and Defra parlance, risk is probability times consequences, and consequences are usually likely to be more compelling in urban areas. The point I would really like to make is that urban drainage systems were designed perhaps more for drainage than for conveying floods, and they are to a very low standard in terms of recurrence interval events. I think new developments are somewhere around the 30 years but many, many are a lot less than that. What we badly need, if we are going to invest in that type of approach, is knowledge of urban drainage behaviour above the current rather low design levels. When we know how they behave, we can then see if
it is worth investment there. What developers must do is not only solve their development patch but not pass the problem on within an urban area and not pass it on within a catchment either.

Mr Noyes: This is a really important point. One way that I tend to think about it is that a lot of effort and investment has gone into understanding the meteorology that gives rise to rainfall and the effect that then has on river catchments and then what you do about managing the effect of rivers in flood through managing the flow of the water but also on the flood defences. I think historically that has been what one might call a tractable problem in the sense that the science and the engineering is established well enough to be able to do something about it, to understand what is going to happen in the atmosphere and what happens in the river catchment, and then how you deal with it, how you design the management and mitigation systems to deal with that. It is really only relatively recently that the problem that you described in terms of urban flooding, flash flooding, is beginning to become tractable because on an atmospheric scale we are now beginning to model the atmosphere at a resolution which is approaching the sort of resolution you would need to be able to do something useful. Ordnance Survey and the like are now gathering data around what is actually happening on the ground at that resolution and also importantly keeping it up to date. The water authorities and the Environment Agency are together beginning to keep more records of what they are doing. Probably for the first time it is becoming a tractable problem so that we can actually start to provide some useful advice around it. The area where it probably is possible in the longer term, and we have already talked about this but it needs significantly more work, is what is going to happen under climate change. On the one hand, in real terms, in terms of providing forecasts so that emergency services can respond to something that is going to happen next week in an urban area, I think we are close, with more investment, to people working better together and being more focused on that issue to start dealing with that in terms of the here and now. With more investment in understanding climate change and the links to the hydrological impacts, then the engineering design solutions should be available for the future.

Q582 Paddy Tipping: This is the work that you were talking to us about earlier, Jacqui?

Ms Yeates: I understand the problem is that as much as they can model the future climate change, ideally I believe they would like 30 second information in terms of future climate change. As the climate modelling people will tell you, you just cannot have that. So there is still a mismatch between the type of information required, because obviously rainfall intensity is very important and that is why they ideally would like 30 second rainfall. They cannot have it and I believe they ended up using two minute rainfall with very large cautions around it given to them via a weather generator. There is still a problem with the level of information needed for this type of work and what can actually be provided with any type of accuracy or certainty in it. It is still very uncertain information we are dealing with.

Q583 Paddy Tipping: This would be interesting data for insurance companies?

Ms Yeates: Yes.

Professor Mitchell: Just to comment on the extreme events, in winter with both the mean rainfall and the extreme events, the tendency increases in virtually all models over the UK. As was indicated, in summer the mean rainfall is split between getting wetter and drier, certainly in England in the southern part of the UK. When one looks at the extreme rainfall, there is still a tendency, even in some cases where a model is producing a drier mean rainfall, for it to produce heavier extreme rainfalls and so the heaviest day rainfall increases—not in all cases but in many more than in the case of mean rainfall. As Steve explained, that is simply because you have a moister atmosphere and typically that is about 6–7% per degree. So you have a rule of thumb for that particular mechanism. There may be other things happening which might intensify the storm but, in terms of the temperature effect, there is a very rough rule of thumb of about 6–7% per degree in the maximum amount of water that the atmosphere can hold at a particular temperature.

Q584 Paddy Tipping: Sticking with the reasons to be cheerful, you seem to be telling us that climate change can be more intense with heavy rain in summer but longer, more protracted rain in the winter.

Professor Mitchell: Certainly it can be wetter with an increase in mean rainfall and an intensity in rainfall. In summary, the jury is split on what is happening in terms of mean rainfall but there is a tendency in some of the cases where models are producing a reduction in rainfall still to have an increase in the extreme rainfall.

Q585 Paddy Tipping: On the climate change pattern, what about tidal surges? East Anglia was going to be overwhelmed at the beginning of November and narrowly escaped that. What is the pattern of weather change on some of those events like that?

Professor Mitchell: In terms of storm surges, there are at least three main factors. One is what is happening to the land surface in the south-east of England as it is sinking. If you go to Scandinavia, it is rising. The second is the change in mean sea level. The third is any change in meteorology which increases the tidal events. If you look at the last UKCIP report, I think there is a case of a high emission scenario in somewhere like Immingham. A one in 100 year event became a one in seven year event. The majority of that was due to changes in the meteorology in terms of storm surges with slightly less than half the contribution coming from sinking land and changes in mean sea level. The more recent predictions that we have show a smaller contribution from storm surges and a similar
contingencies from mean sea level and so on. The predictions of storm surges are even less certain than rainfall. I think one should be aware of that, but that gives you a typical idea of changes in surges down the southern North Sea.

**Ms Yeates:** That was the median high scenario and not the high emission scenario. If memory serves me correctly, it is medium high and not high.

**Q586 Chairman:** Are all coastal areas potentially around the United Kingdom subject to storm surge? Could any one occur at any time?

**Mr Noyes:** Yes, but to varying degrees. I think that is the point. Storm surges are common but when they become particularly severe is less common and it is largely the area around the North Sea coastline that is most at risk because of the collection of water in the sea pushing up. One way of thinking about it is that if you push a tablecloth on the table, it ruffles up. It is the same effect in that the wind pushes the sea; it gathers at the bottom of the southern end of the North Sea. You get storm surges all round the coast, during the winter months in particular, but what is particularly of concern is the shape of the North Sea basin and the gathering of water in the North Sea.

**Q587 Dan Rogerson:** On urban flooding, and we are talking about modelling, just in terms of the weather that is on the way and the interaction you see when you are looking at the fluvial events, you have that relationship with the Environment Agency, which is very clear. When you are dealing with local authorities, I imagine that is quite a different relationship to have one organisation with lots of others. How does that interaction occur?

**Mr Noyes:** We deal with a lot of different agencies. For example, if there is going to be an exceptional weather event this coming weekend, we would already be talking, as you say, to the Environment Agency. We talk to the local authorities, both directly in terms of the ones that are most likely to be affected, and also, through the Civil Contingencies Secretariat, to the Cabinet Office. We also have contacts with the Fire Service and Police directly. At different stages of the event, then we would be talking to different people. If, for example, a Gold, Silver or Bronze Command was established, we would be in regular contact with them. Indeed, we have a small team of people who are located around the country called our Public Weather Service Advisers whose sole role is to communicate with that community. To the extent that they would be talking to them at any time of day or night, they may indeed deploy to work alongside colleagues in a Gold Command, should they wish it. We talk also to the Cabinet Office and to government departments directly and to the community of utilities of course which have an important role to play, whether it be the water utilities, energy utilities, Highways Agency or Network Rail and so forth. Those dialogues are happening all the time. We tailor our messages to the people to whom we are talking. As you say, the Environment Agency would probably want to have a dialogue with us in one particular context, whereas Network Rail as one example would be talking about the issue in a different context.

**Q588 Dan Rogerson:** Is that on the basis that they are asking you questions and you are providing the answer or is that on the basis that you think there is a matter of concern and you are initiating the process?

**Mr Noyes:** We initiate that. There is a protocol whereby we contact them. There is a routine service that happens in terms of alerting people during the routine service that operates 24 hours a day, seven days a week. In addition to that, over recent years we have developed matters and we have found at the operational level that sometimes when we are talking to our customers the high impact exceptional events do not become escalated. To get round that, at senior level we will make direct contact with senior management in those customer organisations so that senior management is aware that something is going to happen and then they can gear up their own organisations.

**Q589 Dan Rogerson:** But is it because of the way flood defences have been focused on the river catchments? Is going into the Gold Command process and all the rest of it really triggered by river catchment stuff and the urban stuff is tacked on to it or if you are likely to have an event that is happening in an area that is not part of the significant catchment? Do you see what I am trying to say? How would that go direct to a local authority rather than through a wider process because of a concern over river catchment?

**Mr Noyes:** There is a routine protocol for the warnings that we issue, and indeed the warnings that the Environment Agency issues. We have something called the National Severe Weather Warning Service, which would go to all the local authority responders, but we do not deal with flooding; we deal with heavy rain. The Environment Agency then deals with warnings related to rivers. There is a gap, which is indicated in our submission in terms of where you are driving to and that is the pluvial or flash flooding, in UK capability in terms of warning people about that risk.

**Dan Rogerson:** As the MP for Gloucester and as you have mentioned a couple of times, the much smaller event we had this year was far more connected with the surface water coming there. I guess because the community had been through it so recently, they were far more pragmatic about it and were able to analyse for themselves what had happened and so it was very different.

**Q590 Mr Williams:** On the tidal surge issue, I can understand how seasonal and tidal events are exacerbated and how wind can exacerbate that, but what I did not understand was how in very low pressure conditions the actual level of the sea rises. Is that right?
**Professor Mitchell:** That is true.

**Q591 Mr Williams:** What causes that? Is the water becoming less dense or is it moving?

**Mr Noyes:** Think about the weight of the atmosphere pushing down on the oceans. Pressure is just a way of measuring the weight of the atmosphere above you. As the pressure reduces, then the sea can rise higher, and so, yes, it is effectively expanding.

**Q592 Mr Williams:** So it is becoming less dense?

**Mr Noyes:** Yes. It is rising up higher.

**Dr West:** It is rising up higher. It is being pushed down more strongly elsewhere.

**Dr Calver:** If I may add a point on that surge, the low pressure systems that cause this effect can of course also be associated with inland flooding. Occasionally you have what we call a joint probability situation with both inland and coastal flooding and that of course can be one of the occasions when you get very extensive flooding. It is worth thinking about spatial extensive flooding in general because that is when the emergency services are really tested. It is very bad if it happens in an individual place but if you get a spatially extensive event that is perhaps even worse. It is probably worth looking into some of the circumstances that promote those events.

**Q593 Mr Williams:** Could you explain how that works?

**Dr Calver:** Yes. The low pressure that Steve and John have explained and how that causes a surge is often also associated with a depression of a weather system. If that tracks over the country in a certain way, it can sometimes produce enough rainfall in locations so that there is big river flooding, coastal flooding.

**Q594 Mr Williams:** That is not to do with the lifting of the water?

**Dr Calver:** No, it is the precipitation associated with low pressure systems.

**Mr Noyes:** There is a direct impact on rivers from the surge. If you go back to the East Anglia event we have talked about, and you can imagine the water egressing the land through the river, if you have a storm surge, it is like the tide staying in all day and so the water cannot leave the rivers. If you take the East Anglia event, the flood defences on the coastline held up, thank goodness, with just one breach but the flooding we did have, particularly in Norwich, was because the river flowing through Norwich could not get into the sea. There are circumstances which are fairly common where a surge will stop the river getting rid of its water.

**Q595 Lynne Jones:** You commented a few moments ago that pluvial flooding, which is a new word to me, nobody is responsible for forecasting. Also, the Met Office in its evidence referred to the different system they have from most of Europe where there is one single agency responsible for all these forecasts. Are you implying that there should be changes and, if so, what and who should be responsible for pluvial forecasting...?

**Mr Noyes:** There are two parts to the question and two answers. One is around pluvial forecasting and what shall we do about that, and then there is a second point which is: is there benefit to be gained from integrating more closely how we model hydrology and how we model the atmosphere. With regard to pluvial forecasting, because of capabilities that are coming, and we could potentially accelerate those capabilities, and, as I mentioned earlier, because of better understanding of what is going on on the ground in terms of Ordnance Survey, better records being kept of what is being put in the ground by builders and developers and water authorities and better modelling of the atmosphere by us, we can start really for the first time to be doing pluvial forecasting and warning in a sensible context. I think in Europe there is no difference. Everyone has the same problem. Everyone is trying to come up with a way of forecasting and warning early enough of flash floods so that people can do something about it. In the Boscastle sense, people could be contacted a few hours in advance and be told to evacuate to high ground so that they did not have to be lifted by helicopter, for example. That problem is the same in the UK as it would be in other parts of the world. Everybody is now getting to the stage where we think we can do something about that. The other is with regard to whether there is benefit to be gained from more closely coupling the responsibilities for hydrology and weather. We think that there is, and that is evidenced by what happens in Sweden and in France in particular within Europe. Why do we think there is benefit to be gained? For a start, if you take the example within the Met Office of the Hadley Centre, which looks at climate change and the weather forecasting business, which is our traditional, core business, by having them in the same organisation we have been able to develop our science and our modelling in such a way that we end up with a better understanding of climate change and the weather impacts that then helps our colleagues in UKCIP to produce better predictions of what the impacts will be. In the same sense, if you can couple modelling of the water that then has fallen on the ground with the way that you model the atmosphere and if the research and development that goes into those are done with the same aim in mind, then when we are developing our science for the atmosphere, we can be very much gearing that to what is going to be done in parallel with modelling the hydrology. At the moment, I think it is fair to say that there is not so much co-operation and coupling as there should be. There is a lot to be gained from putting much more effort into a unified approach to how we do that in the future.

**Q596 Lynne Jones:** In practical terms, what are you saying? It has been proposed that the Environment Agency should take over this role. Are you disagreeing with that or are you saying that you just need a much better relationship or that you can
provide better information to the Environment Agency? You also said a few moments ago that we could accelerate these capabilities. I assume things are going ahead with your new super computer which will enable you to increase the resolution of your predictions. What about other areas of research into hydrology? Have we got the resources in there that will maximise our capability in this area?

Mr Noyes: Again, there are two parts to that in terms of the response. One is around who is best placed to provide that once we have the capability in place to do pluvial forecasting well. I will pass to John and colleagues to my right in terms of how we might do that and where the research should be focused. Bearing in mind that pluvial flooding is related to high intensity events and the response is quite quick, river flooding tends to be slower; there is more of a lag until the response. Pluvial flooding is very quick and therefore we need to get messages to the citizens very quickly, in the middle of the night potentially. You need an organisation that is used to providing that immediate advice to the emergency services. The Met Office’s view is that we are best placed to provide that advice in an operational context because that is what we do now and we already have the contacts. We are there all day and all night every day of the year; the Environment Agency is not. That would be our view in terms of the actual advice to the emergency services and the public. With regard to the operational running of the models, it would make sense for those to be done together so that they are closely coupled. Where the research and development should be done is less clear. I will pass on to John for that.

Professor Mitchell: To add to what Steve has said, in particular on the operational modelling, the running of the operational model I think would have to be done in the Met Office because in coupling an atmospheric model to a flow model, particularly if you go to high resolution perhaps in samples, there is a lot of data streaming out of the computer that has to be fed directly into the flow models. I think that is where we would want to see it. In terms of the actual advice to the citizens, I think both, in actually achieving what you say we need to do?

Dr Calver: Can I clarify whether you are talking about operational work or longer term research, please?

Q597 Lynne Jones: I would like to explore the research issue and capabilities a bit further. Are you actually bidding to take over responsibility from the Environment Agency?

Mr Noyes: We have indicated what our capability is and we think we are well placed to play an important role, and we have made our submissions to the Pitt Review that is underway at the moment. What Government decides to do we will wait and see. We have indicated that we believe we have a very important role to play and that our existing capability could be better exploited than it is currently. In that sense, I guess we are bidding but we are not saying that the Met Office must do this. We are saying there is a lot of capability in the Met Office that could be better exploited.

Q598 Lynne Jones: We have to maximise our capability, obviously. I am referring back to Dr West’s comments earlier about defining vulnerability and thresholds. He implied there was a lot of work that needed to be done to get to that level. Could I ask the other witnesses if they would like to comment on whether we are investing in that capability and have we got the right set-ups to achieve what you say we need to do?

Dr Calver: I am only talking from the more strategic research view and not the operational view because I think that is beyond my remit. The important thing for hydrological research is that any flood research is also done in the context of other things that catchments are used for—water resources, the requirements of the Water Framework Directive, etcetera. Hydrology research, although it relates very much to floods, also relates to other things. If you ask researchers whether they need more money, there is always the great danger that they will say “yes”. Flood research is done in our organisation. The Defra and the Environment Agency joint programme is a big client and a big funder and I would say that was well developed but could do with more funding. We are also funded by a Science Vote...
through the Natural Environment Research Council and CEH has a programme on water extremes, which includes flooding. I do not really think I can comment on levels of Research Council funding, except that we are always pleased if we get an increase at Spending Review time.

**Q600 Lynne Jones:** There has been quite a big increase in NERC’s spending, has there not?

**Dr Calver:** It is across the whole board of NERC’s subject matter remit. We also get *ad hoc* funding from the European Union. There are some directed programmes in NERC—Flood Risk from Extreme Events—and the Engineering Physical Sciences Research Council has a Flood Risk Management Consortium. There are lots of initiatives. Of course, if there is more funding, things can be done sooner but I think as regards details I would be straying too far from my science remit.

**Dr West:** I think you have raised an important point. It is not something we can address through traditional research funding. I think this is an issue of training society to start asking difficult questions. Perhaps society is not good at discussing about probability; it is worse at thinking about risk. Some organisations have been very good at defining their own critical thresholds. The Railways know exactly at what point they have to impose speed limits because of the risk of buckled rails. The Environment Agency in the Thames Estuary 2100 Programme knows what sort of flood level causes what sort of problem. In general, people know that very dry summers cause damage to roads but very few organisations know what that cost-response curve looks like, so they do not know how a dry summer causes them problems. What we would like people to do before we offer them the opportunity of looking at these good probabilistic climate scenarios is to examine their own operation. At what temperature do you have to start giving water to people on the Underground? At what temperature do you have to start looking after old people in a different way? In general, people know that there is such a threshold but they do not know what it is, and so they tend to wait until there is a problem before they respond. What we would like people to be able to do is to say, “We know that if the temperature goes over so and so for three days, we are going to have to get our gritting lorries out to grit the roads because the tar is melting”. It is an entirely different sort of research and it is quite introspective. It is asking people out in the fields with their wellies on what is happening so that people in the office can say, “We know that we have a problem above this threshold”.

**Q601 Lynne Jones:** How do we maximise the probability that those with these areas of responsibilities will actually do as you have suggested? Who should have the chivvying up role in achieving these capabilities?

**Dr West:** If the Climate Change Bill works out as I hope it will, I think that there will be a statutory duty on some public bodies, maybe all public bodies, that they have assessed their current vulnerability. I would suggest that you cannot assess your current vulnerability without defining your thresholds. **Chairman:** On that note we will conclude our inquiry. A little while ago I think I became saturated with high quality information, and there is a limit to how much I personally can digest. When we look back, there may well be one or two other areas that we might want to contact you on in correspondence. Equally, if there are things which you want to expand on or explain to us if you wish you had had a chance to put, we would be delighted to hear from you. May I thank you all for a truly fascinating and certainly intellectually challenging series of exchanges. I think it has given us a much better understanding of our capability, particularly in the meteorological area and the very interesting possible extensions of marrying up the hydrology with the meteorology. Dr West, you have brought things rather nicely to a conclusion when you said that with all this information you have got to challenge your preparedness to deal with some of the climatic phenomena that we have been discussing. Thank you all very much indeed for your contributions.

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**Supplementary memorandum submitted by the Natural Environment Research Council’s Centre for Ecology and Hydrology (FL 112a)**

1. The Centre for Ecology and Hydrology (CEH) welcomes the invitation to submit additional evidence following the oral session on 12 December 2007.

**Background rationale**

2. Paragraph 37 of the Natural Environment Research Council’s original written evidence briefly outlines relevant research directions at CEH addressing future flood risk. Given the issues of interest discussed at the session in December, it appears appropriate to enhance this to indicate the major capabilities of hydrological research which do already and can be further expected to inform flood risk assessment under changing environmental conditions.
Scope of hydrological modelling

3. For given climate predictions used as input variables, the hydrological response of the landscape can be modelled: a variety of methods is available with different degrees of complexity of interpretation of the hydrological domain. Because this hydrological domain of the rural and urban landscape, both surface and subsurface, is complex and both spatially and temporally variable, it is not a straightforward matter to assess, even in the past, the separate effects of land use, land management, river regulation and climate variability on flood risk. Assumptions are necessarily made in encapsulating real-world behaviour in tractable hydrological models; good modelling practice makes these assumptions clear and it also tests model performance against such observations from the past as exist, before moving to predictions of the future. It is appropriate also to offer some quantification of error or, as is frequently said, uncertainty relating to the results. Hydrological modelling of river catchments under expected changed climate scenarios was the basis of Defra’s current guidance for climate change allowances in scheme design.

4. Global temperature rises are generally-accepted features of climate change. The future flood risk in the UK is a function of how this translates into regional and local climate which drives the catchment hydrological response, particularly in the case of precipitation—not only with respect to totals but also intensities, areal extents and sequences. These aspects are far less well known, particularly the extreme aspects of rainfall. Note, though, that extreme flooding occurs with or without climate change: it is the relative frequency of floods of particular magnitudes which may change. Outputs from hydrological models include river flow regimes, which can be tested against past observations and, in the case of some models, aspects of soil and aquifer (water-bearing rock) water content, for which there are far fewer observations to test performance.

Priority activities

5. Given the current state of knowledge and the considerations above, the most compelling hydrological research to inform flood risk management includes:


b) Downscaling of most recent outputs from regional and global climate models for driving spatially-distributed catchment hydrological models for river flow regimes (and catchment wetness where appropriate) together with associated error levels.

c) Elucidation of the hydrological behaviour of urban and suburban areas for rainfall events above the design level of drainage systems, together with management options which avoid increased risk in a wider catchment context.

d) Assessment of the risk of concurrent spatially-extensive flooding, given its greater impact on emergency services, whether pluvial (direct from extreme precipitation), river, groundwater and/or coastal flooding.

e) The inclusion of tested urban (see “c)” above) and groundwater flooding models/procedures (see, *inter alia*, NERC written evidence paragraphs 21, 35) in a regional and countrywide system of overall flood risk assessment, for example, RASP (“Risk Assessment of Flood and Coastal Defence for Strategic Planning”): the latter system was used in Floods Foresight but at that time included river and coastal flooding only.

f) If an updated Foresight process is re-run in the future for the long-term (30-100 year) view, it would be advantageous, as well as covering “c)” and “d)” above, to have more than a single group determining expert weightings on risk factors, given that much emphasis rests on these weightings in determining the end results.

g) Given the *Making Space for Water* philosophy, together with the view that land use is likely to affect flood risk only at local scales and for floods at lower recurrence intervals (rather than regional scale large floods), a nation-wide assessment of potential flood water storage volume available from a wide range of sources, including soft-engineered options, within catchments would be informative, bearing in mind the need for flood conveyance as well as storage.

Centre for Ecology and Hydrology—Natural Environment Research Council

January 2008

Supplementary memorandum submitted by the Met Office (FL 120a)

1. The Met Office is grateful for the opportunity to provide oral evidence to the Environment, Food and Rural Affairs Select Committee inquiry on the summer 2007 floods. At the session on 12 December, and also through Marek Kubala’s letter of 18 December 2007 to Professor Mitchell, you invited witnesses to provide further written evidence, either to clarify or build on the oral evidence submitted. The Met Office would like to offer the following in support of its oral evidence.
Did anyone provide advice on the impact of large amounts of rainfall falling on already saturated ground?

2. The Met Office always considers the impacts of the weather when issuing a forecast, so does take into account previous meteorological events. For example, Met Office broadcast meteorologists will often refer to the impact of rain falling on already saturated ground.

3. However, the Met Office does not have access to detailed hydrological models or maps and so is unable to add any specific or local detail over and above the general statement that rain falling on already saturated ground is potentially a problem. Better integration of hydrological and meteorological models would provide better information that would show, in advance, how catchments will react to weather events.

4. At present only limited use is made of precipitation forecast data in relation to river flooding. As the resolution of rainfall forecasts improves as planned in the coming years, better integration with hydrological models and mapping of river catchments should allow more timely and accurate warnings of river flooding.

5. As highlighted in earlier evidence, no organisation currently has responsibility for providing a pluvial flood warning service. Such a service would also need to integrate detailed hydrological and meteorological models in order to make a useful and timely assessment of risk. This capability could be developed on the back of our high resolution weather forecasting model to be deployed in 2009. To provide timely warnings would require a 24/7 operational capability and robust communication mechanisms.

Do we need to re-assess our definition of return periods to take into account intense rain fall in such short periods of time?

6. There was some discussion at the evidence session regarding the relationship between return periods and rainfall intensity. It might be useful to clarify the fact that return periods do take into account rainfall intensity.

7. Return periods are calculated for a range of weather events, including rainfall events, which are specified in terms of duration and quantity (giving an average figure of intensity over a known period). So, for every rainfall event it is possible, in theory, to calculate the associated return period either for the whole event or for a particularly intense part of it.

8. The concept of a 1 in 200 year rainfall event being squeezed into a shorter time period is therefore misleading as the more intense event will itself have its own return period.

9. For example, the table below displays data for two locations from 20 July 2007. The table broadly shows that short periods of intense rainfall are more common than long periods of intense rainfall. It is important to note that these return periods relate to rainfall rather than flooding. As already understood by the Committee, even a short period of intense rainfall can lead to flash flooding if it is falling onto already saturated ground or impermeable surfaces.

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Start time (GMT)</th>
<th>Duration (Hours)</th>
<th>Rainfall amount (mm)</th>
<th>Return period (Years)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>20/7/07</td>
<td>13:00</td>
<td>1</td>
<td>17.2</td>
<td>7.8</td>
</tr>
<tr>
<td>Brize Norton</td>
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<td>3</td>
<td>48.6</td>
<td>83</td>
</tr>
<tr>
<td>Brize Norton</td>
<td>20/7/07</td>
<td>09:00</td>
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<td>90.6</td>
<td>&gt; 200* (497)</td>
</tr>
<tr>
<td>Brize Norton</td>
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<td>06:00</td>
<td>12</td>
<td>115.4</td>
<td>&gt; 200* (728)</td>
</tr>
<tr>
<td>Brize Norton</td>
<td>20/7/07</td>
<td>00:00</td>
<td>24</td>
<td>126.2</td>
<td>&gt; 200* (640)</td>
</tr>
<tr>
<td>Pershore College</td>
<td>20/7/07</td>
<td>15:00</td>
<td>1</td>
<td>16.4</td>
<td>6.3</td>
</tr>
<tr>
<td>Pershore College</td>
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<td>14:00</td>
<td>3</td>
<td>37.8</td>
<td>26</td>
</tr>
<tr>
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<td>6</td>
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<td>144</td>
</tr>
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<td>07:00</td>
<td>12</td>
<td>113.8</td>
<td>&gt; 200* (568)</td>
</tr>
<tr>
<td>Pershore College</td>
<td>20/7/07</td>
<td>00:00</td>
<td>24</td>
<td>142.4</td>
<td>&gt; 200* (860)</td>
</tr>
</tbody>
</table>

* The fact that return periods are calculated using historical data sets typically stretching back 100 years means that extrapolation to produce return periods beyond 200 years is probably not justified. Our statistical modelling techniques can produce return periods in excess of 200 years—but we quote these as > 200 years.
10. To illustrate the timing and intensity of the rainfall on the 20 July, hourly rainfalls for Pershore College (Worcestershire) and Brize Norton (Oxfordshire) are given below.

11. The models and statistical analysis used to produce the return periods above work well in a stable climate system.

12. However, we know that climate is changing and therefore the past is no longer a useful guide for the future, in terms of weather patterns. In order to translate the impacts of climate change into weather patterns and return periods, more work is required. The Met Office Hadley Centre continues to conduct world-leading research in these areas, but we do already know enough to suggest that the decisions we make now and in the future must be made in the context of a changing climate.

13. In the future, average winters are likely to be wetter than they are now and summers are likely to be drier. However, the expected intensity of severe weather increases in both seasons, which will have an impact on our flood defence strategies and warning services.

Met Office

*January 2008*
Wednesday 9 January 2008

Members present

Mr Michael Jack, in the Chair

Mr David Drew
Mr James Gray
David Lepper
Miss Anne McIntosh

Dr Gavin Strang
David Taylor
Paddy Tipping

Memorandum submitted by the Mayor of London (FL 151)

INTRODUCTION

1. London is prone to flooding from five sources: tidal, fluvial, groundwater, surface and sewer flooding. Climate change will increase the probability of flooding from all these sources except groundwater, whilst London’s growth may increase the consequence of any flood.

2. The unseasonably heavy rainfall of July this year affected 15 London Boroughs, with significant numbers of homes, schools and other essential social infrastructure being flooded, despite London not experiencing the amount of rainfall that caused flooding elsewhere in the UK.

3. The management of flood risk is critical to London’s future. Flood risk in London is increasing due to climate change, but also due to ageing flood defence infrastructure, the fact that much of the infrastructure was designed to meet lower flood standards, a low level of public flood risk awareness and their capacity to respond to a flood.

Who and what is at flood risk in London?

4. The Mayor defines “risk” as the product of probability, vulnerability and consequence. These components are assessed below to provide an indication of the current flood risk.

Probability

5. Nearly 15% of London is at fluvial or tidal flood risk. Despite having some of the best standards of tidal flood defence in the world, London has poor standards of flood defence on the tributaries to the Thames. Figure 1 shows the tidal and fluvial flood defence standards in London. It can be seen that the standards of protection on the tributaries to the Thames are significantly lower than the 1 in 75 year (0.3% annual probability) threshold determined by the Association of British Insurers as the level above which their members can provide affordable flood risk insurance.
6. The Mayor has prepared a draft Regional Flood Risk Appraisal (RFRA) to identify “who and what” is at risk of flooding in London for the areas shown at flood risk in Figure 1. The draft RFRA has revealed that as well as an estimated 1.25 million people and 593,000 properties, there is extensive social and civil infrastructure at high flood risk. It is important to note that 82% of these properties are at “low” flood risk, but that 100,000 properties are at “moderate” or “significant” risk.

7. It is essential to determine which elements of this infrastructure need to remain operational during a flood, either to manage the flood response, or to ensure that the parts of London not flooded can continue to function as normal. Table 1 below identifies the key social and civil infrastructure at flood risk in London. Further work is required to identify the utilities (electricity, gas and water networks) at flood risk.

Table 1

<table>
<thead>
<tr>
<th>KEY SOCIAL AND CIVIL INFRASTRUCTURE AT FLOOD RISK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number in Flood Zone 3</strong></td>
</tr>
<tr>
<td><strong>Total in London</strong></td>
</tr>
<tr>
<td>(percentage of total in London)</td>
</tr>
<tr>
<td>Social infrastructure</td>
</tr>
<tr>
<td>Schools</td>
</tr>
<tr>
<td>Hospitals</td>
</tr>
<tr>
<td>Gypsy and traveller sites</td>
</tr>
<tr>
<td>Civil infrastructure</td>
</tr>
<tr>
<td>Police stations</td>
</tr>
<tr>
<td>Fire stations</td>
</tr>
<tr>
<td>Ambulance stations</td>
</tr>
<tr>
<td>Prisons</td>
</tr>
</tbody>
</table>

Vulnerability

8. Vulnerability is the third factor that defines risk. Whilst measuring the consequence provides information on who and what is at risk, it does not provide an indication of how vulnerable those people and assets are to a flood.

9. There are a number of factors that make an individual more vulnerable to flooding than the average person. These can be divided into two categories:

   — Personal—for example, age (the very young and old), health, disability and proficiency of spoken English.
   — Situational—for example, income, living on the ground or lower-ground floor, having advance warning of a flood, having insurance.

10. Independently or in combination, these factors may mean that an individual may be:

   — less likely to be aware of the flood risk they live at;
   — physically more at risk from a flood if flooding occurs;
   — less likely to know what to do and be able to do it;
   — less likely to receive and use information on what to do through regular communications channels; and
   — less likely to be able to recover independently, or access services to aid recovery.

11. Other factors which contribute to reducing vulnerability are:

   — **Advance warning.** Advance warning of a flood provides the opportunity to take action before a flood occurs. This warning time can be used by individuals to take personal action to protect themselves, their family and their assets, and for the emergency services and Boroughs to initiate their flood plans. Many of the tributaries in London that have a low standard of protection are also liable to flash flooding. The Environment Agency states that it is unable to provide more than three hours warning on these catchments.

   — The Environment Agency provides a flood warning service, called **Floodline Warning Direct**, where an automated flood warning is sent by facsimile or phone to people registered for the service when a flood is predicted. Fewer than 1% of Londoners living or working in areas of flood risk London have registered to receive this advance warning. This compares with a national uptake of approximately 12%.

   — **Public Awareness.** Prior to the construction of the Thames Barrier, regular flood drills were held in London. The presence of the Barrier and upgraded defences has meant that people have become oblivious to the risk of flooding. The Environment Agency estimate that 30% of people would not know what action to take following a flood warning.²

   — **Insurance.** Flood risk insurance is generally provided within standard insurance cover. The uptake of insurance (both buildings and contents insurance) tends to be lower than average in low-income households³ and it is estimated that less than 1 in 5 households living in social housing make use of the Housing Associations “insurance with rent” schemes⁴. This is significant because, if flooded, these low-income households would not be able to pay for replacing essential household goods, or repair their homes by claiming on insurance.

Assessment

12. Analysis of “who and what” is at a flood risk shows that:

   — a significant proportion of London’s population lives and works at risk of flooding, though the probability of them being flooded is considered low;
— the poorest in the city are more likely to live at flood risk\(^5\) (though more affluent people also live in areas of fluvial flood risk);
— there is a low level of public awareness of flood risk and what action to take to prepare, or respond to a flood;
— there is a lower uptake of insurance for people in social housing or on low-incomes;
— very few people at flood risk are registered to receive flood warnings, so are unable to make use of even short advance warnings of a potential flood; and
— a significant proportion of London’s critical infrastructure lies in areas of flood risk, including emergency services that London would be reliant upon to manage the impacts of a flood.

**Storm Drainage and surface water flooding**

13. London’s impermeable urban realm means that the city is reliant upon storm drains to conduct rainwater away to prevent flooding. Many of these storm drains discharge into local watercourses, or the combined sewer system, so may contribute to flooding elsewhere. The probability of surface water flooding in London is much higher in comparison to tidal flooding, and will increase for the following reasons:
— the predicted increase in winter rainfall and extreme rainfall events;
— the reduced permeability of the urban realm due to development using impermeable materials and waterlogged soils;
— the fact that most drainage systems are designed for high frequency, low volume rainfall (1 in 20 year occurrences or less); and
— lack of maintenance of surface water sewers—see below.

14. A report by the London Assembly\(^6\) identified that an area in excess of 22 Hyde Parks had been paved to create private parking on front gardens of domestic dwellings. The Mayor believes that this loss of permeability, in combination with the finite capacity of the drainage network, will lead to increased surface water flooding in the future as rainfall intensifies.

15. The Mayor’s Water Strategy (see Appendix) proposes that a forum of agencies responsible for drainage should be formed to collate data on drainage ownership, capacity and management to assess the capability of the drainage system in London under a changing climate. This forum, known as “Drain London” met for the first time in October and is preparing to commission a scoping report to better understand London’s surface water and sewer flooding issues.

**Recommendations**

16. The Mayor recommends that the Committee consider the following issues:
— *Better coherency between plan making authorities in undertaking Strategic Flood Risk Assessments*: Strategic Flood Risk Assessments in London have generally been developed in an uncoordinated and ad hoc fashion. The London Regional Flood Risk Appraisal recommends groupings of Boroughs collaborate in undertaking their Strategic Flood Risk Assessments according to common hydrology.
— *Better links between spatial and emergency planners and emergency services*: In our experience, in the development of Strategic Flood Risk Assessments, emergency planners and emergency services are seldom involved, or are any involved at the consultation stage, and therefore unable to effect significant change.
— *Lack of leadership on surface water flooding*: Responsibility for managing and maintaining drainage networks is held by too many agencies and the historic transfers of responsibility have meant that the quantity and quality of data on the drainage networks is poor. The Mayor believes that the Drain London forum previously referred to should be recognised as good practice. The Mayor supports the Making Space for Water proposal that the Environment Agency should be given strategic overview for drainage, provided that this function is properly funded.


\(^6\) London Assembly (2005), Crazy Paving. The environmental importance of London’s front gardens.
— Using the Climate Change Bill to require statutory undertakers to identify, and act sustainably on climate risks: The Mayor supports the recommendation trailed in the second reading of the Climate Change Bill that public authorities should identify, prioritise and act sustainably on climate risks. Appropriate guidance will be required to ensure that drainage undertakers consider “soft” measures such as sustainable urban drainage as well as more traditional “hard” engineering.

— More emphasis on rainwater harvesting: The Mayor believes that rainwater harvesting can supplement limited mains water supplies for non-potable uses and reduce flood risk. New development should be required to include rainwater-harvesting systems through the planning system (for example the Code for Sustainable Homes), and existing development should be encouraged through financial incentives.

— Sustained investment in managing surface water flooding: The Regional Flood Risk Appraisal and the Climate change Adaptation Strategy identify that surface water flooding is a significant and growing risk for London. It is important that sustained funding for managing surface water flooding is found and the mechanism for assessing potential solutions encourages both soft and hard solutions.

Mayor of London
November 2007

APPENDIX

FURTHER ALTERATIONS TO THE LONDON PLAN

The “London Plan” is the title given to the Regional Spatial Strategy for London. The London Plan was published in February 2004. In September 2006, the Mayor published the Further Alterations to the London Plan (FALP) for public consultation. The FALP were subject to an Examination in Public by an independent panel, whose report was published in October 2007.

The London Plan took a progressive stance on flood risk management, providing policies that were later enshrined in PPS25. These policies have been reviewed in the FALP. The most relevant of these are highlighted below:

3. SUSTAINABLE PLANNING FOR FLOOD RISK MANAGEMENT

Policy 4A.12 Flooding

In reviewing their DPDs, boroughs should carry out strategic flood risk assessments to identify locations suitable for development and those required for flood risk management. Within areas at risk from flooding (flood zones) the assessment of flood risk for development proposals should be carried out in line with PPS25.

Policy 4A.13 Flood risk management

Where development in areas at risk from flooding is permitted, (taking into account the provisions of PPS 25), the Mayor will, and boroughs and other agencies should, manage the existing risk of flooding, and the future increased risk and consequences of flooding as a result of climate change, by:

(a) Protecting the integrity of existing flood defences.
(b) Setting permanent built development back from existing flood defences to allow for the management, maintenance and upgrading of those defences to be undertaken in a sustainable and cost effective way.
(c) Incorporating flood resilient design.
(d) Establishing flood warning and emergency procedures.

Opportunities should also be taken to identify and utilize areas for flood risk management, including the creation of new floodplain or the restoration of all or part of the natural floodplain to its original function, as well as using open space in the flood plain for the attenuation of flood water.

The Mayor will and boroughs and other agencies should, take fully into account the emerging findings of the Thames Estuary 2100 Study, the Regional Flood Risk Appraisal and the Thames Catchment Flood Risk Management Plan.
Policy 4A.14 Sustainable drainage

The Mayor will, and boroughs should, seek to ensure that surface water runoff is managed as close to its source as possible in line with the following drainage hierarchy:

- store rainwater for later use;
- use infiltration techniques, such as porous surfaces in non-clay areas;
- attenuate rainwater in ponds or open water features for gradual release to a watercourse;
- attenuate rainwater by storing in tanks or sealed water features for gradual release to a watercourse;
- discharge rainwater direct to a watercourse;
- discharge rainwater to a surface water drain; and
- discharge rainwater to the combined sewer.

The use of sustainable urban drainage systems should be promoted for development unless there are practical reasons for not doing so. Such reasons may include the local ground conditions or density of development. In such cases, the developer should seek to manage as much run-off as possible on site and explore sustainable methods of managing the remainder as close as possible to the site.

The Mayor will encourage multi agency collaboration (GLA Group, Environment Agency, Thames Water) to identify sustainable solutions to strategic surface water and combined sewer drainage flooding/overflows. Developers should aim to achieve greenfield run off from their site through incorporating rainwater harvesting and sustainable drainage. Boroughs should encourage the retention of soft landscaping in front gardens and other means of reducing or at least not increasing the amount of hard standing associated with existing homes.

Sustainable drainage techniques will be one of the keys to ensuring that long-term flooding risk is managed, particularly given the extent of hard surfaced area in London. The Mayor believes that managing London’s surface water and combined sewer flooding/overflows should start with source control management—improving the permeability of the public realm through the incorporation of rainwater harvesting and sustainable drainage—before proceeding to enhanced drainage capacity. These techniques include permeable surfaces, storage on site, green roofs, infiltration techniques and even water butts. Boroughs should encourage the retention of soft landscaping in front gardens and other means of reducing or at least not increasing the amount of hard standing associated with existing homes. Many of these techniques also have benefits for biodiversity by creating habitat and some can help to reduce the demand for supplied water.

The Further Alterations to the London Plan can be downloaded from http://www.london.gov.uk/mayor/strategies/sds/further-alts/docs.jsp

The Examination in Public panel’s report can be downloaded from http://www.london.gov.uk/mayor/strategies/sds/eip-report07/index.jsp

Regional Flood Risk Appraisal

The GLA is one of the first regions to undertake a Regional Flood Risk Appraisal (RFRA), as required under PPS25, to inform the development of the review of our Regional Spatial Strategy (the Further Alterations to the London Plan).

The draft Regional Flood Risk Appraisal can be downloaded from http://www.london.gov.uk/mayor/strategies/sds/docs/regional-flood-risk.pdf

Climate Change Adaptation Strategy

The Mayor requested an amendment to the GLA Act 1999 to be given a statutory duty to tackle climate change. A second piece of legislation relating to the GLA received Royal Assent in October 2007. The GLA Act 2007 supplements and updates the GLA Act 1999 and grants the Mayor of London new powers. Included in these powers is the statutory requirement of the Mayor to produce a Climate Change Adaptation Strategy for London.

The draft Climate Change Adaptation Strategy will be launched for consultation with the London Assembly in January 2008. A second publication consultation draft will be launched for public consultation in May 2008.

The Adaptation Strategy identifies the strategic climate risks for London. These are flooding, droughts and overheating (high temperatures).
Water Strategy

The Mayor, together with the Environment Agency and Thames Water has produced a Water Strategy for London. The second stage consultation draft (Public Consultation) of the Water Strategy will be launched in mid December 2007.

The aims of the Water Strategy are to:

— present a London-specific view of water management;
— enable a more sustainable supply-demand balance of water for London;
— manage the risk of surface water and sewer flooding;
— review the energy generation opportunities for sewage sludge; and
— investigate what is the true value of water to incentivise water efficient behaviour and to prioritise demand side management measures.

The London Assembly Consultation Draft of the Mayor’s Water Strategy can be downloaded from http://www.london.gov.uk/mayor/environment/water/docs/la-draft-water-strategy.pdf

Mayor of London

November 2007

Memorandum submitted by the Royal Town Planning Institute (FL 156)

Summary

— The RTPI considers the risk of flooding to be a major civil contingency that requires to be considered and responded to in planning policy and decision making.

— The RTPI is persuaded by work carried out by the IPCC, Sir Nicholas Stern and the Foresight Review of the view that:
  — Climate change processes are a significant likely source of additional flood risk over and above that experienced by urban areas in the historical record.
  — Additional costs over and above BAU should prudently be devoted to addressing this likely risk-adaptation costs.
  — The effect of not incurring adaptation costs, but responding to individual events as considered likely to be necessary is likely to be manifold higher than of incurring adaptation costs.
  — Planning assumptions should respond to the outputs from flood models that factor in climate change drivers.

— The RTPI has considered the interim report of Sir Michael Pitt into the 2007 flooding. The following key questions emerge for planning:
  — What should be the strategic relationship between planning policy and decision-making and flood risk identification, mitigation and management?
  — What should be the relationship between planning controls (development management) and other mechanisms of control and regulation?
  — What should be the ‘threshold’ of planning (or indeed other) control and regulation?

— It is important to ensure that urbanisation and development processes stop contributing to an ongoing exacerbation of flood risk due to overland flows and increased or unmanaged discharges to drains, sewers and catchments generally. Planning has a key role to play in delivering this objective in partnership with other regimes of policy and control.

— The RTPI agrees that action is necessary to reduce “urban creep”: the ongoing and uncontrolled reduction of the permeability of urban land. However, measures other than the creation of new discretionary development management processes within the planning system are urged for small and incremental works.

— The RTPI agrees that action is necessary to control access to sewer and drainage systems, but again seeks measures other than discretionary development management for small and incremental works.

— New “performance-based” techniques for responding to “urban creep” should be developed and conditioned through permitted development and/or building control.

— There should be a principle that urban development processes should, in aggregate and at the scale of individual land ownerships, ensure that the permeability of land is retained/restored at or near pre-urbanised values. Strategically managing this is a valid operation of development management.
Q602 Chairman: Good afternoon, everybody. Our inquiry into flooding has once again been the subject of parliamentary television. I welcome from the Greater London Authority Mr Dan Hawthorn, their Senior Policy Adviser for Planning and Development in the Mayor’s Office, and Mr Kevin Reid, who is one of their senior planners; and from the Royal Town Planning Institute, Mr Rynd Smith, who is their Director of Policy and Communications. You are very welcome and thank you for your written evidence which you sent in advance. That is much appreciated. London is a very important part of the United Kingdom. Before I go into some specific questions about your submission, you say that nearly 15% of London is at fluvial or tidal risk of flooding. It may be that we should reflect on all the other risks: the Thames, the Thames Barrier, the capacity of the Victorian sewage system. All of these things have been around as issues. Perhaps you could give us a short overview as to what exactly are the flood risks for London and try to grade your remarks against a measure of probability that these will occur.

Mr Reid: You have touched on work that we have been undertaking of the last year or 18 months. I think we mention particularly in our evidence work that we have done since the 1953 floods. They give in excess of once in 1000 year protection through the Thames Barrier, the river walls and embankments, et cetera. You have probably heard some of that detail from the experts that run all of that at the Environment Agency. I am not an expert on it but I may be able to answer some more detailed questions. That is the tidal flood risk. The fluvial flood risk is a more mixed picture. London has a great number of tributary rivers, some fairly large and some fairly small. Most of them have some element of flood defences along them. We have provided a small map in our evidence. It may be hard for you to see the detail on that. We have that information from the Environment Agency which collates all that information for us. There may be a couple of things that they may wish to update on that map. We can certainly supply a more detailed version or, if you have it in electronic form, you can zoom in and view it more closely.

Q603 Chairman: If you could send us the web link, we could all look at that.

Mr Reid: Suffice to say that the level of flood protection along those tributaries varies in some cases from the order of about once in 20 years up to and in excess of once in 100 years. It is a different picture for different tributaries. I would point out that much of the land along those tributaries is still in some form of open space use. It is not necessarily the case, although it does occur, that building has happened right up to some of the banks and indeed over the top of some of those rivers. I am sure you...
can envisage the sort of situation. If I may continue with these five sources, the third source is from groundwater. During our Regional Flood Risk Appraisal, we found little actual evidence of any history of groundwater flooding within London, although the Environment Agency has recently told me that there have been some cases. I am keen to investigate with them just where and when that has occurred because it had not initially been flagged up to us. The fourth source, and you mentioned it, is sewer flooding. That does occur in two aspects: firstly, the overflow of the Victorian sewer infrastructure, which takes both rainwater and foul sewage water. You are probably aware that the Government announced in March of last year a very large-scale tideway sewer project of the order of about £2 billion in order to accommodate the vast majority of those overflows. That project is still being finalised. The go-ahead in general has been given. It will take up until about 2020 to put in place. It tends not to affect any properties as such. Indeed, the reason that that combined sewer system overflows into the River Thames really is in order to prevent the flooding of rainwater and mixed sewage onto streets and properties. That is what the Victorians built as their safety-valve. The fifth source of flooding, which I have deliberately saved until last, is from surface water; that is, direct from rainfall. This was one of the key matters that our Victorian sewer flooding. That does occur in two aspects: firstly, the overflow of the Victorian sewer infrastructure, which takes both rainwater and foul sewage water. You are probably aware that the Government announced in March of last year a very large-scale tideway sewer project of the order of about £2 billion in order to accommodate the vast majority of those overflows. That project is still being finalised. The go-ahead in general has been given. It will take up until about 2020 to put in place. It tends not to affect any properties as such. Indeed, the reason that that combined sewer system overflows into the River Thames really is in order to prevent the flooding of rainwater and mixed sewage onto streets and properties. That is what the Victorians built as their safety-valve. The fifth source of flooding, which I have deliberately saved until last, is from surface water; that is, direct from rainfall. This was one of the key matters that our Regional Flood Risk Appraisal brought out, that it does happen in London reasonably frequently, as far as we can make out. In the summer of last year there was surface water flooding in some parts of London. I am told that affected parts of 15 boroughs. What we were most concerned about was that there was not really any central co-ordination or overview about where and why that flooding had taken place, or indeed any consistent record of when it had happened so that any particular organisation could go and look at this as a problem to be addressed. Perhaps in its nature it is somewhat haphazard in where it will happen. It could be down to a localised thunderstorm or a localised blockage of the drainage system. There were no consistent records being kept.

Q604 Chairman: Did the old GLC ever have any overarching responsibility for flooding?
Mr Reid: You are testing my knowledge a little. As far as I know, there was a drainage division of the old GLC. Quite what data records they held, I could not answer. We do not have anything much from the former GLC at the GLA today.

Q605 David Taylor: On your map we seem to have this spuriously accurate figure again of one in 1000 year return period for flooding. How on earth can we calculate figures at that sort of scale? We are going back to before the time of William the Conqueror. That is an artificially reassuring figure, is it not?
Mr Reid: I am told that the level of protection is somewhat in excess of that once in 1000 years.

Q606 David Taylor: How on earth can we be that precise?

Mr Reid: It is not a GLA figure. This is information that essentially I am reporting to you. I am sure it has been reported to you by the Environment Agency.

Q607 David Taylor: Have you ever challenged that?
Have you ever asked the origin of that degree of certainty?
Mr Reid: We have not. We have accepted that the Environment Agency has a level of expertise on this. They have been looking after these flood defences for however many years. They discuss these things with colleagues in Holland. I am sure that I remember hearing a figure that the Dutch think they have about one in 10,000 year protection.

David Taylor: I just do not accept the figures. They are absolutely meaningless. You are quoting in good faith what the Environment Agency tells you.

Q608 Chairman: This does raise an issue. You have described the five areas where there are potential flood risks for the capital. One of those areas which the Committee has been exploring is the intensity with which these events occur. There are definitions on a probability basis of an extreme weather event. I would not like to be around when the one in 1000 year event occurs. What we have seen are concentrations over very short spaces of time of these events, which puts a new time dimension. Therefore, the question of surface run-off and sewer capacity seem to me to take on a different viewpoint than a one in X year event, which may be spread out over a long time period, as opposed to one of these events that might occur within a short time period. Have you done any sensitivity testing on that for London’s flood risks?

Mr Hawthorn: In a way, that is precisely what our flood risk assessment identified, that the clear and present danger is not from the fluvial flooding but particularly from surface water flooding, which in research terms is very poorly understood as to how the risks accumulate and arise and whether and how it might be possible to predict events with any certainty before they happen, in the way that sometimes happens with fluvial flooding. Our Drain London project is for the first time trying to co-ordinate the local authorities, Environment Agency, water companies and so on to pool their expertise, understanding and resources and to try to get a grip on this. That is what we are just embarking upon.

Q609 Chairman: Have you done any modelling whereby, for example, you have said that you would just look at London as an entity and run a computer model that shows that in an hour we have one, two, three, four inches of rain and in two hours, five, six, seven inches of rain to see what actually happens?
Mr Reid: No, we have not done that. I would stress that the GLA’s role is obviously a strategic role, as set up under the Act. We are deliberately a fairly tightly constrained organisation. We take information from the other government experts, the Environment Agency and the water companies in some cases. We ask them some questions but we do not have the resources to build and develop our own models in that sense.
Q610 Chairman: Do you think that somebody should do that in the light of the intensity? Part of the reason this inquiry is taking place is that in those areas that flooded, like Tewkesbury for example and indeed Hull and Sheffield, they experienced such intensity in two days, effectively a month’s rainfall. 

Mr Hawthorn: I think it is right to say that the risks can be assessed not only by an assessment of how many inches of rainfall but also how the infrastructure is equipped to deal with it. If the infrastructure is equipped to deal with it well, then you can deal with more than you can if the drains are blocked or poorly maintained.

Q611 Chairman: Do you think that somebody should do that work for London, given the sensitivity of what is in the capital?

Mr Hawthorn: That is precisely what Drain London has been set up to explore doing. The intention is, first, to understand the infrastructure and then the hydrological monitoring on top of that. It is putting those two pieces of the picture together that gives you a proper assessment of the risk.

Q612 Miss McIntosh: When we had local flooding in the Vale of York, way back in 2000, it was my distinct understanding that each district council does a form of mapping. One of the confusing things is that you have the Met Office doing one sort of mapping together with the Environment Agency and the insurance companies doing another sort of mapping and forecasting. It is my understanding that all local authorities do this. Are you saying to us that you are unique and that you do not do this kind of mapping down to house postcodes and the impact? For example, your role in floods presumably is to issue sandbags?

Mr Reid: No, that is very much a local authority role. It is worth being clear that some local authorities do that and others have taken a clear decision that that will not be part of their role.

Q613 Miss McIntosh: In the event, and I know it is not so much the role of this Committee, that for example sandbags are available to some and not other local authorities, will it not seem clear that you should perhaps take on a co-ordinating role here?

Mr Reid: To be clear, the GLA itself would not do that but we are working with a group that the Government Office for London has set up, which is trying to co-ordinate exactly those sorts of issues across London. There are adjoining boroughs which have a different approach. I cannot really say whether a similar case arises outside London. I honestly do not know. As far as I am aware, the initial point that you made about each local authority mapping these has only recently started to occur with the requirement under PPS25 for them to produce a strategic flood risk assessment. I was not aware—and I am happy to be corrected—that all local authorities were doing that previously.

Q614 Chairman: Let us ask you a couple of quick questions arising out of the Pitt Review. One of the conclusions there was that the right to connect to a public sewer whenever new development took place should effectively be abolished. Is that something that you think is a relevant issue for London?

Mr Reid: It is certainly an issue for London. Perhaps I ought to say that it is not something that we had particularly investigated or researched before seeing the Pitt Review. This is something of a view at short notice. It seems to us, and given that we have identified particularly surface water as a high risk for London, that at the very least that right ought to come with a certain amount of responsibility really to demonstrate that before connecting reasonable steps have been taken to reduce, possibly eliminate, some or all of that surface water drainage, for example through sustainable drainage techniques, perhaps even water butts or diverting the roof gullies to a garden or a pond or a permeable surface, that sort of thing.

Q615 Chairman: So you would agree with Pitt’s suggestion that the right to have an impermeable surface at the time you develop something should be removed?

Mr Reid: Yes.

Mr Hawthorn: It should also be conditional.

Mr Reid: That is particularly given the intensity of built development in London. There are some locations where there is very little choice other than to connect into a surface water sewer. There are other more suburban locations where it would be fairly easy and relatively inexpensive to have your new house or perhaps the extension to your property draining sustainably, and it could indeed drain the existing premises as well to give an overall reduction in surface water run-off.

Mr Smith: It is fair to say that this is an issue that the Royal Town Planning Institute has been thinking on for some time. We have been strongly urging, as a matter of general principle through the Government’s consideration of the Householder Development Consents Review, about what you can do that requires planning permission in relation to changes to individual dwelling units. In fact, there is a need to look very carefully at the proliferation of hard surfaces and the degree to which they are a generator of catchment flood risk. Our key thought process here has been to take the view that it would be important not to over-burden the planning system with thousands of additional applications for planning permission to put down small areas of hard-standing. We believe that it ought to be possible to have conditional classes of permitted development where a particular set of techniques is identified that will return the piece of land that you wish to pave effectively to its unpaved state, enabling water to pass through it and soak away and effectively to re-enter the groundwater rather than running off and entering catchments and exacerbating flooding. Interestingly, work was done on this going back to about 1998 in Australia. The Commonwealth Scientific and Industrial Research Organisation did a very interesting piece of work there that looked at the practical identification of techniques that could be used. In the City of Melbourne in Australia a group of local authorities,
the Association of Bayside Municipalities, asked what this means for planning and how we can promote, through the way we exercise planning control, the take-up of those techniques to start winding some urban land back in a sense almost to rural permeability without entailing excessive cost. That is a set of work streams that would obviously have to be re-done in the geological and climatic conditions prevailing.

Q616 Chairman: Is that the kind of thing that ought to be put into building regulations?

Mr Smith: Yes, absolutely, but we would strongly be urging that where those sorts of techniques can be diagnosed, rather than taking the approach of decanting that sort of stuff into the planning system and creating a lot of new, minor applications, in fact performance requirements in the building regulations could deliver significant improvements. Certainly, part of the issue has to be the way that permitted development for both householders, and indeed for other classes of use or development, are constructed. At the moment, householders have really quite substantial rights to pave over their garden space. Particularly in the London context, but I would argue across urban England, there is a very strong argument for taking a fresh look at those rights.

Q617 Mr Drew: It would be interesting to know in the case of London and the degree to which the failure to adopt many sewers because of developers not reaching the requirements of building standards if the Pitt proposal could make that work. The danger with this is that it is the law of unintended consequences. Obviously we want high standard sewers but many builders clearly do not build to that standard. Therefore, the sewers are not adopted and therefore it is not the developer’s problem in a sense. Clearly, until we get the changes, it is not the local authority’s problem; it is the householder’s problem. It really is one of neglect of the problem. I do not know what your views on that are.

Mr Reid: I am not aware that it is a particularly significant issue in London that sewers are built below the standard where they are ready to be adopted. Being the strategic authority, it is not an area that the GLA gets into. If you have evidence to the contrary—

Q618 Mr Drew: Certainly it happens in other parts of the country. It is interesting that it may not be so in London.

Mr Reid: All I can say is that it has not come to us as a matter that has been drawn to our attention. If it was happening on a fairly common scale, I imagine that it would have come to us at some point.

Q619 Miss McIntosh: This is a point of clarification for Mr Smith. You mentioned a specific subject about planning applications, which I think you did say could be dealt with by building regulations.

Mr Smith: One of the things that is necessary here is to look at the range of options that might be available for best ensuring that we reduce the potential flood-generating effect of putting down hard surfaces without planning permission.

Q620 Miss McIntosh: That is a separate question to what the Chairman asked. I want to get on record your views about the right of connection because at the moment, and I know this is a different part of the country, I was just wondering if it is the same in London or across the country and whether you agree with what Pitt said.

Mr Smith: In terms of the right of connection issue, in broad principle the Institute does agree with Pitt. Again, I think we would have a concern to ensure that the technique or the mechanism used would not generate a raft of minor discretionary planning applications to local councils and that there ought to be better, smarter regulatory mechanisms than that. It is fair to say that across the nation it would be useful to focus the minds of people on the fact that they should be using sustainable urban drainage techniques to reduce the volume of drainage from land going directly into public drains and/or sewers in ways that might compromise the wastewater treatment system.

Q621 David Taylor: I have read your concise submission on sustainable urban drainage schemes very carefully. Right at the very end you talk about local planning authorities needing clarification of support for SUDS, Mr Smith. Briefly, what do you mean by that?

Mr Smith: We mean that there is the potential and scope for very widespread use of SUDS, particularly in new and residential development. If we are looking, for example, at growth corridor type housing development, it would be superb to see the widespread roll-out of reasonably well-proved, cost-effective SUDS techniques and mechanisms.

Q622 David Taylor: What do you mean by “support” for them?

Mr Smith: We mean a combination of policy support that then comes down to the local level so that within local development frameworks as well it is clear that councils are calling for SUDS as an integrated part of the design submission on housing schemes.

Q623 David Taylor: Planning authorities should be able to require it? Can you not do that at the moment?

Mr Smith: Not in my view, no.

Mr Reid: It is probably worth adding that PPS25 takes us forward in terms of the use of sustainable drainage techniques. On the back of that, what we have done with the further alterations to the London Plan—and you have a sneak preview of that in our evidence but it will be published next month—is introduce a policy that sets out a sustainable drainage hierarchy for London. Again, it recognises

7 Ev 212
that we see this as a particular problem. It is on the first page of the appendix in our evidence.\(^8\) It takes you through seven different steps going from more to less sustainable.

**Q624 David Taylor:** We have had extensive evidence and support from people urging the widespread use of SUDS, as you might expect. Indeed, when we went to Lyon, the Committee saw some evidence of what happens in other countries in that regard. Are you saying that the two key barriers to the roll-out, to use your phrase, of SUDS on a grander scale are: one, the powers for local authorities to be able to require that to happen from developers; and, secondly, some financial support?

**Mr Smith:** Some financial support would, I think, be extremely valuable. We have to recognise that these are techniques or technologies in transition. We are learning and improving as we go and every effort should be put into accelerating the learning curve. It is critically important that the best practice policy development that seems to be going on, for example in London, is encouraged to happen not just in London.

**Q625 David Taylor:** For a major development of an internal highway infrastructure, the local authority needs, are you saying, central finance from Government to pay for its share of some of that infrastructure as well as the developers themselves?

**Mr Smith:** It is certainly a consideration. I would also highlight as a possible research priority, and this is down at the smaller scale too, that if we are looking, for example, at sorts of techniques—getting back to the impermeable surface dilemma that Pitt has very rightly, in our view, identified—then something as simple as a research digest published with the government elephant stamp that says that these are broadly cost-effective mechanisms in the British climatic, geological and hydrological context, that these are things you can use that will return your lot—

**David Taylor:** You have a point, Mr Smith, about better understanding of urban drainage, pressures which may relate to this.

**Q626 Chairman:** Let me ask one question. Looking at the Policy 4A in the appendix, the flavour there is about prospective development and how you should deal with water. One aspect that slightly worries me is that we have learnt that SUDS stands for Sustainable Urban Drainage Systems and you think that we must have lots of those, but it is very difficult to retro that.

**Mr Hawthorn:** By and large, the planning system is not a mechanism by which you can do that. We need to look at other ways to bring that about.

**Q627 Chairman:** Being realistic, SUDS does not mean a retrospective policy of tearing up hard-standing: is it a question of looking at it prospectively?

**Mr Reid:** That is right.

**Q628 David Lepper:** The issue we have not really touched on yet is who, particularly in the view of the GLA, should be responsible for operating and maintaining SUDS where they are put in place? We have had difficulties expressed to us. Yorkshire Water suggested that it should be local authorities that are responsible. Thames Water has suggested the Scottish approach of everything above land being for the local authority and everything below the water company’s responsibility. Pitt helpfully or unhelpfully says that it should be sorted out and decided. Do you have a view?

**Mr Reid:** It is fair to say that we do not have a strong view. It is not something where we are involved in the implementation. I would point out a couple of matters. There are numerous sustainable drainage systems which have been built as part particularly of large development proposals over the last four or five years. Most of those, as I understand them, are managed by a managing agent for that particular development and in a similar way they will paint the fences or repair the lifts. The second point would be, as someone said earlier, that flooding risks are all interrelated. These surface waters will eventually become river water, et cetera. The Environment Agency looks after fluvial and tidal flooding; Thames Water looks after the sewers and sewer capacity. I think that the Committee itself ought to consider how helpful it is to have another form of agency that is looking after a different type of potential flooding. We are putting together this Drain London project, which is trying to get these groups together. There is a certain logic in saying that the fewer groups responsible for too much water in the wrong place, the more likely it is to be a joined-up mechanism. You do not want one set of people getting rid of all their water as quickly as they can and passing the problem on to whoever is going to receive that.

**Mr Smith:** I wholeheartedly endorse that. May I add briefly that it is critically important that if SUDS are ever going to be anything more than a relatively minor or marginal endeavour, then we have got to have a clear, consistent institutional means of dealing with their ongoing ownership. With management that is not in effect a residual body corporate or freeholder type approach or developer, then there is the concern about who they hand that liability on to. The Royal Town Planning Institute has no strong view at all about who that should be but really makes a plea for some systematic thought about the governance of SUDS and an attempt to make the simplest arrangement possible that is consistent.

**Q629 David Lepper:** Mr Smith, am I right that you are saying that in the long run the number of separate managing agents that you have described as

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\(^8\) Ev 211
Mr Smith: I do not believe it is a satisfactory solution. I would suggest that SUDS in the medium to long term have to be considered as part of a broader portfolio of infrastructure assets for drainage per se. If we have a vast plethora of private agency type operating arrangements without at least a clear strategic overview about how they talk to one another about who subsequently repairs, maintains, monitors, manages and connects to it and the like, then we are likely to be making a problem for ourselves in the future rather than finding a valuable and useful solution.

Q630 Chairman: Has anybody done any technological work on, for example, permeable road services or payments and the type of thing that could be applicable in London? We talked about SUDS in one sense as areas and you have the current hard-standing features but are you doing any work on future SUDS—the SUDS-ing of London?

Mr Reid: We are not at the minute. I think there are some reports by the Construction Industry Research Institute (CIRIA). I am sorry to keep going back to this: it is certainly part of what the Drain London group will be looking at. I say this with a little caution because we have only had one meeting of this group. Certainly, to address some of those historic issues, the fact that we already have a vast drainage infrastructure may well require some research in terms of how we could manage the existing drainage more sustainably.

Mr Hawthorn: I think I am right in saying that the solution to permeable hard-standing is not something for the future as that already exists. It is not crystal ball gazing to think that that might happen in London. There are already options now which developers and local authorities have to install those options. The fact that we are and should be worried about people paving over their front gardens to put their car there does not mean that they should not do it; it just means that they should do it in a way which is sustainably drainable and a permeable hard-standing surface might be one way of doing that. That can be done now.

Q631 Chairman: Before we come to our final area of questioning, I want to jog back. You have talked about the work you are doing in London to look at the flood risk in London and co-ordinate the authorities on this matter. In your evidence you have a table of infrastructure which we have looked at. You have tried to locate that in flood zones in paragraph 7. What rather surprised me about this was that there as no mention of power or water infrastructure. Why was that?

Mr Reid: We did go into some of that detail in the Regional Flood Risk Appraisal to which we have made reference. It was published in June of last year. That does look at some of the power and water infrastructure. I can tell you that there is certainly a lot of different power infrastructure throughout London. Some of that is within flood risk areas. As I am sure you would expect, a lot of the water infrastructure is located beside rivers because that is a sensible place to manage water.

Q632 Chairman: Is part of the future flood-proofing for London going to be devising a strategy, particularly in the light of what happened in Gloucestershire, to try to minimise the risk to the infrastructure of flooding?

Mr Reid: Yes.

Q633 Mr Drew: I am sorry I missed the restart after the vote. The point I was going to make is this. The key thing we learnt from our visit to Lyon was the co-operation between the city authority and the myriad of local authorities around and their ability to use space. I would be interested in that in terms of London because it is a pretty congested, urban centre. To what extent do you feel that you are dependent upon the wider authorities around and how might you be able to use some of the space they have and you do not have to solve your problems in terms of density and the problems that come in on the back of that regarding flooding?

Mr Hawthorn: As a final word on the water and energy infrastructure, first, I understand that there are difficulties to do with national security which mean that that information is not as easily and readily available as is the case with some of the other infrastructure, which is why we do not have as much data on it.

Q634 Chairman: National security?

Mr Hawthorn: There are security vulnerabilities with energy and water infrastructure which mean that information about the nature of the risks involved in them is not as easily available as it might be.

Q635 Chairman: I can understand in the capital city why people might want to be circumspect about where certain things are if those certain things are located within potential high flood risk areas. It was very interesting that the Committee was told that if the second electricity sub-station in Gloucestershire had gone, half a million people could have been without electricity. Hang on a minute, one big London borough could be the equivalent of that. It would be very interesting to know spatially in London how many boroughs were vulnerable in terms of their electricity/water/gas or any other distribution system. I only wanted to have the reassurance that these were matters that, in the overarching work you are doing, are being looked at as far as London is concerned.

Mr Hawthorn: We are working as much as we can with the London Resilience Group, as it is called, to map the critical infrastructure as well as we can. I am merely reporting to you the difficulties.

Q636 Chairman: Are you having difficulty in getting hold of information to enable you to do to that work for the capital city?
Mr Hawthorn: I would not say that it is a major problem but some people are more circumspect about some of the kinds of infrastructure than they are about other matters, which explains why we are not able to give as much detail as we would like on things like schools and hospitals.

Mr Smith: May I make a brief observation on that which takes this to the issue of nationally significant infrastructures and indeed the passage of the Planning Bill which is at its committee stage in this place. The Royal Town Planning Institute had quite a long and interesting internal discussion about the degree to which we should suggest as an amendment to that Bill the proposition that major issues of flood contingency around nationally significant infrastructures should directly be a consideration for the preparation of national policy statements for infrastructures, and indeed for the decision making by the proposed Infrastructure Planning Commission. The Bill as it is currently before the House does not set out either of those requirements. However, clause 11 does allow the Secretary of State potentially the power to add other things to the list, so to speak. On balance, we have taken the view that we have not specifically called for an amendment on that point. In relation to the transactions of this Committee and the need for careful and rigorous examination of the effects of one regime of policy control translating on to the actions of others, we want to look into about the extent to which the local authorities, often through no fault of their own as it were, are equipped to implement it to its full extent.

Q638 Dr Strang: Do you reckon the statement itself has it right?

Mr Reid: Certainly, from what we have seen over the last 18 months or so, in the planning applications that are referred to the Mayor and his ability to determine them, there is an improvement in terms of the attention that is paid to flood risk and the quality of the flood risk assessments that accompany some of those development proposals. What I cannot answer is whether that is mirrored, as Dan has indicated, in the smaller scale developments that do not come to the Mayor, of which there are many thousands in London.

Mr Hawthorn: It is early days to judge, as it were, how effectively it is doing its job. These are our initial impressions.

Mr Smith: I would broadly endorse those conclusions. The sequential test and the exception test outlined in PPS25 seem to be pretty much on target. Anything more stringent, and people occasionally talk about the banning—

Q639 Chairman: Could I ask both you and Mr Hawthorn particularly to develop Mr Hawthorn’s observations about the skills that local authorities need to be able to get the best use out of PPS25? Mr Hawthorn, you seemed to be suggesting to us that you felt a concern that some local authorities did not have enough in-house expertise fully to understand, appreciate and implement this. Am I correct in understanding that from what you said?

Mr Hawthorn: It is hard, from where we sit in the planning system, to know as much as we would like about the way in which planning policies are implemented at the level below the big strategic applications that are automatically referable to the Mayor. I do not want to claim any great volume of evidence behind this, but it is broadly the case that the resources that local authorities have to dedicate to smaller planning applications are shrinking and that the major new pieces of policy which they have to incorporate into their assessment of applications—and that applies to things like PPS25 as well as our own London Plan—present new challenges for an ever more challenged and constrained service.

Q640 Chairman: Mr Smith, what do you think about that?

Mr Smith: In broad terms, again I would concur with that assessment. Good practice is becoming disseminated. It is marching out across local government. I would, for example, remark on the local authority network on drainage and flood risk management, LANDFORM, a CIRIA initiative, which is helping, but it will take time for every single local authority in the land to be absolutely one hundred per cent up to speed. They are going to need assistance, particularly in terms of the data that is provided to them by the Environment Agency.
around issues like flood risk identification and mapping. At the end of the day, we are dealing with complex data here.

Q641 Chairman: When you say that they will need assistance, where should they get that from? I suppose what is at the back of my mind is a small borough council with a limited planning capacity in an area under a lot of pressure from a well financed series of developers, all of whom have their environmental experts, all busy justifying the developer’s position, and the authority may only have the advice of the Environment Agency to call on because they are now a statutory consultee. They are a bit bereft of being able critically to appraise the technical data which is coming at them. Is that the area where there may be a deficit of expertise?

Mr Hawthorn: It is partly about the training and resources that the planners have at their disposal; it is partly about spatial planners learning to work better with emergency planners to draw on the expertise which may be elsewhere in the authority but which they have not yet tapped into.

Q642 Chairman: Given that you may have small local authorities, again going back to the experience in somewhere like Gloucestershire, authorities with a limited resource at their disposal, do you have a recommendation to put to the Committee as to how this information expertise deficit could be solved realistically?

Mr Smith: This is creative thinking on the hoof to some extent. One possible way forward—again thinking of the mechanisms emerging in the Planning Bill, is the concept of a community infrastructure levy that the Bill provides for, whereby the cost implications of infrastructure requirements for a locality will have to be identified in the local development framework for that locality. Thinking literally on the hoof, it might be possible, among the range of infrastructure goods identified and costed for in that sort of levy plan, to have the cost of actually providing the necessary technical advice, if it is not already available through effective in-house mechanisms or through agency or partnership working arrangements, so that in other words a council would be able to say: yes, we need advice before this application can proceed but we recognise that the cost of advice is something that we are asking the applicant to contribute to and we have a levy fund to help us buy that advice.

Q643 Chairman: In other words, a potential developer might have to put some money up-front to the authority to enable them to buy specific expertise to deal with an application that could potentially have a flood implication?

Mr Smith: Yes, and that would be fairly apportioned out across the many—

Mr Hawthorn: The data that comes before that is the local authority having carried out its flood risk assessment so that the developments that have that risk as it were trigger that process by hooking in on the map.

Q644 Chairman: Mr Reid, I cut you off earlier, is there more?

Mr Reid: I only wanted to say that the main source for that expertise at the minute for both local authorities and for ourselves is to go to the Environment Agency. Clearly that organisation has limits on its own resources.

Chairman: Thank you very much indeed for your contributions, both written and oral. You are going to send us a web link so that we can explore for our greater sense of security the blue map, Figure 1 on your evidence. If there is anything else you think of that you wanted to write to the Committee about, obviously we would be delighted to hear from you. Thank you very much for your contribution this afternoon.

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Supplementary memorandum submitted by the Mayor of London (FL 151a)

Thank you for your letter of 14 January. Please accept my apologies for the delay in replying; we have been waiting for a new version of the flood map to be published, which is enclosed.\(^\text{10}\)

This map has been updated to take into account flood risk as well as the condition and likelihood of failure of defences, to show better the variation in risk across the catchments rather than just assuming one standard of protection (SoP) across the catchments as a whole.

I also wanted to take this opportunity to give the Committee further information on London Resilience, which was mentioned in our oral evidence. The GLA is working with London Resilience Team to review the London Strategic Flood Response Plan. In line with the Pitt recommendations, the reviewed Plan will identify critical assets at flood risk and examine the dependency of these assets upon utilities also at flood risk.

I would also like to stress that London benefits from the highest standards of tidal flood defences in the country (and second only to the Netherlands globally). In the coming period, the GLA will be working with the Environment Agency and London boroughs to identify strategic opportunities to manage flood risk on London’s tributary waterways, where the standard of defence is lower.

\(^\text{10}\) Not printed
If the GLA can be of any further assistance, please do not hesitate to contact Richard Wiltshire in our Parliamentary Relations team.

Dan Hawthorn  
Senior Policy Adviser—Planning & Development  
Mayor of London  
February 2008

Memorandum submitted by Water UK (FL 95)

EXECUTIVE SUMMARY

Water supply companies have a statutory duty to provide wholesome drinking water at all times. Water and sewerage companies have an additional duty to treat and dispose of sewage/wastewaters.

It is important that our infrastructure is adequately protected against flooding and is sufficiently resilient to coping with extreme events.

The industry is working with regulators and stakeholders to:

— Factor climate change scenarios into strategic business planning (the water industry is one of the first sectors to be doing this already).
— Consult water bill payers and wider consumers on their investment priorities and their willingness to pay.
— Review function and design of our infrastructure ie storm overflow storage and operations and sewer design standards.

Recent events have brought the ability of the system to cope with flooding into focus. To this end there are a number of important areas that we consider need to be addressed by this and other inquiries.

These include:

— Sustainable land use planning.
— The more widespread use of sustainable drainage systems.
— Reducing inappropriate flushing and dumping into sewers and drains, which contribute to blockages and sewer flooding.
— Reviewing the resilience of infrastructure at risk of flooding and coastal realignment.
— The promotion of catchment flood management plans and surface water management plans for all significant urban communities.
— Processes for early consultation and considerations of impact of developments on water industry services to reduce the risk of flooding.
— A clear designation of responsibilities and duties for wider drainage and flood risk management issues.
— Legislative improvements for administration of flood defence and storm water drainage.

Water UK will be undertaking its own review on behalf of the UK water industry. Further details of this review and its terms of reference are provided below.

INTRODUCTION

Water UK is the representative body for the regulated water businesses in the UK. We are a policy-based organisation with members both in the public and private sector. Our role is to represent the interests of the industry and of its customers with Government, regulators and stakeholders in the UK and in Europe.

Water UK and its members are committed to providing efficient and effective water and wastewater services to all those we serve. We are proud of the improvements we have seen in a number of areas of recent years, including customer service levels, drinking water quality, sewer flooding incidence, asset maintenance and environmental quality. This has been achieved by efficiently managing a financial investment approaching £70 billion since 1989.

The protection of water consumers through the maintenance and improvement of water and wastewater services is our continuing priority. Challenges facing the industry include increases in severe weather events (perhaps linked with climate change), continuing investment requirements to meet European Legislation, increases of population in water stressed areas, land use planning and the need to ensure that our services are affordable to those that pay the bills.
The water industry worked well together during the recent exceptional and severe floods to maintain services and to provide support to those water companies and their customers most severely affected. Largely, this worked to great effect, although we are reviewing the vulnerability of our services to such events and how the industry’s “mutual aid” arrangements might need to be improved or extended.

EVIDENCE

1. Water supply companies have a statutory duty to provide wholesome drinking water at all times. Water and sewerage companies have an additional duty to treat and dispose of sewage/wastewaters. This duty is the top priority of all our members and our regulators, but is susceptible to extreme and unforeseen climatic events.

2. Flooding is partly a natural and partly a man-made phenomenon. It impacts on many aspects of water company activities and can have serious implications for water and wastewater services. The key role for the water industry is in planning for and minimising the risks presented by predicted flooding.

3. Public health is always our priority. Recent exceptional flooding impacted on the industry’s ability to deliver its services and presented a potential threat to public health. This was the particularly the case in the Midlands and South West England. However, a number of other water companies across the United Kingdom have also been impacted by exceptional weather events.

4. Water companies across the UK closely coordinated their efforts during the recent severe flooding to provide assistance to those companies, their customers and consumers most severely impacted. The industry operates a mutual aid system to facilitate rapid mobilisation of resources in such situations. As an example Annex 1 provides a summary of the industry wide support provided to Severn Trent Water (the most severely affected water company) at the height of the recent flooding.

5. For historical and economic reasons, the UK has mostly combined sewer systems in urban areas, collecting both foul sewage and surface water. When combined sewers can’t cope with heavy rainfall, the result can be surface flooding or backing up of foul sewers.

6. The frequency of such events is predicted to increase with climate change. This may mean that the design of sewers and of flood risk management projects in general needs to be reviewed.

7. The water industry is already building the predicted impacts of climate change, including on precipitation, on susceptibility and resilience of infrastructure, on river and surface flows, on demand for water, into long term business plans. We would urge the inquiry to draw on this experience and consider what best practice planning might include.

8. Our priority is the prevention of internal property flooding and reducing surface flooding when the system is overwhelmed. In the current investment period, the industry is directing over £1 billion of investment towards reducing the risk of sewer flooding.

9. The recent floods brought into sharp focus the susceptibility of water companies’ sewerage infrastructure to extraordinary and unpredicted climatic events. This has been particularly the case in areas with combined sewers. During the floods, water companies responded to thousands of flooding incidents, and prioritised those cases where consumers’ homes suffered internal sewer flooding.

10. Water companies have very limited control over both the amount of water and the nature of items that are put into the system. Greater control over items and substances that contribute to blockages is needed. Increased urban development has also tended to increase the pressure on sewerage systems. Early consultation and consideration of the impact of development on water industry services within the planning system is therefore vital.

11. The industry supports the Defra Making Space for Water project on Urban Flood Risk and Integrated Drainage. This project will work to identify the causes of flooding in urban areas; manage urban drainage to reduce flooding; examine and improve the effectiveness of partnership working; and test new approaches to reduce the impact of flooding.

12. The water industry cannot and should not be responsible for wider drainage and flood risk management issues. What is needed is a clear designation of responsibilities and duties in this complex area and a greater emphasis on more sustainable or “softer” approaches, including catchment solutions and integrated or sustainable urban drainage systems.

13. We have argued for some years, that legislative improvements need to be made to the administration of flood defence and storm water drainage. At the moment, responsibility for these functions is split between Defra, the Environment Agency, internal drainage boards, sewerage undertakers, county and district councils, but without anyone having an overall duty of coordination. In contrast, in Holland, such responsibility is vested in the Minister of Transport, Public Works and Water Management. As a result, Holland has not faced a major flooding problem since 1953. We therefore believe that steps now need to be taken to invest in Defra overall responsibility for flood defence and storm water drainage.

14. Water UK is, on behalf of the industry, conducting its own review of recent events and the implications for short-term emergency planning and longer-term policy. This will be chaired by Sir John Baker. We would be pleased to share our findings with the EFRA Committee when this is complete.
15. The draft terms of reference for Water UK’s review group on flooding are:

— To consider the industry’s emergency response to the flooding.
— To identify the impact and effectiveness of mutual aid and how this might be improved in future.
— To identify medium and long-term policy issues (eg infrastructure resilience, dual/alternative supplies, drainage, disaster management, regulatory and financial impacts).
— To understand the impacts of the flooding on the reputation of the UK water industry.
— To consider how we might have communicated better as an industry, with the public, the media, regulators, Government and MPs, and each other.
— To make recommendations based on the above.

Water UK
September 2007

Annex 1

Water industry support provided to Severn Trent during recent flooding

<table>
<thead>
<tr>
<th>Company</th>
<th>Tankers</th>
<th>Bowsers/tanks</th>
<th>Manpower</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thames Water</td>
<td>2 x 9,000 litre</td>
<td>251 cleaned and disinfect</td>
<td>6 drivers on a rotating</td>
<td>Two nights of overtime preparing the</td>
</tr>
<tr>
<td></td>
<td>tankers 24 hrs a day</td>
<td>ed static tanks (1100 litres)</td>
<td>shift for the two tankers</td>
<td>static tanks for dispatch</td>
</tr>
<tr>
<td></td>
<td>for one week</td>
<td>107 additional un-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wessex</td>
<td>3 15,000lttr tankers</td>
<td>80 (2500L), 100 bowser</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>and 1 25,000lttr tankers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South West</td>
<td>5 x 5000g</td>
<td>100</td>
<td>10 staff</td>
<td>4 x tractor units from local hauliers</td>
</tr>
<tr>
<td></td>
<td>2 x 2000g</td>
<td></td>
<td></td>
<td>pulling SWW trailers. Offered overland</td>
</tr>
<tr>
<td></td>
<td>12 x 500g from Gregory</td>
<td></td>
<td></td>
<td>mains laying team and 6km of pipework</td>
</tr>
<tr>
<td>South Staffs/Aqua</td>
<td>4 (30000L)</td>
<td>10 + 40</td>
<td></td>
<td>Aqua Direct is running its bottling</td>
</tr>
<tr>
<td>Direct</td>
<td></td>
<td></td>
<td></td>
<td>plant 24/7 and despatching bottled water as and when readily available. We have also depleted our stock</td>
</tr>
<tr>
<td>Mid Kent (1) Sutton &amp; East Surrey</td>
<td>Tankers from WD</td>
<td>From WD</td>
<td>8 drivers + support manager</td>
<td>Bottles from WD</td>
</tr>
<tr>
<td>Bournemouth</td>
<td>2 (13000L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welsh</td>
<td>4 (9000L to 13000L)</td>
<td></td>
<td></td>
<td>Offered tanker fill points in Wales</td>
</tr>
<tr>
<td>United Utilities</td>
<td>7 x 1500g</td>
<td>281 tanks</td>
<td>5 drivers</td>
<td>Mobile comms vehicle deployed to</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Field Service Engineers</td>
<td>flooded WTW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 Network operators</td>
<td></td>
</tr>
<tr>
<td>South East (2)</td>
<td>1 (25000L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scottish</td>
<td>4 (18000L)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern</td>
<td>100 (1800L)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Company | Tankers | Bowsers/ tanks | Manpower | Other
---|---|---|---|---
Bristol | 1 x 25000L | 50 | 5 drivers + 3 support | 2 grab lorries
 | 1 x 18000L | | 1 man at Avonmouth fill point. Local and HQ Management | 6 man days, providing cross border supply options
 | 1 x 14500L | | |
Northumbrian | 3 (30,000L) | 18 (1100L) | | 2 incident managers
Northern Ireland Water | 2 tankers | | |
Anglian Water | 2 x 4000 gallon tankers with drivers | 60 No. 250 gallon bowsers, 100 static tanks | | 1 Media Manager support
Water Direct Contractor to Cambridge | All fleet | | |
 | 2 (28000L) | | |

Notes:
(1) Mid Kent authorised Water Direct to issue from their stocks at WD, to ST on request.
(2) Operated by Water Direct—deployed this trailer locally enabling 2 x 10,000 litre WD tankers to be deployed with Severn Trent.
(3) Three Valleys Water responded through Water Direct.

Witnesses: Ms Pamela Taylor, Chief Executive, Mr Phill Mills, Deputy Chief Executive, Mr Bruce Horton, Policy Adviser, Mr Jim Marshall, Policy Co-ordinator, and Mr Richard Venters, Legal Adviser, Water UK, gave evidence.

Chairman: We have got a fine body of people from Water UK. For the record: Pamela Taylor, Chief Executive, Phill Mills; Deputy Chief Executive; Mr Bruce Horton, Policy Adviser; Mr Jim Marshall, Policy Co-ordinator; and Mr Richard Venters, just to keep them all in order, the Legal Adviser. You are all very welcome indeed. Thank you very much for your written evidence. I am going to ask James Gray to start our questioning.

Q645 Mr Gray: As a very general beginning and without seeking an encyclopaedic response, can you tell us in Boys' Own terms that even I would understand who is responsible for surface water drainage?
Ms Taylor: There are many responsibilities, which is probably part of the problem. The responsibilities are governed first of all by common law, then the Building Act which is the responsibility of the DCLG, then the Water Industry Act which is the responsibility of Defra, then the Highways Act which is the responsibility of the Department for Transport; the Water Resources Act, which is Defra, the Environment Agency, internal drainage boards and local authorities, and the Town and Country Planning Act, which is the planning authorities and DCLG. If this boy is being brave, we can go into layer by layer what each of those is but I think, as you can see, it is a complete mess and it needs to be reformed.

Q646 Mr Gray: It was not so much the statutory background and the regulation of it, I was being even more Boys' Own than that, so for example, in a town, where does the highway authority's responsibility end and where do your members' responsibilities begin? Where in the pipe work do I stop writing to Wiltshire County Council and start writing to Wessex Water?
Ms Mills: To put it in that level of language, the sewerage undertakers' responsibilities are effectively to drain their customers' properties, so it is sometimes referred to as roof and yard drainage, which is separate from highway drainage. Highway drainage is the highway authority's responsibility but more often than not that highway drainage will discharge into the surface water sewers and pass to the sewerage undertaker.

Q647 Mr Gray: So at what stage does it stop being the responsibility of the highway authority and become the responsibility of the sewerage undertaker?
Ms Taylor: In a way nobody really knows.

Q648 Mr Gray: That is why I was asking the question.
Ms Taylor: Exactly, in a way, nobody knows because we have got all these beautiful separate pieces of legislation with different responsibilities by different government departments and so on, but obviously rain water falls where rain water chooses to fall and when it comes to it, somebody whose home is flooded or a village is flooded or a town or a city, or whatever, people actually do not care at that stage. They just want to know who is going to pick up the responsibility for dealing with this and how quickly are they going to do that.

Q649 Mr Gray: Sorry to press you on that but that is precisely what we are trying to find out. I will give you an example. The town of Winterbourne Bassett in my own constituency was flooded and we cannot

discover whether it is Wessex Water who are responsible for the sewerage and surface water drains or whether it is Wiltshire County Council. I want to know from you what your members’ views would be as to at what stage they take over responsibility for the drainage of surface water or, indeed, is there no answer to that, maybe it varies from place to place?

Ms Taylor: There is no perfect answer to it.

Mr Mills: They will be responsible for the surface water sewerage pipes generally in the street. There may be separate drains from the highway but, as I said earlier, they may connect. The root cause of the flooding, if it was something straightforward like a blockage on a sewerage undertaker’s pipe then obviously that would be their fault, but if it was sheer overwhelming by the volume of surface water, it really depends where that surface water is coming from.

Q650 Mr Gray: So your submission on behalf of the water companies would be that there is no clarity at all as to who is responsible in different places and it is a muddle?

Ms Taylor: That is exactly right, it is a muddle, which is why we would like to see it reformed.

Q651 Chairman: If it is a muddle what is your recommendation as to how it should be sorted out?

Ms Taylor: One thing that we have looked at is all of these Acts which give various bodies certain statutory responsibilities but, as we can see from our discussion, it actually does not add up to a whole. What we would like to see is one body taking overall responsibility. What we are not looking for is one body to be put on top of the existing muddle. We are looking for the existing muddle to be taken away to rationalise both the legislation and bring the bodies together so that you have one organisation. In terms of who might be the most appropriate organisation, we think the most appropriate department would be Defra and we think the most appropriate organisation would probably be the Environment Agency, provided it was sufficiently funded to carry out the role.

Q652 Chairman: I was musing on this because one of the issues is not directly related to water utilities but to the whole question that you raised, Pamela, in terms of people just want somebody to do something about it. A number of submissions we have had, particularly from members of the public, have looked at ditches, drains and other items which they, from a lay standpoint, say if only somebody could come and unblock it the job would be better. Should we be looking at some kind of registration system for those who have a responsibility for the different elements of the water chain so that it is absolutely clear who at each point is responsible, including highway authorities, statutory bodies like the ones you represent, riparian landowners; almost the equivalent of the Land Registry but for water?

Ms Taylor: Yes. At the moment for example you will have some highway drainage which goes straight into sewers and the sewers really cannot cope with the increased intensity of rainfall so we are seeing that happen. You have things called SUDS—sustainable urban drainage systems—where nobody is particularly clear who is responsible for maintaining them and so on, so it is absolutely right there is such a lack of clarity in this area and we need that clarity.

Q653 Chairman: Okay, let us move on to an issue which I know our colleague David Taylor wanted to raise but David, sadly, has not been able to be with us just at this moment so I will ask the question for him. When the review of the lessons learned about Hull was done, Professor Coulthard found a series of what he described as “serious issues” which referred to the design, maintenance and operation of Yorkshire Water’s pumped drainage system. He described particularly the Bransholme pumping system which failed during the floods and he raised the general issue that if a water company gets its calculations or its design wrong and things do not happen as they should do, are the risks associated with that allocated correctly?

Ms Taylor: When something goes wrong, that can either be that it goes wrong immediately and it is obvious from the start that a water company has got it wrong (which, to our knowledge, does not happen and certainly should not happen because of the methods of design and calculations that there are now) or something can go wrong because it is no longer fit for purpose but was fit for purpose at the time. I think what we are seeing now is increasingly intense rainfall patterns. We are certainly noticing and recording that they are getting more intense and they were not happening to us before. Things like that which were built in good faith and good calculation at the time to cope no longer can cope with the extreme weather conditions that we are currently seeing. Certainly we would be in favour of all utilities needing to review their systems all of the time to make sure that the systems they have got are actually fit for purpose. Obviously, as we know, some of the sewers and other assets are 150 years old or more and they had not been designed with this in mind, although fortunately, as we know, with some of the Victorian engineering it was over-engineered, which was lucky for us.

Mr Horton: One of the key things about last summer’s floods that we need to remember, and everyone I think recognises, is the exceptional nature of them. They caught to a large extent not only water utilities but other utilities and many others by surprise and we need to take stock of that. There are certainly things you can do to reduce the risk of your assets failing under those circumstances and companies will undertake risk assessments to look at their assets. You can certainly do things like raising the level of equipment, putting flood defences around infrastructure and assets and so on. Companies will be looking at that again in the light of last year’s events.

Mr Marshall: Water companies as well have quite good in-house expertise in this whole area of modelling and design, it is what they do, so we are
Quite confident that the systems built to the current design standards are fit for purpose. It is a case of how time changes these.

Q654 Chairman: But you have just said the words “systems built to current design standards” whereas Pamela Taylor a second ago quite rightly reminded us that much of our water infrastructure is of a vintage when current design standards did not apply. Sometimes they got it more right than the current ones might do but otherwise in certain cases we might be going in the opposite direction.

Mr Marshall: Fortunately, we had a tendency to over-engineer in the older networks. We do work with our regulator to agree the investment requirements to deal with the ageing infrastructure on a risk-based approach.

Mr Mills: The other point to make there is that with the impact of climate change and changing weather patterns and storm intensities and the weather we had last summer, the companies have been doing a lot of work through UKWIR, which is UK Water Industry Research, looking at the impacts of climate change on the sewerage systems but also on water supply implications as well and a significant amount of work looking at what the new design standards should be for sewers for the 21st century. That work has been started and is on-going next year as well.

Mr Horton: Uncertainty is the key issue there because when you are looking at climate change scenarios for drainage and flood risk management, what you are looking at firstly is worldwide temperature and precipitation scenarios; then you are looking to refine that into national and then regional scenarios; then you need to factor in what mitigation strategies we may take. You need to think about land use planning and growth in terms of new developments and so on. At every one of those layers you are adding more and more uncertainty into the equation, so that is one of the key challenges and at the end of the day what we are looking for really is very short interval rainfall data in very localised areas, literally five or ten minute rainfall data and that is where the impact of extreme weather events will cause local flooding.

Q655 Chairman: Have you got any objective data collected by the water companies to substantiate this? Going back to Mr Marshall’s point about being fit for purpose, the implication of what he was saying is that some of the infrastructure cannot cope because of the severity of rainfall which we are now seeing. But you, Mr Horton, were implying that perhaps we should be collecting some data on the severity issue. Have we got the body of evidence to justify what Mr Marshall has said? There is a gentleman behind shaking his head so I am assuming that he has sent me the body language message answer that says no to that. Is that true?

Ms Taylor: We do collect the data obviously but the point that Bruce is making is that you can have data but when it comes to localised flooding, whether it is a village near where I live where the water just shot down the hillside and there had never been any history of flooding in that village before and may not be again, then to have that kind of very localised data at the moment is just not possible. What we are saying is that there are so many layers of uncertainty here that in addition therefore to looking at who owns what and sorting out responsibilities and so on, we also need to look at sewer design and we also need to look at the way in which we use our sewers and drainage. Another thing we have to try and do is slow down water, which at the moment is a big difficulty for us.

Q656 Chairman: I think King Canute tried that without much success.

Ms Taylor: He did.

Mr Mills: There are different techniques we can use. Ms Taylor: Just one other thought that when we were talking about liability and so on there are also private sewers and drains that connect into the public system but many people do not know that they own those private sewers and drains and that liability currently lies with the householder. I am sure most households are completely unaware of this. We are pleased though that these sewers now are going to be given to the water companies. I say we are pleased; it makes sense that we should be given them, but at the moment there is quite a lot of doubt as to how many miles there are of them. It is probably 125,000 miles of these that we are going to be given. Not many people know the mapping in terms of where they are, not many people know in what good condition or otherwise they are, but because of the risk of flooding and the importance of being able to plan overall we will be accepting that responsibility and it will mean that the sewage network will be better managed and more integrated in the future than we are able to do at the moment.

Q657 Mr Gray: Does that mean septic tanks and all that?

Mr Mills: No, it does not mean private sewerage treatment works or cesspits and the devices you mention.

Q658 Mr Gray: It is private sewage systems?

Mr Mills: Private sewers that are currently discharged to the public sewerage system but for which householders are responsible.

Q659 Mr Drew: Following the events of last year, clearly individual water companies have rethought through what plans they need to have in place. I just wonder to what extent firstly you have done work collectively—

Ms Taylor: Yes.

Q660 Mr Drew: --- Secondly, how you are advising individual water companies and, thirdly, what you need to do in the future to re-evaluate the scale of the events of last year and how individual water companies will be able to respond.

Ms Taylor: Because of the work that we have been doing at the moment we felt that it was essential that we should get together as a water industry and learn the lessons very quickly and share those lessons, which we are doing and we are continuing to do. We
are also updating ministers on that information. However, water and sewerage undertakers have to comply with the Security and Emergency Measures Direction (SEMD) and that is about co-ordinating, planning and so on. It was quite obvious from the events of last year that although the plans exist and although those plans are rehearsed with many different bodies and different organisations that in fact, when it came to an event that people had not foreseen, then although the plans worked element-by-element, when you added it up to the whole they could not cope. As far as we are concerned now, we are looking for these plans to be shared more rigorously, if that does not sound too silly. In other words, that people should not just do desk exercises and computer exercises and so on but should do real and old-fashioned exercises, and these should be co-ordinated through local resilience forums. We should also be learning the real lessons from what happened and making sure that we are prepared for the future. Any scenarios that people had in their minds, we have now got to up those, and the research that we referred to earlier is helping us to do that.

**Mr Mills:** Companies are already looking at their critical infrastructure, the water treatment works—and a lot of them are near rivers anyway because this is the source of the water—but they are re-evaluating their resilience and looking at flood protection or increased flood protection measures for them or improving the security of supply so that they will be able to get water supplies from alternative sources. Companies are obviously doing that now and they will be putting proposals to the regulator as part of their business plans because we are now getting into the periodic review cycle when Ofwat looks at companies’ submissions and looks at what the investment programmes will be and what the price limits will be from 2009 onwards.

**Q664 Mr Drew:** A final point, if there is unhappiness over a very specific piece of critical infrastructure, is it possible to say to a water company, “You have got to move that? That is just too high a risk. Sorry, it has got to be moved out of the flood plain and we might be able to give you some help to do so”? Is that a possibility or is that one of the things, Pamela, that you would allege actually falls between all these different bits of legislation?

**Ms Taylor:** Sadly, I think the answer is both in that when you are analysing risk you cannot just take the water industry on its own. You have to look at the impact on other utilities such as electricity. Power cuts are a worse threat usually than flooding and flooding of course can be linked to power cuts, so we have to look at it across the piece. I think that it is fair to say though that water companies err on the side of asking for what it is they think is right and regulators will err on the side of saying, “Can you justify that financially?” I do not think there is any need for anyone to say to a water operator, “You are not looking at this risk properly; you are not asking for sufficient funding; you are not looking at resilience sufficiently,” and so on. If you like, the balance is the other way around, that the water operator would obviously ask, and then it is a question of whether the economic regulator would say that was right and justified or not.

**Mr Horton:** In response to that specific question, it would be one of the options, but moving a water treatment or waste water treatment works a significant distance is going to be extremely expensive, and there are other things that you could do probably that may be cheaper or more cost-effective such as localised flood defences or improving connectivity within the region so that you are not isolated and you are not over-reliant on one works.

**Q665 Chairman:** The only thing that bothers me about what you say, Pamela, you say you are going to improve your business resilience, you are going to do all this, as if to say this is a new discovery. I would not imagine that there is one water company that does not have a backed up IT system because it realises in this day and age that if it does not its business processes are totally vulnerable, and yet in the case of this summer it seems to have come as something of a surprise—and we say this with the benefit of hindsight—that certain assets were suddenly found to be vulnerable or eventually overwhelmed.

**Ms Taylor:** I think it is fair to say that they were found vulnerable or overwhelmed in ways that nobody, not just the water operators but everyone else who is involved in the planning, had foreseen, so, yes, companies are always looking at resilience. Where the economic regulator has refused the financing for example, going back to the previous point, then companies have used their own money, ie shareholder money, in order to improve the resilience of their infrastructure. The need is there, the need is recognised and the need had been being met, but last year was different of course.
Q666 Chairman: I want to move on to talk about the design of sewers, but obviously sewer capacity is pretty expensive stuff. If you decide that sewers are not able to cope, then ripping up streets and building new sewers is seriously expensive stuff. Just before I get into the design issue do you believe that the current model of determining the payment structure for water is a correct model and a correct basis to take into account the implications of more extreme weather? I ask this question against the background that when bathing water standards for example were to be improved, particularly in the South West, individual users’ bills went up very steeply because there was a big bill and not many people to pay it. It has occurred to me as to whether in fact the current user-pays-all-expenses model is correct when there are extreme weather conditions of an unpredictable nature, not the fault of the water company but they are now becoming a consequence of climate change. We deal with that on a national, European and international basis, so I come back to my central question: in responding to some of the pressures which may be associated with climate change, is the current water pricing investment and payment model the right way to deal with it?

Ms Taylor: The answer is that we are asking the same question and we do not yet know the answer. It is certainly something that we are aware of and our regulators are aware of as well, so it is something that certainly more people now are beginning to ask, and there is a bigger debate about that. One of the things about the five-yearly cycle—and as you know, our prices are set for us by the economic regulator every five years—and what we are discussing with Defra at the moment (and we are very pleased that) is to look at the strategic direction of the water sector, to say long term what are the things that we have to take into account in terms of planning, and then to say, well, long term how do we need to make sure that we are fit for the future and therefore can we make sure that price reviews are not just a five-yearly battle where the environment wins one time or customers the other, prices go down or prices go up, or whatever else it may be, but making sure that those five-yearly price reviews are actually a stepping stone on the way to where it is we think long term we need to be. Part of that debate now is whether regulation as we currently have it is fit for the future, and if it is not what are things that are blocking it that we need to consider.

Mr Horton: Just two points I wanted to make in relation to climate change. The first is we need to understand the impacts of climate change on the water industry. There is an awful lot of work going on to do that. Phill mentioned earlier some of the UKWIR work that is going on. We have been doing research on climate change for ten to 15 years already and our understanding is improving, although it is still not perfect, so we still need to do more work to understand the impact. Water companies and the regulator do not want customers to be paying for investment unnecessarily. The second point is that adaptations to climate change are not necessarily always going to cost a lot of money. In some circumstances they will but we should be looking for the most cost-effective and in the long term most sustainable solutions. Phill mentioned earlier things like SUDS, permeable surfaces, restoring natural flood plains and so on, and with things like the Water Framework Directive we are increasingly being given the tools to move towards those more low-tech, sustainable solutions which may be less costly.

Q667 Chairman: Let us talk about sewer design because as I understand it, you are supposed to have your sewers designed to deal with a one in 30 year event. Who set that standard?

Ms Taylor: All sewers since 1980 have met the standard of one in 30. That was actually something that the water industry itself pushed for as a standard.

Q668 Chairman: Who decided that a one in 30 year event was the right number?

Ms Taylor: Based on information that we had at the time in terms of the modelling available to us, information on climate change, demographics, the ways in which people are using water and so on, it was right and it looked as if it was right at the time, and it probably was right at the time.

Q669 Chairman: So all sewers that we have got now ---?

Ms Taylor: Only those built since 1980 were designed to meet the standard of one in 30.

Q670 Chairman: Let us go back because an awful lot were built before then

Ms Taylor: An awful lot, yes, but it is quite likely that many of those built before 1980 meet that standard too thanks to the Victorians, but it is also quite likely that a whole load of them do not meet the one in 30.

Q671 Chairman: You said that the standard was set in 1980, so this is 27 years ago and the scenario of what you have to cope with because of development, and now climate change, has changed, but are you saying that the industry does not have knowledge of the status of the sewers that were built before 1980, because your response to my probing on that was of a general nature alluding to the fact that you hoped that much of the other infrastructure was up to the one in 30 year but you could not be certain?

Ms Taylor: That is because we do not control all of the sewer network that we have to take responsibility for. We do not control the water that comes into it. We do not control the connections that people have on and the automatic right to connect to it. We do not control the water run-off from highways and so on. As usual, there are too many things that we do not control in order for us to be able to—

Q672 Chairman: You might not control it but coming back to this question of what we need to do, were it necessary to have a sewer system that can
cope, there is lots you cannot control in terms of the liquid input, but you have already identified a large number of sources of water.

**Ms Taylor:** Yes.

**Q673 Chairman:** So I am just a little concerned that nobody has gone out and done some modelling.

**Ms Taylor:** We have.

**Q674 Chairman:** Right. Let me come to the simple layman’s question: you might not be able to tell me exactly if all of the sewerage system is at one in 30 years, but let me turn it on its head, how much of it does not cope with what we have already got in terms of all this water coming into it, because otherwise, if it all coped we would not have any flooding!

**Mr Mills:** You are correct, companies have done modelling since they took over the sewerage system in 1989 and they have been required to map sewers as well. They have not mapped all the sewers yet but they have done it on a risk assessment/risk management approach. They have looked at areas and sewers where they have problems and they have established what are their critical sewers, so they have looked at putting investment in those critical sewers, which could be because of the flow capacity or could be because of the impact if there was a collapse of a particular sewer, and the modelling has been geared towards that. They have also done lots of CCTV surveys to check the condition of sewers, or could be because of the flow capacity, et cetera, et cetera, and you come to the real question we do not want this to happen again; we know there is a problem; how do we deal with the problem there when that kind of real world event occurs? I am getting the impression that there are so many variables that you have put before us that it is quite difficult to make any kind of prediction as to where you ought to invest to avoid the problem. The only way you can identify it is when the problem occurs and you do something about it retrospectively. Is that right?

**Ms Taylor:** Nearly in that, yes, it is very, very difficult and, yes, there are many, many variables, but it is a menu of things that you need in order to try to deal with it, first of all, to try to prevent it happening and then, secondly, going back to the discussion we had right at the beginning, in terms of responsibilities and so on when it does happen. If you think about the classic picture in whatever city it may be of the railway bridge and flooding underneath it on the road and so on, it is quite likely if you looked back to when the homes around were first built they would have all had front gardens, they would not have been paved over, they would not have had cars parked on the front gardens, and you would not have roads that are really rivers now because they are acting almost as urban drains taking the water away. Of course, no drain is designed for that and no sewerage system is designed for that. We have to ask do we want to spend customers’ money on expanding the size of the sewers or do we want to look at a menu of options here? One would be more permeable covering and so on for people’s driveways, et cetera. Another would be slowing the water down in other ways, SUDS and so on. We think that it is a mixture of things, it is a menu of things that we need.

**Chairman:** Paddy, do you want to come in on that?

**Q677 Paddy Tipping:** I think that is right. You do things on the uplands and flood plains, SUDS and the kinds of things you have been talking about, but ultimately we are asking a very straightforward...
question. I think you told us that the standard was set at one in 30 in 1980. Is it going to increase? As a result of the problems this year are you going to increase the standards? Should they be increased? 

Mr Mills: The current Defra advice is for an uplift of 20% on that to 2050. It is a complicated issue to grasp but the one in 30 is obviously based on probability. However, as you move forward, the intensity of a one in 30 year return storm is going to increase anyway, so the design standard or the flow that you would expect to design for is going to increase anyway and there will be that increase in the standards. There is research going on at the moment into 21st century sewer design and what those future standards should be. I cannot emphasise enough that in future we are going to look at a twin-track approach, if that is the right word, and try and keep surface water out of sewer systems through sustainable urban drainage and getting water to percolate back into the ground rather than into pipe systems.

Q678 Paddy Tipping: So you are saying to me that at some point in the future, and perhaps you would just clarify when that might be, with big new developments the sewerage infrastructure is going to be of a higher quality design and higher volume design?

Mr Mills: Big new developments going forward ideally would have SUDS installations and retention basins so that that water would not go into the existing sewerage system because then it will overload it somewhere downstream.

Mr Horton: Ideally in the future we would like new developments to be drainage neutral as well as carbon neutral and anything else neutral you want to make them.

Ms Taylor: Exactly.

Q679 Paddy Tipping: Just explain for us beginners what drainage neutral actually means.

Mr Mills: No additional contribution to the drainage network.

Ms Taylor: No additional burden on the drainage network.

Mr Mills: So it would be offset by SUDS or green roofs or permeable surfaces or localised storage. Mr Horton: Just one very quick point on the one in 30 standard. Although we are looking at that and there is a project now, as Phill says, to look at the design standards of sewers in the future, the first thing we need to do is to make sure that the climate change scenarios of the future are built in. The one in 30 may still be a one in 30 standard but at least it has got the more intense rainfall events built in there.

Q680 Miss McIntosh: Do you think it has contributed historically?

Mr Mills: Yes, we are aware of incidents, not necessarily last year, of increased surface water connections or misconnections, where people have connected into the surface water sewerage system and it has caused flooding locally downstream. I would emphasise that we are not talking about removing the right to connect to the foul public sewerage system. It is only the right to connect surface water to the sewerage system. We have already been through quite a number of other solutions for the disposing and treating of surface water and we feel that the automatic right to the public sewer should not be there, and developers and planners should consider the sustainable urban drainage options.

Q682 Miss McIntosh: How much of a problem is it?

You mentioned the age of some of the sewerage pipes. How much of a problem is it of connecting new pipes to old pipes in the sense that there might be some surface water run-off that will eventually cause a flood?

Ms Taylor: It varies but it hardly ever is not a problem. They are connected, they are misconnected. Trying to plan within a region, trying to plan within a catchment and so on, it makes it so difficult—unnecessarily so.

Q683 Dr Strang: Before I ask a question about the safety of reservoirs and dams, obviously water utilities are major owners of dams; are you satisfied that the legislation in place is adequate to ensure that the checks and controls are such as to protect the public and indeed public infrastructure from the risk of a dam failure? 

Ms Taylor: There is no doubt at all that the legislation has served us well so far. I think that now, though, as we were all surprised by what has happened last year, that people are beginning to say does that legislation need to be looked at again regarding the regulation of reservoirs in order to build in some kind of basis for risk assessment. We would certainly be interested in helping to look at that.

Q684 Dr Strang: The stakes are very high. There is a potential loss of life.

Mr Venters: I think the legislation itself under the Reservoirs Act is very broad and thorough, but I think the suggestion that the scope of the legislation needs to be broadened is probably a good one. At the moment it only covers reservoirs which hold more than 25,000 cubic metres above the natural level of the land and it does not cover all reservoirs. It certainly does not cover reservoirs associated with mining and quarrying and the suggestion that perhaps we should move from a capacity-based
measure to a risk-based measure may be something that needs to be looked at. I think the legislation is probably fine; it is the scope that needs a second look.

Q685 Dr Strang: Just one final point, apparently there are a number of old dams that serve no current economic purpose. Should we be doing more to get rid of these?

Mr Mills: The legislation is fine as it stands for those reservoirs above 25,000 cubic metres. There are a lot of reservoirs smaller than that that are not owned by the water companies which have processes in place but may be under private ownership or agricultural ownership that do not have to meet those criteria but still can pose a big risk if there was a failure of that dam. The legislation needs to move away from that numerical basis to a risk-based approach.

Dr Strang: That is very helpful. It occurs to me that it might be useful if they have any other ideas if they send us a note on some of these points that we could pursue.

Q686 Chairman: Just before we conclude I want to go back and ask a point of clarification about sustainable urban drainage systems. We talk about these but there seems to be a lack of willingness for anybody to say, “We will take responsibility for looking after them.” Why is this and who should do it?

Mr Mills: Water UK was part of a national steering group and we produced an interim code of practice back in July 2004 because there was a lack of government direction around sustainable urban drainage systems. The industry put an addendum out to help developers in what water companies would take on, but there is still a lot of uncertainty, not least around the ownership and maintenance and also the funding. Under the legislation, water companies would not be able to look after SUDS because they do not come under the definition of a sewer. In Scotland they got around that by changing all the legislation on sewers so that SUDS, provided they met the one in 30 design criteria, could be classified as a sewer. Scottish Water now take on the SUDS of that size in Scotland. There are other issues about rights of discharge from SUDS because companies do not have rights of discharge.

Q687 Chairman: I am sure you can give lots of problems but I am actually looking for solutions.

Ms Taylor: It is easy—we just need to have some kind of statutory backing to the code that we have developed. That would be fine.

Q688 Paddy Tipping: Who would be responsible?

Ms Taylor: Water operators would take responsibility if they have the funding and so on just as they have done in Scotland.

Q689 Mr Drew: So it is sewer works?

Ms Taylor: Yes exactly and at the moment there is some silly thing where this you can call a sewer, that you cannot, and we just need to get over this nonsense.

Q690 Chairman: You said if they have the funding. You were bewailing the fact that you were going to have to take over some private sewers and there is a funding implication. Here we are talking about various systems for absorbing water and the question is, yes, okay, we change the law, we fix it, it is your responsibility, but does that mean that the cost then is simply spread over the companies’ water users?

Ms Taylor: Yes. And it would then be part of the price review process with the case being made to the economic regulator and so on.

Mr Horton: It would not necessarily always be the water company who is the responsible party. Just clarifying the legislation would help to identify who that was. It may be the local authority in many circumstances, depending on the type of SUDS and the location.

Q691 Paddy Tipping: That does not seem to clarify things; that seems to confuse things. Surely one body needs to be in charge? Just help me through this. You have made great play throughout the afternoon about SUDS and how it was the way forward to be water neutral—was that the phrase that you used—but presumably on a new development the developer would have to talk to you and the local authority about the design and then if the legislation changed you would be responsible. Why would the local authority be responsible?

Mr Mills: I think you have to be careful about what we mean by SUDS.

Ms Taylor: The kind of SUDS that you are describing is the kind of SUDS that we are talking about as well, and certainly we would expect to take responsibility if we were given the right circumstances to be able to do so, but there are some SUDS that we would not recognise as a SUDS, that we would recognise as a community facility for sailing and goodness knows what else and balancing lakes and all the rest of it. It is a question of what we are calling a SUDS. Bruce is quite right in pointing out that we would not necessarily in every circumstances be talking about all SUDS, but certainly the kind of thing that you are describing is the kind of thing that we would expect.
Q692 Chairman: What would be very helpful to the Committee—and I appreciate you have probably got a library full of information—is if you could précis for us SUDS, what they do and who is responsible. That would be helpful because when we went to Lyon what we saw was balancing pools and it looked to me like a lake but I was told it was a SUDS. It was part of a very substantial piece of urban redevelopment where the system was an integral part of the development and I think it was the developer who had the requirement to maintain it. Ultimately, if you have got a body of water it has got to go somewhere, which at that point it might well become a water company’s responsibility, so if you could give us a succinct layman’s guide to SUDS and who should pay, that would be extremely helpful.

Ms Taylor: We would be delighted to and if I may just add one comment on SUDS and balancing lakes and so on—and you must not laugh at this—if you wanted to visit Milton Keynes you would there find where there was perfect planning in consultation with the water company. Because it was a new town it meant that all the existing planning rules were, if you like, bypassed in favour of partnership planning and partnership working. There you have got a very fine example of building a city that has not put additional strain on the river resources, flooding and so on. It is a very good example if you wanted to visit it.

Q693 Paddy Tipping: The new eco towns that are all the rage that we are all looking for; are they going to have SUDS?

Ms Taylor: They are going to have to.

Q694 Paddy Tipping: Have you been consulted on that?

Mr Mills: I think some companies will have been consulted on that but sustainable urban drainage systems are properly a requirement of the planning application or the planning conditions, and the issue is who is then responsible for their long-term maintenance.

Ms Taylor: When you are building a new town you just say let us do this together, let us work in partnership. There were different rules there when you had development corporations and so on that you do not necessarily have in existing places. The reason why I raise this is because it shows it can be done and there is no excuse not to do it.

Q695 Paddy Tipping: They are managed by Anglian Water.

Ms Taylor: Yes they are.

Mr Mills: One final point—one of the key dangers, you said about the developer still maintaining that particular SUDS installation, if that developer should then go bust or decide he has had enough, he could just pipe that SUDS straight into the surface water or a combined sewerage system which would cause overloading and flooding downstream. That is why we need to look at the right of connection and remove that automatic right.

Chairman: You have made my railway trips through Milton Keynes of even greater significance as I gaze from my window at the plastic cows and the obvious sustainable fuel and water that they have. It is a very interesting comment that you made. Thank you very much indeed for your evidence and for your written evidence; it is much appreciated.

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Supplementary memorandum submitted by Water UK (FL 95a)

SUSTAINABLE URBAN DRAINAGE SYSTEMS (SUDS)

Currently in the UK the Environment Agencies and water companies are encouraging the inclusion of sustainable urban drainage systems (SUDS) in the planning and design of new developments.

SUDS are not designed to provide flood protection or act as prevention systems. Their primary purpose is to provide surface water treatment and slow down surface water flow into the drainage system. They can be used to ensure there is no increase in downstream flood risk and can help manage surface water run-off, reducing the impact of urbanisation on flooding and pollution. They are part of the solution to urban flooding but are not sufficient on their own.

SUDS are commonly used in other countries, notably USA and Scandinavia.

The water industry supports sustainable drainage initiatives and is involved in all 15 Defra Integrated Urban Drainage pilots. The SUDS initiative is seen as a valuable tool to improve the manner in which the sector deals with surface water. SUDS are not however flood defence measures.

SURFACE WATER DRAINAGE AND FLOODING

Impervious concrete and tarmac surfaces in urban areas stops infiltration of rain water into the ground. As a result, built-up areas need to be drained to collect and convey the resulting surface water into a watercourse or public sewer. Traditionally this has been done using underground pipe systems designed to prevent local flooding by conveying the water away as quickly as possible.
The underground pipe systems in urban areas may be either provided specifically for surface water or provided to carry both foul and surface water drainage (combined sewer systems). Combined sewer systems are owned by water companies whereas surface water drains may be the responsibility of the water company, the local authority or the highways agency.

Since the 1980s separate foul and surface water systems have been provided for new developments, however, in larger urban areas these invariably connect into older combined systems further downstream.

If the combined system is overwhelmed or blocked this will result in foul flooding (ie flooding with dilute sewage). Localised flooding may also be caused by blocked road gullies, rather than a problem with the design capacity of the sewer.

Appendix 1 presents a more detailed legal perspective on surface water urban drainage.

**Surface Water Drainage and Pollution**

Surface water run-off can become highly polluted in urban areas due to the uptake of contaminants deposited on the ground. Direct discharges via a separate surface water system may therefore have an adverse effect on the receiving watercourses. Combined sewer systems convey surface water to treatment works but in storm conditions these are designed to overflow to watercourses. This is a “safety valve” to prevent overloading the system and localised flooding of property. These overflows contain a mixture of sewage and surface water and as such will affect the quality of the watercourse they discharge to.

**How do SUDS help reduce flooding?**

The most important way in which SUDS help to minimise the risk of flooding is to slow down the rate of surface water flow thus reducing the load on the drainage system. This is done by combinations of the options listed below:

- Encouraging householders to collect water from roofs in rain butts or even underground rainwater harvesting systems.
- Use of “green roofs” (ie roofs that are partially or completely covered with soil and vegetation).
- Allowing more water to soak into the ground. This includes simple soakaway systems and filter drains.
- Providing more permeable and porous surfaces eg roads, pavings and car parks to allow water to soak into the ground.
- Temporary storage of water in a normally part-filled pond with an overflow, to attenuate flow (Figure 1).
- Temporary storage of water in a grassed detention basin which is normally kept dry (Figure 2).12
- Temporary storage of water in an area which can be allowed to flood with no damage to property eg a car park, sports ground.
- Temporary storage of water in a constructed wetland area.
- Collecting water into a roadside swale or filter strip. These are grassed surface features that drain water evenly off impermeable areas (Figure 3).13 Swales are long shallow channels whilst filter strips are gently sloping areas of ground.

**SUDS and the Environment**

Properly designed SUDS can have many environmental benefits:

- They are able to reduce pollution of watercourses by settlement or filtration.
- They even out peaks in run-off flow to reduce the surface water load on combined sewers and thus reduce the risk of sewer flooding of downstream properties. They may also reduce the quantity of storm water overflows.
- They provide attractive wildlife habitats—particularly wetland areas and ponds.
- They provide attractive landscape features.
- They encourage natural ground water recharge by allowing water to soak into the ground.

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11 There are also a large number of private sewers (foul, surface and combined) that discharge into company owned public sewers. Government has recently consulted on the transfer of these private sewers to Sewerage Undertakers
12 Not printed.
13 Not printed.
LIMITATIONS OF SUDS

SUDS cannot be effective if the ground water reaches the surface or they are inundated by river water. SUDS can only be a part of sustainable flood management system which uses natural features to reduce the risk of flooding rather than constructed flood prevention schemes which often shift the problem from one area to another. Sustainable flood prevention systems include the managed use of floodplains and constructed wetland areas to store water and attenuate flow in river catchments.

MANAGEMENT OF SUDS

The water industry was instrumental in developing an interim Code of Practice14 with the National SUDS Working Group15. A number of model agreements have also been drawn up to be used either through the planning process or for use between two or more parties outside the requirements for planning permission.

There is a lack of provision for the implementation of SUDS technologies within existing legislation and this is a barrier to their implementation. There are issues of:

— The right of water companies to refuse a design that is not appropriate.
— Restoration of the right of Sewerage Undertakers to discharge to watercourses.
— Removal of the automatic right to connect surface water discharges to the sewerage system.
— Health and safety issues associated with open water features that would be owned by private companies in residential areas.
— Many techniques are relatively new and the long term costs of maintenance are not well understood.
— Water industry responsibility for SUDS should be limited to those SUDS features that have connectivity with surface water sewerage systems (porous pavements, isolated infiltration systems, soakaways and swales should remain in private/local authority ownership).

These issues will need to be addressed by changes to legislation to enable the adoption of SUDS by water companies. Under Scottish legislation Scottish Water will assume responsibility for certain types of new shared SUDS so long as they are constructed according to the Sewers for Scotland technical manual16.

The water industry is keen to resolve issues preventing the implementation of sustainable drainage systems and, through Water UK, is lobbying Government to adopt legislation which reflects the existing Code of Practice, developed by the national SUDS working group. In this it is particularly important that the following are addressed by legislation:

— Sewerage undertakers being involved in the planning process.
— Ownership and maintenance and funding of SUDS.
— Definition of works capable of constituting SUDS.
— Design standards.
— Restrictions on rights of drainage to SUDS and connection to surface water drainage.
— Rights of discharge from SUDS to watercourses.
— Protection of groundwater and surface water quality in accordance with the Water Resources Act 1991 and EC Directives.

SEWERS FOR SEWERAGE

Central to the issue of maintaining adequate sewer capacity is ensuring that they are used for the purpose and only the product for which they are designed. Misuse of the sewer network by disposing of inappropriate materials such as cooking oils, sanitary products, food waste and other waste materials can drastically reduce sewer capacity or cause blockages that lead to backing up and flooding.

15 National SUDS Working Group includes—CLG, Defra, DoT, Welsh Assembly Government, Ofwat, CIRIA, HBF, LGA, Natural England, EA, Planning Officers’ Society, County Surveyors’ Society
16 “Sewers for Scotland”, 2001—www.wrscplc.co.uk/sfs
APPENDIX 1

SUDS—LEGAL PERSPECTIVE

(1) In England and Wales, from the legal perspective, surface water urban drainage is generally effected by the following means:

(a) buildings and their curtilages by “drains” and “sewers”; and
(b) highways by means of “highway drains”.

(2) By virtue of section 219(1) of the Water Industry Act 1991:-

(a) “drain” means a conduit for the drainage of one building and its curtilage; and
(b) “sewer” means a conduit which drains more than one such building,

ownership of which are as follows:

(i) “drains” within the curtilage of a building can only be privately owned;
(ii) “lateral drains” outside the curtilage of a building can be either privately owned, or publicly owned by a sewerage undertaker (water company);
(iii) “public sewers” are sewers vested in the sewerage undertaker either by legislation or by adoption;
(iv) “private sewers” are all other sewers which are thus privately owned;

but in which connection it must be noted that a conduit can only be a sewer if it conveys water or sewage from a point to a point of discharge with a proper outfall.

(3) Under the Highways Act 1980, a “highway drain” is a conduit which conveys water from the surface of a publicly maintained highway, “belongs” to the highway, and generally serves no other purpose— although this is subject to various qualifications. Such drains vest in the highway authority, which is usually the highways agency or the county council. In this connection, under section 299 of the Act, a highway authority is entitled to discharge water from its drains to natural and artificial inland waters.

(4) Under section 115 of the Water Industry Act 1991, highway authorities and sewerage undertakers may enter into agreements for the drainage of surface water from highway drains to public sewers, and vice versa, on such terms as they may agree or, failing agreement, on such terms as may be determined by the Secretary of State (DEFRA).

(5) However, unlike Scotland, English legislation does not accommodate SUDS (sustainable urban drainage systems). Taking into account that SUDS may involve the use of such arrangements as filter strips and swales, filter drains and permeable surfaces, infiltration devices, also basins, ponds and wetlands, it is apparent that these will not generally fall within the definition of “sewer”. In the circumstances, such works cannot be adopted by and become the responsibility of sewerage undertakers.
(6) In Scotland, this problem has been addressed in the Water Environment & Water Services (Scotland) Act 2003. This Act includes provisions which extend and adapt the laws relating to sewers to “sustainable urban drainage systems” which it defines as: “ . . . a drainage system which:

(a) facilitates attenuation, settlement or treatment of surface water from two or more premises (whether or not together with road water), and

(b) includes one or more of the following: inlet structures, outlet structures, swales, constructed wetlands, ponds, filter trenches, attenuation tanks and detention basins (together with any associated pipes and equipment)”.

(7) Clearly some such solution also needs to be found for England and Wales.

Water UK

February 2008
Wednesday 23 January 2008

Members present

Mr Michael Jack, in the Chair

Mr David Drew  
Mr James Gray  
Patrick Hall  
Lynne Jones  
David Lepper  
David Taylor  
Paddy Tipping

Memorandum submitted by Sir Michael Pitt (FL 58)

You will be aware from media reports that I have been appointed by the Government as the independent chair leading the review into the severe flooding that occurred this summer. I am conscious that your Committee has invited written memoranda from interested parties and will be taking oral evidence soon so that you can “...contribute to the conclusions of the independently-led lessons learned exercise that the Secretary of State announced on 12 July 2007”. I thought therefore it might be useful for us to meet and exchange views on how we might best complement each others’ activities.

Enclosed are the full Terms of Reference for the Review. The review is to be carried out by the Cabinet Office with support from the Department of Environment, Food and Rural Affairs and the Department for Communities and Local Government. It will examine how to reduce the risk and impact of floods, the emergency response and the transition to recovery. We are seeking views from as many people as possible who were affected or have expertise or views to offer, including residents, elected representatives, the emergency services, businesses, academia, and other organisations. My priority is to identify the things that could be done to make improvements to any aspect of flood risk management as set out in the Terms of Reference.

My office will make contact with the Clerk to your Committee in the next few days in the hope that we can find a suitable date and time to meet.

Sir Michael Pitt  
Independent Chair  
August 2007

LEARNING FROM THE FLOODING IN ENGLAND DURING JUNE AND JULY 2007 TO IMPROVE FLOOD RISK MANAGEMENT AND THE RESPONSE TO FUTURE EMERGENCIES

Terms of Reference

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.
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.

The Review should not cover longer-term recovery issues which will be the subject of a separate, later, review.

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 co-ordinate 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 make recommendations in each of these areas to improve the UK’s preparedness for flooding events in the future.

ix. 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 Department for Environment, Food and Rural Affairs and the Department for 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.

Sir Michael Pitt
Independent Chair
August 2007

Witnesses: Sir Michael Pitt, Chair and Mr Roger Hargreaves, Head of Pitt Review, gave evidence.

Q696 Chairman: Good afternoon ladies and gentlemen. Welcome to a further evidence session of the Select Committee’s inquiry into flooding. Can I welcome representatives of the Pitt Review Team, specifically Sir Michael Pitt, Chair of the Learning Lessons from the 2007 Floods Review; he is supported by Roger Hargreaves, the Head of the Pitt Review Team. Gentlemen, you are welcome and may I congratulate you on the interim report which you have produced; it is beautifully laid out and I think the illustrations certainly give an added dimension to the words in there in terms of the conclusions that you draw. Sir Michael, you have spent six months now looking at this matter. You have come up with a very large number of interim conclusions, 72 in fact, but none of them at this stage are prioritised in terms of the one that you really think should be the number one area for action, so what is it?

Sir Michael Pitt: First of all I should mention that there are also 15 urgent recommendations that we would like the Government and other organisations to act upon as quickly as they possibly can. I think the overriding issue as far as we are concerned is preparedness. The floods which took place during the summer of last year, as we all know, were unprecedented. We think that the emergency services, the local resilience forums and other organisations were stretched to the absolute limit, if not beyond. The objective of this report and volume two—which will be available in the summer—is to ensure that the country both nationally and locally is much better prepared for this degree of flooding which we suspect will be happening again at some stage in the future.
Q697 Chairman: Can I just pick you up on a bit of language there? You used the word “unprecedented” and one of the issues we are trying to grapple with is the fact that a lot of the preparedness is determined by the frequency of events, but it would appear that what we had last summer was, if you like, a concentration of the event over a shorter timescale than had been taken into account by previous planning based on a probability basis. Is that an impression that you gained as well?

Sir Michael Pitt: Yes, we know that during the months of May, June and July last year more rain fell than ever recorded in history so this was a very, very major flood and therefore it was not surprsing that those people I was referring to earlier were stretched to the limit by those floods.

Q698 Chairman: So you see any evidence that there is to be a revision of the way in which you plan in the future, taking into account that intensity factor?

Sir Michael Pitt: One of the big points we are making is that we want people to recalibrate their risk registers. We think flooding should have a higher status in those risk registers and you may have seen in some of the press reports at Christmas that we were arguing that this has a degree of seriousness which is laid alongside terrorism or flu pandemics and so we are inviting central government and local organisations to review their risk registers in the light of the lessons learned from last year.

Q699 Chairman: Do you have any say in the terms of reference of your inquiry? When you got the phone call asking you to look at this did you jointly determine those terms of reference?

Sir Michael Pitt: I was invited to review some terms of reference which had already been drafted and the conclusion I came to was that they seemed appropriate.

Q700 Chairman: One of the things that intrigues me—maybe part two will deal with that—is that the terms of reference do not seem to have any cost dimension to them and your interim conclusions are a cost-free zone. Why?

Sir Michael Pitt: We do intend during the second part of the review in the spring to look much more intensively at value for money. What we are trying to be sure of is that the recommendations we come up with are not only the right thing to do but also that they offer cost benefit for the country at large. I agree with you that at this stage we have not done a lot of detailed financial evaluations but that will become a much bigger part of the review this year.

Mr Hargreaves: The difficulty for us, of course, is that we do not have a pot of money that we can spend ourselves; we are asking the Government and other organisations to spend money in response to our recommendations. What we think we need to do in the final report is to be quite clear about what the potential costs and benefits are so that government and others can make a judgment about what they choose to spend. In the final conclusions we may say, “Here are a range of options; here is their consequential range of costs and benefits” and allow people to make a judgment on the buck of that.

Q701 Chairman: Even if the costing of your shopping list—if we can put your 72 interim conclusions in that way—comes to a number greater than £800 million you will fearlessly publish the number even though it might exceed by a very large amount what the Government have said it can currently afford to spend in this area.

Sir Michael Pitt: I am absolutely keen that the report is realistic, challenging—perhaps challenging to central government—but also regarded as affordable in the terms of the costs of the recommendations that we come forward with.

Q702 Chairman: Inevitably there is going to be the odd bit of enquiry between you and the Secretary of State. He rings up and asks how it is going and you say, “Great, we are getting a lot of evidence in, it’s really interesting, masses of submissions, great ideas” and he says to you, “It’s going to cost a bit this, isn’t it? Could you just tone it down because you know the state of Defra’s budget?” Are you going to be robustly independent when it comes to putting numbers against these recommendations? You are not going to be influenced by the odd phone call you might get.

Sir Michael Pitt: I am going to listen very carefully to all the messages and phone calls that I get but ultimately it is my report, I am independent and I am determined it will be done that way.

Q703 Mr Gray: A moment ago you said that flooding was in the same league as terrorism and flu pandemics. The latter of course we do not know but I found that very difficult language to accept because terrorism is so gigantic. However, in that context, given you think it is that important, I was very worried just now when you said that it had to be affordable. If we had the head of MI6 in front of us talking about terrorism and he said, “We are going to make Britain safer but it has to be affordable; we cannot afford to breach any budgets. It has to be affordable and if unfortunately we cannot afford protection against terrorism then bad luck”, there would be a national outcry. What the Chairman was saying was, supposing you looked into this and you came to the conclusion that many billions were required to be spent—to take to its extreme—by using the word “affordable” you are saying that you might not do that. Is that not right?

Sir Michael Pitt: If—and we are being very hypothetical here—we discover that there is a very strong economic case for spending larger sums of money then the report would say so. Ultimately I acknowledge that it is the role of central government to decide about national priorities and that is always a difficult job for them to do.

Q704 Chairman: Are you going to be able to address public expectation? What actually should we be protecting ourselves from? If you had been a victim of flooding—we have heard of some harrowing
human dimensions to this, people still living in caravans six or seven months afterwards and our heart goes out to those people—they would be absolutely right in saying “I want protection” but in a cash limited world you cannot protect everything. Are you going to be able to offer some guidance to the question what degree of flood protection should the public and businesses in this country actually receive? In other words, what is going to be protected and what can we not protect?

Sir Michael Pitt: The report has been drafted very much from the perspective of being a home owner or a business owner or a farmer directly affected by flooding. You will know from the various visits I have made that I have met many, many people who have been victims of flooding and I am very sympathetic to their position. Ultimately the choice about the levels of investment on flood defences and flood risk management must lie properly with the Government itself; the Government has to make those choices. I think we are in a position where we can expose the consequences of different levels of investment and that is something we would like to do in the second volume.

Q705 Mr Drew: Sir Michael, the predecessor committee to this committee, made a very radical suggestion in terms of coastal flooding, that we should just face up to the fact that there would be—and would have to be—managed retreat. How radical can you be? I have people who have been flooded four times in six months and going to see them every weekend is pretty miserable, as you can imagine. To what extent are there now unprotectable parts of the inland parts of our country, as there certainly are in terms of the coastal parts?

Sir Michael Pitt: Going back to lessons learned from last year, I think it is impossible for any government to fully protect all homes; the sheer volumes of water involved, the numbers of properties that already have been built in flood risk areas means that there can be no overriding answer to that very challenging question. What the report is about is ways of mitigating the impact of flooding, the ways in which the country—both nationally and locally—can prepare itself much more effectively for flooding events of the scale we experienced and also things that individuals can do to improve their own resilience to flooding as well.

Mr Hargreaves: It is certainly true that our analysis points to the idea that you have to make hard choices about these things, but that is where the cost and benefit become all the more important. If there is an economic case to defend then fine, push ahead with that, but there will be instances where it is simply not and as we understand more about the cost and benefit equations we will get a stronger picture.

Q706 Mr Drew: You will be looking at this in your final report, will you, at least the mechanics of how this might be done? I do not expect you to do into the detail; someone is going to have to sit down and work that out, but you will do that.

Mr Hargreaves: Yes.

Q707 Chairman: Can I ask you about the many other reports that have been conducted in this? We have seen ones about Sheffield, Hull, Gloucestershire and so on and so forth; are you planning to draw all of those people together to collectively share the outcome of their experiences and blend that into part two of your report?

Sir Michael Pitt: Absolutely, yes. We have had something over 600 written representations to the review and as each of these reports becomes available around the flooding that took place last year we are taking account of that as we formulate our ideas and move towards the second volume. Also of course we have looked back historically at reports that have been done in the past on flooding and again taken account of their findings and reviewed the extent to which their recommendations have been implemented.

Q708 Lynne Jones: You make recommendations about the Climate Change Bill and its importance, including adaptation. Do you think the Bill as it stands is sufficiently strong or do you think it ought to be amended in some way?

Sir Michael Pitt: What I have seen of it so far suggests to me that it is heading in the right direction; there are a number of good provisions within the Climate Change Bill. I know there are amendments also being considered but our position is that we are very keen for central government to take this matter seriously. We are also keen that what follows is an action plan in terms of delivery in relation to that but as we were talking about a little bit earlier on there are concerns about the degree to which flooding will be more frequent than in the past and anything that can be done to reduce the consequences of that must be helpful.

Q709 Lynne Jones: The proposal in the Bill is that the Government produces a report on identifying the need for adaptation and then later on a report on what policies should be.

Sir Michael Pitt: Yes.

Q710 Lynne Jones: Is that adequate? Is there anything else that might improve it?

Sir Michael Pitt: One of the things we discovered during our evaluations was the extent to which water companies or electricity companies, for example, were running their affairs without enough conversation taking place with local resilience forums, for example, sharing their information. We think that we need mechanisms that hold all organisations to account, both locally and nationally. It seems to us that this idea of having regular reports from those organisations to demonstrate how they are adapting and changing to changing climatic conditions is a really good thing.
Q711 Lynne Jones: Should there be something in the Bill which requires the Government itself to seek out and identify where the risks are before producing its report or a requirement to consult with certain organisations over the need for adaptation?

Sir Michael Pitt: I think what is needed is a system which is self-improving. Whether we are talking about the water industry or the power industry the mechanisms in place for reviewing the extent to which they are investing in flood defences or flood risk management are such that they undertake that work anyway. It is good for them from a business point of view, for management point of view, that they are constantly reviewing the safety of their facilities. Also I think we need to have arrangements whereby their performance is being independently scrutinised. That is why we are bringing forward scrutiny at the local level. I think the provisions that we have just been talking about in the Bill might well provide a fall back for scrutiny at the national level. Hopefully those systems, operating together, will produce a much better outcome.

Sir Michael Pitt: We are now. We have had the terms of reference of the review extended to fully include the recovery phase so that is a change which happened around about Christmas time. We will now be looking at the costs of recovery, the extent to which local organisations are being financed and supported by central government and the quite complicated regime that currently exists for funding both the emergency works and expenses and the recovery costs.

Q714 Chairman: When you produce your report you will become very knowledgeable about flooding; you will probably be one of the most knowledgeable people about every aspect of flooding in the country.

Sir Michael Pitt: A flood tsar.

Q715 Chairman: Yes, that is it, a flood tsar. If the Government offered you a position in the Environment Agency would you take the job?

Sir Michael Pitt: I think I would have to ask my wife that question.

Q716 Mr Drew: In terms of the urgent 15 recommendations, is there movement on those? How do you carry those through? Obviously the other ones are going to be much longer term.

Sir Michael Pitt: There is already movement taking place. We know that discussions have been taking place ever since we published the report on implementation. We know that the Secretary of State has accepted those 15 urgent recommendations. He did that in fact on the day of publication. More than that, we have told the organisations concerned that we will return to the issues of the 15 urgent recommendations on 31 March and we will be asking them the extent to which they have made the changes that we are requesting, so we are going to chase that up.

Mr Hargreaves: We have been in regular dialogue with some of the key organisations like the Environment Agency and Defra; we are also sending members of our team out to the regional forums to talk about how local areas are implementing some of the urgent recommendations. Not everything in the urgent recommendations that is in the gift of government. As Michael says, come 31 March we will be able to make a public assessment of how well we are doing which will tell us something not only about the urgent recommendations but the general will of these organisations towards the review as a whole.

Q717 Mr Drew: Moving onto legislation then, from all the evidence we have received the legislative framework is a bit of a mess and that has a huge impact on who takes responsibility. Do you think there is a need for a flood agency or do you think that the powers of the Environment Agency allied to the way it works with other bodies like British Waterways and Natural England are at least sufficient in essence?

Sir Michael Pitt: We have not come forward with a proposal about a supra-national organisation. What we are arguing is that the role of the Environment...
Sir Michael Pitt: I think the legislation is there to provide a framework within which people can then make local decisions to give the right answers to these complicated questions. One of the things we discovered very quickly when travelling to different parts of the country was how the nature of flooding and circumstances varied so radically. If you look at the floods in Gloucestershire, for example, and compare them with what happened in Hull, there were two completely different situations demanding different responses from emergency services, for example. That is why we argued in the report very strongly for not just changes at the national level but also the changes at the local level. One of the recommendations there is for a much stronger role for local government, for councils, who of course have a very important and long term stake in their local communities, to be a key part to these preparations for these emergencies and also the scrutiny aspect which I referred to earlier.

Chairman: We are going to adjourn the Committee for the vote. Would colleagues please be back in ten minutes. The Committee stands adjourned for the division.

The Committee suspended from 3.36pm to 3.46pm for a division in the House.

Sir Michael Pitt: Yes, indeed. I would like to join you in saying that when it came to the emergency the responders acted in the best possible way imaginable. Huge efforts in terms of recovery took place and I take my hat off to them. However, as we make clear in the report, I think the local organisations could have been better prepared. There needs to be more sharing of information. Category two responders which are water companies and electricity companies were too remote from the emergency at the beginning of the emergency and they need to participate in the planning of preparations for the next time it happens and to be there in Gold Command from day one rather than being brought in at a later stage. A whole series of chain reactions took place in Gloucestershire in particular where it started off with being a flooding problem but very quickly became a crisis around critical infrastructure and saving these extremely important sites. We think those are areas where some quite major improvements can be made.

Q719 Mr Drew: To what extent can you drill down in terms of the legislation so that in a sense there is an identikit map that actually tells people at a fairly local level that there should be such a person as a flood warden and this person should have these powers, should be able to commandeer these facilities? Is that something you think is a role for legislation or is it basically common sense, except that common sense does not always work in every area all of the time?

Sir Michael Pitt: I think you are asking if that common sense does not always work, should there be legislation or is it basically common sense that we need to address is the extent to which we feel that it is appropriate. What that does is to give the schemes in a list of order of priority. The other issue then is around the total quantum of money which is spent, which is currently in the order of £600 million and we know it is rising year by year over the next few years. One of the points that we need to address is the extent to which we feel that that quantum of money is the right quantum or should be at some different level.

Q721 Chairman: Are you going to take into account, for example, the construction industry inflation which appears to be a missing element in deciding how much net new expenditure will be available from within the rising envelope? Having done a calculation it would seem to me that there is very

Q720 Chairman: Sir Michael, on the subject of finance the Government has made a great deal of the fact that it sees a rising trend in terms of the money that is going to be available for flood defence expenditure, principally to the Environment Agency. Is your final report going to conduct any kind of specific analysis on the size of that particular budget item?

Sir Michael Pitt: We are going to be reviewing that scheme to make sure we feel that it is appropriate. What that does is to give the schemes in a list of order of priority. The other issue then is around the total quantum of money which is spent, which is currently in the order of £600 million and we know it is rising year by year over the next few years. One of the points that we need to address is the extent to which we feel that that quantum of money is the right quantum or should be at some different level.

Q721 Chairman: Are you going to take into account, for example, the construction industry inflation which appears to be a missing element in deciding how much net new expenditure will be available from within the rising envelope? Having done a calculation it would seem to me that there is very
little at the end of brand new money that could be used for new projects in what is currently being proposed.

Sir Michael Pitt: I think we have to take account of things like Baxter indices and the extent to which construction costs are moving ahead. At the moment it seems they are moving ahead more rapidly than the general rate of inflation so I think that has to be put into the calculations.

Q722 Chairman: One of my parliamentary colleagues sent me an e-mail before we came today because he, for example, finds that looking at his constituency where there has been a lot of local flooding which he and local people, for example, attribute to poor surface drainage systems or—one of the issues we will come onto later—land owner maintenance of waterways and streams within their land. He asks who has the budget to deal with all of these small scale works when most of the focus is on big numbers like the £800 million or £600 million which goes to the Environment Agency. Is that an area which you are going to be commenting on?

Sir Michael Pitt: Yes, it is. One of the things we feel quite strongly about is the need for proper inventories of the drainage system in each local authority area. Even now there is confusion about who is responsible for a particular ditch or pipe work or whatever and part of the proposals is that those inventories should be drawn up effectively, ownership should be clear, quality and standards of maintenance should be clear and who is responsible for that maintenance should be clear. I think just doing that alone will be a significant step forward.

Q723 Chairman: In the financial analysis are you going to be able to adjudicate between the shifting positions of people like the Association of British Insurers who, on the one hand said a billion pounds would be good (drawing. I think, from the Foresight Report), then they welcomed the Government’s £800 million, then they issued a press release just before they came to give evidence to us saying that it is back to a billion. Going back to the point that Mr Hall was making when he said no holes barred, no predetermined position, are you going to be able to come and give some guidance on what ought to be the global investment in flood defence, drawing on all the bodies of evidence which are available for example the Foresight Report which gave an indication that a billion would be the right number?

Sir Michael Pitt: Certainly at this stage we have not got figures that we can give to the Committee today but we will be looking at those issues over the coming months. Indeed, we are in very close conversation with ABI in relation to insurance and we pay high regard to the understanding that has been reached between central government and the Association of British Insurers in relation to the amount of capital investment by central government and the degree to which the insurers will ensure that people can get cover for their property.

Q724 Chairman: I suppose the difficulty we face with what you have done so far is that even in the 15 priority areas we do not know whether any of that costs any more money to implement. Do you know whether that is the case?

Sir Michael Pitt: We have carefully selected those 15; in my judgment they can all be afforded within existing budgets.

Q725 Chairman: In their agreement by government to those priorities do you implicitly assume that in spite of Defra’s straining financial circumstances that will be the case?

Sir Michael Pitt: I am making an assumption that those 15 priorities will be delivered. As we said earlier we will be measuring their progress by the end of March.

Q726 David Lepper: In answering a question from Patrick Hall a little while ago you used the phrase “value for money”.

Sir Michael Pitt: Yes.

Q727 David Lepper: Is there the suggestion there that some of the expenditure which is currently going on flood management schemes and flood protection could perhaps be better used?

Sir Michael Pitt: The first thing I would say is that the analysis I have seen so far of current levels of expenditure and current programmes is that they do offer very good value for money, exceptionally so. From that point of view one starts from the point that flood defences, if properly constructed and designed, then flood risk management is a very good thing and an area where the country does get good value for money. I have no evidence at this stage of schemes which have been carried out wastefully or unsatisfactorily.

Q728 David Lepper: In one of your interim conclusions—I think it is number 28—you talk about the need for the Government planning 25 years ahead in terms of investment in flood risk management. I appreciate the fact that you are not going to talk about particular figures this afternoon, but is the importance of planning in that longer term rather than up to 2011 as is the case at the moment something which you are going to expand in your final report? Is it likely that will have a bill of some sort attached to it?

Sir Michael Pitt: What you will not see is a programme of schemes. We are not going to try to identify the next 25 years’ worth of investments. The main point here is that to undertake these major civil engineering projects, to ensure that they have planning approvals, that they have been properly evaluated and consultation has taken place, means that you need a long lead time. It is very helpful to the industry to know what schemes are coming forward and also to have a good understanding of the amounts of money which will be available in the foreseeable future. The advantage here of a long lead time is that we will get better value for money on each project than we would do if we are hastily pulling them together.
Q729 David Lepper: Is it likely you will advise the Government on this area of public expenditure that it ought to be thinking more than three years ahead at a time?

Sir Michael Pitt: I think we have to wait and see what conclusions we come to on these financial matters. There have been quite a lot of questions on that today but I think that until the work has been done, until we have reached our conclusions, we are probably just about at the limit of what I can say.

Q730 Lynne Jones: In your model for the management of surface water flooding you envisaged the Environment Agency being given overall strategic responsibility, with local authorities leading on management of surface water flooding and drainage at the local level.

Sir Michael Pitt: Yes.

Q731 Lynne Jones: Could you perhaps say a few words about how you envisage this model working in practice?

Sir Michael Pitt: The starting point is to look at forecasting and predicting where flooding will arise. At the moment there is a major gap in terms of being able to predict the implications of surface water flooding. We have a pretty good regime now for coastal flooding and for river flooding, but surface water flooding is a major problem. We know that the Met Office is looking at a much higher resolution in terms of their forecasting model and there is a problem about computer power. They are looking at something called a super computer. We understand that the modelling itself of what happens to water once it hits the ground is highly complex. However, I feel sure that if we are going to make some real inroads here in terms of being able to protect property and protect lives we have to improve our ability to predict where flooding will arise to make sure that people are properly warned and can take the precautions they need to take. I want to put that right at the beginning of this because the response teams—Gold Command or whatever it might be—or those people making preparations for serious flooding must have available to them the best possible information about where the rain is going to fall, the intensity and the implications for individual streets within their urban areas. There is a lot of work still to be done on this and some people say to me that it is all far too difficult to do, but I take the view that this is important work and we must make progress in this area. Even if for a while our estimates are very approximate they will be better than the ones we have just now. That is the first part. The second part is about this local leadership issue. I am not saying that the local authorities have to do all the work themselves; what I am saying is that they should be accountable to their local populations for ensuring that that work is being done. I would expect the local authorities to be relying very heavily upon the Environment Agency for different tools and techniques for measuring what would happen in their particular area if there is an intensive rainfall. I would expect there to be more resilience planning, more testing of different flood scenarios so that the emergency services are working at exercising with other local organisations. I would expect them to identify the critical infrastructure sites, to know which of those are vulnerable. Then ultimately the elected councillors of those authorities, through a process of scrutiny, would call into account the top management of different companies and other organisations involved.

Q732 Chairman: You have described the co-ordination of a lot of bodies in a very interesting way. I note that in the Government’s 2005 response to the consultation Making Space for Water it said the same thing, it said that a joined up approach to drainage management should be pursued in high risk areas. Two years on it has not happened. Do you hope your recommendation will actually happen when the Government, for two years, seem for whatever reason to have failed to make it happen?

Sir Michael Pitt: I see the Government placing a legal duty on local authorities to undertake this work.

Q733 Lynne Jones: That would be the checking of the infrastructure and what other tasks? Do you envisage this requirement in this new Flooding Act that you propose?

Sir Michael Pitt: That is absolutely right. I have to say to you that local authorities now have been quite seriously denuded or professional expertise in the water area. The loss of water agencies, the privatisation of a great deal of engineering work I think presents us with a serious problem. We have to face up to this that many local authorities are not currently well equipped to carry out this work. One of the aspects of the second report will be looking at the consequences of this new duty on local government, the extent to which they would need to recruit a small number of very senior engineers who fully understand how drainage systems work and could stand toe to toe with senior management in water companies or in electricity companies or whatever to ensure that when scrutiny of those arrangements takes place the elected councillors are properly briefed.

Q734 Lynne Jones: Do you envisage that that will require additional resources for local authorities?

Sir Michael Pitt: Yes, I do.

Q735 Lynne Jones: They need to have the ability to be intelligent commissioners and have oversight.

Sir Michael Pitt: Yes, and that is something we are discussing with the Local Government Association and we are meeting them again to talk through the implications.

Q736 Lynne Jones: Have you looked at the way they do it in any other countries? France is considered to be a good model. We give a lot of responsibility to the Environment Agency and many people think that the Environment Agency has enough on its
plate to cope with. Have you looked at the way it is dealt with in other countries and perhaps considered a greater role at the regional level?

_Sir Michael Pitt:_ We are thinking about whether or not we should go to one or two other places, perhaps in Europe or elsewhere, to check out how they deal with some of these problems. If we can find countries where they have made real advances in these areas then I think it would be well-worth spending some time there during the next three months.

_Lynne Jones:_ We went to Lyon and it was very interesting. They are well in advance of us in terms of their understanding of the local areas and where the susceptibilities are.

_Q737 Mr Gray:_ You talk a bit in your report about modelling; surely the Environment Agency has produced loads of models of the years with regards to surface water and the likelihood of it causing a problem. What is wrong with the current models?

_Sir Michael Pitt:_ The work of the Environment Agency has focussed heavily on coastal flooding and river flooding and that is where they have very high levels of expertise. Interestingly their terms of reference do not include surface water flooding and this is an area where we need to improve our expertise and our ability to model how water moves. When it does not penetrate the ground it is skidding along the surface because the ground has become saturated or because the ground has been largely paved over as a consequence of development or urban creep as it is called.

_Q738 Mr Gray:_ Is there a difference in modelling between the summer and winter? Presumably most traditional studies in these subjects have been in regards to winter flooding. Would there be a particular difference in terms of doing it in regards to summer?

_Sir Michael Pitt:_ There are differences, yes, and you are right to say that most flooding in the past has tended to be during the winter months and again this was something which was new and surprising about the major floods that we had last year. There are issues, for example drainage channels can often be overgrown with weeds much more so in the summer than they are in the winter; the extent to which ground is permeable can depend a lot on agricultural conditions at that time of year so there will be variables that will change between the summer months and the winter months.

_Q739 Mr Gray:_ We have heard evidence that one of the greatest single causes of urban flooding, particularly in summer, is the hard tarmacking over people’s front gardens, a new phenomenon in the last 20 or 30 years. What can be done to prevent that?

_Sir Michael Pitt:_ One of the interim conclusions which we have reached in the report is that the automatic right of any householder to pave over their garden should be removed unless they use permeable materials. What we are saying is that if somebody wants to concrete their driveway or concrete their garden, front or back, that would require planning approval from the local authority and, if necessary, an opportunity for the Environment Agency or somebody to step in and say that this is a bad move. The obvious answer for any householder is to use permeable materials; they would have the same effect in terms of being able to get their car off the highway but without causing the consequential problems with surface water run-off.

_Q740 Mr Gray:_ What about rights of property and rights of the individual to do what they want to do with their own land? I understand the benefits from all that but do you not think that having the Government saying, “You can’t actually put concrete down your garden unless we give you permission”, that is the nanny state gone bonkers, is it not?

_Sir Michael Pitt:_ I think on this one I am going to have to disagree with you. I think the consequences of paving over gardens are cumulatively very serious and something needs to be done to bring that under control.

_Q741 Lynne Jones:_ Do you envisage it being permissible to use porous materials without requiring permission?

_Sir Michael Pitt:_ Yes, that would be automatic.

_Q742 Paddy Tipping:_ I represent a rural area and there is a strong view around that the water courses and drains are not being properly maintained. Given the unprecedented nature of the flooding last summer is this a real complaint or is it a myth?

_Sir Michael Pitt:_ One has to be very careful about how you answer this question because many, many people we spoke to were very angry about what they regarded as lack of maintenance, that the local council had not cleared the gullies, the Environment Agency had not dredged a particular river or stream. You can understand this and I am quite sure that lack of maintenance can lead to local problems. Individual or small numbers of properties can be flooded; fields can become flooded as a direct consequence of poor maintenance. When you move away from the local position and look at the strategic position about flooding, sometimes maintenance can make things worse. I am fascinated by this idea of what we call “slow water”: slow water is a good thing, fast water is potentially difficult for people further down stream. I am arguing that maintenance, when it is carried out, has to be carried out with a very detailed understanding of the implications and in some case maintenance is absolutely vital to make sure that the system operates effectively; in other cases it probably will not make much difference or could even make things worse.

_Q743 Paddy Tipping:_ Just talking about who is responsible for water courses in rural areas, the Environment Agency is responsible for water courses over a certain size that are designated, but it is riparian owners for the rest. Do you think that riparian owners are, first of all, aware of their
responsibility and, secondly, as I understand it, local authorities have reserved powers to do work. Is that a satisfactory situation?

Sir Michael Pitt: I do not think the position now is entirely satisfactory. One of the reasons why it is not terribly satisfactory is that nobody is taking this strong overview of what needs to be done and what perhaps does not need to be done. That comes back again to this point about drawing up inventories of drainage and having the local authorities directly involved in looking at the whole system in their local area. I come from a farming family; farmers know a great deal about the drainage in their locality. Most farmers are very thorough in ensuring that their ditches are cleared and that things are done properly on their farms, but that is not always the case. Also you can get urban situations where a lot of landowners have a little bit to do with a particular part of the drainage system. This is very complex and it comes back again to this problem about complexity, accountability, who is responsible and why the public become so frustrated when there are problems.

Q744 Mr Drew: I would like to pick up the point about the problem in trying to take one measure which alleviates an immediate problem, it has major ramifications. Going back to my earlier question, is this something that really only the law can sort out or is it, as we saw in France to some extent it has been overcome because of the way in which the commune has much greater authority over land ownership; it will not have any of this nonsense saying that householder A should not do this because of the impact on householder B, it will do what is best for that community. How do we resolve those sorts of issues in this country?

Sir Michael Pitt: During the review so far we have come across a number of intriguing examples of how one simple part of the drainage system can involve multiple interests: the riparian owners, the Environment Agency, water companies. Water can be travelling on its route through various owners of that particular bit of infrastructure and I think this is presenting us all with major problems. I do not have a quick, slick answer to that problem; I think it is something we need to spend a bit more time looking into. Individual cases turn out to be extremely complex. We were hearing about one this morning where to really understand what was taking place took about 15 or 20 minutes of description and it is trying to find solutions to those difficulties which I think we have yet to solve.

Mr Hargreaves: It is very easy to fall into the trap of thinking that the answer to this is simply to take away the responsibility from all the individuals and organisations and so forth and put them in the hands of a single agency. Actually, if you go down that road, that single agency becomes terribly overburdened and struggles to deliver what people expect and faces many of the same problems in terms of not being able to meet public demands for maintenance and so forth. The answer is probably less about just piling everything into the same organisation and more about opening up the process of transparency, consistency and proper oversight.

Q745 David Taylor: Three members of this Committee—James Gray, David Drew and myself—we went to Gloucestershire to see the events that were so disastrous in the Gloucester and Tewkesbury areas and we went round the Severn Trent Mythe Water Treatment Plant which was directly affected by flooding and that took a third of a million of people off water for ten to 17 days. Talking to staff it was very, very close indeed to 600,000 people in the Gloucester area losing their power and producing a short-term dark ages scenario for people affected. One of the most effective and well-argued chapters in your report is the one on critical infrastructure, chapter six. On page 102 at figure 16 you produce a strategic framework for protecting critical infrastructure and I wondered if you could explain a little bit more how what you are suggesting improves on what we have at the moment. I think it has been mentioned before that when we went to Lyon we talked to the city authorities there not about critical infrastructure particularly but some of their arrangements seemed immensely complicated and dependent on high levels of co-operation between separate organisations. This to me has a similar resonance.

Sir Michael Pitt: The emergency services, Gold Command and others were surprised by the extent to which these sites of critical infrastructure were at such risk from flooding. During the emergency they were discovering almost day by day the implications of these sites. I do not think we should ever let that happen again. Part of the answer to your question is ensuring that local responders fully understand which sites are within their areas, just how vulnerable they are to flooding, the extent to which either the water or power companies have alternative arrangements in place if there is an emergency (sometimes they have alternative circuits for getting electricity and power or alternative sources of tap water supplies that can be laid on) and all of that needs to be deeply understood by the locality. That is the area where I think we need to do much more work. There has to be much more planning, much more engagement of what I call the category two organisations under the Civil Contingencies Act so that they are involved in discussions in advance of the next flood about what is going to happen “if”. That, if you like, is one of the fundamental aspects of these proposals which would be different to what happened in Gloucestershire last summer.

Mr Hargreaves: The big deficiency at the moment in terms of the institutional arrangements is that if you look at terrorism there is an organisation called the Centre for the Protection of National Infrastructure whose job is to collect from government departments and others a sense of the vulnerability and criticality of infrastructure sites across the country and then take that information and overlay onto it their understanding of the risks that terrorism poses so they can then get advice to
organisations about what they might do. What we do not have is a similar set up for natural hazards, for non-terrorist risk and what we are talking about here is something that moves further down that road. So you have a body which takes the diverse range of information that is scattered across government, across the private sector, at local levels as well and brings it together and starts overlaying onto that criticality and vulnerability data information about which areas are likely to flood or which areas are likely to suffer from severe weather.

Q746 David Taylor: So the existing organisational infrastructure for dealing with likely events of this kind, you are arguing needs to be broadened geographically to set it into a number of regional contexts perhaps as well a national context. Is that what you are saying?

Mr Hargreaves: It is making sure that this information about which sites are particularly vulnerable to flooding is held consistently at the centre of government but then shared more widely so that people at the local level also understand which sites in their areas are vulnerable, but you use the same structure up and down the chain so it is not the case that government is terribly concerned about Mythe because it knows about Mythe because it has talked to Severn Trent but the local authority or the local police force simply have no idea because it is just not on their radar screen.

Q747 David Taylor: It does require over the years a high degree of co-operation between very distinct organisations in the private and public sector and so on. Are you confident that that structure will catalyse such co-operation.

Mr Hargreaves: Essentially it works for terrorism and you can use that model. You can say flooding is a different kind of risk but the institutional framework, the communication, the dialogue between the private and public sectors and between the centre and local levels works and so adapting that model and broadening it is probably the right answer and certainly what we put in the report.

Q748 Chairman: I think it was 2004 when the Foresight Report came out and it alerted everybody to possible extreme weather events. The flooding in 2007 came along three years later and everyone went “Oh, critical infrastructure: we need to protect it”. Do you think that the utility companies were derelict in their duty in not having carried out an appraisal exercise for risk taking into account the timely warning of the then chief scientist?

Sir Michael Pitt: What are we inviting the water companies and the power companies to do—and what I think they are already doing—is to review their priorities. They have an issue about their financial regulators; the financial regulators like Ofwat are there to ensure that the bills to consumers are payable, that people can afford to pay for their water and likewise that they can pay for their electricity. The companies have this balancing act to do between how much can they invest in protecting their infrastructure and to what extent will they be permitted to increase their charges to consumers. What we are looking for here is a change in priorities. We are saying that flood risk now is a higher priority than we thought it was previously and that those companies now need to review all of their infrastructure, look at their investment programmes and decide whether they need to invest more money in protecting those critical infrastructure sites. I think almost certainly they do.

Q749 David Taylor: You make a good number of interim conclusions and a block of four of them relate to this very area, 55 to 58. You talk about imposing a duty for infrastructure operators to have business continuity planning; contributing information on critical sites and share it with other operators; single points of failure; and participating fully in Gold and Silver Command structures. Is it the case that we really do need a whole range of new responsibilities or, as the Chairman has implied, are the existing obligations that they have are properly delivered and professionally complied with? That seems to be the core of what went wrong in Gloucestershire in July.

Sir Michael Pitt: The obligations placed on the companies by the Civil Contingencies Act for category two organisations like the companies are less than the obligations on category one organisations like local authorities and the Environment Agency. What we are arguing in this report is that we need to look again at the framework that category two organisations operate within. They did comply with their obligations as category two companies; this is no longer sufficient given the degree of flooding we had during the summer last year and we need to have now much closer involvement of those companies in flood risk planning and involvement when there is an emergency.

Q750 David Taylor: The Civil Contingencies Act allows the Government presumably to designate to new areas the category two groups that you have talked about, so it does not need new legislation, does it?

Sir Michael Pitt: No, but it needs a revision to the regulation.

Q751 Mr Drew: Can we talk about another aspect of planning which of course is planning for development? Some of us are increasingly concerned that not only do we have infrastructure in the wrong place but we have houses—if not some communities—in the wrong place. To what extent do you think the Government needs to be more robust in its approach towards planning? Floodplains have traditionally been good places to develop, much easier than on hills but more particularly they are easier for transport links, they are easier for larger factories and so on. Do we really need to rethink some of this? Is it possible that there are existing planning permissions that have been given that at the very least need to be very carefully evaluated before they are allowed to be continued? Is that something you are looking at?
Sir Michael Pitt: I find it quite an experience going to relatively new housing which was built in flood risk areas where the bottoms of the houses have had to be totally gutted, where the residents there are still out of their homes as a direct consequence of flooding, and yet these properties are just a few years old. I think it is quite distressing when that takes place. I think there should be a strong presumption against building in any flood risk areas at all. If there has to be building in areas of flood risk then we want provisions in PPS25 absolutely applied and those provisions I think are much stronger and better than they have ever been before. That puts a real obligation on developers and planners to ensure that development in the flood plain only takes place as a last resort and if it does have to take place that there are the proper evaluations of flood risk, that sustainable drainage systems are introduced and applied and, in particular, I feel very strongly about the nature of construction, that it is now easily possible to harden buildings against flooding, to make them resistant and resilient to flooding. I feel very strongly about this and I suspect in volume two we might be even more firm about this particular aspect.

Q752 Mr Drew: Would your views also hold to the extent that the danger with planning is that you could give permission in an area that is not necessarily flood plain but because your issue—which I totally understand—about what we want is slow water, that the danger is it is the law of unintended consequences. An area upstream which apparently has no flooding problems whatsoever is built on and in all of a sudden two miles down that valley, places that historically have never flooded, start to flood very seriously. It is the people downstream who will pay for it because it has not been thought through. My final point is about the role of the Environment Agency in this. The Environment Agency at the moment has only advisory powers when it comes to making recommendations to local development committees. Do you think that they should now have greater power to say that this is an inappropriate development, we will not support it and if it goes ahead because you give planning permission you, as an authority, could be liable in the future?

Sir Michael Pitt: The first point first on new developments and developers, there is an obligation on developers to ensure that if they are proposing housing for example in an area which might not be at immediate flood risk but nevertheless could have consequential effects further downstream, they prepare flood risk management plans. In other words, those possibilities are fully evaluated long before any planning permission is given at all. The local planning authority would expect to see those plans and the Environment Agency would have an opportunity to review those plans to make sure that technically they are up to standard. The Environment Agency already has a right to be consulted on all planning applications and also has a right to ask for those planning applications to be called in by ministers for a planning inquiry and then ultimately refusal by ministers if need be. That is a relatively new power available to the Environment Agency. I think it is pretty effective; it ought to work. We ought to test it for a while and if we find that there are significant planning applications slipping through the system then I would like those powers to be strengthened even further. I think the Environment Agency is very well placed to make a judgment about whether new development is appropriate at all or properly designed if it does take place.

Mr Hargreaves: PPS25 does make a significant difference to the way that developers and local authorities will have to operate and require them to consider not only the effects at site level but also at a local and regional level. There are a whole series of other fairly stringent aspects to PPS25 but it will take time for it to bed in; it has only been in place for around 14 or 15 months and to judge PPS25 against last summer’s events is not really fair to PPS25 and we need to give it time because a lot of the things we are talking about here are actually in PPS25.

Q753 Lynne Jones: In what way do you think that the modelling and mapping which clearly needs to be done will inform the planning process? One system that operates in France is that there are certain areas which are red zoned, where no planning permission is allowed; others are blue zoned where each case is looked at on its merits; and white zones where it is up to the planning authority to decide. Do we need to move towards that system? Have we got the necessary information to do that and how long do you think we might take to move to such a system if it were recommended?

Sir Michael Pitt: I think you may have sensed from some of my earlier answers that I am a great believer in the importance of modelling and mapping. We know, for example, that the Environment Agency is able to identify what have been called “hotspots” places which, because of their geography and topography, are very likely to be areas where flash flooding can take place and those are places which can be identified on maps and can be taken into
account by the local planning authority. Just standing back from the detail here, what are we saying? What we are saying is that we want more technical analysis and intellectual power applied to these issues of flooding, that we should not be caught out by mistakes, errors of judgment; organisations need to be much better informed about the implications of their decisions and in particular the implications of new developments.

Q755 Mr Gray: Sir Michael, your chair will be occupied in a short time this afternoon by the Regional Flood Defence Committees who will be giving evidence to this Committee. Rather curiously they are not even mentioned in your interim report. None of your recommendations touched on them. What would you ask them if you were in our position?

Sir Michael Pitt: I am due to meet them shortly so I will have the opportunity to ask the questions directly. What I would say to them is what I am saying to a large number of organisations and individuals and that is here is our report, these are the conclusions we have reached as of Christmas, how do you feel about the report? What are the things you would want to support? Are there areas where you think we have made a mistake? Do we need to extend our evaluations? I think probably the question I would like you to ask them—I will have a chance to do it myself later—is whether they feel that this report is heading in the right direction, is it good for the country? That is the main thing. Are there any improvements that they could recommend to the report?

Q756 Chairman: Sir Michael, Mr Hargreaves, thank you very much for your contributions. Obviously we have looked with interest at your interim report. It is a bit like being at the cinema, we have had the forthcoming attractions so we are looking later in the year for the main feature when you come up with your recommendations. I hope by then we will have reported so that you will be able to take into account what we have said and blend it in with what you have said. By that time we will have the ultimate, all singing dancing answer to every question known to man on flooding and therefore we can confidently predict, I am sure you will agree, that there will be no more in the future. Thank you very much indeed for your contribution; we greatly appreciate it.

Sir Michael Pitt: Thank you all very much indeed.

Memorandum submitted by the Chairmen of Regional Flood Defence Committees in England (FL 63)

EXECUTIVE SUMMARY

— This summer’s floods were the worst in England for more than half a century, with a much greater impact than in Autumn 2000.
— They cannot be attributed directly to climate change, but are consistent with the changes that are predicted.
— Flood defences mostly did the job they were designed to do, but were in many places inadequate to cope with the floods that occurred.
— Past investment has therefore paid off, but much more will be needed particularly, if as predicted, extreme weather events become more frequent, and as sea levels rise.
— Greater mobile heavy pumping capacity is needed and should be stored at strategic locations from which it can be moved quickly to help deal with major flood incidents.
— Surface water and river flooding combined. Better joint planning of investment in drainage systems and responses to extreme rainfall events is needed.
— Pooling of resources and joint planning is likely to be more effective than reorganisation of agencies
— Both regulation and incentives to voluntary action have a role in helping prepare for flood risk and increasing resilience to it
— The Government’s announcement of £200 million more for flood defence in 2010–11 is very welcome
— However a clear commitment to additional resources over the next two years is essential to bring forward delayed capital schemes which are ready to start
— Whilst it will never be possible to prevent all flooding, a failure to invest more in adapting to this obvious and tangible risk from the changing climate will cost the country and the economy dearly.
— Given the pressure on public funds, partnership approaches to funding should be encouraged.
REGIONAL FLOOD DEFENCE COMMITTEES

1. This note by the Chairmen of the Regional Flood Defence Committees in England (RFDCs) responds to the Committee’s request for written submissions to their enquiry on flooding. There are eleven statutory RFDCs made up of an independent Chair and a number of appointees by the Secretary of State for the Environment, and the Environment Agency (EA), together with members of local authorities in the region (who comprise the majority). RFDCs advise the EA on its plans and priorities for flood risk management investment (FRM) in the region, approve its business plan and account to the Agency and to DEFRA for the stewardship of FRM resources. Committees also raise a levy on local authorities for investment in local schemes. Amounts of levy vary from region to region, but in total amount to some £25 million in the current year.

BACKGROUND

2. The summer saw the worst flooding in England since 1953. The impact in Yorkshire, the Midlands and parts of the South West and Central Southern England was significantly greater than in autumn 2000. Those floods were described by Ministers at the time as a “wake-up call” and that message is being repeated forcibly now. What is all the more surprising is that the floods stem from heavy and prolonged summer rainfall across wide areas of the country. This is not flash flooding as a result of localised storms that might be expected in the summer, but rather the kind of event we associate with autumn or winter conditions. In addition too many communities, especially those without proper defences, are seeing repeat flooding far too frequently.

3. So whilst it may not be possible to ascribe recent flooding to changing climate, the severity and increasing frequency of extreme weather conditions are entirely consistent with the thrust of climate change predictions. If anything the occurrence of extreme weather events seems to be increasing sooner than predictions might have led us to expect.

THE EVENT

4. Existing defences generally worked as they were designed to do. There were very few failures although of course in many places defences were simply inadequate to cope with the sheer volume of water the heavy rain produced. Without these assets, flood damage and loss of life would have been much worse. In other words, previous investment in flood defences is paying off. Notwithstanding the uncertainty that attaches to a different climate, it is likely that new investment in new defences will also provide a good return. We believe that that DEFRA’s recent “zero based review” reached the same conclusion.

5. Although the warnings of imminent flooding in the affected catchments were generally timely and reasonably accurate, this was not universally the case. In particular there were still difficulties in providing adequate warnings of the onset of flooding in areas of the heaviest rainfall, and immediately downstream from them, particularly where a combination of surface water and river flooding occurred. There is a case to develop warning services for areas that are prone to ponding or where surface drains are known to be inadequate in heavy rain.

6. Emergency services, the military, the Environment Agency, the water companies and local authorities generally responded well, in spite of the fact that flood response plans were not in some places designed to deal with the scale or particular nature of the floods that took place. That said we have come across instances of inadequate co-ordination.

7. Although additional pumping capacity was sourced relatively quickly, a faster response in this regard could have brought real benefits. Fire service pumps are helpful but generally do not have the capacity to deal with the scale of incident seen this summer. For example the Environment Agency brought very high volume pumps to assist in Yorkshire from the South West, the only region to have such machines available. Thought needs to be given to acquiring and storing emergency high volume pumps in a number of strategic locations around the country so they can be brought on stream very quickly. This will require investment in both the pumps themselves and in preparing sites for their installation where it is reasonable to expect a need for emergency capacity, but where there is no economic case for a permanent pumping facility.

8. The impact of surface water was very great. Increasingly intense rainfall events are overwhelming the capacity of drainage systems, especially in urban areas. So investment to improve that capacity is now an imperative. This is clearly an issue for other sectors too, including local government and the water industry, and requires a joint approach to planning the investment in drainage infrastructure (see below).

PLANNING

9. The combination of different sources of flooding is likely to be an ongoing issue as rainfall events become more intense. This produces challenges for a number of different agencies. It is likely that much more could be achieved through a pooling of manpower and material resources at least, through joint planning. Although the number of responsible bodies compounds the problem we do not believe that it is feasible or sensible to try to integrate in some single body the flood related responsibilities of local authorities, the water companies and the Environment Agency. Indeed far reaching organizational change could make matters
worse. The focus should be on better planning, to encompass both investment and resilience. This needs in particular to focus on urban areas and to consider how to manage the impact in all our towns and cities of rainfall events of similar scale to those in June and July.

10. In handling existing risks, the permissive powers of the operating authorities, including the EA, already confer some responsibility. The introduction by DEFRA and the EA of Outcome Measures and Targets will help provide clearer and more tangible outputs, although as currently formulated they are incomplete and their effectiveness will inevitably depend upon the resources that are made available. The true costs of managing risks are not seen by those that cause or live with them; insurance diffuses such costs at present.

11. The EU Floods Directive and Civil Contingencies Act may provide stimuli for multi-agency planning and action, but mechanisms will be needed to ensure that this happens in practice. Regulation also has a part to play and for minimising future risks, PPS25 needs to be applied rigorously and the use of Strategic Flood Risk Assessments (SFRA) should be compulsory wherever there is a prima facie evidence of a significant risk from any source. Development proposals that do not deal properly with flood risk should be turned down. Incentives to voluntary action are also important and might be put in place through the Building Regulations and Code for Sustainable Homes, for example. Grants might be made available to assist householders to install flood resistance and resilience measures.

12. There is a need to think through better and plan for the threat to key infrastructure. For example a higher level of protection might have prevented the loss of the water treatment works which deprived much of Gloucestershire of fresh water. We also came very close to losing all power in most of Sheffield and Rotherham for an extended period. We therefore welcome the Government’s intention to require flood defence plans for key infrastructure.

MAINTENANCE

13. Asset maintenance is critical. Many flood defence assets were damaged and need repair. This will have to be a priority for the Environment Agency. It is essential however that the unexpected costs, which we understand to be around £20 million, do not lead to further delays in much needed capital investment to bring forward new schemes. The EA does not hold reserves and does not have the benefit of Bellwin arrangements. These costs therefore should be a call on the national contingency reserve.

RESOURCES

14. Longer term it is inevitable that more resources will be needed to deal with these issues. We recognise that this is not easy and competition for public funds is intense. However flood frequency is increasing. Rising sea levels and the growing intensity of extreme weather events mean that this will continue and may accelerate over coming decades. Whilst it will never be possible to prevent all flooding, a failure to invest more in adapting to this key risk of the changing climate will rapidly come to cost the country and the economy dearly.

15. We therefore strongly welcome the Government’s commitment to increase FRM investment to £800 million a year in 2010–11. However with construction industry costs rising at around 7–8%, well above the level of inflation, the three years between now and then will substantially erode the value of this increase. The likelihood that the increase will also be spread amongst many different bodies—the EA, DEFRA, internal drainage boards and local authorities—may diminish impact. And as noted above in the short term the EA and others face substantial bills to pay for flood response and repairs to damaged assets. Pressure on resources already means that there would be few if any new starts on capital schemes, although there are many at an advanced state of planning which could be delivered quickly. The combined effect of these factors is that the public may not see much difference on the ground for some years. Confidence in our determination to improve flood protection will be at risk, especially if further serious flooding occurs.

16. The Government’s recent Foresight study suggested a need for an annual engineering FRM investment of around £1 billion. The commitment to increase total FRM expenditure to £800 million in 2010 is therefore a good step in the right direction, but more is likely to be needed. Only a significant increase in resources will enable the country to put in place a properly funded long term programme of investment in better flood risk management. This is not just about new capital schemes but also involves asset maintenance, improved forecasting and warning systems, better planning and resilience not least around essential infrastructure. As we state above it also needs to encompass joint planning and investment to deal with the combination of river and surface water flooding.

17. Bearing these points in mind we think it essential that the Government commits to year on year increases in FRM investment up to 2010–11and ideally beyond, or at least a clear direction of travel thereafter. During CSR2007, the increases need to be large enough to do two things. First the national capital programme should be given a new kickstart by bringing forward capital schemes in the pipeline which have been delayed or postponed. Secondly they should enable the necessary design and preparatory work to be carried out to ensure the most effective investment in new capital projects as the full additional £200 million comes on stream in 2010–11. Thereafter funding should recognise the recommendations of the Foresight Report (DT1, April 2004, www.foresight.gov.uk ).
18. It is also important to look at different sources of funding, and approaches to partnership funding arrangements with both public bodies and the private sector, including of course the water industry as well as developers, should be promoted.

CONCLUSION

19. We hope these initial observations will be useful to the Committee and we would be glad to elaborate on them in presenting oral evidence if the Committee so wishes.

Mike Bateman, South East  
Robert Caudwell, Anglia Northern  
Anthony Coe, Anglia Eastern  
Tim Farr, Midlands  
Clive Gronow, South West  
Frank Major, Northumbria  
Sinclair McCleod, North West  
Bob Price, Anglia Central  
Peter Ryder, Thames  
Humphrey Temperley, Wessex  
Jeremy Walker, Yorkshire

Chairmen of Regional Flood Defence Committees in England  
August 2007

Witnesses: Mr Jeremy Walker, Chair, Yorkshire RFDC, Dr Peter Ryder, Chair, Thames RFDC and Mr Tim Farr, Chair, Midlands RFDC, gave evidence.

Q757 Chairman: We will move onto our next set of witnesses. We welcome now on behalf of the Regional Flood Defence Committees Mr Tim Farr, who is the Chairman of the Midlands Regional Flood Defence Committee; in a similar role for the Thames Region we have Dr Peter Ryder; and Mr Jeremy Walker occupies the same position but in Yorkshire, so we have a very good geographic spread. I was going to ask you as an opening question how you felt about not being featured in Sir Michael’s interim report and then he told us he was going to meet you and take you into account so you can look to star billing in terms of the final report. Perhaps I could just start with a comment from the first paragraph of your written evidence to us. It says: “Regional Flood Defence Committees advise the Environment Agency on its plans and priorities for flood risk management investment in the region, approve its business plan and account to the Agency and to Defra for the stewardship of flood risk management resources”.

You have given a lot of very good advice, do you ever get frustrated that some of it has quite clearly not actually happened, been implemented or is ignored? Perhaps if some of the things you have said in the past had happened we would not have had some of the problems that we are now facing. Or is it the case that everything you have said has been implemented so that my argument falls flat on its face?

Dr Ryder: There is one example certainly—in our evidence already to the Pitt Review we have made reference to this in the Thames Regional submission—and it is the use of weather radar. You have drawn attention to the fact that there is no reference to Regional Flood Defence Committees in Sir Michael Pitt’s report; there is no reference to the use of weather radar either.

Q758 Chairman: Nobody would ever accuse you of being lapdogs to the Environment Agency or Defra; you are in the business of making recommendations about how to improve flood defences. You have your feet on the ground buried in the soggy earth and territory that you are defending from the flood waters, there must have been things in perhaps the last five years where you have made a recommendation which, for all kinds of perfectly justifiable reasons, did not happen, but when you look back if they had been done it might have at least helped ameliorate some of the problems that we are now facing. Or is it the case that everything you have said has been implemented so that my argument falls flat on its face?

Dr Ryder: There are undoubtedly lessons to be learned. We have all just heard Sir Michael Pitt about how he has teased out as a result of those experiences and we are part of the business of learning those lessons as well as anybody else.
Northern Ireland. I need to say that to you so that you can judge where I am coming from in this. We invested jointly between the water industry and the Met Office in the weather radar network precisely to try to provide warnings and quantitative information to help manage precisely the sorts of events that happened this summer. It is a source of some disappointment to me personally—which I have expressed, of course—that those data were not used in that way.

**Q760 Chairman:** You heard Sir Michael being very strong about building in flood plains just before he left and you represent Thames. What do you think about the Thames Gateway? Is it now being built in the right place or should we get rid of it?

**Dr Ryder:** That is a very harsh question.

**Q761 Chairman:** It is; that is why I had to ask it.

**Dr Ryder:** Clearly the area where the Thames Gateway development is to take place is amongst the best defended parts of the country by the one in a thousand year present time standard. That is one issue certainly to be taken into account. The work that is going on in the Thames Estuary—the 2100 Project which I hope you have heard about—is actually looking to see out to the end of this century whether that is safe and sensible. The conclusion is that there are things that can be done to maintain at least that level of protection. I think if we are to have development in an area that is at any risk at all then it is hard to see why that area should not be a candidate.

**Q762 Chairman:** In paragraph four of your evidence you say, “There were very few failures” (this is talking about existing flood defences) “although of course in many places defences were simply inadequate to cope with the sheer volume of water the heavy rain produced”. From your collective point of view how would you explain to members of the public what they ought to be protected from and how would you explain to members of the public what they have to take their chances with?

**Mr Walker:** Going back to the defences themselves, it is the case that a lot were tested and there were very, very few physical or power failures. Around 1,000 kilometres of defences were tested during the floods and although they did not fail about half that length of defence was overtopped, the water came over. That was down principally to the fact that they are built to a design standard which was not designed to cope with quite the amount of rain that we had during the summer event. Going on to how to explain where you put the defences and where not to put them, I do think the broad thrust of the approach we have at the moment is right, which is to get the best balance you can between the costs—in a constrained resource situation—of making investment in a defence in the first place and the benefits that it is likely to bring. The ones that get the highest score on that ratio are where you should put your money first. Over a period of time you move, as it were, down the list and you progressively pick off those with lower cost benefit ratios.

**Mr Farr:** In the Midlands Region you will find exactly that exemplified because the capital schemes are prioritised on a national basis but you get quite a volatile pattern of spending in terms of what towns or cities are actually to be protected in your particular region. If a scheme goes through it is because it has met national targets rather than being a local priority.

**Q763 David Taylor:** Mr Farr, what is the definition of “Midlands”? Does it include, for instance, North Gloucestershire and Tewkesbury? Does it include Upton-on-Severn?

**Mr Farr:** Actually the committee is known as the Severn Trent Committee; it is two separate committees that developed and years ago merged. It is the Severn and the Trent catchment with some complications on the Welsh borders.

**Q764 David Taylor:** Have you made any recommendations in relation to Upton-on-Severn in recent times and do you have any observations about work that may or may not have been recommended in relation to Tewkesbury, both of which are in your area?

**Mr Farr:** I picked up on your first point about frustration and I suppose going back to that I would at some point be expected to allude to temporary defences which have to be distinguished very clearly from the demountable defences. Upton is obviously the highest profile of those places enjoying—if that is the right word—temporary defences. In fact, as it happened, about a year ago the Regional Advisory Panel (that is various groups of people who sit in similar positions to ourselves) were looking at ways in which we might devolve the responsibility for the use of those temporary defences—the deployment of them, the storage and the general management of them to bodies—closer to the scene of the event. Obviously everyone will be familiar with the experience of the defences being held up on the M5 and the difficulties surrounding that. I very strongly welcome Sir Michael Pitt’s approach in terms of the direction he is going to, taking responsibility as far he can towards the local communities and local authorities. The Environment Agency is essentially a top down organisation and it struggles, I think, both in terms of resource and mindset to reach and deal with some of the bottom up issues which are, in many cases, extremely parochial and miss the radar until, of course, an event like we had last summer emerges and there are no end of examples of where things would and could have been done better. I think again preparation is key. My feeling as far as Upton-on-Severn is concerned is that it is a good example of where temporary defences have a value but they need to be put in a longer term context. The model, for example, in Scandinavian countries is that most of these are managed at a community level and they take most responsibility for it. I think there has been concern in the Agency that the organisation and preparedness of the emergency services and the local authorities is not adequate enough to allow them that responsibility at this stage. Again I think
Sir Michael Pitt is on to that in trying to return some of the expertise in terms of drainage flooding issues to local authorities.

Q765 David Taylor: What about Tewkesbury, Mr Farr?

Mr Farr: The area flood risk manager in Tewkesbury had to actually override the modelling information he was getting because the speed at which the river was rising was greater than the model could adapt to and could take on board. Human instinct kicked in and very wisely said, “I think something’s coming here, we’ve got to move forward”. I am afraid that Tewkesbury is an example of a town that is on the confluence of two rivers, the Avon and the Severn, and it is probably always going to have a problem. In certain circumstances, particularly when the Severn fills and some of it is actually water returning back up the Severn, Tewkesbury is in a very bad location in terms of its long term prognosis.

Q766 David Taylor: Do you advise the Environment Agency on their flood risk management policy and projects in the region?

Mr Farr: Yes.

Q767 David Taylor: Did you have any recent recommendation or analysis of the vulnerability of Tewkesbury prior to the flooding?

Mr Farr: Not specifically. There was not something that everyone was aware of. I think part of the issue here also is, as my colleagues alluded to, about standards of protection. Coming back to the point about building in the flood plains, the committee that I chair and represent was very strongly of the opinion that there should be no development in flood plains. I think possibly because flood plains will grow perhaps as sea level rises kick in but also because in cases like Tewkesbury you have already got a problem and if you started from scratch you might decide not to build on large parts of it. It is vulnerable. It is like Hull, another city where there is natural vulnerability and I think given the size of Tewkesbury it is always going to be hard to be on the cusp of any positive responses to a cost benefit analysis.

David Taylor: As the three of us splashed out of our minibus at Tewkesbury we saw builders’ signs of the usual type—black on yellow—indicating their River View Development. That seemed to say something, although I am not sure what.

Q768 Paddy Tipping: By implication the spending analysis favours large urban areas rather than smaller rural areas. Mr Farr, you will be aware of the controversy in Nottingham where there are big schemes—the Left Bank Scheme, for example—that is costing multi-millions of pounds. It has a displacement effect further down the Trent to some of the Trent villages. What are your views on that?

Mr Farr: I suppose the expression you would use is the greatest good of the greatest number. Unfortunately there are victims and there are plenty of villages that will suffer if the Left Bank Scheme goes ahead. There is an assumption of course that it will; it is simply shelved temporarily perhaps for a year while they sort out some technical details.

Q769 Paddy Tipping: Once the Agency gets its modelling right for a start.

Mr Farr: Yes. I think the key here is that we tried to ameliorate where possible the effects on the downstream villages and the upstream villages as well by trying to encourage them to take great cognisance of what resilience products and measures can be taken by them. As a flood defence committee we raised money from the local authorities and county councils and we have committed a substantial sum to that over the next few years to allow those villages to try to do something for themselves insofar as that is available to them. Clearly it is not all singing and all dancing but, again coming back to mindset, I think it is important that people are beginning to understand that the first thing they can do is try to help themselves. That is not always going to be possible but I think there were perhaps too many people caught out by it and yet if they had been more aware they would have picked up on the fact that they were in a much riskier position than they thought they were.

Q770 Mr Drew: Clearly the July floods are still in our minds but of course we now have winter equivalents coming or not quite coming but one day it will come. You have obviously looked very carefully and you are going to be talking to Sir Michael Pitt. What three messages would you give from the Regional Flood Defence bodies to him to say what you think should be happening?

Mr Walker: I think the first message would be to encourage him to stick with what he is saying in his interim conclusions about the importance of long term investment. We have seen an increase in resources; that is very welcome although, as you pointed out, it will be eroded by construction inflation costs in particular. It is possible—and indeed both Tim Farr and I are engaged in the production of a 25 year plan for the Humber Estuary and its defences—to develop very long term plans and identify broadly what they are going to cost over that period. That is being done as we speak for the Humber. It would be good to see a really serious commitment to a direction of travel which recognises that flooding is an issue for the long term for which long term commitments are essential. That would be my first message. I think my second message would be try to stand back from all the events and responses and so on and just to think harder and longer about land use management, especially in the upper catchments, and to think more and harder about how land use practices can be used to maximise water slowness (if I can pick up on the image that was being used earlier on). Thirdly I think it would be about investment in forecasting, mapping and warning systems. He makes a lot of good points about how those might be improved which I would want to encourage him to push forward.
**Dr Ryder:** Particularly with reference to the surface water problem which is the characteristic you would expect from a summer time flood, the outstanding feature of it, because it is essentially caused by the very heavy rain that you are going to get at that time of year and it is of a different nature because the flooding is occurring with the water on its way into the rivers rather than coming back out of the rivers. His approach to that is very good.

**Q771 Mr Drew:** I started many years ago in local government and I was always unsure what internal drainage boards did and I was certainly quite critical. Latterly I have become far more willing to accept that they have quite an important role, more than anything they have local knowledge. Would you welcome bolstering the powers of IDBs and in particular would you welcome their powers being brought inland because we have this bizarre notion that they can only operate within a mile or two of the coast or whatever and that does seem to be quite a limiting factor. Or are these people irrelevant to you?

**Mr Farr:** I am involved with the internal drainage boards and I am glad you are seeing the light in that respect, but there are fundamental flaws. When asked for the three suggestions to Sir Michael Pitt one of mine was to try to join the rural and urban flooding issues together. Internal drainage boards work within internal drainage districts which invariable exclude—they draw lines round—the built up areas. It is this failure to join up the issue of the ground that I think is fundamental. On a broader basis what I would be keen to say to Sir Michael is that when you are developing what you think the local authorities might do, my instinct would be to make sure that the drainage boards and the local authorities get together and I would suggest that he prescribe the ways in which the bodies are brought together. If it is left vague it will not work so well. The expertise is there and that is probably the one thing that the local authorities are going to need in the very early stages of any changes being implemented. The other thing is that you have to bear in mind that internal drainage boards do generate their own revenue and again I think there is a model there which could be developed for bringing further sources of revenue and local spending outcomes that could be used to address some of the smaller schemes that might be missed by the bigger picture at the national level. I think there are quite a lot of templates that need to be expanded upon and looked at in greater detail and internal drainage boards are a very good example of that.

**Q772 David Lepper:** We have talked a lot about expenditure this afternoon and you have heard what Sir Michael said about that earlier. I think when the announcement of the Government’s spending plans up to 2010–11 were announced you did describe that collectively as a good step in the right direction, but you reminded government of the Foresight Report and the billion pound figure. Do you still feel that the levels of funding that have been committed over the next three years are adequate?

**Mr Walker:** We stand by what we said and we would like very much to see the direction of travel continue into the next CSR period and then into the next one beyond that. This is not a short term business and it will require more money.

**Q773 David Lepper:** So the 25 year span of planning that Sir Michael referred to and I think you have referred to as well this afternoon is something you feel the Government should give serious attention to as a very defined area of public expenditure.

**Mr Walker:** I do.

**Q774 David Lepper:** Irrespective of what it is doing elsewhere in terms of three years?

**Mr Walker:** Yes. Clearly everybody is constrained by the amount of overall public expenditure that is available and there are a lot of competing priorities. Seeing this from a Yorkshire perspective we are in the throes—although the levels are now decreasing—of very serious flooding again this last week or so, preceded by the summer floods and of course there was a major incident in 2000 as well with a lot of local ones in between. The North Sea level is rising: we have long stretches of undefended or partly defended coast which all needs to be looked at. It does seem to me that whatever position you take on the link between the extreme weather events and climate change things do seem to be moving in a direction that makes flooding more likely and this is going to go on whether or not we manage to mitigate it in 30 or 50 years’ time; we clearly have to adapt to what is going on and that does require some planning for decades and not for three years.

**Mr Farr:** The catchment flood management plans are in the process of being finalised one hopes this year. They are 50 year outlooks with a regular five year review structure and behind them sit the strategies which will be shorter periods but within which there will be more detail. They are obviously trying to apply broad policy issues to the area.

**Mr Walker:** Going back to the three points of Sir Michael Pitt’s report, it is not simply a government responsibility; it is a responsibility that goes much wider. We would want to encourage all those concerned—the Government and the Agency—to think about what they might do to incentivise other third parties to contribute more to investment in flood risk management. Also Sir Michael’s interim report talks quite a bit about individual responsibility and I think again there are pilot schemes being funded by Defra here at the moment. Finding ways to encourage individual businesses and householders to think about how they can make their businesses and properties more resistant to floods and more resilient to flooding when they do happen is also an important area that we should all be looking at in the future.

**Mr Farr:** I think it would be worthwhile looking closely at the mechanisms for allowing and helping those who can offer land that will store water to protect a town. The word “compensation” always rings alarm bells in the Treasury I understand but I think it would be as well to focus on the confidence that can be generated within the agricultural and...
Q775 Chairman: Do you think having heard Sir Michael talk about value for money that we are going to get a different list of priority areas for spending than we have at the moment? One of the things I was intrigued to know was whether you felt that there were things that money should be spent on that were not. We will have to suspend the Committee at this juncture for this division and resume in ten minutes’ time. The question I would like you to answer when we resume is whether in fact there are things we should be spending money on that we are not, and the reverse of that, are there things we are spending it on that we should not be? The Committee is now suspended for the division.

Q776 Chairman: Are you ready with your answer?
Dr Ryder: The whole idea of us having a prioritisation process is designed to tease out against the rather complicated assessment of cost benefit, value for money, achievement of objectives that are set by ministers and so on. I think we have to go with that except that it is a long way from perfect in its formulation and it does not deal with some very important issues and it was those I wanted to draw to your attention. It does not deal very well with the issue of capital and revenue expenditure and that is a great worry. Most cost effective uses of money for flood risk are actually spent not on capital schemes but on things like development control, the avoidance of building properties on the flood plain. If you are cutting back, as is the case at the present time within Defra, on revenue expenditure you are in danger of cutting back on that very resource that is so important. Similarly there are aspects of flood warning and mapping and so on which again are revenue intensive; they use staff time and so on to be completed and they are not properly prioritised. They are under threat because they are viewed by government generally, as you know, as capital expenditure is good but revenue expenditure is inefficient and so on. So those are the areas that I think are most worrisome and within the Pitt Review there is a great focus on protection and it is understandable given the terms of reference he has, but flood risk management is really serious, it is about managing risks and there are more ways of managing those risks downwards than there are simply building our defences around them. It is getting that balance that I think is the important thing and I hope you will be able to make comments on that also.

Q777 Chairman: Dr Ryder, time is at a premium but if you wanted to develop that thought line and perhaps jot a few notes down which might give a compare and contrast between the current approach to a problem and the suggestion that you put forward that there are different ways to skin a cat, to use a phrase, we would be very interested to read them.
Dr Ryder: I would be happy to do that but I will just give you one more example now. The prioritisation system takes no account of funding for critical infrastructure. In many cases it is a private asset that you are protecting, not houses, so that has no weight in the prioritisation. That cannot be right, can it? So that is another good example. What we do not want as RFDCs is for the utilities to build defences completely outwith some broader strategy that we are trying to put together to protect a broader area of housing and assets that are not the ones that they own. I think there has to be an integrated approach to that.

Q778 Chairman: I think there are many small communities too who have what I call spot problems who never seem to get a look in within the current structure.
Dr Ryder: Have you taken on board the concept of the local levy? We mention it in our evidence to you; we mention it is £25 million. I do not know whether it is clear from our evidence as to how that is used, but unlike the flood defence grant in aid that comes to the Agency from Defra this comes through a subvention on local authorities. Remember, we have a majority of local authority members on our committee so it is not that the local authorities are not in control of the decision making about the size of that levy, but that levy is then used on local priorities, the very things you have just been talking about. I am very pleased indeed that we have that. We nearly lost that capability in an earlier re-organisation when the local levy nearly went and there was some VAT issue that kept it in and it is a very important tool.

Q779 Chairman: To develop that point one of the things that you might care to address is the issue that if the local levy was bigger could you, in terms of actions, do more than might be achieved simply by re-ordering a point scoring system on the big spend?
Dr Ryder: That is a big ask.

Q780 Chairman: You can reflect on that while I ask Mr Walker.
Mr Walker: One instant reflection would be that it is possible to use the local levy—indeed, we do this as a matter of principle with the committee in Yorkshire—as a form of leverage to bring in other people’s money. That is very effective.

Q781 Paddy Tipping: One of the things that Pitt acknowledges and you acknowledge is that there are a lot of players in this field. The Pitt solution seems to be at a national level with Defra taking on a greater leadership with the Environment Agency having an enhanced role and having wider powers. What I am not clear about is where do your organisations fit in under Pitt?
Mr Walker: In some ways it is not surprising that he does not mention Regional Flood Defence Committees because he was looking very much at
the operation of the incident and the response to the incident and the lessons you learn from it. Regional Flood Defence Committees are not involved in incident response. We can learn lessons from it too—and so we do—but we are not directly involved in that part of the process. We support the notion of the Environment Agency having a stronger co-ordinating and strategic overview role; that makes a lot of sense. Sir Michael Pitt’s report does not say much about the regional level at all and there is a role to be played in terms of bringing together at the regional level because catchments go well beyond local authority boundaries; they are not always coterminous with regional boundaries but there is not a bad fit in many catchments. There is a role to be played in bringing together the bottom-up bit with the top-down bit and we can do that. There is an issue around bringing local accountability to bear a bit more on the Agency at the local level and we can also in other practical ways work with local stakeholders to make more local things happen. In the round there is quite an important place for that regional sphere. Before I leave that, we talked a lot about planning earlier on in the session and I would not want to overlook the regional level here either. Following the Treasury’s sub-national review of economic development we should consider the responsibilities of Regional Development Agencies who will be taking on overall strategic planning for the region. We will be arguing certainly that we need to look at adaptation issues to climate change in that part of the process, including of course flood risk management and how we take account of that in the way that regional strategic planning is done.

Q782 Paddy Tipping: One of the problems is that Mr Farr’s area does not fit in with the government offices by any means. You also mentioned, Mr Farr, earlier on the notion of the Water Framework Directive and river catchment base and the planning for that. How do all those mesh together? What is your role in that?

Mr Farr: I think that really there is an advantage perhaps in coming at this from an almost purely catchment orientated approach. I have made reference also to the issue of the Welsh border which is now more significant in many respects, particularly in terms of funding and decision making, than the catchment, but the catchment still exists as it always has in terms of the carrier of the water. Therefore having that perspective is actually very important. I think it is the natural boundary and therefore it should be protected. It also means that within that context you can produce some relatively consistent decisions or at least approaches to water based issues and then they get referred up to higher authorities who are either in a position to take a political decision on it or a financial one, but at least they are well-guided thereby. I would hesitate to say that we should sit in total judgment but I think in an advising capacity we can to do anything and initiatives they have taken since the summer. It obviously went down really well; it was entirely appropriate and picked off this point about local people getting more engaged in the whole issue of flood management and flood risk management particularly. Also, with the majority of local county councillors on it, you find that it resonates with them, they take up the point and away they go and these initiatives spread further and wider. There is an engagement with all the local authorities through the RFDCs which brings the Agency—which is a body which tends to be more closely associated with policy and the local authorities are closer to the grounds of the issues there—and links them in a sort of intellectual capacity in terms of taking initiatives forward and allows the debate to take place.

Chairman: Colleagues, I am going to cede the chair to David Lepper as I have to go and represent the Committee on a committee that represents all the select committee chairs. My apologies that I will not be able to hear everything you say, but I can assure you I will read the transcript with keen interest. Thank you so much for what you have already said. David Lepper is in the chair.

In the absence of the Chairman, David Lepper was called to the Chair.

Q783 Lynne Jones: I want to ask you about the performance of the Environment Agency. I will start by addressing Dr Ryder because earlier you were expressing concern at the lack of use of the broadcasting abilities of the Met Office. Who were you criticising there? I know from some work I did that there were concerns about the decision making of the Highways Agency and the Environment Agency acting on the warnings on Thursday 19 July where they did actually hone in quite accurately on where the flooding was and yet it was not until the next morning that we had the flood defences caught up in traffic. What were you getting at? If you were not getting at the Environment Agency you need not spend too much time talking about it.

Dr Ryder: No, I was not getting at the Environment Agency and I was not defending the Met Office. What I was saying was that there is a problem which has been well analysed by Sir Michael Pitt through the concept of surface water flooding and the lacuna is that it is not the responsibility at the moment of the Environment Agency and therefore the procedures within the Environment Agency are based on the idea of measuring water in rivers, watching the levels change, having models that predict how those changing levels here will impact on levels further down stream through the flow of the water. It is very much about flooding from rivers. What we got this summer—we also had it in that awful event at Boscastle too—was flooding essentially caused by intense, prolonged, sustained and very localised rainfall. What to do about that? To simply say that that is beyond our remit, we cannot do anything and no warnings are issued, or actually to do what I would like to see happen and that is essentially by embedding the use of weather radar which actually tells you the intensity of the rainfall over an area with
a resolution of a few kilometres, very close time to
minutes as to when the rain will fall, and because it
is a two dimensional picture essentially you can
integrate the amount of water that has fallen on a
catchment of any size you wish down to the
resolution of the radar. That is not routine practice
within the Environment Agency because it is
incidental in a way to their main business of
forecasting the evolution of the rivers. I think that is
a weakness.

Q784 Lynne Jones: Whose fault is that? Surely the
Environment Agency has the ability to say, “Look,
we could take this into account, why don’t you let
us” or “We’re going to do it anyway”.

Dr Ryder: They have not done those things. They
have focussed on the things for which they are
especially responsible. It is not a matter for the Met
Office to say, “And as a result of this very intense
rainfall falling on Boscastle there will be flooding in
Boscastle”. No-one is doing that; there is a gap.

From the evidence that you have had and certainly
from conversations I have had with my ex-
colleagues in the Met Office and within the
Environment Agency they say they much invest
more in the numerical models that will provider
longer term forecasts than these actual
measurements. There is a difference between a
forecast that “Six hours ahead the rain will fall on
Boscastle” or “It is now falling on Boscastle, shall we
do anything with that information?” That is where I
think more could be done, but it does mean that you
would be encouraging the Agency to do that work
even though it is not part of its formal remit. I hope I
will persuade the Pitt Review to see this as an interim
measure to be taken before the undoubted work that
tools to go on between the Met Office and the
Agency, to do that job with higher resolution
models, the very thing that Sir Michael said.

Q785 Lynne Jones: With the models that they have
the Environment Agency could have acted had it
used the information from the Met Office. You think
it could have actually issued warnings even though it
is not strictly its job because it does have that ability?

Dr Ryder: I do. There is a difficulty about it and that
is that you would have to be prepared to put up with
a higher rate of false alarms, by that I mean an alarm
that flooding of this kind from intense rainfall was
going to happen but it might not.

Q786 Lynne Jones: What is an acceptable amount of
false alarms?

Dr Ryder: Can I take you to the example of a gale
warning at sea for ships? The objective there is never
to miss a gale because if you do people die. If ships
that are not equipped to be operating under gale
conditions are at sea people will die so you accept
there will be false alarms and there are many
occasions when gales are forecast at sea and they do
not actually quite make it. That is viewed by the
marine community as quite acceptable because they
have got used to that idea. Any attempt to do this
type of forecasting, this type of approach would
certainly need an educational programme, it would
certainly need an approach to the problem that was
different to the one that exists at the present time. I
have not had this debate with the Agency but this is
probably why they are reluctant to go down this
route. I have had discussions about elements with
the Environment Agency but not at a corporate
level. They are reluctant to go down this route.

Q787 Lynne Jones: Can I ask your colleagues about
their assessment of the performance of the
Environment Agency and are there times when you
have had disagreements with them and how were
they resolved?

Mr Walker: I would like to pick out just one point
on the Met Office as well which is that in the last few
days in Yorkshire to help us be able to see what was
likely to come in advance a Met Office expert has
been sitting in with the Environment Agency and
working with the Environment Agency forward
planners. That has been enormously helpful in
getting a higher level of accuracy about when to issue
warnings and so on. On the subject of warnings, on
the downside people responding to warnings incur
cost and inconvenience and so on—usually one
hopes very much for the best. But the risk of putting
out warnings which are not actually needed of
course is the cry wolf problem. If it happens
repeatedly people will disregard warnings and it is
already difficult enough to get people to sign up for
the warning service and one does not want to do
anything that will put them off further. Moving onto
your main question, I have a very high regard for the
performance of the Environment Agency. We have
many discussions, many about whether they are
sticking to budget, how they are deploying
resources, how they are developing their catchment
flood management plans and, as we have indicated
already, sometimes there are frustrations about pace
and so on but not, I think, about direction. Perhaps
just reflecting on the lessons learned exercise which
of course is your focus, one area where I thought the
Agency could have been sharper in the summer in
my part of the world was in its external
communications. It found itself with events moving
faster than its ability to respond so it was always
dealing with the rumour and counter-rumour and
was not ahead of the game in getting accurate
messages out. By the time they had done that there
were inaccurate ones in the public domain and that
is never helpful. As I am sure you know in crisis
situations communications are always very difficult
and can always be improved, but I think the Agency
themselves recognise that that is something they
need to work on.

Q788 Lynne Jones: I detect some disagreement; what
level of inaccuracy in terms of warning is acceptable?
Would that depend on the nature of the warning? If
it was something you would only need to take minor
inconveniences that would make a difference or you
could end up doing a lot of very inconvenient actions
to no avail.

Dr Ryder: There is quite a theory about this use of
probabilistic forecasts. Supposing I were to say to
you that the probability of your house being flooded
The Environment Agency runs its media operations. Am I misunderstanding what you said in your evidence to this Committee about flood defence committees actually not only advising the Agency but having power over the Agency, determining each year the local three year business plan, approving the programme of work and monitoring their performance? Does that not mean you have real power and therefore surely you have the ability to get the Agency to listen to the points that certainly Dr Ryder has been making.

Dr Ryder: This is a very difficult question. I would be surprised if you had not picked up in the comments that have been made earlier about the legal provision for flood risk management or flood defence. It is within the law that the Agency is required to fulfil its obligations in flood defence through regional flood defence committees which is completely out of line with the accounting officer responsibilities that lie with the chief executive of the Environment Agency, who is accountable to Parliament as an accounting officer. The ultimate judgment as to the proper use of money within flood defences does not lie with us, it lies with her. Over the recent years—and I am glad to have the opportunity to describe this process to you—we have clearly thought about this, we have discussed it with the chief executive, we have discussed it with the chairman of the Environment Agency, we have put proposals forward to them to find a sensible accommodation, to live within at least the spirit of the law but at the same time have a sensible working arrangement which makes maximum use of the expertise that we have, the local authority expertise that we have—each of the members that are appointed by Defra bring some expertise to the party—and I have to say the long experience of working. We are appointed typically for three years and then another three years. I have been a member and then chairman of my committee for ten and a half years (a member for six years and four and a half years as chairman) so we have that to bring to bear. What we do, as officers in local authorities do, guided by the officers, is that we have an oversight of the final programme that has been put together that has actually been seen, acknowledged and approved up at headquarters by the Environment Agency so they are comfortable and we accept it. You might say it is more of an endorsement than an approval. In that way we have some ownership for that programme of work. I think there is engagement by the local authorities that they have had an opportunity to scrutinise the programme in an informed and professional way.

Q789 Patrick Hall: I would like to follow up on Dr Ryder’s fundamental point about forecasting and what is measured by the Environment Agency which I think is perhaps more significant than how the Agency runs its media operations. Am I misunderstanding what you said in your evidence to this Committee about flood defence committees actually not only advising the Agency but having power over the Agency, determining each year the local three year business plan, approving the programme of work and monitoring their performance? Does that not mean you have real power and therefore surely you have the ability to get the Agency to listen to the points that certainly Dr Ryder has been making.

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Q790 Patrick Hall: And change it?

Dr Ryder: Yes, and change it indeed. The other thing we do which is a recent addition is that we meet once a year with the directors who are responsible within the Environment Agency and look at the flood defence grant in aid allocation that is to be made to the regions, the sub-division that is to be made between the various functions that go into flood risk management—the things I spoke of earlier, the business of how much to go into development control, how much to go into mapping, all those other functions—and we sit down with them and listen to the rationale that they have put together as a national authority and we agree or disagree with them. We did that this year and, for example, we questioned quite a bit the amount of money that was going into maintenance. We were not entirely persuaded but we went through the arguments with them and became persuaded. We were not entirely comfortable with the amount of money that was going into flood forecasting and warning for the very reason that we recognised the severity and importance of this issue because of the surface water problems we faced this year. Our feeling was that we should be spending more money on this but then it was explained to us that the intent was to use this coming year as a period to revisit the flood forecasting strategy within the Environment Agency and we could expect higher expenditure in years two and three of the comprehensive spending period. So again we had a much closer understanding of what was in the minds of the directors and eventually the board of the Environment Agency and were able to support that line, which I know the Agency board was comfortable with and appreciated that we had scrutinised this, again independently, as with a degree of expertise in the way I have explained. I am sorry if that sounds a rather complicated way of doing this work but that is practically how it is being done at the present time. I have to say that on behalf of us all we are very comfortable that that lives with the spirit of the law as it stands but it is also pragmatic and sensible and we feel deals with our accountabilities, particularly downwards to the
Q791 Mr Drew: The problem with giving people information that actually proves to be alarmist is that I now have people who sit at home waiting for the flood. In the first session I was asking Sir Michael about planning and the implication for flood plains and so on. I wonder if you would want some greater understanding about planning and the implication for flood plains in the flood. In the first session I was asking Sir Michael about planning and the implication for flood plains and so on. I wonder if you would want some greater authority—indeed powers—to be able to say, as Lynne was saying about Lyon where effectively the French have red demarcations which means “do not build, this is not acceptable”: is that where we should be going in this country, where we should have a much clearer identification of areas where we should not build or which we should allow to flood because that gives us that level of protection for those areas that we really want to protect.

Dr Ryder: I have spent a fair bit of time looking at PPS25 and its implications not just where it is now but also future implications for surface water flooding, the kind that was so worrisome this summer. I have to say that my personal answer would be the same as Sir Michael’s was and that is essentially to give PPS25 time. I think it is a much stronger situation now; things were getting better about controlling development on the flood plain where that was dangerous previously and this has only strengthened that. I am sure that as parliamentarians you will look at this issue again once there has been an opportunity for PPS25 to do its job because it is well thought out. The practice guide for PPS25 is not yet fully written but it has the hooks within it to do many of the things that I think are causing you the most anxiety.

Q792 David Lepper: There does seem to be general agreement about this. What do your colleagues think about it?

Mr Farr: In response to the question about the role of the RFDC within the Environment Agency, at the regional level Peter explained in real depth the situation as far as the chairmen representing the regions at a more central point, but the reason the Environment Agency staff do take the Flood Defence Committee seriously because they regard it on the positive side as a form of public approval and at that level they do not always get want they want. Sometimes they are told, “Sorry, we are not agreeing to that; you will have to go away and think about that again” so it does actually work, particularly at the regional level which I think is where the thrust of the legislation was designed to put it. In terms of performance I think again there is approval for Sir Michael Pitt’s position. I actually think that the Environment Agency is particularly strong in its strategic overview rules, there are some very bright people who spend their time in many cases creating formulae which allow very fair decisions to be made; even if people do not like them at least they know how and why they have got to that position. I think that is important but there are pieces missing there and obviously surface water flooding is one and I think the more the role of the Agency can be expanded in that respect to make it more complete and broaden it, then so much the better. However, I would say that I would like—and I know others feel this way—to see them try to set themselves at least a target to spend as much as possible on the ground rather than through the office. I appreciate that is necessary and quite likely what Sir Michael Pitt will generate. It is going to make it almost impossible for them to achieve that in the short term but in the longer term in the public interest, seeing things happen in your area, is a far more important result of the Agency’s activities in flood risk management. I would like to see that happen; it has drifted the other way recently and I think that that should be redressed. There is no criticism of performance but I think there is a sense of setting them an objective that perhaps they not always look closely enough at.

Q793 Paddy Tipping: Dr Ryder, you talked to us a lot about the notion of local broadcasting and the fact that local broadcasting becomes more reliable nearer the time.

Dr Ryder: Yes, it does.

Q794 Paddy Tipping: The essential problem is that we do not understand the relationship between the weather and the natural environment and the built environment because our understanding of geophysics is not detailed enough and presumably we need to do more work on that to be able to understand the relationship and take the necessary action.

Dr Ryder: It is a huge problem. If you take a pan of boiling water it is easy to predict that the pan will boil but it is not at all easy to say where each individual bubble will be and depending on what you are trying to get out of the experiment is either important to you or it is not. That is why in a way winter time flooding generally, as it has been this year, by and large caused by widespread meteorological phenomena with broad scales, against the summer flooding which is intense convective activity, sometimes tide features on the land, sometimes just randomly occurring just like the bubbles in the boiling pan. I am very optimistic. I think the direction which Sir Michael Pitt mentioned and I know the Met Office have put into their evidence that higher resolution models is the right way to go.

Q795 Paddy Tipping: Mr Farr made an important point about doing things on the ground. One of the things that comes out of the Pitt Review is a greater enhanced role for the Environment Agency, maybe around forecasting, maybe around flood alert. Given that the budget for the Environment Agency now looks pretty firm from the first of April, is there enough money in the pot to enable them to take on this enhanced role?

Mr Farr: That is a very difficult question. I suppose you could say there is never enough but at the end of the day they are structured to prioritise within the Agency to make difficult decisions. If I could add to what I said a moment ago, I think the corollary of an enhanced central strategic role should be a greater
devolution of some of the spending decisions to the regional and local situations. I would pick out particularly the distinction between capital and revenue in that respect. I think it is right that for the sums of money involved and the nature of the projects that spending on capital projects is made centrally. I think that is reasonable, no matter how disappointed people are in regions that their particular area does not get done. I think that is an important means of managing the capital quantum, given that, as we have talked about local levy before, you have those local opportunities to pick up the pieces where you see fit. I think in terms of revenue spend, particularly of the maintenance budget here, I feel that the Agency would be better advised to leave a degree of fluidity in the means of spending to local bodies or bodies with whom they have some authority so they are not exactly handing the money over with no strings but allow them a degree of latitude because I think—and this comes back to Mr Drew’s comments about internal drainage boards—sometimes on the ground you find you have to make difficult decisions but they tend to be slightly instinctive but fundamentally reactive. Sometimes those decisions cannot be made a long way from the point of impact and I also think that it is not necessarily productive to try and work to meeting targets when it is more about achieving the art of the possible. If you see a problem you might have to make a difficult decision but at least you have next year to catch up. I think that rolling management programme is better suited away from the centre with the right management controls being applied to handing over the money. That, I think, is an area where the Agency will probably find itself having to go because there is too much to do when you start looking at every individual bubble as Peter Ryder just said.

David Lepper: Gentlemen, can I thank you for both your written evidence and your evidence to us this afternoon. I will say, as Mr Jack when sitting in this seat always says at the end of a session, if there is anything else that you wish you had said to us that suddenly comes to mind afterwards then please do write to us about that. Unfortunately we cannot change anything which you have said. Thank you very much.

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**Supplementary memorandum submitted by the Chairmen of Regional Flood Defence Committees in England (FL 63a)**

1. **The Priority Score System and its use in ranking Flood and Coastal Erosion Defence expenditure**

   1.1 The priority score system is designed to rank the expenditure of capital in flood and coastal erosion defence schemes that, if implemented, would deliver specific benefits. The system is not able to rank non-capital expenditure, in particular revenue funded work, and the benefits that can be counted are controlled. In practice some flexibility is permitted in the benefits that are included but the process is opaque. This is almost inevitable but it sits uncomfortably in a system that purports to be objective; a point that is discussed further below.

   1.2 The system is based on three criteria designed to weight the economic impact of a scheme, the effect on people and the benefits for the environment. These mirror the economic, social and environmental pillars of sustainable development.

   1.3 The benefit/cost ratio is the basis of the economic impact score. It is assessed using the guidance in the Flood and Coastal Defence Project Appraisal Guidance documents published by Defra, primarily FCDPAG3. This covers the need for defences as represented by the economic risk (economic damage resulting from flooding or erosion multiplied by the probability of the events causing the damage) compared with the whole life cost of providing the proposed defence. Only benefits and costs that can be assigned a monetary value are included in the benefit/cost ratio. The cost of repair of damage (adjusted for obsolescence and depreciation) is estimated and reflected in the benefit/cost ratio and score but consequential damage, eg from the loss of a water treatment works or electricity sub station, is generally not included, but examples are known where this stricture has been relaxed.

   1.4 The people score recognises that there are often impacts on those living in risk areas that are not reflected in the economic assessment. The focus is on impacts on people as a result of flood or erosion risk at their places of residence, rather than at their places of work. Ideally the basis of the population adjustment would be the number of residents affected but as this figure is difficult to obtain, the number of residential properties which have their risk of flooding significantly reduced by the proposed investment is used. An attempt is made to factor in vulnerability of communities at risk, based on a measure known as the “scale of economic deprivation”, which ranks electoral wards on an assessment of a mix of economic indicators.

   1.5 The environment score is included to give greater priority to those projects that are expected to provide additional benefits to the natural environment. This includes the recognition that Government is committed to the promotion of Biodiversity Action Plan (BAP) targets, which include habitats such as grazing marsh, reed bed and salt marsh that may be created through appropriate flood and coastal management projects. This is intended to assist achievement of the target that all projects should, at least,
maintain the status quo in habitat terms and should, where possible, provide environmental enhancement. Thus additional priority is provided for those projects that support national environmental policy by addressing national BAP targets as well as their primary defence.

1.6 Further details on the applicability of the priority score system can be found at http://www.defra.gov.uk/environ/fcd/policy/grantaid.htm#psstudies.

1.7 There is a general belief amongst practitioners, and those for whom the priority score system is a black art which has a profound but opaque effect on their efforts to manage flood risk—which includes the RFDCs—that a new approach is required. Defra have commissioned research on the subject the results of which can be accessed at http://randd.defra.gov.uk/Document.aspx?Document=FD2013_2315_TSM.pdf. The work is attempting to use current thinking on multi criteria analysis (MCA) to update the priority score system. Defra and Environment Agency officials are in the best position to describe the current state of play in adopting the findings of this work, but from our participation in workshops devoted to the subject, it seems very unlikely that a wholly objective system can or will be devised.

2. The broader issues of resource allocation

2.1 From the above description and discussion it can be inferred that the Priority Score System, or any foreseeable development of it, will not remove the need for judgement in the allocation of resources. To be credible such judgements need to be transparent and open to challenge, at least during their formulation and preparation. Arguably they should also be open to subsequent review as part of a necessary learning process.

2.2 It is clear that RFDCs, meeting four or five times a year, cannot hope to second-guess the detailed assessment of alternative uses of resources developed by a large cadre of full time officials, but they can and do help to formulate the total need for expenditure at regional level and challenge the subsequent proposed allocation of resources at both regional and national level, as outlined in the response to Q789. As argued there, we believe that this is both feasible and healthy, and compatible with the accountabilities of the EA Chief Executive and Board to Parliament and government, and of the RFDCs to the communities we are there to serve and represent.

2.3 What then are some of the current issues? Is there an appropriate balance between expenditure on recurrent maintenance of assets (revenue) and capital expenditure for replacement of assets at the end of their useful life and new structures designed to increase the standard of protection? What revenue funded resources should be committed to control development, in the implementation of PPS25 and elsewhere? Flood risk mapping is revenue intensive, what priority should be given to that? What revenue and capital expenditure should be allocated to improving the quality of flood warnings (accuracy, reliability, specificity, timeliness) and what to increasing their uptake (numbers of subscribers to Flood Warnings Direct)? What is the correct balance between expenditure on policy and process development centrally and delivery in the Regions? What fraction of the total expenditure on measures to improve standards of protection should be spent on preparatory studies and strategy development and what on building the assets that deliver that protection? Defra ministers have made it clear that they expect multiple objectives to be delivered from investment in flood risk management. Some of these objectives stem from European Environmental Directives. What priority should be given to those? Many of these issues cannot be judged effectively on an annual basis, which is why we are pressing for a long term funding arrangement, from which effective strategies for all of the above can be prepared and implemented efficiently.

2.4 From our oral evidence, the Select Committee will know that the RFDC chairmen as a whole have had the opportunity to review the planned expenditure for the coming financial year funded by Grant in Aid and after discussion have endorsed the executive’s proposals. The final decisions on allocations will be made by the EA Board during February. Of course there are always small differences in opinion at the margin. Peter Ryder has expressed the view that improvements in the quality of flood warnings might be achieved, which is compatible with Pitt’s Interim Conclusions 3 & 7 and Tim Farr has recommended a different approach to the deployment of demountable and temporary defences, which feeds into Pitt’s Recommendation 3.

2.5 There are other outstanding issues which exercise the RFDC Chairmen. These concern the acceptability and role of third party funding, eg from developers or public and private authorities. Should such contributions affect the priority score of capital flood alleviation schemes, through their reduction in the net cost to the public purse? There is an imperative throughout the Pitt review that flood risk management needs to engage a wider range of authorities and is not something that can be delivered effectively by any one central organisation. This is certain to require the effective pooling of resources and their agreed deployment; policies to govern these arrangements need to be put in place.

3. The use of local levies

3.1 Although reference was made in the response to Q778 to the local levy, we are not sure that the significance of this source of funding and the implications for resource allocation were made sufficiently clear. The vast majority of revenue expenditure and capital investment by the EA in England and Wales is now supported by a Grant in Aid from Defra and the Welsh Assembly Government. In 2008–09 this is expected to amount to £530 million of which £250 million is for capital expenditure.
3.2 In addition regional committees have raised a further £27 million for use in 2008–09 through a levy on principal local authorities in their regions. The levy rate is agreed by each Committee separately and must have the support of a majority of their local authority members. As a result, the amount of levy and the rate at which it is set vary widely. The amounts raised by each English committee are set out in the table below:

<table>
<thead>
<tr>
<th>Flood Defence Committee</th>
<th>Approved Levy 08/09 £k</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anglian Central</td>
<td>926</td>
</tr>
<tr>
<td>Anglian Eastern</td>
<td>1,670</td>
</tr>
<tr>
<td>Anglian Northern</td>
<td>1,473</td>
</tr>
<tr>
<td>Midlands</td>
<td>3,000</td>
</tr>
<tr>
<td>Northumbria</td>
<td>1,542</td>
</tr>
<tr>
<td>Yorkshire</td>
<td>778</td>
</tr>
<tr>
<td>North West</td>
<td>3,433</td>
</tr>
<tr>
<td>Southern</td>
<td>1,131</td>
</tr>
<tr>
<td>Wessex</td>
<td>3,015</td>
</tr>
<tr>
<td>South West</td>
<td>473</td>
</tr>
<tr>
<td>Thames</td>
<td>10,000</td>
</tr>
<tr>
<td>Total</td>
<td>27,441</td>
</tr>
</tbody>
</table>

3.3 Local levy is typically invested in flood protection measures which are important to local communities but which do not achieve a priority score that is high enough to be funded from the national grant in aid. Although projects must be cost beneficial, the investment of local levy is otherwise entirely at the discretion of the regional committee, who generally exercise their collective judgment against a range of options. Because the sums involved are relatively small it is often necessary to accumulate balances to fund individual schemes, which requires forward planning and commitment. Some Committees are beginning to seek third party funding too.

3.4 It may be helpful to illustrate the approach and implications with three examples:

*Improving the defences at Kilnsea*

The village of Kilnsea in east Yorkshire faces the imminent erosion of the coastal defences which protect it with a serious risk of flooding to houses in the village that would result. The economic case for realigning the defences at Kilnsea so as to protect the village is not good and it is difficult to justify spending money from the national flood and coastal defence budget, so the defences would probably be abandoned. When we looked in more detail, however, we concluded that we could carry out the work provided a significant part of the funding was raised by others, since even though no money would be available from national budgets we could use the resources from the levy raised by the Yorkshire Regional Flood Defence Committee to lever in resources from elsewhere.

The offer of a £100,000 grant from local levy stimulated local residents who had formed the Kilnsea and Spurn Flood Defence Group to raise funds themselves and to seek further grants, and also brought a sizeable commitment from the East Riding of Yorkshire Council for infrastructure protection. These funds allowed the Environment Agency to go ahead and build a new earth flood bank in time for the 2006–07 winter storms. The Group has taken on the responsibility for managing the new defence, which will protect the village for a further 30 years or so and give the residents much needed time to plan their future.

*Completing the Flood Alleviation Scheme at Banbury*

Extensive rainfall during Easter 1998 on the Cherwell catchment caused flooding within Banbury to over 160 residential and 30 commercial properties. Banbury railway station was out of action for several days. The event was estimated to have a return period of 1:100 years. Upstream flood storage with online improvements in Banbury and a pumping station to take water away from properties during flood conditions will provide a 1:200 year standard of defence reducing the risk of flooding to 386 residential and 97 commercial properties.

The pumping station was completed in 2003, but it proved difficult to obtain the land for upstream storage. Eventually CPO action became necessary and was approved by the Committee. A Public Enquiry was called and was due to take place in September 2006. However, the priority score for the scheme was 16.9 at a time when the threshold for Grant in Aid funding had risen to the mid twenties, so funding could not be assured and the Public Enquiry had to be abandoned.

Alternative funding options were explored. Cherwell District Council has agreed to contribute £2 million and to seek a similar sum from business in the town. On this basis the Committee has resolved to commit £9.7 million over four years from the local levy to enable the scheme to be built. This is almost a quarter of the expected levy over that period which shows very significant
solidarity from the local authorities in the Region, which include the London Boroughs as well as upstream authorities out to the Cotswolds The Public Enquiry will restart in 2008–09. Banbury railway station and several commercial properties flooded again in Summer 2007.

**Breadth of Local Levy’s Impact**

In the Midlands region, there have been many examples in recent years of schemes that have brought a range of benefits. On the River Maun at Mansfield a collapsing culvert was opened up and an attractive, natural and flood-friendly watercourse created in partnership with the County Council, in front of whose offices the work was needed and by whom it was undertaken. At Coleshill in the West Midlands an old quarry adjacent to an industrial area produced an environmental improvement at the same time as offering a substantial reduction in flood risk. Local Levy has helped to fund the provision of temporary defences (at Beale’s Corner, Bewdley and Upton-upon-Severn), a recent development in which the Midlands region has been pioneering creative solutions to flooding issues and expanding the flood risk management options available to the Environment Agency. The scheme at Newark that is currently getting off the ground will bring much needed third party financial contributions into the arrangements, allowing a project that might otherwise have remained unfunded and thus un-started to happen.

The Midlands region’s programme for 2008–09 will cost approximately £3.5 million, and will be applied to flood vulnerable locations at Worcester, Ashbourne, Long Itchington, Burton Joyce, Gunthorpe, Radcliffe-on-Trent and Newark. Approximately 788 properties will be better protected or prepared as a result of this expenditure, including approximately 50 houses (in the second year of a three year rolling programme) at Trentside villages downstream of Nottingham that suffer repeated regular flooding where conventional methods of flood risk management are unlikely to be cost beneficial.

4. **Internal Drainage Boards**

Internal Drainage Boards ("IDBs") exist primarily for the drainage of agricultural land and only extend over low-lying areas of land that require this function. There are 160 individual IDBs at present, covering substantial areas of eastern England and running inland from the south, south-eastern and south-western coastlines. Defra has recently launched an initiative to concentrate these IDBs into 22 sub-catchment groups (see attached map).²

The responsibility for land drainage of IDBs is confined to Internal Drainage Districts ("IDDs"), which are defined in a document of many years standing known as “The Medway Letter”, and which is based on a formula derived from worst known flooding events (of no particular date or specification) and for rural areas an additional eight feet in elevation from that line.

Many IDBs remain fundamentally unchanged in functional structure from the 1930s and earlier. There is a strong body of opinion that the change recently initiated by Defra is overdue, and ought to be undertaken on as broad a basis as possible to improve the integration between land drainage and flood risk management, particularly in relation to updating the IDDs and the definitions contained in the Medway Letter.

5. **Self Help**

It is to be noted that in the village of Woodborough, Nottinghamshire during the June flood event, one of the householders in the flooded area had the foresight to acquire Floodguard to block his doors and vents against the waters. His was the only house not to be inundated in the flooded area and demonstrated the viability of such flood defence products and the potential for their application by householders in certain circumstances.

6. If further explanation on this evidence and our oral responses to questions asked on 23 January please let us know.

*Tim Farr (Midlands RFDC)*

*Peter Ryder (Thames RFDC)*

*Jeremy Walker (Yorkshire RFDC)*

Chairmen of Regional Flood Defence Committees in England

*February 2008*

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² Not printed.
Wednesday 30 January 2008

Members present:

Mr Michael Jack, in the Chair
David Lepper
Paddy Tipping
Mr Roger Williams

Memorandum submitted by the National Farmers’ Union (FL 106)

1. Executive Summary

1.1. The National Farmers’ Union represents the interests of some 55,000 businesses which are engaged in a diverse range of agricultural, horticultural and related activities throughout England and Wales. We welcome the opportunity to present our views on the recent flooding to the EFRA Committee as many of our members have been severely impacted by these floods and have strong views on lessons that can be learned.

1.2. The NFU do not dispute that given the extreme weather in June and July there would have been extensive flooding. Evidence from our members shows that the investment and maintenance in flood protection and watercourses has been inadequate to deal with this type of severe event. Increased investment could have reduced the severity and the duration of the floods: the combination that has caused livestock losses, crop damage, complete crop loss and subsequent impacts on fodder availability. We have attached as an appendix a summary of the type of flood damage that occurred this summer.

1.3. We have received information from many hundreds of farmers who have been affected by the flooding this summer, in addition we have comprehensive written and photographic evidence from over 50 members. It is clear the impacts on agriculture and horticulture have been severe. The evidence has provided us with some key areas of concern which we would like considered in your inquiry.

1.4. The losses faced by farmers in different regions, and therefore nationally, as a result of the flooding are difficult, if not impossible to quantify. In many cases you would not know until a rain affected crop was harvested. They have been in vegetables (carrots, peas, cauliflowers, broccoli, cabbages, leeks and salad crops) and potatoes and combinable crops (wheat, barley and oilseed rape) and grass where rain fell heaviest and floods were greatest. Farmers cannot insure against these losses—their livelihoods, their employees and processors as well as those further along the supply chain are all affected. No compensation for crop loss is available from central government or the EU.

1.5. Key problems raised include problems with flood warnings, lack of information following and during flood events, exacerbated flooding due to insufficient watercourse management, inadequate funding of Environment Agency (EA) flood risk management and lack of planning to prevent a crisis due to damage to utilities and infrastructure.

1.6. We have identified a need for a change in flood risk management, not least a need to undertake research and apply measures on flood risk on a catchment scale. Urban and rural areas should not be segregated, land use change in either can influence flood generation and risk which makes the categorisation of high to low flood risk nonsensical. We must ensure we are not apportioning blame but finding solutions especially as flooding events are likely to be on the increase with climatic change.

1.7. Farmers can help reduce flood risk, particularly with temporary flood storage areas on land with the right financial support. However, highlighting that farming practices cause floods, as has been seen in the press, is neither helpful nor based in research at the scale of the floods we have seen. We know land management practices can impact on very local scale floods but little can be done to mitigate against the kind of extreme rainfall through changes in agricultural practice alone. Indeed this could actually increase flood risk in rivers downstream if flood peaks from tributaries reach the main channel at the same time. Further research is needed on flood generation and mitigation at a catchment scale assessing all land uses and any impacts of changes.

2. Problems Raised

2.1. A number of farmers who had signed up for flood warning did not receive a warning or did so too late. Had the flood warning system worked properly, farmers would have had some prospect of rescuing their livestock. Some 950 sheep and lambs from just two farms were lost in the Tamworth area alone. One lost 600 and the other 350. A third farm lost more than 220 sheep. In the same area crops such as potatoes have been lost. It is understood that the River Tame Flood Alert system did not provide adequate warning.
One member, who would normally be alerted by phone, reports that he did not receive a call at any time while the flood waters were rising. Others received a text message on the Saturday morning to say that the flood warning of the previous day was being withdrawn as the flood waters were receding.

2.2. We have received considerable evidence about poor maintenance of infrastructure from all regions and it is considered in the cases presented that this lack of maintenance contributed to the extent or duration of flooding. Individual cases include:

2.2.1. Near Wantage about 300 acres of land was still underwater on 18th August as a result of the flooding at the end of July. The reason is that the river involved (the Millbrook, a tributary of the Thames) is blocked. We have been informed that the EA has done little in recent years to dredge or clear weeds and debris. The farmers have paid for a basic survey that shows a fall of 5 metres from the flooded area to the Thames but yet the water is still not able to get away. This additional duration of flooding has causes considerable additional damage to the land and crops.

2.2.2. On 25th June after the heavy rains a member in North Lincolnshire had 90 acres under water on one farm, approx 18 inches deep. The drains had all backed up and overtopped. The Internal Drainage Board’s pumps were working flat out and reduced the levels over 10–12 days. It was on the 6th July that a 12 m breach was found in the Winterton Beck, the responsibility of the EA which had flooded the low lying surrounding land. A month later, his fields are still saturated, which he believes is because the drains are full of weed, restricting water flow.

2.2.3. A sluice gate at Kirkham Abbey on the Derwent used to be capable of being lowered by about 6 feet at times of high water to aid flow but cannot be lowered because the electric motors have burnt out. Our member was informed it would cost over £100,000 to repair and so this has not been done. In addition, members have provided pictures of an oak tree which has fallen across the Derwent between Crambeck and Kirkham Abbey and nearly blocked the surface channel and has not been removed. This is apparently typical of stretches of the Rivers Derwent and Rye.

2.2.4. One member in Holderness comments that whilst the farm dykes and drainage board ditches are well maintained each year the EA maintained high level drains were unable to transport the water away causing flooding back onto rural properties and land.

2.2.5. A member grazes his cattle on some low-lying meadows on the river Crane. At one point there is a weir to divert water away from the farmhouse. The EA have blocked the storm channel, so all the storm water now rushes over the weir or down the old mill race, which the member considers inadequate, overgrown and in definite need of maintenance. He is also concerned about the low productivity of the EA staff sent out to do work and does not consider this is value for money as a taxpayer.

2.2.6. Another member farms on the Thame River which used to be dredged every 5 to 10 years but he believes it has not been dredged for 20 years. There are three trees that have fallen into the river within a mile of where he farms which have been there for 2 years. He is used to the Thame flooding but lately he reports its pattern of flooding has changed: usually it takes 3 days after a heavy rain but this winter it came up overnight, which seems to be due to reduced capacity of the channel to hold the water.

2.2.7. In addition, he highlights local authority maintenance of gullies on the side of the road is insufficient. Consequently when it rains rather than a trickle every so often soaking into the field a torrent runs down the road and into the drains, brook and eventually adds to the water and floods in the rivers. Local Authority maintenance of roadside drains and ditches needs to be examined.

2.3. In all of these examples listed above it seems that the EA, and local authority, have inadequate funding to carry out the level of work that is needed. This suggests that the flood defence budget is simply too small or an insufficient proportion is spent on maintenance. In addition we believe, and our members report that this reduction in maintenance is due to environmental constraints. It is considered that the frequency of weed cutting and whether sites are dredged or not is undertaken to protect habitats and wildlife, which results in a reduction in maintenance that would otherwise be carried out for land drainage or flood defence reasons alone.

2.4. We also have evidence where the EA have insufficient funds to remove a flood defence structure where they are causing a greater flood risk problem:

2.4.1. Approximately 18 years ago the predecessors of the EA upgraded a dysfunctional weir in Shropshire which originally provided water to local meadows but with the introduction of water tanks, the sluices became redundant and were filled in. The weir was rebuilt bigger and higher so the banks of the river upstream were built up to contain higher water levels. This worked well for many years until the river changed course and moved beyond these heightened banks. Now the river flows just below the bank top and with any excess rainfall it bursts its banks, flooding the village of Walford, its houses and three busy main roads and has done so on five occasions in 2007. A Parish Councillor and local farmer proposed the reduction or removal of the weir. This was originally accepted 5 years ago by the EA. However, after numerous conversations and more floods he was advised that they did not have the funds to undertake the job.
2.4.2. We also have evidence that Internal Drainage Board (IDB) maintenance may have caused flood problems, with a member suggesting that due to environmental policy this has reduced the amount of maintenance the IDBs can undertake.

2.5. During the flooding in Gloucestershire, water supplies were cut off in some areas. Water companies do not have a duty to provide water to non-domestic customers and so livestock farmers were not provided with water. Given that many of the livestock in the affected areas were housed as the ground was flooded or too wet to allow them out, mains water supply was for many the only source of water for their livestock. The NFU contacted Severn Trent who had no interest in assisting. The NFU worked hard sourcing tankers to ensure supplies for these farms immediately after the water was cut off and organised sharing of water between farmers. After subsequent negotiations, Severn Trent are now in the process of reimbursing the cost of the emergency tanker supplies. We would like to think in this situation, assistance from Severn Trent could have been more forthcoming as the NFU undertook both the organisation and management of the supplies. We consider on animal welfare grounds, in these kind of emergencies, water companies should have a plan to enable them to work and make decisions quickly to ensuring no time is lost and animal health put at risk.

3. Suggested Improvements

3.1. Riparian livestock farmers should be warned about potential floods for obvious animal welfare reasons. The NFU are keen to work with the EA to improve lists and methods of communication. Also, after the deluge there is a need for those who continue to be affected (some farmers had feet of water in standing crop for days after the rainfall) to talk with someone in the EA who knows what is happening and why. The single switchboard number provided by the EA is not able to provide local and useful information.

3.2. We must ensure rural and urban areas are not treated as separate units with regards to flood risk, but water is managed from a catchment perspective, catchment flood management plans (CFMPs) do not address that if defences are strengthened, or reduced in one area it will have a knock on effect elsewhere. There seems to be little current appreciation about how the elements of a catchment interact. If the water cannot get away it will cause flooding, equally put in too many “hard” defences, and the water will be channeled downstream to flood. This is not helped with the simple high, medium and low categorisation of flood risk that the EA use to determine maintenance programmes. Low levels of maintenance simply stores up problems upstream.

3.3. If we are to “work with natural processes” as advocated by Defra’s Making Space for Water Policy, we need to think about innovative flood storage and solutions in both urban and rural areas and not use it as a justification to reduce spend on maintenance in rural areas. This policy and EA’s allocation of flood defence expenditure also needs to factor in the anticipated increase in residential and urban development and urban densities, as these inevitably place a greater surface water/storm sewage loading on already under-managed drains and watercourses.

3.4. Protection of rural areas is not just for the needs of the agricultural community. Rural areas support many businesses, rural communities are more likely to severely affected if cut off due to their fewer amenities.

3.5. Protection of infrastructure such as roads, railways and utilities which may well pass through predominantly rural areas is vital to ensure economic activity can continue during extreme events. Greater protection is needed of utilities, including electricity supplies and sub-stations, water supply and water treatment works to prevent the power cuts and water cuts experienced during this summer.

3.6. We consider a comprehensive and transparent assessment is needed by the EA of the performance likely to be offered by their flood risk management assets and infrastructure. If it is decided that maintenance, or a particular level of service should reduce then local stakeholders must be informed. At present there is little or no notification to changes in level of service and this leaves local stakeholders both angry and confused. It must also be clear as to whether changes in service are as a result of real budgetary constraints or for environmental benefit. At present, is seems that one reason is used as a smokescreen for the other. If genuine environmental benefits are required this should be monitored and costs and benefits to society need to be weighed up.

3.7. Drainage systems are considered to be restricted in rural areas as there is the desire to manage all watercourses to benefit the environment and wildlife, allowing silting up and reed bed formation which has the long term effect of restricting water flow, with the effect is all too often felt further upstream. There is a genuine concern from people on the ground that problems are being stored up for the future.

3.8. There is a spectrum between environmental and flood defence concerns to consider. Historically, the balance was tilted towards flood defence so that riverbanks were regularly mown to remove vegetation and rivers were dredged to clear out channels, regardless of the needs of wildlife. The balance is now in the other direction with environmental interests dictating that watercourses be maintained for the benefit of wildlife. We are firmly convinced that there needs to be a review of this prioritisation, not simply to reduce biodiversity prioritisation, but to ensure that the drainage system and flood protection levels we have in place is fit fir purpose in view of the future challenges of climate change.
3.9. It has been suggested that spend on maintenance of waterways has reduced, or has certainly reduced over time as a proportion of overall spend by the Environment Agency. After prolonged investigations, it was realised these figures cannot be obtained. We consider that spend on different elements of the EA’s as well as IDB’s flood management budget over time should be publicly available and scrutinised.

3.10. We understand that there are full reports by the EA on proposed water storage schemes on the Rivers Ancholme, Bain and Witham in Lincolnshire which would have helped considerably in the recent floods. In these cases, farmland is deliberately flooded to protect other land and property and the farmers affected are compensated accordingly. They were not put into operation and washlands were not created because of lack of resources. We see distinct advantage in schemes such as these that can use farmland in a planned and compensated way as a soft flood defence. We would contrast this to the unmanaged flooding of land and property caused by breaches and overtopping that creates de-facto storage areas to the benefit of other members of the community but without recognition of the difficulties these present to farmers and growers.

3.11. The practice in rural areas of creating gulley pots from roadside ditches when housing is built has two effects. Open deep ditches act as storage in extreme events often holding significant volumes of water, potting and filling them in reduces that storage feature. Secondly, flow in potted ditches is thus restricted to the width of the pot and its eventual outflow. Often these potted ditches are in rapidly developing rural areas and the effects of this together with the accelerated run-off from the development means the system can no longer take water away quick enough. This can cause problems in the case of normal rainfall but in extremes can result in serious flooding.

3.12. We can not afford to lose the benefits of the Internal Drainage Board (IDB) structures. There is no replacement for local knowledge and nobody better wants to see their land drained correctly than local landowners, we should also remember that as a result we are draining local communities. While moves to centralise the IDBs should be discouraged we should maybe favour a move for increased co-ordination and consultation between the EA and local authorities, particularly when new development is planned.

4. CLOSING REMARKS

4.1. The NFU is acutely aware that as climate is changing we all have to adapt to this change, both as individual businesses and as a society, and that includes adapting to a greater risk of droughts and floods. Urban development too can only increase the severity of storm water run-off, we are concerned that new development is plumbed into drainage systems mindful of downstream impacts for farmland and town and cities and drainage systems which are ultimately sustainable. We must also recognise that the potential of our land for the production of food—and indeed for the mitigation of climate change—will be needed as never before over the years to come.

4.2. Farmers are prepared to play their full part in reducing the flood risk. The creation of temporary flood storage areas has obvious potential, but this needs to be planned and rewarded. Changing the way land is managed can also help reduce the severity of floods at a local level and there are many successful examples of this around the country, all based around the voluntary co-operation of farmers and landowners. There is little evidence to date to suggest that this could make a difference at a catchment scale, and it is of less importance in mitigating major flood events, such as seen recently, than adequately funded, well-designed, properly maintained flood defences and drainage systems. Focus must also lie on sustainable drainage systems in all paved areas. A recent report suggests that the catchment upstream of Ripon would need to have an unrealistically high 35–70% of the soil in the catchment degraded to produce any detectable increase in flood flow at the catchment level suggesting land management practices may only have limited influence on floods.

4.3. Further investment is needed in research to determine how land management practices, including urbanisation, influence flood generation and damage at a catchment scale. At present studies focus only on urban areas or agricultural practices, this is wholly inadequate and misses the influences of a multitude of changes to land use, including paving and drainage as well as increasing urbanisation in more rural catchments. We cannot and should not look at flooding in specific areas in isolation.

4.4. We must appreciate that water level management and flood defences are part of our national asset that generations before us worked hard to ensure that land, properties and businesses were viable and protected. We want to make sure these assets continue to perform their function into the future.

NFU

September 2007
FLOOD IMPACTS

IMMEDIATE FLOOD IMPACTS

Among the casualties of the recent floods were 950 sheep and lambs from just two farms in the Tamworth area. One lost 600 and the other 350. A third farm lost more than 220 sheep. In the same area crops such as potatoes have been lost, and livestock have proved reluctant to eat grass that has been under flood water. Other losses include at least 50,000 chickens lost in Lincolnshire through flooding and over 70 piglets in their farrowing shed, close to the Humber.

In Gloucester, a number of dairy farms have had to dispose of milk as collections have been impossible with impassable roads. Access to fresh water supplies have been a major issue for those trying to keep their animals in the best possible condition. Some farms were completely cut off by floodwater with no mains supply.

The Teme valley was inundated for a second or third time in as many weeks, with damage to hopyards and many farms. An arable farmer has lost his whole crop, a loss of around £100,000 to the business, in his first year of trading.

Storage facilities have also been flooded, with a report of a farm losing all their stored hay to flooding of their barn. Another reports 22 acres of big bagged silage floating around in the floodwaters.

PROLONGED FLOODING

A farmer in Lincolnshire has written off 70 acres of potatoes due to banked drains and rivers overflowing. Alongside this he has had 140 acres of wheat under water for up to a week. He considers this will cost him £14,000–£200,000 in loss revenue on the potatoes alone.

One farmer who grazes 72 ha on marshland has approximately two thirds either flooded or waterlogged and the livestock had to be moved. The flooded marsh is still too wet and most of the grass is dead and rotting so it will not be available this season.

A number of farms in Oxfordshire still (17th August) have 300 acres under water following the flooding on 20th July. This is four weeks after the flood event, these crops will be irrecoverable.

Potatoes submerged in flood water are a total write off and will eventually be ploughed in. There have been reports of a blight-affected crop being so bad that it has been ploughed in. Where blight spraying has worked then the unknown factor now will be yield and storage potential. Both will have been impaired by the disease and weather issue.

Calculations by farmers have indicated that the weather conditions have resulted in a 3% loss of potato crop in England and Wales, this is approximately 4,300 hectares and 196,000 tonnes. Some 56% of peas have also been lost in England and Wales.

Waterlogged soils and localised flooding has meant that one farmer in Lincolnshire has lost 30–40% of their total sprout crop. After harvesting and grading this resulted in a 50–60% losses due to quality. This equates to £200,000 gross profit loss, and means they would need a minimum farmgate return of £600 per tonne across the whole sprout harvest campaign to ensure any return to the business. This is compared to average £300/350 per tonne. They mention if it does not reach this value it is likely that they, like many others, go out of business.

LIVESTOCK IMPACTS—BEDDING, FODDER AND YIELD

Silage and hay making have been badly affected, with little or no hay made during July, and silage quality affected through both wet conditions, waterlogging and flooding. Contractors are concerned that they won’t cope when the dry weather does come. Already there is talk of a shortage of straw for winter bedding and feed. And with the cost of cereals on the up, producers are beginning to be worried.

Cattle have been housed during the wet conditions and flooding and winter stocks of feed already being eaten into. Some report reduced condition and fertility because of poor pasture growth and poaching as well as poor quality silage. This results in higher feed bills as greater quantities of fodder and concentrates are needed to replace this lack of quality. There are also reports of difficulties in traveling on the land and collecting straw. Reports from the end of July highlight that grassland is badly affected and hay is costing anything up to £10 for a small bale.

A dairy farm described the situation as dire, worst in 30 years of dairying. Their normal dry farm was a complete swamp, and even with a good track system to the grazing fields they believed they were causing serious damage to the soil structure. Their cows are already eating their way through first cut silage and the surfeit of water seems to be preventing grass growth. The second cut silage is delayed and forage quality as well as quantity will be poor this coming winter. They are also feeding more concentrate feed and achieving less milk per cow than in a normal year. Another farm indicates his yields are down by 250 litres per day.
OTHER IMPACTS ON CROP QUALITY AND YIELDS

The highest proportion of cereal crops lodged (fallen over flat) is north Lincolnshire and the north west of England. Lodging will hit quality more than yield, and some fields will have been planted to milling wheat or malting barley and quality may well be affected for those markets.

DELAYS TO PLANTING AND HARVESTING OPERATIONS

Vegetable growers have just been able to resume planting programmes after a long, disrupted period where successions have gone out the window. The whole season is really upside-down and the ramifications on supply and price will be felt for sometime to come. Those crops planted before the wet weather are all going to suffer in yield terms with green and white brassicas badly affected. Delays in planting has meant that effects may be felt into the spring with over-wintered crops.

Severe soil water-logging is preventing succession planting of autumn and winter brassicas; one grower reports that upwards of 15% of his autumn cropping is still unplanted. Crops that are in the ground are turning all the colours and not growing. Harvesting was constantly interrupted by heavy rain and travelling on water-logged soils is leading to soil structural damage. Growers report that supermarket programmes are running short on a wide range of product with some gaps filled by imported vegetables some from as far a-field as California.

The daffodil bulb harvest is proceeding slowly and is behind schedule. Some growers are having difficulties with waterlogged soils, taking longer and using more fuel to harvest their crops. Drying is also taking much longer and is more expensive and labour costs have risen as more manpower is needed.

OTHER IMPACTS

We are aware of costs to farmers of the clean up and repair of damage after the floodwaters have receded. One farmer in Derbyshire describes his farm as filthy with all the silt carried down with the floodwaters. Dry stone walls are down and will need repair as will his fencing. There is considerable debris in hedges, fences and dry stone walls and he is very concerned about the costs of disposal of this waste under the Agricultural Waste Regulations despite the waste not coming from operations on his farm.

NFU

Memorandum submitted by Natural England (FL 102)

EXECUTIVE SUMMARY

1. Increasing frequency of severe rainfall events and rising sea levels due to climate change, mean that we have to adapt our approach to flood defence. Traditional methods—building concrete and earth embankments—may no longer be adequate or sustainable.

2. Natural England’s view is that multi-objective schemes at the level of catchments, estuaries and coastal cells, which work with—rather than against—natural processes, should be more widely implemented through the Environment Agency’s flood-risk management programme. Integrated schemes, which take account of catchment functioning, bring added benefits to biodiversity, landscape and amenity, pollution reduction and carbon storage.

3. River restoration, floodplain storage, blocking of moor grips and re-alignment of defences are key elements of a catchment approach. Natural England is participating in pilot projects on these separate elements. Appropriate land management and drainage systems are important in reducing run-off and soil erosion.

4. Catchment measures are unlikely to prevent the sort of unprecedented floods that have occurred recently (1 in 1,000 year events), though they should reduce their intensity and impact. In these circumstances, adaptation becomes important. The flood management capital programme should include funding for adaptation measures (eg as well as moving assets, such as water-treatment plants and vulnerable dwellings, out of areas of high flood risk). Planning control needs to be more robust in refusing inappropriate new build in these areas (in accordance with Planning Policy Statement 25).

5. Natural England fully supports the Government’s policy, as expressed in its response to Making Space for Water (2005), to pursue a more strategic approach, and move to a wider portfolio of responses to flood risk—with greater use of rural land-use solutions, such as creation of wetlands and washlands, coastal realignment, river-corridor widening and river restoration.
6. Shoreline Management Planning (SMP) was formally introduced in 1995 and Catchment Flood Management Planning (CFMP) in 2002, but we are disappointed that there has been very little action on the ground in terms of integrated flood management schemes. Managed re-alignment of sea defences in the Humber Estuary, completed in 2006, is the only example of a strategic-scale flood management scheme. We explore the reasons for inaction on sustainable approaches and propose the following action:

6.1 Deadlines should be set for implementation of integrated schemes identified in SMPs and CFMPs, and of the policy to withdraw maintenance of uneconomic defences announced in 2004;

6.2 A significant proportion of the EA’s flood-risk management budget should be earmarked for “sustainable” schemes; and

6.3 Projects under Defra’s Making Space for Water should be prioritised, and those informing “integrated schemes” should be completed and put into practice within the next year.

INTRODUCTION

7. Natural England is a statutory body created in 2006 under the Natural Environment and Rural Communities Act by bringing together English Nature and parts of the Rural Development Service and the Countryside Agency. Natural England has been charged with the responsibility to ensure that England’s unique natural environment, including its flora, fauna, land and seascapes, geology and soils are protected and improved. Natural England’s purpose, as outlined in the Act, is to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.

IMPACTS OF CLIMATE CHANGE AND INTENSIVE LAND USE

8. More intensive rainfall at different times of the year, including the summer, is leading to flash flooding. Rainfall runs off drained upper catchments, with soils compacted by intensive stocking of sheep, and removes topsoil from the ploughed soils of river valleys. The soil ends up as silt in streams, rivers and lakes, reducing their biodiversity and water-conveyancing capacity. Run off follows drainage systems through farmed fields, along tracks and roads—normally discharging into streams and rivers. In urban areas, water runs off concrete and paved surfaces, and can overload drainage systems.

9. At the coast, sea-level rise is exacerbated by melting of ice caps and glaciers, caused by global warming. Intertidal habitats, such as saltmarsh which can absorb wave action, are squeezed in front of sea-defences. In Essex alone, 50 hectares of saltmarsh are lost to coastal squeeze every year.

IMPACTS OF FLOODING ON THE NATURAL ENVIRONMENT

10. In Natural England’s view, undue emphasis has been placed on possible harmful effects of flooding on the natural environment, often to justify building new or higher flood-defence structures, which are likely to be damaging to the natural functioning of ecosystems. Some habitats and wildlife have suffered as a result of the recent summer floods (e.g. the hay meadows in the valley of the Yorkshire Derwent), but this is not due to inadequate flood defences—rather to the habitats having adapted to an embanked river and a system of floodplain drainage channels, with some winter flooding.

11. By their very nature, floodplains evolved to absorb overflow from river channels. Before they were drained for agriculture and urban areas, they were habitats for a rich variety of wetland wildlife. In England, only a few areas of floodplain habitat remain, mostly in nature reserves. Wetland creation projects, such as the Great Fen in Cambridgeshire, are seeking to utilise flood waters to re-wet agricultural land.

A CASE FOR DEVELOPING MORE SUSTAINABLE STRATEGIES

12. Natural England believes there is a strong case for strategic approaches (at catchment, estuary or coastal-cell level) and integrated flood-risk management schemes that work with natural processes, rather than sole reliance on traditional concrete or earth embankments. In the face of climate change, we advocate adaptation—recognising that locating housing and infrastructure in high flood-risk areas is increasingly unsustainable. The Environment Agency website states “the best way to reduce the risk of flood is to focus on ways that work with nature, not against it, such as constructing flood barriers”—we agree.

13. Land uses and management practices that are “flood friendly” are usually also beneficial to soil conservation, landscape, biodiversity, woodland management, pollution reduction and carbon storage. They are not a replacement for, but a complement to flood defences protecting particular assets.
KEY ELEMENTS OF AN INTEGRATED APPROACH

14. River restoration: removal of in-channel structures has multiple benefits. A current example is the River Wensum, a European Special Area of Conservation (SAC) in Norfolk, where the removal or lowering of three redundant mill weirs is seen as the most cost-effective solution to flooding problems in the upstream villages. This is also a key step in a river restoration plan for the River Wensum SAC. 67% of which is backed up from such structures. This is the first whole-river restoration strategy in England. It is led by Natural England, in partnership with the Environment Agency and the Norfolk Rivers IDB. It has synergies not only with the flood-management strategy, but also with the Fisheries Action Plan and the Wensum Catchment Sensitive Farming (CSF) project.

15. Morphological impacts are recognised in the Water Framework Directive, and a programme of physical restoration on 18 river SACs and SSSIs in England has been costed (at £39 million) in the WFD preliminary Cost-Effectiveness Analysis conducted by Defra.

16. Floodplain storage: re-creation of wetlands can, if properly designed, provide increased capacity at times of peak floods and help protect urban areas. The benefits of floodplain washlands and the requirements for their design were reviewed in English Nature’s research report no 598: Integrated washland management for flood defence and biodiversity (2004). As wildlife habitat, washlands need to be wet in winter (for wintering wildfowl) and relatively dry in spring and summer (for breeding waders). To provide maximum capacity for flood storage, they should ideally be fairly dry at all times, and any flood water should be routed back into the river as soon as possible. Therefore, the design to meet both functions needs to be deep—or shallow but more extensive. Although there are a few washland creation projects (eg Beckingham Marshes at Gainsborough on the River Trent), it has proved difficult to quantify their benefits in the present flood-risk scheme appraisal system.

17. Natural England is a partner in the 50-year Wetland Vision project, which is seeking to recreate floodplain wetland habitats—not just washlands—in suitable locations. An example is the Great Fen project, intended to link two National Nature Reserves (Holme Fen and Woodwalton Fen) south of Peterborough. This will also contribute to the new UK Biodiversity Action Plan (BAP) target to create 8 landscape-scale wetland complexes. The intention is also that the Great Fen should play a role in storing flood water.

18. Blocking of moor grips in upland catchments: drainage of upland blanket bog was facilitated by Government grants between the 1950s and 1980s and exacerbated by moor-burning. This is having a damaging effect on the condition of designated conservation sites and has resulted in a degraded landscape. A recent study in the North Pennines AONB has identified 9,300 km of damaging grips, and a total cost of £10 million to restore the blanket bog affected. It is estimated that there are over 30,000 km of grips above the 200-metre contour in England. A programme of grip-blocking would deliver multiple benefits by helping to restore biodiversity, reduce run-off, improve raw water quality (and thereby reduce the cost of treatment), emphasise the role of land managers as carbon managers and contribute to the Defra “peat project”, being developed as a key part of the Soil Strategy for England.

19. Rainfall runs off quickly through the moor grips and eroded gullies. Sediment is transported into rivers and lakes. Streams and rivers can often be seen discoloured by the concentration of peat in the water. Studies in Upper Wharfedale by the Environment Agency and—as part of a Defra-led partnership—on the streams above Ripon by Natural England, have estimated up to 15% reduction in peak flood flows, by techniques of grip-blocking. Successful projects are being undertaken—in the Peak District by Moors for the Future, and in the Bowland Fells by United Utilities (in a partnership with Natural England, RSPB and the Environment Agency). Techniques of grip-blocking have improved, and there are some specialist contractors. The HLS stewardship option offers £3.40 per metre of grip blocked, but actual costs vary between £1 and £4.50 per metre, depending on the degree of erosion.

20. The effects of grip blocking on peak flood flows have not yet been demonstrated in large-scale experiments; these would entail flow meters on streams fed from blocked and unblocked grip systems in upland catchments, which is a very expensive monitoring programme—and flood peaks may not occur for another ten years or more. However, grip-blocking has multiple benefits and is worth pursuing as part of an integrated approach to catchment flood-risk management. In particular, upland restoration has the potential to enhance the capacity of the uplands as a major carbon store. We estimate that England’s peat uplands currently have the capacity to store 3 billion tonnes, and that restoration of upland peat bogs could save around 0.4 million tonnes of carbon per year equivalent to around 2% of the UK’s Kyoto commitment.

21. Managed re-alignment at the coast: sea-level rise means that many sea defences (particularly in the south and east, where much land was originally reclaimed from the sea) are unsustainable. This is a viable sea-defence reason for implementing managed re-alignment schemes, which would also achieve the delivery of key biodiversity targets. There is a good example of set back as an integral part of the Environment Agency’s flood-risk management strategy for the Humber Estuary (eg Alkborough, Paull Holme Strays).

22. Managed re-alignment has been undertaken elsewhere for other reasons (eg at Freiston Shore RSPB reserve on the Wash in 2002 to help meet the Defra high-level target requirement for EA Flood Risk Management to create 200 ha a year of BAP priority habitat, at least half of which should be saltmarsh). The achievement to date has been approximately 50 ha a year of saltmarsh creation (100 ha a year is lost to
“coastal squeeze”). Set back of defences has also been undertaken at Wallasea Island in Essex, as compensation under the EC Habitats Directive for habitat excluded from protection at Lappel Bank in the Medway.

**Adaptation**

23. Climate change is posing an increasing challenge to our flood defences. As well as adopting more sustainable land management and a catchment-approach, we also need to adapt to increasing sea-levels and storminess by locating housing and infrastructure outside areas of high flood risk. This will require action by local authorities, public utilities, the Highways Agency and others responsible for authorising or undertaking infrastructure development. The principles are set out in Planning Policy Statement 25: Development in Flood-risk Areas, revised in December 2006. Defra is leading a project under Making Space for Water to develop an “adaptation toolkit”.

**Government Policy**

24. Defra has been moving towards a more sustainable flood-management policy over the last two decades. Firstly, the focus of flood defence schemes has moved from agricultural land drainage—which dominated from the 1950s to 1980s—to the protection of lives, property and infrastructure, and a greater emphasis was placed on flood warning. Defra introduced strategic approaches through Shoreline Management Plans (1995) and Catchment Flood Management Plans (2002). In March 2005, they published Taking forward a new Government Strategy for flood and coastal erosion risk management in England, as a response to the consultation on Making Space for Water. The response announced the intention to pursue a more strategic approach, and move to a wider portfolio of responses to flood risk. These would include greater use of rural land-use solutions, such as creation of wetlands and washlands, coastal realignment, river corridor widening and river restoration. Natural England fully supports this approach to flood-risk management.

25. Since then, Defra has led a programme of 25 projects under the Making Space for Water banner and initiated an Innovation Fund of £1.5 million over three years to stimulate sustainable approaches. The first six projects to be supported by the Fund were announced in January 2007. They included “development of an educational tool for shoreline management”, “farming floodplains for the future in Staffordshire”, “restoring floodplain woodland for flood alleviation” by the Forestry Commission and a study on “ways of integrating ecology and sustainable flood-risk management into the planning for the Thames Gateway”. As a separate initiative, Natural England is leading a project with the Association of Drainage Authorities to develop Biodiversity Guidelines for Internal Drainage Boards.

**From Policy to Implementation—Slow Progress**

26. Despite the policy initiatives outlined above, the integration of strategic and sustainable approaches into the flood-risk management programme is barely in evidence. To most appearances, it is “business as usual”. Defra perceived that there were barriers to—and lack of incentives for—implementation of the new policy. They made an assessment of the reasons through a project under Making Space for Water. Natural England has contributed to this project. We suggest some possible reasons why there have not been more integrated schemes:

26.1 Schemes need to be devised and proposed. In the case of the Environment Agency, this involves identifying a flood-risk problem, commissioning consultants to develop a solution, and determining priorities for funding through a Regional Flood Defence Committee (which has an inbuilt majority of local authority members). At none of these stages is there any incentive to propose catchment solutions, and very few consultants or flood-defence engineers would feel confident about proposing land management solutions, particularly as they would need to involve other partners at an early stage.

26.2 Hard defences are a tried-and-tested protection against flooding (if built high enough), while catchment solutions are new territory for the flood-defence engineer. Results are likely to be longer-term and may not protect property from the next flood, if that occurs before new processes have had a chance to take effect. Nevertheless, catchment solutions could be used as part of an integrated approach. Some re-training may be desirable, aided by demonstration projects.

26.3 At the coast, set-back of sea defences has been shown to be a viable flood-management option. Although several SMPs include managed re-alignment schemes, there is an apparent reluctance to implement them, because of perceived opposition from local interests. The continued maintenance by the Environment Agency of uneconomic sea walls in Essex, despite the Government’s policy announced in April 2004, is a case in point. The Environment Agency recently produced guidelines for withdrawal of maintenance from flood defences—so we hope that action is imminent. Funds saved can be redirected to sustainable approaches.
26.4 The Defra cost-benefit appraisal scheme for capital flood-management schemes—and the way in which the assessment of a scheme is expected to be put together by the Environment Agency—appear to militate against inclusion of sustainable solutions and adaptation to climate change. The appraisal methodology is currently under review. It may become easier to develop an economic case for integrated schemes in future.

26.5 Major changes in the administration and supervision of the flood management capital programme took place soon after the announcement of the Making Space for Water policy. In 2006, Defra started to give the Environment Agency a block grant for flood-risk management (£436 million in 2007–08), though it can direct it to spend some of this on particular types of work and still approves schemes over £50 million (one or two a year). Before this, Defra Regional Engineers approved schemes and could reject those that did not include environmental and social elements. As part of downsizing of Defra Flood Management Division, the Regional Offices have been closed. It is imperative that the same strategic overview (economic, technical and environmental) is exercised consistently in all Regions of the Environment Agency.

26.6 There are 25 projects under Making Space for Water. Several of them are crucial to the implementation of sustainable approaches to flood-risk management, including adaptation to climate change. The number of Defra staff working on Making Space for Water has been gradually reduced—and key staff members have recently been seconded to working on the Government and EFRACOM inquiries into the handling of the 2007 floods. This, combined with all the other pressures on the funding available to the Environment Agency to play its part in the programme, argues for prioritising those projects which will help to deliver integrated schemes and sustainable solutions.

Recommendations

27. In the light of the slow progress in implementing a strategic and sustainable approach to flood-risk management, Natural England makes the following recommendations:

27.1 Target deadlines should be set for implementation of integrated schemes identified in SMPs and CFMPs, and of the policy to withdraw maintenance of uneconomic defences announced in 2004;

27.2 A significant proportion of the EA’s flood-risk management budget should be earmarked for “sustainable” schemes; and

27.3 The 25 projects under Making Space for Water should be prioritised, and those informing “integrated schemes” should be completed and put into practice within the next 12 months.

Natural England
September 2007

Witnesses: Mr Paul Temple, Vice-President, Mr Andrew Clark, Head of Policy Services, and Mrs Anna Hall, Water Adviser, National Farmers’ Union; Mr Andrew Wood, Executive Director, and Mr James Marsden, Director of Policy, Natural England, gave evidence.

Q796 Chairman: Good afternoon, ladies and gentlemen. Can I welcome everybody here to this on the record evidence session of the Environment, Food and Rural Affairs Select Committee on its inquiry into flooding. My name is Michael Jack, I chair the Committee. I am joined by other colleagues of the Committee on both sides of me and you can see their names in front of you. Can I just deal with one rather important housekeeping matter before we go into our evidence sessions? Could I ask everybody who has a mobile phone—I see one or two are already anticipating—if you would be kind enough to turn them off? It would be very much appreciated. Can I say at the outset that the Committee has been very warmly welcomed in Lincoln. We had a very good tour this morning looking at the City’s flood defences, so we have had a look at the situation in practice and this afternoon we are going to take evidence. This particular inquiry has brought forward an unprecedented number of contributions, not just from professional organisations like the National Farmers’ Union and Natural England, from whom we are going to hear in a moment, but from members of the public and those who represent them, either at local council level or in the House of Commons. In addition, for those of you who listen to Radio 4 you may have heard last week’s You and Yours programme on Tuesday was dedicated to the inquiry that we are undertaking and, again, that triggered further contributions from the public for which we are very grateful indeed. A number of those people who have been kind enough to give us evidence are going to form the second part of our inquiry this afternoon. We are under quite a lot of time pressure so we will try and be brief with our questions and I hope those who reply will be equally succinct with their answers, but I do not want to turn off any really good thoughts that people may have. Finally, can I thank in advance Sue Few, the lady who is sitting here. She has the difficult task of recording all the words that we say because what we do say this afternoon by way of our formal evidence session will form a part of the inquiry. These words will be published in due course when the Committee publishes its conclusions and its evidence. This is a proper on the record
parliamentary occasion. For the record, let us move into our evidence session. I would like to formally welcome from the National Farmers’ Union, Mr Paul Temple, their Vice-President, Mr Andrew Clark, the Head of Policy Services, and Mrs Anna Hall, their Water Policy Adviser, and from Natural England, Mr Andrew Wood, their Executive Director, and Mr James Marsden, their Director of Policy. We are going to start off with some specific questions targeted to each of your organisations and then colleagues from the Committee will put other questions to you. Can we start with the National Farmers’ Union. I think it would be helpful, given the pictures of flooded farmland from all over the country, in particular with reference to last summer’s flooding, if you could give us a brief synopsis as to how those floods actually impacted upon agriculture in general and, more specifically, which parts of the country were most affected. Sector-by-sector, was it livestock or arable that took the brunt, or was it spread evenly across those parts of agriculture?

Mr Temple: Thank you very much. It is not so much a pleasure to be here but we are really pleased to be able to give evidence. Thank you for introducing my colleagues but there are also several farmer members behind me who have been severely affected by the effects of this flooding. There is no definitive pattern or no definitive sector. The flooding occurred in more than one part of the country. It is difficult to define exactly what the details are, but I will give you one specific example that has been absolutely verified. The East Riding of Yorkshire Council has compiled a map of flooded land and it was 25,500 acres. At first sight it was difficult to distinguish where this flooding was because crops were on the ground. The estimated loss to agriculture in this area that has been verified is £18 million. That is a huge and considerable loss. For many farmers it was the individual impact that was most severe. Some of them lost complete crops in terms of potatoes and vegetables and these were uninsured losses, you cannot insure these crops. Cereal crops were also lost. We saw grassland badly affected, so we saw the loss of winter feed, which has been very expensive to replace, and we also saw farmers struggling to ensure they did not lose stock because of the flooding. These are some of the really severe effects that occurred. For different reasons in different parts of the country, and we can maybe go into the details as to why it happened, by and large all of them have real frustration at the process. They do not expect to be able to carry on the good work that you have done for nature conservation that the flood took place in the summer, but for the agricultural community this was the worst time that a flood could have taken place and probably the least likely time for flooding to take place. Can you make any assessment of how likely this is to take place in the future? If this had taken place in the winter then the losses to agriculture would have been considerably less, would they not?

Mr Williams: Perhaps I could say to Mr Temple that we wish you well in your election for the NFU and to carry on the good work that you have done for the Union.

Chairman: Are you voting for him?

Mr Williams: I do not think I have a vote in that election. Natural England said that it was lucky for nature conservation that the flood took place in the summer, but for the agricultural community this was the worst time that a flood could have taken place and probably the least likely time for flooding to take place. Could you make any assessment of how likely this is to take place in the future? If this had taken place in the winter then the losses to agriculture would have been considerably less, would they not?
Mr Temple: Absolutely, and that is a key point. A lot of this should be about looking forward and could this be a regular occurrence. If we are going to take climate change seriously the patterns of rainfall that are falling seem to be larger and are unpredictable. It really does call out in many ways for the need to enhance the level and ability to drain land and move water, understand the issue and make sure we try to prevent the worst effects. For many of the farmers behind me it was a complete and catastrophic crop loss. The public is feeling that now in the sense that vegetable prices are higher than they would have been otherwise. We have to be aware globally that soils are under greater pressure than ever before and we have to be aware that the resource we have in this country is more valuable. Forty per cent of this country’s vegetables are produced from the Fens. Fifty per cent of our most productive soils are on floodplains. It is really relevant that we look at this as something that might occur more frequently and upgrade and take seriously some of the things that have come out of this, learn the lessons from this year to try and avoid the worst of the effects and manage the water more effectively.

Q800 Paddy Tipping: I wanted to follow up your written evidence in which you comment that the Environment Agency’s flood warning system was inadequate. I just wonder whether you can spell that out a little bit more for us and then go on to say how you think it could be improved.

Mrs Hall: We reported that a few members had actually received late flood warnings or did not receive flood warnings at all. One particular member did not receive a flood warning and then received a warning the following day saying the warning had been repealed, but he did not receive the warning in the first place. There is a definite need for the Environment Agency to review their flood warning system and identify where those problems have been caused. We have been shown individual cases and definitely feel there needs to be a review. However, we do think there needs to be some kind of better modelling. If we are having these more extreme events then we need to be able to work out where the problems are going to be and identify where the pinch points are.

Mr Temple: Can I just add a point to this. One of the things that come out of it is not the warning of a flooding but the warning that many of our farmer members have been given to say that the water levels are running too high. We have seen a case in point literally this last month when, yet again, some of these farmers have been flooded. It is how we look at the risk before we get to a level of warning, how we monitor the level of rain in these drains and in the rivers through winter and at what levels should they be so that we can deal with the worst cases.

Q801 Paddy Tipping: So you need time to move your stock and move your equipment. You have already raised your concerns with the Environment Agency and their Chief Executive said to us that proportionately very few farmers were on the flood warning system. Why is that? Is it because they think it is inadequate? What is the reason?

Mrs Hall: As far as I understand it, the figures they quoted were not just for farmers, it was all flood warnings. There might be many people who did not receive flood warnings who were not farmers and not associated with farms. However, there might be large numbers of farmers who do not actually need flood warnings. If you have got potatoes in the floodplain and you receive a warning, what can you do? I would like to think that large proportions of people who have got livestock in the floodplain are still getting their warnings. It is getting the messages to those people that is key. We are quite keen to work with the Environment Agency to see if we can identify triggers for farmers that might be specific so that we can get those warnings out in good time.

Mr Clark: What we are concerned about, and I suspect any member of the public is concerned about, is we are in real danger of warning fatigue. If you look at the weather forecast nowadays there is always a weather warning and the same issues must apply to flooding as well. What we are looking for is accurate flood warnings which are suited to farmers as opposed to domestic properties or business properties where it is pretty clear you can model where the floodwater is going to come from. We are looking at a much more unpredictable system and I think a lot of work has to go into that to ensure we have got a flood warning system that works in rural areas of farmland in a more effective way than it does at the moment.

Q802 Paddy Tipping: So you are advocating for more local forecasting of the weather?

Mr Clark: If that is possible I think it is absolutely critical in the future. It is not enough to simply know there is a big weather front coming in, you have to know where you are already in terms of flood rates.

Q803 David Lepper: We have been finding out about the Lincoln Washlands scheme this morning and there has been increasing emphasis on working with natural processes to deal with flooding. Natural England, can I turn to you first. You have been asked by Sir Michael Pitt in his interim report to work with the Environment Agency and Defra on processes like this. Could I ask what do you believe are the most effective land management or collateral process methods to reduce that risk?

Mr Wood: We would like to see the nation take a much more holistic whole system approach to all of this. One of the key components of that is to start in the uplands and to restore our hilly areas as functioning ecosystems that could absorb more rain, slow the rate of flow into rivers, slow the rate of flow downstream and, therefore, give some of the early warning that our colleagues were asking for but minimise the impact. That is just one small step. Let me illustrate that. In the 1970s and 1980s the uplands were very heavily drained. Land managers put in things called grips, which are large trenches, to run water off the uplands. If you block those grips the

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1 Note by witness: Having checked the statistics this sentence should read “Fifty per cent of our most productive soils are below the 5 metre contour.”
water does not run off, it sinks down into the soil, you get the re-creation of peat bog, you get benefits in terms of carbon capture and storage, which would be good too, and the low range of cost of doing that across the uplands is of the order of £30 million. I accept that there is another end to the range which is rather greater, but £30 million is five per cent of the flood risk management budget, so there are things you can do cost-effectively. Further down the system we have land managers still indulging in comparatively poor land management practice that results in ploughing right up to the edge of watercourses and so on, which simply minimises the benefits of letting the system work naturally and adds to the risk of what happens when floods occur. Finally, the washlands you have been looking at this morning are a good example of an intervention that can be made to work really well and at its best can provide multiple benefits for the environment as well as flood management. Wetland re-creation is another way to go with that. We need a package of measures here.

Q804 Chairman: Just before we move on to that, one piece of evidence that we had which rather surprised me was somebody was suggesting, for example, in moorland areas, areas like the terrain that surrounds the City of Sheffield, that because sheep have become heavier and, therefore, are contributing to higher rates of compaction, this has degraded the ability of a moorland landscape to actually soak up water. I must admit I found that quite a difficult argument to accept because previously we had been hearing arguments about the difficulties of light lambs. Nonetheless, it is amazing what evidence you do get. I think you did raise the question that in areas like the moorland terrain surrounding a major city there are things that in all seriousness should be done to improve the way that landscape like that can absorb water because it has been argued that part of the reason Sheffield flooded—Sheffield was deemed to be a low risk city—was that the land above it was now absolutely sodden, could not absorb any more water and, therefore, the runoff rate was much faster. Is that something you have looked at?

Mr Wood: Not in the specifics of heavy sheep.

Q805 Chairman: No Weightwatchers for sheep, but what about the landscape?

Mr Wood: Soil compaction is a real problem, not only in the uplands. It might be helpful if Mr Marsden said something here.

Mr Marsden: In the area you are talking about in the Pennine country, working with the water companies, we are currently restoring those blanket peats, blocking the grips and restoring the eroded peat hags. To cover what Andrew suggested in answer to the last question also, 15 per cent is the estimate in attenuation that would reduce the flow of water off the hill which partly answers the question you are asking now. If we did block all those grips we think that there would be a 15 per cent reduction in the peat flow off there. Restoring the sponginess, the function of blanket peat is a good thing, not a bad thing. If there are too many sheep you lose the vegetation which, combined with the legacy of historic atmospheric depositioning, creates the problem that we are now addressing through this rather expensive restoration. It costs in the region of £3,000 to £3,500 per hectare to restore just the eroded peat. More sheep, heavier sheep, continues to erode the peat. We are restoring Geojute and that sort of thing.

Q806 Chairman: You, as an organisation, are under tremendous financial pressure from Defra.

Mr Marsden: Yes.

Q807 Chairman: What you have described is very important work. Have you got the resource to carry it on from your standpoint?

Mr Wood: No, we have not at the sort of scale that it needs to be done at.

Q808 Chairman: So what is the deficit?

Mr Wood: I do not think I would be tempted to calculate that.

Q809 Chairman: Can I not tempt you? We would love to know.

Mr Wood: You can tempt me to what we understand to currently be the impact on our grant-in-aid for next year, which is about £12.5 million, although we do not have the final settlement from the Department yet. We think that the whole programme of the restoration of natural processes will inevitably be an expensive one and, as an organisation, we do not have either the resources or in some ways the remit to attempt that, but if agencies were to be mandated to work together the resources we would have collectively would be more than enough to do this properly at little risk to the maintenance of more conventional hard flood defences where we need them for the protection of people.

Mr Marsden: Chairman, if I could just add one other public benefit that would accrue. The current runoff with the erosion of these uplands is actually adding to the costs to the water consumer because the water companies are having to spend vast amounts of money stripping peat colouration and other things out of the water at the primary treatment works, which is going to be a cost as we get into the next price review, PRO9, which we are currently in the foothills of. Bringing together multiple objectives and integrating them in ways in which we can tackle this problem can deliver public benefits and reduce costs and that is a key message from our perspective.

Q810 David Lepper: Can I return to the NFU, and you are straining to comment, Mr Temple. I note the NFU have said that: “farmers are prepared to play their full part in reducing the flood risk”.2 You said that in your evidence to us. What is that “full part” that you think farmers can play? Can they play a bigger part than they are doing at the moment and, if that is the case, what sort of encouragement do farmers need to play that bigger part?

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Mr Temple: The farmers we have here today all want to play a bigger part because they do not want to see themselves put in the same situation. If you take the issue of the washlands, we think it is a really important part of water management. It is critical that you take this down to the local level. You cannot stamp this from the top and say, ‘That’s the way it should be carried out in the whole of the country’, each local area has a different solution, and farmers are more than willing to play their part in that. It is all about organising and planning. Andrew defined the fact that there are uplands and lowlands, and that is a useful distinction to make because there is a distinction between those two areas and how you manage that water. Lowlands have a much higher intrinsic value to this country in terms of their productivity and I think that has to be recognised. Farmers will play their part if the value of what they produce is recognised. They recognise that increasingly they might have a more important role in protecting urban areas. In many ways it is the urban footprint that is creating some of these problems, but they recognise that they can be part of the solution provided they are involved in this process rather than just used and provided they are compensated properly. I do just refute one or two examples that have been given by Natural England on the ploughing. Farmers do not irresponsibly plough up against watercourses. By the deed of cross-compliance we can no longer plough near watercourses. We have half of our land in environmental schemes that could be a fundamental part of water management. They take their responsibility really seriously. No farmer allows soil to become compacted necessarily because it is a fundamental part of good soil management to prevent compaction.

Mr Clark: I suspected the fat sheep scenario would be played out and I have just been looking at some Defra stats to check that out. There are five million fewer sheep now than there were ten years ago and we have got the same sheep population in England as we had in 1983. I suspect the argument that having heavier sheep is not a viable scenario. We very much feel that the introduction of environmental stewardship, which has seen an absolute sea change in the amount of commitment that farmers have to participate in environmental schemes since March 2005, will bring real benefits backed by cross-compliance, such as making sure that you do not plough up against trees and field boundaries, you get real value on farmland from keeping buffer strips. All those are things which have happened, and are happening now increasingly, across all the farmland of England at a scale which must have an impact not just for biodiversity but for natural resources. My concern, however, is that there is a collision between rural and urban, and many of the questions you have put to us have been saying what can we do and I know that we are a farmers’ union and you will ask us what we are doing in rural areas, but as farmers and members of the rural communities we are concerned about what happens in urban areas because we feel it is urban areas which are also contributing to the floods we have seen. We would like to see urban areas also becoming more permeable and concerned about holding up floods, holding water in those areas and letting it into the watercourses gently in the same way that we too are being encouraged to do. It is a shared situation, flooding cannot be divided up into easy zones of urban and rural.

Mr Marsden: Could I just come back briefly on the stocking rate issue. I do need to be quite clear. If you are to restore upland peat in the way that we have described the stocking rate has to be zero. We have paid through high level stewardship to remove stock completely from the areas that we are restoring and that is what is needed on the rest of it otherwise you cannot re-vegetate the moorland. In instances capital works through the utilities are being used to provide other monitoring facilities as well.

Q811 David Lepper: Mr Temple, you talked about playing a full part in being involved. There are two particular schemes, and I hope it is all right if I use their code letters, HA6 and HA7, that Defra have under way at the moment. Could you tell us something about the involvement of your members in those schemes.

Mrs Hall: This is in relation to the land management project run by the Environment Agency and also linking to the Ripon Multi-objective Project. We have close links to both of these projects. In terms of actually on the ground, our members have been involved in the Ripon project and a lot of good, positive messages are coming out of these. There are some things that I want to pick up on. It is about putting research into practice and very much about now we have done a lot of the background work we need to get on and do it. We need to do things at a catchment scale to find out what works. There seems to be a bit of a science gap. We can understand local events and local flooding, but finding out what causes catchment scale flooding and how we can reduce catchment scale flooding is a completely different question. We need to try and put that into practice. We cannot have short-term funding, these are long-term projects that we need to look towards. Communication is also key, communication with the farming community and working with the farming community to come up with a community-based solution. The Parrett Catchment Project, for example, is a good case in point. That is a community working together with information disseminated through schools and farmers feel very much a part of the solution. Also, policy fluctuations can certainly undermine any projects in place, so we need a strong steer from Government and a strong policy drive to get these catchment-type projects up and running.

Mr Temple: Just to give you an example of some of the degree of engagement in this. It is about tapping into the local farming experience and the Environment Agency staff, many of whom do feel very frustrated that they do not feel listened to further up the chain. There has been a particular element of dredging as a result of the flooding last summer at Hedon Haven. A simple act of dredging
has managed to reduce the water level by a metre and with this last month’s rain it successfully prevented 180 houses that were badly flooded in the summer from flooding again this year. That is how it should be working. It is on the ground in the individual circumstances and each circumstance will be slightly different.

Q812 David Lepper: Before we leave that question of your involvement in schemes, and I did ask about encouragement as well and you have told us about that, in schemes, for instance, like the washlands that we saw this morning, do you feel, representing the NFU, that the current compensation system is fair for farmers taking part in that type of scheme?

Mr Temple: My colleagues might speak with regard to the individual scheme, but I think it comes down to the level and value of production that is on that land. Two years ago wheat at £60 a tonne would have been a reasonably easy thing to compensate, but wheat at £160 a tonne is a more difficult thing to compensate. Part of the question in this is where will that price be or the value of that land in five years’ time, and that is something we have got to look at.

Mrs Hall: As far as we understand, the current compensation for the washlands is negotiated with individual landowners, so it depends on the particular scheme and when the scheme came into play. We are in discussion with Defra at the moment about the valuation of agricultural land. The way that agricultural land is valued has for flood risk assessments and appraisals, simply the market value at that time of that land, and is discounted to take account of direct payments, so-called transfer payments. We are quite concerned about this because that is only the current market value, that does not take into account the need to produce food into the future and the strategic value of that land which is a finite resource. That is something we would like to be looked at further. There are also a number of planned washlands in this area that we are aware of in the Ancholme, Bain and also Lower Witham. These are schemes that were discussed ten years ago but, as far as we understand, they have simply been shelved. We were talking to farmers at lunchtime today who are quite keen for these schemes to get moving but, as far as we understand, funding is just not there. These are schemes that have been worked up and time and money has been spent on working these schemes up by the Environment Agency but they have not been put into practice.

Q813 David Lepper: Does that include a scheme for the Horncastle area?

Mrs Hall: Yes.

Q814 David Lepper: Finally, could I turn to Natural England again. Making Space for Water initiated, I think, some 25 projects. Is sufficient progress being made on those projects? Could the Government be doing more to ensure that progress is made?

Mr Marsden: Chairman, I hope we made some clear recommendations on that score in our written evidence and we stand firmly by that. We are involved in those but we have identified some specific barriers to progress which we would urge you to look at again in our written evidence. Those barriers remain.

Q815 Chairman: Sometimes we just love to hear it all over again.

Mr Marsden: If you would like me to repeat it, I have it here.

Q816 Chairman: As a point of force, the greater accuracy is in taking part.

Mr Marsden: Firstly, the way in which schemes are proposed, brought forward, we feel that process inhibits looking at some of the more novel solutions we are talking about today, and we agree with our colleagues in the NFU that we too would like to see more washlands, but the current process by which schemes are brought forward inhibits that. The second point is the easy option is to go for hard defences. That is what the industry, the engineers, are familiar with, that is what they reach for their slide rule for. In many ways they do not know how to quantify it. We have heard there is a science gap, the potential effect of catchment scale solutions, and we desperately need to plug that gap. The third point is the cost-benefit system mitigates against these system solutions. We fear that with the loss of the former regional MAFF engineers there may be a potential for lack of consistency of approach at the regional level that may also need looking at.

Q817 Paddy Tipping: I just wanted to ask you about the stewardship that Mr Clark mentioned. Does stewardship have a role in promoting a natural solution to these problems that you are talking about?

Mr Marsden: Yes, it does. The real benefit could be if you combine flood risk management funding which, as Anna has said, can only pay for so much, with some agri-environment scheme HLS funding. If you put those two sources of funding together I can give you a very graphic example of that: create a new washland, the FRM money would pay for it to be a winter storage area, add the agri-environment HLS funding and you will get breeding birds through the spring as well, but you will not be able to conserve the arable crops. In terms of total public benefit we would argue that is for the greater good.

Q818 Paddy Tipping: Are Defra looking at this at the moment?

Mr Wood: Yes, Chairman. Through the Stewardship Review they are looking at options. The bottom line here has to be that farmers across the country provide public benefit and where they are providing that they ought to be rewarded for that, but where they are engaged in business that is not our business. We need to draw that sort of distinction and we need to use agri-environment schemes more intelligently to get the maximum benefit from that and farmers can help us do that.

Mr Clark: I think there is, however, a real tension that we have detected between those who are advocating environmental stewardship for
biodiversity and those agencies who are saying entry level schemes should be more about resource protection. Environmental stewardship tries to ride level schemes should be more about resource stewardship. Do you think the farming community could be involved in such mutually helpful activities to protect other agricultural land by sacrificing a certain amount of land that is now in agricultural use?

**Mr Temple:** I am quite sure that farmers would.

When I visited a farmer who had two-thirds of his farm full of water, he said, “If it takes my farm to be sacrificed that is fine, as long as I am part of the plan and I am compensated for the loss at the end”. He had no problem with that. He recognised that an urban environment could be a more expensive loss in terms of houses and flooding but it is being part of a strategic plan. There is no point in him being sacrificed if some of the simple aspects of maintenance are not carried out because it is significantly cheaper to carry out continual planned maintenance to deal with the eventualities that we face than going for a knee-jerk reaction to put in possible flood defences which might seem a good idea at the time but if ever they are breached then we end up with catastrophic losses. You have got to have more of a holistic approach as to how this comes about.

**Q820 Paddy Tipping:** I wanted to follow that point up and it is a point you have made on a number of occasions. I represent an area with a large rural element and one of the things that people have been saying to me very strongly is that watercourses, ditches and dykes are not being maintained properly. In a sense that is what people say, but have you got any hard evidence to show that maintenance is being neglected?

**Mr Temple:** We have sheets of evidence from people behind us. We have pictorial evidence. Vegetation is a classic example: it takes five minutes to plant a tree and some of these trees and willows grow very quickly and, talking to farmers, they need trimming yearly otherwise they have a real risk of too high a vegetation level. Interestingly, on the entry level scheme two year-old hedge cuttings are now proving a real problem as they float and cause blockage. One member behind us has 25 bends in the river through his particular farm, it does not naturally clean the silt out. It always used to be cleaned out on a planned basis but when, as some of these farmers are finding, instead of being on a five year cycle it is 15 years you have got too big a job to tackle at once.
farming management and agri-environment management so we keep that balance right. It is finding a way through when we have got climate change and these events that are becoming more frequent.

Q826 Paddy Tipping: Another angle on this, Mr Wood, is the charge that is made that maintenance work is not taking place because of potential damage to wildlife, flora and fauna. Is there any truth in that?  
Mr Wood: The maintainers of waterways need to take a whole variety of considerations on board when they set out to do their job. Much of that would be a lot easier for them if they maintained the waterways in their natural state. The more concrete you pour, the more embankments you build, the more difficult it becomes to do that and, as I said before, the more you pass the problem on downstream. Yes, certainly, in some places, particularly where we have got European designations or SSSIs, then they have to have regard to those and their condition.

Q827 Mr Williams: One of the effects of flooding is that infrastructure is threatened, such as electricity substations and water supply facilities. In evidence, the NFU told us that water companies do not have a duty to provide water to non-domestic customers but we differ on that and we believe that water companies do have that duty under the emergency legislation. Obviously at a time of flood you have got a lot of water about, but livestock might not be receiving that water in a form that is appropriate to them. What evidence do you have that companies did not supply water to livestock farmers?  
Mr Clark: Our concern there related to Severn Trent Water Authority and the actions that we felt they should have taken to ensure that housed livestock which had been rescued from flooding in the Severn floodplain and also intensively housed livestock, poultry and pigs, in the Tewkesbury and Gloucester areas needed to receive water. When the mains were cut off we recognised that water needed to be provided to those units, however warning that was given to those farm businesses was insufficient to help them sort out the problem. Both ourselves and Severn Trent Water Authority had some frank discussions and hopefully we have both learned from that. Perhaps if the Committee has found out that they are responsible for that, that is very good, but we want to make sure that the managers in that sort of emergency situation are reminded of their responsibilities and I suspect that they probably will be and we will not have what was potentially a very significant animal welfare disaster on our hands.

Q828 Mr Williams: In practical terms, how do you think water companies should deliver water to rather remote units?  
Mr Clark: In that situation what we did was we arranged for milk tankers to be used as water bowers effectively to deliver water to the units. Our south-west region, based in Exeter worked 24 hours a day in that particular situation to source some water tankers and arranged for them to pick up the water from the local reservoir and supply water to the units that needed that water. That sort of emergency procedure needs to be something that we can pick down straight away in that sort of situation. Hopefully it will not happen again. It was a good indication of where flooding in rural areas can affect critical infrastructure which impacts not just on urban communities but rural communities as well.

Q829 Chairman: In our last couple of minutes can I just ask each organisation, starting with Natural England, what for you out of Sir Michael Pitt’s interim report was the most important conclusion he reached from your standpoint?  
Mr Marsden: Chairman, most definitely the recognition of the importance of exploring the options for working more closely with natural processes. It builds upon the conclusions of Making Space for Water in some exciting ways from our perspective and we need to move on from that to actually start delivering it at a catchment scale.

Q830 Chairman: Thank you. The NFU?  
Mr Clark: The Pitt Review was a useful first start but I think it was a bit cautious from a land management point of view. We feel that it very much focused on protecting urban communities and really has not grabbed properly the rural communities and, secondly, the need to recover from those floods and how affected they were, because that is where we are. The other point is things that have been missed about maintenance and having an integrated approach to maintenance of our main rivers and our infrastructure of drainage is going to be absolutely critical because it is not just about stopping flooding, it is about getting the floodwater away, and that is where we need to look.

Chairman: Thank you very much indeed for coming to Lincoln today to give your views in person. Thank you again for your written submissions. I am sure that in our future inquiries we look forward to doing business with you both in the future. Thank you very much for coming. If you would be kind enough to vacate your places we will move on to our first panel of citizens who are going to give evidence to us.
Supplementary memorandum submitted by Natural England (FL 102a)

Thank you for the opportunity to give oral evidence to your Committee on 30 January. There are a number of key issues which we were not able to explore fully in the time available.

OUR ANALYSIS

1. Flooding is not a new phenomenon. It happens and always has, but climate change is making extreme flooding events more frequent and more damaging.

2. Decades of land drainage and poor land management practices have exacerbated both the incidence and impact of flood events by increasing the flow rate of water from agricultural land. There are important links between continuing poor land management practices, resource protection and flood risk, which call for more integrated approaches at a catchment scale.

3. Drainage of upland blanket bog, facilitated by Government grants between the 1950s and 1980s, has damaged designated conservation sites, degraded the landscape and increased the cost of raw water treatment. It is estimated that there are over 30,000km of grips above the 200m contour in England and that a programme of grip-blocking could reduce flood peaks by up to 15% at a cost in the range £30–£90 million.

4. There have been corresponding losses in lowland wet grassland. Approximately 20,000km² of wet grassland were drained between 1940 and 1980 which has led to declines in numbers of breeding waders: 61% for snipe, 40% for curlew, 38% for lapwing and 20% for redshank between 1982 and 2002 (Source: Breeding Wader Survey, BTO & RSPB).

5. A research project (FD 2114) undertaken by the Environment Agency (EA) and Defra with involvement from Natural England concluded that changes to land management practices (eg grazing, cultivation, underdrainage, woodland cover) can significantly reduce run-off at a local, sub-catchment scale, but the extent to which they could mitigate flooding in larger catchment situation has not been demonstrated.

6. Taking forward a new Government Strategy for flood and coastal erosion risk management in England is the Government’s response in 2005 to the consultation exercise on Making space for water. It announced the intention to pursue a more strategic approach, and move to a wider portfolio of responses to flood risk. These could include greater use of rural land-use solutions, such as creation of wetlands and washlands, coastal realignment, river corridor widening and river restoration.

7. Defra announced a new policy on 1 April 2004 on the Maintenance of uneconomic sea defences with a rationale for abandoning those sea walls which are unsustainable. This would be done by the EA through its Shoreline Management Plans. The assessment has since been extended by the EA to inland flood defences. The EA is also completing a programme of Catchment Flood Management Plans (with input from Natural England), which are meant to take a holistic view of flood risk and solutions within major catchments. The EA website states “the best way to reduce the risk of flood is to focus on ways that work with nature, not against it, such as constructing flood barriers”.

8. The interim report of the Pitt Review expressed unequivocal support for integrated solutions, working with natural processes “through better land-use planning and management—for example creating washlands and wetlands—can also reduce the need for extensive, costly hard flood defences, offering a more sustained, long term solution to flooding problems”.

9. Despite the benefits outlined in Making space for water and the Pitt Review, integrated schemes at a catchment, estuary or coastal cell level remain a rarity for reasons outlined in our written and oral evidence to the Committee.

OUR PROPOSED APPROACH

1. Natural England supports the emphasis in Making space for water and the Pitt Review on natural processes and ecosystem function. We call for an holistic, integrated, whole system approach to land and water management to be adopted at catchment scale, whilst we acknowledge that the evidence of their ability to deliver significant flood risk mitigation in urban situations is not yet certain.

2. Flood risk management needs to be addressed as part of a package of levers to deliver the optimum mix of public benefits for people now and in the future. The mix of potential public benefits delivered (eg water quality/source protection, wetland restoration, benefits for particular species such as breeding waders, carbon sequestration and public enjoyment) will vary between different catchments and sub-catchments. Depending on location, a different mix of interventions will be needed to deliver the optimum mix of public benefits which should be funded from different “pots” accordingly—for example, flood risk management...
funds could be used to create a managed washland, whilst HLS funding could enhance its potential for breeding waders by paying farmers to retain water levels within 10–15 cm of the soil surface until the end of July.

3. Land managers should be supported with public funds for providing public benefits, but should not be compensated for known business risk (eg arable cultivation in flood plains) or to stop polluting or damaging the natural environment. Therefore, we believe the England Catchment Sensitive Farming Delivery Initiative should be extended through a mix of advice and transitional support for a defined period only, followed by a regulatory approach which we believe can be delivered through EA’s powers to designate Water Protection Zones.

4. We advocate early action to implement a strategic programme of grip-blocking in the uplands and more rapid progress towards managed realignment in both coastal and fluvial environments, including the creation of managed washlands and wetlands in appropriate locations.

5. In adopting such an approach, we need to recognise the legitimate needs of communities already existing in flood plains and support the removal of critical assets (eg electricity supply substations and water treatment works).

6. The Habitats Directive already provides a mechanism for advancing this case, but Natural England and its partners will need to be bolder in both making the case and seeking innovative solutions which could lead us to seek amendments to habitats regulations in the forthcoming review.

7. The land use planning system needs to ensure that new development is appropriately located in relation to flood plains and eroding coasts; and provide the space for natural processes to function and managed realignment to be a realistic opportunity.

I hope this is helpful and look forward to reading the Committee’s report of this inquiry.

Natural England
February 2008

Memorandum submitted by Steve Batty (FL 59)

HOLDERNESS FLOODS OF 25–26 JUNE 2007

My family were badly affected by the floods of 25–26 June 2007. They and others so affected have asked me to send this to you.

Findings following consultations with residents, farmers and authorities:

— Evidence of the loss of drain capacity due to build up of silt and debris.
— Allegations that dredged material from Burstwick drain was found contaminated with toxic material leading to excessive disposal costs. Drains not cleared since.
— Habitat protection schemes are blamed for mud flat build up at Hedon Haven and Stone Creek. Even though legislation (Conservation Regs 1994) have provision to allow this.
— Claims that the use of mechanical means to clear outlets to the estuary is prevented to avoid mud disturbance. English Nature say there is no widespread use of “management agreements” (as in Conserv’ Regs 1994) for areas bordering SSSIs etc. When put to EA manager Peter Holmes he agreed it is budget issues affecting maintenance activity.
— Humber dredgers now “recycle” mud under conservancy regulations.
— EA blamed for lack of maintenance on key facilities such as sluices or cloughs, the EA’s own evidence >1 m of debris/silt on sills inhibiting flows to the estuary. Doors do not fully shut allowing sea water into land drains and do not fully open to release properly at low tides. Fresh water or landward side barrier doors are not operated as they had been years ago to hold water back and to be released suddenly to flush sluice/clough sills clear.
— No adequate flood risk management for Holderness.
— The plan needs to address three risk cases:
  — Rising sea levels and tidal surges.
  — Sudden high influx of water from tributaries (45% of England drained to Humber estuary) into a silt clogged estuary.
  — Changes in weather patterns leading to “monsoon” conditions in localised areas of Holderness.
— There is no routine maintenance plan and no provision for exceptional contingency, even given it is a high level document.
— Keyingham level drain not referred to, it receives Skeckling drain this drain was a significant contributor to Burstwick flooding.
— Cash damages in the CFMP way off! Table 3.14 of page 113 of EA’s Hull and Coastal Streams Flood Management Plan are grossly under estimated. The events of 25–26 June much worse than figures given for a 1% AEP! These then affect cost effectiveness appraisals of any proposed mitigating actions.
— There should be use areas of farm land as flood relief—local farmers are in favour of these measures.
— Controls on housing developments are poor.
— Examination of one such location showed NRA recommendations do not appear to have been considered, they were:  
  — Surface water drainage cannot go into a system already at maximum capacity (Skeckling drain).
  — Therefore this must go to agricultural run off at a min of 1.4m/sec/hectare.
  — In this case development base level should be lifted to the level of a previous development (approx 2 m)—this would have left it away from the effects of the run off recommendation.
— Residents believe the authorities were slow to respond to the developing emergency.
— Residents in particularly high risk locations not aware of how serious the risk was to them.
— When under severe pressure people turn to most trusted agencies of Police and Fire Brigade, but these were over stretched.
— ERC emergency control not set up until 1.30 pm Wednesday 27 June?
— Sandbag distribution was too late—flooding already happened.
— Representatives sent to talk with residents appeared too defensive and not “engaged” enough.

Stephen K Batty
August 2007

Memorandum submitted by Malcolm G Coward (FL 45)

RUFFORTH, NORTH YORKSHIRE, FLOOD DAMAGE REPORT; 25 June 2007

SUMMARY

Paragraph 1

Over a considerable period of time, numerous complaints have been lodged with Yorkshire Water concerning the inadequacies of the sewerage system in the village and problems that various home owners have with sewage backing-up in the drains. In some areas the surface water run-off is connected to the main drainage system which compounds the problem.

Paragraph 2

North Yorkshire experienced very heavy rainfall during Monday the 25 June 2007 when we recorded a total of 43 mm of rainfall during the 24 hours from 1800 hours on the 24 June.
Paragraph 3

This resulted in areas of the village becoming flooded, to a magnitude that has never been seen in the memory of elderly residents who have lived in the village all their lives. Emergency Services were called to the village to pump out water from a house that had been contaminated with raw sewage, as well as drainage ditches that could not contain the volume of water.

Paragraph 4

Subsequent investigations have shown that a land drain pipe, believed to have been installed twenty years ago is plugged, and it is believed that this is central to the problems that occurred with surface water flooding.

REPORT ON FLOODING IN RUFFORTH

Paragraph 5

Mains water was not supplied to the village until circa. 1953, when the main drainage system would have also been installed. At that time there were probably about 62 houses and farms in the main community of the village, and in the intervening years this number has more than doubled with little or no increase in the capacity of the sewerage system apart from the installation of strategically placed pumping units.

Paragraph 6

Heavy rain had fallen in this area of North Yorkshire during the previous two weeks which had water-logged the ground prior to the very heavy rain storm that occurred on Monday 25 June 2007. The drainage ditches had managed to cope with the volume of surface water but some flooding had occurred on the B 1224 York to Wetherby road which passes through the village.

Paragraph 7

During the course of the day water levels in the drainage ditches increased until it overflowed into the gardens of properties in Bradley Lane and also onto the B 1224. When this happens, one house in particular, “Ivy Cottage”, is likely to flood and precautionary sand bag defences are placed across doors in an attempt to stop the ingress of water into the building. The drains from the house are also vulnerable and a “check valve” has been installed in an attempt to stop sewage entering the building. In this instance it failed to prevent the sewage contaminating the building.

Paragraph 8

The rainfall was so heavy that surface water from the airfield adjacent to the south of the village flowed across the gardens of properties in Southfield Close and into the back garden of my bungalow in Bradley Lane, the additional volume of water could not be accommodated in the already overloaded ditch system around my garden. The water level in the back garden rose to between 250 mm and 1500 mm, which resulted in the water level at the front of the building to rise. Water then encroached to the walls of the building causing water to seep into the front room which is at ground elevation.

Paragraph 9

Yorkshire Water had deployed pump trucks to the village and they were operating on the B 1224 to lower the level of water, because at that time the main road was closed. I spoke to the person supervising the operation to find out if they would be able to pump water away from my property, but I was advised that the drivers and crew were almost out of hours and so I then had to consider alternative arrangements.

Paragraph 10

I contacted City of York Council to find out if they had pumps to dispose of the water, only to be told that all their pumps were working in other areas around York, but they could supply sandbags. These would not have helped my particular situation and I advised them accordingly.

Paragraph 11

However about an hour later a council employee called at the door offering sandbags to me. Having seen the situation he could see that sandbags would not have helped and he suggested that I call the Fire Service, which I did. The Fire Service could not provide immediate help but a Fire Tender arrived about an hour later and pumped water from the ditch outside my property for approximately three hours, until the surface water was away from the walls of the building. This prevented more water entering the property.
Paragraph 12

The following day I hired a carpet cleaning kit and vacuumed about 10 gallons of “free” water from the front room carpet. There was additional water in the carpet and under-felt but it was impossible to economically recover any more.

Paragraph 13

The severity of the flooding was reported to Yorkshire Water and also to City of York Council and both organizations have taken re-active action. Yorkshire Water have had “jetting” equipment in the village to clear the main drains and City of York Council have been tracing the surface water drain into which the ditch in front of my property discharges. They have established that there is a blockage in a pipe that carries the water across a field into a main land drainage dyke. It would appear that had this pipe been clear the water would have drained into the dyke, preventing the surface water from flooding the adjacent area.

Paragraph 14

The City of York Council have indicated that they will have to carry out repair and maintenance work to clear this pipe. I am not aware of any maintenance work being carried out since the pipe was installed, which to the best of my knowledge was twenty years ago.

CONCLUSION

Paragraph 15

The rainfall in the area of North Yorkshire on the 25 June 2007 was exceptional and coupled together with the heavy rain that had fallen in the area during the previous two weeks, the land could not absorb the water. This resulted in the increase of surface water run-off which overloaded the capacity of the drainage ditches.

Paragraph 16

However it has been established that the underground pipe which carries water away from the ditches to a main land drainage dyke is blocked. Had regular maintenance been carried out, it is very likely that the flooding in this area of the village would have been minimal or even prevented. There are a number of properties that would still have been badly affected by backed-up sewage because surface water from some properties is discharged into the sewage system which is overloaded at the best of times.

Paragraph 17

Both Yorkshire Water and City of York Council must carry out a detailed survey of the drainage systems in the village as a whole and carry out a regular maintenance programme to guarantee that this situation will not re-occur again.

Malcolm G Coward
August 2007

Memorandum submitted by Mr Paul Rouse (FL 154)

I live in East Yorkshire, near to the River Derwent, in a village which has more than doubled in size over the past 10 years. Due to new house building on land which previously provided run off, our combined rainwater and foul water drainage system can no longer cope with heavy rainfall. Because a number of houses now flood in wet weather, Yorkshire Water have installed an additional pump which should start in an emergency. However, we now live in dread of it failing to do so, as these things have failed elsewhere. What we really need is a larger diameter pipe, but YW are loath to spend the money.

The point is, we told the Planners that the housing developments must only be carried out in line with improvements to the infrastructure, but to no avail, as it seems that Government Inspectors have been directed to pass these developments on appeal.

We keep pointing out that new houses generate increased revenue for both Utility Companies and Local Authorities, but none of them seem to consider that this additional income merits any capital expenditure. I would ask that your Select Committee recommendations include a requirement for future building projects to be firmly linked to infrastructure investment, including drainage and water management.
There are plenty of other things that those of us who live in the country would ask you to consider, such as the lack of river dredging and too much hill drainage, but you will no doubt pick up such suggestions from other people.

Paul Rouse
December 2007

Witnesses: Mr Steve Batty, Mr Malcolm G Coward, Mr Paul Rouse and Mr Mark Harrison, Members of the public affected by flooding, gave evidence.

Q831 Chairman: Gentlemen, you are very welcome indeed. I hope it has been explained to you that we have approximately 45 minutes for this panel of witnesses. After welcoming you officially on the record, I am going to ask each one of you if you would be kind enough to speak for five minutes to put on record a summary, if you like, of your own particular perspectives on flooding. I am aware that in the case of Mr Batty, Mr Coward and Mr Rouse you have been kind enough to send written evidence to the Committee, for which we are very grateful, but obviously we would like to hear from you personally. Can I formally put on the record our welcome to Mr Steve Batty from Keyingham, near Hull, Mr Malcolm Coward who comes from Rufforth, near York, and I can remember spending many happy hours on Rufforth airfield watching motor racing in my youth. Mr Paul Rouse from Sutton-on-Derwent, and Mr Mark Harrison from Blyton here in Lincolnshire. I think Mr Harrison has got something to say to us specifically about the Citizens' Jury in this area, so we will come on to that in due course. Mr Batty, would you care to start our proceedings and in five minutes give us the benefit of your views on flooding?

Mr Batty: Thank you, sir. Good heavens, five minutes. I will move on quickly. As you have mentioned, I am a private citizen. My involvement started when my 24-year-old son and his wife were flooded out in Burstwick as a result of the overflow of the Burstwick and Skeckling drains. My history is in the chemical industry. Although people were talking about the deluge, six million tonnes of rain falling on Burstwick drain in the course of a day, usually these sorts of instances have a much longer causation that trails behind them and I set about trying to deal with that. After writing a letter to the papers local farmers contacted me and explained the workings of the Internal Drainage Boards and their relationships with the Environment Agency. Subsequent to the investigations that I carried out, I found that indeed the problems go much, much deeper. The Humber Estuary drains 40 per cent of our country and the incoming tide brings in more silt than the outgoing tide can get rid of and this silt is building up. Witnesses who spoke to me living at Stone Creek told me that times have long since gone when they could sail straight out onto the river and huge mud banks there have been caused by the ingress of silt and also dredging activities dumping silt on the northern bank of the river. All of this is impinging on the ability of the drain cloughs to allow water out of the drains. I found the claim about dredging incredible but I did, in fact, speak to a director of a dredging company who told me that was quite true and what they actually do is dredge mud out of the shipping channel and then dump it in predefined areas in the Humber navigation so that the movement of water in the Humber can redistribute the silt and inevitably that means, of course, on the northern bank, although they do not aim to dump on the northern bank. Farmers told me about their frustrations with the Environment Agency whose reluctance to involve themselves in sustained maintenance of the cloughs was leading to silt build-up and there has been a loss of over a metre and a half above the Newland datum line which, of course, is also impinging on drain water. Internal Drainage Boards have a discretion about which drains they clear. They are obviously interested in clearing land to enable it to be farmed but they have a discretion and often do not clear drains very close to centres of habitation. There appears to be no joined-up thinking in that area. I found that drains, roadside drains and from villages were not checked prior to further development being put in and simple things like putting down tracer into the water to check movement of water, to check the drains are clear, none of that is undertaken, and if the IDBs are not doing the drains, no-one is doing the drains. I have to say that the Internal Drainage Boards, in my opinion, have the highest record in terms of keeping drains clear. This has obviously been mostly farmers who have a very strong vested interest in doing so and I have nothing but praise for those guys. Subsequently, I know of farmers who have approached parish councillors to set up self-help schemes to enable cash to be donated from parish councils to help clear the drains close to villages. I have found that sort of approach is immensely productive and is to be recognised. It was interesting to hear the gentleman on the previous panel talking about the clearing of Hedon Haven. I and others have campaigned since the flooding occurred that these drain cloughs should be dredged clear and it was actually Associated British Ports, when I spoke to their chief hydrologist, who told me that the Environment Agency had not taken up offers to use dredgers and for some number of years had not exercised their responsibilities in keeping those drain cloughs clear. Eventually, through public pressure one of those drains has now been cleared and we are looking forward to seeing Keyingham drain and Stone Creek treated in the same way. As the gentleman on the previous panel pointed out, there was 185mm of rain very recently and that drain functioned properly and got rid of what fell on it. That is an important key piece of evidence.

Q832 Chairman: Thank you very much indeed. Mr Coward?
Mr Coward: Chairman. Rufforth is a small village situated approximately six miles west of York. Historically, Rufforth’s name was derived from the village’s close proximity to extensive moor and marshland where crossing places or fords were needed and one road was particularly bad, hence the name Roughford, which was later refined to Rufforth. The land was subsequently drained through numerous ditches and dykes which remain as an integral part of the land drainage system.

During the Second World War the Ministry of Defence constructed an RAF airfield to the south of the village. To maintain the integrity of the land drainage system a pipe was installed to drain the surface water into Bull Dyke, one of the major drainage dykes in the village. It is not known when maintenance was last carried out on this pipe, but following the flooding in June 2007 surveys were carried out. Two blockages due to damage from tree roots and one area where the pipe had collapsed, probably due to building work, were found. The collapsed area of pipe has been repaired and the roots have been partially cleared. My property and the adjacent properties are drained through a network of ditches which feed into a ditch alongside Bradley Lane from which there is a culvert which connects to a drain on the opposite side of the road.

We have experienced ongoing problems with surface water drainage and repeated approaches have been made to City of York Council, Yorkshire Water and the Highways Department in an attempt to rectify the problem. None of these agencies could explain where the water drained to, nor could they produce plans to show where the pipes are located. During heavy rainstorms we have experienced problems with the sewerage system because surface water from houses on one side of an adjacent cul-de-sac is fed into the main drain system. Both my neighbour and I have experienced sewage backup to our domestic drains, which on occasion prevents use of the toilet. The present sewerage system was probably installed when mains water was supplied to the village. Since then, considerable building development has taken place and additional pumping stations have been installed, however the outflow line from the village is now working to its maximum capacity. Prior to the mid-1930s a very basic drainage system existed in the village. This sewage pipe provided a drains system to various farms and cottages and also to the Tankard Inn and discharged into Old Sewerage Dyke, a main drainage dyke situated to the west of the village. Ivy Cottage, one of the old houses in the village, situated next to the Tankard Inn, has been flooded twice in the past three years. In the first instance, flooding occurred because a sewage pump would not start following electrical maintenance work in the village which coincided with a heavy rainfall. The increased volume of water flowing to the centre of the village from Bradley Lane caused sewage to back up into the house. Yorkshire Water installed two non-return valves in the sewer pipes downstream from the property causing more problems than it cured, because when the water level rose the valves closed and blocked the drains. After the floods in June 2007, Yorkshire Water has installed a separate holding tank and two pumps that will enable effluent from the property to be retained until the water drops. In the worst case scenario, should the holding tank fill up before the level of the water drops, the pumps have the capacity to discharge fluid from the holding tank into the main sewer. Five years ago, two bungalows in Bradley Lane were demolished and one bungalow and two large family houses were built on the land, during which the surface water drain pipe installed by the Ministry of Defence was damaged. The owner of one of the new family houses has experienced continual problems with poor land drainage and the seepage of sewage onto his property. He has made repeated complaints to the City of York Council and Yorkshire Water but has not received a satisfactory response from either party. At his personal cost, an independent survey was carried out and the findings, subsequently confirmed by City of York Council, are alarming: raw sewage from the Tankard Inn and some of the older properties in the village is still being discharged through the original drainage pipe that terminates at the Old Sewerage Dyke. The Parish Council has been very concerned with this issue and, through correspondence and meetings with representatives from the agencies and companies involved, the Council has endeavoured to resolve the fundamental problem regarding ownership and responsibility for maintenance. Last Monday, the Chairman of the Parish Council was advised by City of York Council that Yorkshire Water had agreed to accept responsibility for the outfall into Old Sewerage Dyke. Later this was confirmed verbally by Yorkshire Water. This poses the question, should the pipe be capped close to the centre of the village and the sewage diverted into the main drain system? The pipe should be used for surface water drainage which will help dilute the contaminated fluids and clean residues that remain in the Old Sewerage Dyke.

Q833 Chairman: Thank you very much indeed. Mr Harrison?

Mr Harrison: Chairman, my name is Mark Harrison. I am the publican of a 250 year-old public house in a village called Blyton which is just outside Gainsborough. Early last year in March 2007 we finished a quarter of a million pound refurbishment of those premises and we got the establishment trading only to be flooded on 25 June 2007. The pub lies in the bottom of the village and we received top water from two sides, from the top of the street, which was mainly directed at us as the infrastructure of the drainage system for the village is so inadequate and antiquated that it cannot cope to take top water away, and we had a deluge of water from a new Bovis Homes estate that has been built within the village that has been built on a floodplain. Where water used to be stored and slowly released into the dykes, it now hits the dykes at a torrent rate. Also, the dyke at the rear of the pub overflowed and backed up, a dyke which has not been cleared out for some 47 years according to the local residents. The dyke downstream from the pub was blocked or restricted in 12 separate places. This resulted in over
£100,000 worth of damage to the commercial property and the loss of £50,000 in personal effects in the guise of vehicles and things. The business was closed for approximately four months. We finally reopened on 2 November 2007 after reaching a compromise with the insurers. A compromise indeed: we only received £75,000 for £100,000 worth of damage. The only reason we settled for that was if we had gone down the insurance route the projected reopening date would have been spring this year. As a direct consequence of all the inadequate infrastructure and the blockage from dykes, our premiums have now increased by some 80 per cent and our excess has increased from £400 to £2,500 with limited cover on flooding. We are still negotiating business interruption and loss of earnings and no payment has been received to date. As a consequence, it puts a very bad strain on relationships and on the business. Through the whole event which we had we were unable to talk to one person with authority or responsibility to try to prevent the situation happening again. If you start talking about top water, if it is on the road it is the highways, if it is somewhere else it is the Internal Drainage Boards, and if it goes on to a field it is a private landowner. There is not one person you can pin down. There appears to be conflict between the District and County Councils. We put in for planning permission to develop the site and we have a planning restriction by the District Council that we cannot put any top water into the dyke. Lincolnshire County Council, the highways, bluntly admitted that the infrastructure cannot cope for the village and do we mind taking the top water over the pub car park to put it into the dyke. As a consequence, to protect our property we have had to invest a further £10,000 in having our car park reshaped and re-levelled to direct all the water into the dyke. If there is a conflict with the District Council then my argument is going to be, “I am pumping the village’s water into the dyke, not my own”. We constantly got on to the council and various people within organisations and the dyke was finally starting to be cleared just before Christmas, and it was a good job it was because last week we were within about a foot of flooding again. I state this: it was maintained for the first time in 47 years. If you listen to the Internal Drainage Board they reform the dykes every ten years. The old villagers say years and years ago they used to lead two shire horses down the wash dyke side-by-side but you could not get a donkey down there off Cleethorpes Beach at the moment. We were then invited along on 19 January to a Citizens’ Jury Flooding Review. Basically this was local residents all in similar situations to me from the commercial and private sector and we were given presentations by various agencies and we had reviews and discussions with other members of the public who had experienced flooding through the regions to come up with some comprehensive list of about 70 recommendations and points which were put forward to the council. Basically a summary of those recommendations is here but obviously I cannot spend five minutes on 70 points. I will summarise it in eight points. The people want focus on flood prevention and not recovery. People will try to say, “Well, how were things after the flood?” but we should not have been there; we did not want to be flooded. If maintenance prevention was carried out correctly we should not be in the situation we are in. There needs to be clarity and harmony between agencies. It was quite evident at some of the presentations and some of the dealings I had with agencies that there is a trend to pass the buck; nobody would put their hand up and say, “Yes, that is our problem”. A quite important fact that came out of our meeting was that there should be one authority with knowledge and understanding that has the authority and responsibility for mapping, planning, managing, reinstating, upgrading and enforcing the clearing of drains and waterways because there are a lot of waterways and dykes which have been filled in over the years, et cetera, and there does not seem to be anybody who has a map of everything. The most important one for us is to improve the planning process to ensure that flood risk is taken into account beyond the development and impose building restrictions and pass the cost of drainage and infrastructure upgrades on to the developers. In the case of Bovis Homes it was rejected at district level but passed at national level and there was no consultation with local people and no building restrictions imposed. As a consequence, where properties did not flood up until two years ago they are now flooding on a regular basis, and it is not all down to global warming, et cetera. If there is not the infrastructure to cope then do not build, it is easy. It is alright hitting numbers for the people in Whitehall but not at our expense. The other point that came across in all the presentations, and it wound a lot of people up, was the use of permissive powers and riparian ownership. We do not want to hear the term “permissive powers”, we want to hear what the obligations are, what they are going to do. When it comes to riparian ownership, there needs to be clarity because for some of the older members in the village who have not had to submit Land Registry documents for a number of years their boundary is to the bank of the wash dyke, not the centre, so there is confusion. Another main point that came out of our Jury was that there seems to be a distinct lack of government funding for such improvements. A realistic amount of money needs to be set aside to correct the known problem. It is no good keeping saying, “There’s no budget available”. At the end of the day, throughout all of this, we demanded that there be a review on progress in 12 months’ time to make sure that things have been done because far too often there are public inquiries and reports are written but no action.

Q834 Chairman: Mr Harrison, thank you very much indeed, that was a very good summary of a great deal of very hard work. Finally on this panel, Mr Paul Rouse.

Mr Rouse: Chairman, more of the same. I am afraid. Sutton-on-Derwent is a village with 230 houses, two pubs and a village hall. It lies to the east of York in East Yorkshire. Although the nearby River Derwent floods the surrounding fields and restricts travel, our
flooding problems in the village have been created because new housing development now overwhelms the drainage system in heavy rain. The village is three times the size it was 40 years ago when the system was installed, which is not bad for a village which is a non-selected settlement and is not classified as a sustainable village but something else. As more houses were built we began to see flooding caused by surface water due to drainage inadequacies. This severely affected a number of houses, some of which had to put up with a frequent ingress of sewage. This is because the village has a combined system, which means that the surface water and the sewage are handled by the same pipe work. Also, most of the new housing has been built up above normal ground level to facilitate drainage, often on infill sites next to existing houses. Unfortunately, the runoff this elevation creates, added to the reduction in field drainage that the land used to provide, now floods the adjacent dwellings. Rather than increase the size of the six inch pipe that handles both sewage and surface water for ours and two other villages, and has burst four times in the past two years, Yorkshire Water installed an emergency pump in the local pumping station, our pumping station, which they told us would automatically kick in as required. This pumps the excess water, including raw sewage, into the River Derwent. In fact, we now know it is not automatic and requires an engineer to start it. It does protect most of the houses at risk providing that the engineer is available. Last summer we got the engineer there just in time to stop a major catastrophe. People actually live in fear of the engineer not being available and what happened a couple of years ago happening again, or the pump will fail, as has happened in other villages where a similar system has been installed, like Leven in East Yorkshire. Some people actually stay up all night in heavy rain. Even when the pump is working, houses still flood and have to be pumped out. This is caused by the runoff problems mentioned previously and that they are lower than the drains. In one case, a new house was built lower than the existing drains. I should say that these problems were foreseen by the Parish Council when considering planning applications, but they were overridden by the District Council and in one case by Government inspectors on appeal. The protests were no doubt seen as NIMBYism. They managed to get the drain repaired after it was found that Transco had broken it in a number of places when fitting gas but, despite recently digging up the entire village street in order to fit a new freshwater pipe, Yorkshire Water chose not to lay a larger drain. I can only think this is because the leaks from the old freshwater pipes were costing them money whereas there is no financial incentive to lay a drain. We think that there are lessons to be learned from what has taken place in our village which are just commonsense. Before granting approval for new developments, planners should always ensure that the infrastructure is in place to handle the resulting demand. As councils and water companies benefit from these new developments in terms of Council Tax and water revenue, they should be obliged to make whatever investment is needed to gain that revenue before any building starts. Most organisations, including the public company I used to run, have to invest in order to increase revenue; why should these people be any different? Ofwat should be instructed to ensure that all water companies are fulfilling their statutory responsibilities and are providing adequate infrastructure to existing developments or they should be held financially responsible for the mess they create which would concentrate their minds. Where infill developments are allowed on land adjacent to existing properties, planners should ensure that they are built at an appropriate level and account should also be taken of the field drainage they displace. A company with a right to dig up a road should be held responsible for any collateral damages that it causes to services and for leaving the road surface in good condition so that houses are not damaged by traffic following work in the road, which happens. The lack of affordable housing is currently high on the political agenda but, based on our experience, this also needs joined-up thinking. Before councils approve an affordable homes building programme in a rural area such as ours, a number of things should happen. The first and most important is to quantify and qualify the need. The usual definition of affordable housing is “non-market social housing to rent”; yet the term is commonly used to describe low-cost housing to buy. It is essential to determine which is required. Then, instead of top-down targets based on questionable research, and I say that having spent millions on research in my time, such as the Housing Needs Survey, why not use the parish councils to determine actual local need on a village-by-village basis. We hear about the lack of affordable housing disadvantaging local people in rural areas, but most of the affordable houses built to sell in our village were bought by people from outside our community. All of these houses contribute to the problem I have just been outlining. The East Yorkshire Council wanted affordable housing built in our village because the local school was thought to be in danger of closing. Unfortunately, they got their sums wrong and the school has now had to be doubled in size. Whatever the housing need, developments should never be allowed to start until the necessary infrastructure is in place, and councils should not immediately dismiss local objections as NIMBYism. Finally, we share concerns with all of the villages in the York area, many of which you have heard, and heard in the earlier session, about improving water management, such as making sure that the rivers are dredged. The one thing I did not hear anything about was the level of hill drainage which a few years ago was increased to facilitate grazing, et cetera. All that is doing is pushing a lot of the water that used to be absorbed by the hills down into the rivers. Although the River Derwent does not flood our village, it floods the roads into it, which is why many of us need four wheel drive vehicles. The River Derwent is not our problem, it is the decisions made on developments in the village that have caused all the hassle.
Q835 Chairman: Thank you all very much indeed. You have given us an excellent series of pictures about your own experiences. I wonder if I could start the questioning with Mr Coward, and the others may want to join in. There is a flavour that I get linking you all, but you were particularly focused on, which is trying to find out who is responsible for what and getting some kind of positive response from the person you finally find who listens to you to actually do something. Is that a fair assessment of your key frustration?

Mr Coward: It has been a nightmare. I have lived in the village for 27 years and we have had ongoing problems, more serious latterly. Trying to get hold of the right people to answer questions has been a virtual impossibility. I think this might have been compounded by the fact that in the early 1990s, in 1993 I think it was, the village of Rufforth was transferred from the Harrogate administration into the unitary council of York. When we have approached York or Harrogate authorities for information, plans or information about general topics they have invariably said, “That was all passed to York” and when we talk to York they say, “We have not received it from Harrogate”. This really compounds the problem we have in trying to sort the people who are responsible for ownership and maintenance of the drainage systems within the village. This has illuminated the problem very, very clearly because, as I mentioned in my presentation, the owner of one of the new houses ran into the buffers when he was trying to find out about the pipe that was seeping raw sewage onto this property. He had to go to his own personal expense of carrying out a survey of the drains and the various sewage pipes in the village and it was only through putting dyes in the source areas throughout the village that they managed to determine which properties were responsible for the raw sewage being deposited into what I understand to be a freshwater dyke. I think that is an absolute travesty in this day and age.

Mr Batty: My experience is not the same. The issue has not been people not owning a drain or anything like that, people have been very clear about ownership, but it is about the responsibilities for maintenance. The Environment Agency claimed Burstwick main drain some 15 years ago and the Internal Drainage Boards, whose drains drain into that drain, have claimed that the Environment Agency have not cleared the debris from that drain, whether it is vegetation, dumped debris or vegetation matter growing up the sides of the drains, whereas the Internal Drainage Boards’ approach has been to cut back vegetation by the side of the drains and dredge the drains clear of silt in order for there to be free movement and, therefore, they just speed the water up into Burstwick main drain. Another issue that I heard both from the Environment Agency and the Internal Drainage Boards, whose drains drain into the estuary through the cloughs, was they are inhibited from doing any maintenance work due to conservation regulations. They were all blaming Natural England for imposing restrictions on them. That was not the case. I actually looked at the conservation regulations and there are provisions within the regulations that do allow for maintenance work to be undertaken through the creation of management agreements and providing four months’ notice prior to any work so that Natural England have the opportunity to comment on the work content and give advice on how not to damage the environment. It seemed to me that there is a hassle behind all of that and is something the Internal Drainage Boards were hiding behind. When I asked Kate Jennings of Natural England how many applications they had over the previous months, none was the answer. When I spoke to her after the flood and she was waiting virtually with pen in hand expecting requests for work to come in, none arrived. I asked how a representation was made and she said that there is a strategy committee for managing the Humber Estuary and Internal Drainage Boards people were invited and were normally on those committees, but on the north bank of the river none of them were turning up. It seemed as though the people were ready to point a finger as to why things were not being done but there was no real reason why they should not have been done at all. In the case of the Environment Agency and not clearing the cloughs, Peter Holmes of the north-eastern region of the Environment Agency refused to believe that silt at the cloughs on the outlets or even in the drains was having any impact on the freedom of movement of water through the drains and out into the river. Of course, there are a number of issues there. One is that the cloughs can only take water out at low tide and if those cloughs and doors are not able to re-seat again on an incoming tide then water comes back in and they have got to get rid of it all once more. I repeat the comment that was made earlier, they have been in, they have cleared Hedon Haven clough and we have had much better performance in the recent weather, so clearly maintenance of the cloughs is an issue.

Q836 Chairman: Let me just pick you up on that. You sound as if you have got a very considerable amount of knowledge you have now accumulated over time and you have had one success. Did you get frustrated that there was not somebody you could go to to say, “Here are my observations, can you go away and sort them?” You seem to be a lone battler knocking on lots of doors and getting reaction.

Mr Batty: It has been very frustrating from that point of view. I have to say though that everyone, whether it has been the Environment Agency, the local council and their review board, the Internal Drainage Boards, riparian owners and farmers, everyone has been very helpful. Nobody is hiding anything. Nobody is trying to stab a finger of blame and totally abdicate any responsibility but, you are quite right, there is a very strong sense of frustration throughout the community that there is no joined-up thinking in this at all and that is to the detriment of us all.
Q837 Paddy Tipping: I just wanted to pick up the point Mr Harrison made and Mr Batty has just made about riparian owners. It is a fancy title, an old-fashioned bit of legislation. Do you think people really understand what it means?

Mr Harrison: Basically no. As I say, when I have been to parish council meetings or talked to local neighbours, some of the older ladies in the village whose properties back on to a dyke and they have got their very old Land Registry documents they quite clearly state their responsibilities lie and finish on the bank whereas mine, because it has been bought and sold over the years and they have changed legislation or whatever, quite clearly states it is to the middle. It needs to be spelt out to people what their responsibilities are. Again, it is a very big word. There is an example in the village where a culvert runs under somebody's property, riparian ownership, and that culvert needs upgrading because the Bovis Homes have been built and you should not leave the hydraulics and the calculations down to the riparian owner to change that culvert. He might go from a nine inch to a four foot culvert and flood somebody down river. The whole issue of riparian ownership needs looking at. I think it is down to waterway management, for want of a better word. Where you have building control for a building you should have waterway management control for the waterways, whether they pass on private land or not.

Q838 Paddy Tipping: You just reminded me that you were talking previously about this phrase “permissive powers”. Could you just tell me if I have got this right, that the local council, district council, has got permissive powers, powers that they can use if they want to to make the riparian owner do the work?

Mr Harrison: It is not so much that, but it was in a lot of the presentations, whether it was the Fire Brigade, the Police or whatever, with regard to flooding “permissive powers” were the words that kept popping up all the time. When you talked to people who were at the presentations they were looking at it as a bit of a get-out clause, “You don’t have to do it”. From our standpoint, you pay your taxes, you pay this, you pay that, you want obligations, not “You don’t have to do it”.

Q839 Mr Williams: A number of the witnesses have highlighted experiences that a number of us as MPs will be familiar with, the distress that sewer flooding causes to residents both in the house and on their property and, arising from that, the lack of notice that planning authorities take when sewerage works are reaching their capacity and any more development will give problems and the lack of the water companies responding to those problems when they arise. The other issue that I am very concerned about, and perhaps somebody could help me on, is this issue of combined systems that take both storm water and sewage, either deliberately or because the storm water system reaches capacity and then overflows into the sewerage system which causes sewage problems. Have people got experience of that?

Mr Rouse: Our village has a combined system. It has been there since 40 years ago when they put in the sewerage system. The surface water is there really to flush through the sewerage system. Without it there would be problems, if I understand it correctly, in getting the sewerage system to work properly, but the trouble is a 40 year-old system with a six inch pipe for a third of the houses worked but it does not work now. Instead of increasing the size of the pipe they are trying to compensate by using these pumps that kick in in emergencies and throw the stuff literally across the fields towards the river. That is fine and dandy provided you have got somebody who is on-call and can switch them on and provided they do not break down. In Leven, where my mother lives, they had an emergency pump, it broke down and all the houses that had only just been built were flooded. I cannot understand why nobody can force these people to put in the infrastructure because, as I said before, they get the benefit of the increased revenue. Why should they not improve the infrastructure, it is only an investment to get increased revenue, it is nothing more than that. There is nothing particularly complicated about it. You were talking about the planning people reacting to things. The planning people allow these developments. There must be some kind of recommendation that if you are building on a floodplain you should elevate the site. So you start with a flat field and you build a hill and put houses on top of it, but all that is going to do, particularly if it is an infill site, is to allow the surface water to come down on either side and flood the adjoining houses. That is what has happened in scores of instances in our village. That is just stupidity. Nobody is thinking about it. They are saying, “That’s the recommendation and it makes life easier”, and sure it does if you are building a town but not if you are building on a infill site.

Q840 David Lepper: This is to Mr Harrison. You took part in the Citizens’ Jury and you told us about that. Do you feel that has increased rather than dissipated your sense of frustration about what has happened? Do you feel as a result of those Citizens’ Jury hearings that you took part in that somebody is going to be made more accountable for these issues?

Mr Harrison: I think everyone left there positive from the point of view that we came up with these 70 recommendations come what may. A manager out of a private sector, when you start looking at the cost and the time that goes into such meetings, a little bit like this, will squelch they have not got the budget and then we will see this sort of forum and more forums, but at the end of the day it is like I said, a lot of what we came up with was commonsense. It is a bit like getting a consultant into a factory and they just want reassurance from the planning company that what they are thinking is correct. We probably saw that a little bit with the Jury. What was most apparent at the end of the meeting was that people are very frustrated, they can see a lot of mistakes, a
lack of management, a lack of action, and at the end of the day they do not want to keep talking about it, actions speak louder than words, and that is why at the end of the meeting it was agreed that we would have a review of progress in 12 months’ time.

**Chairman:** Mr Harrison, that is a very good note upon which to end. I should add, of course, that once the Committee produces its final report the Government will have a short period of time to then respond and everybody will be able to see how they reply to the many important points, including yours, which we will reflect upon in our report. Gentlemen, thank you very much, not only for your written evidence before we came but also for coming here today and talking to us and answering our questions. You have brought, as always, that unique perspective of people who have been involved in problems connected with flooding and who can articulate it as no others can. Thank you very much for your contributions.

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**Memorandum submitted by Burton Joyce Residents’ Association (FL 10)**

**FLOODING IN THE VILLAGE OF BURTON JOYCE, NOTTINGHAMSHIRE JUNE/JULY 2007**

**SUMMARY**

This submission relates to the flooding experience of Burton Joyce.

It describes the sources of flooding, the causes of the flooding and residents’ experience of emergency arrangements.

On the basis of this experience it concludes:

- Watercourses and drainage systems must be properly maintained on a regular basis.
- Existing drainage channels must be retained or replaced with equivalents.
- The impact of additional housing or other development on the potential to overload the drainage and sewage systems must be considered when assessing planning applications.
- The impact on the drainage system of the creation of large areas or driveway or hard-standing where there used to be gardens should be understood and controlled.
- Development should not be permitted in flood risk areas particularly where development will increase the flood risk to another property or another area.
- There should be integration of the various agencies responsible for different aspects of drainage/sewage/flooding/watercourses.
- There should be better co-ordination of information and provision in times of emergency.

1. **Location:**

Burton Joyce lies in the flood plain of the Trent River, 6 miles north-east of Nottingham. It has no formal flood defences but a railway embankment between the River Trent and the village serves as an informal defence against flooding from the Trent at a 1:30 year level.

2. **Sources of flooding:**

There are several potential sources of flooding in the village

- the river Trent, which lies to the south
- the stream that runs through the village in a dumble from the hills on the north side of the village to the Trent on the south side
- run-off from the hills on the north
- groundwater as the village lies on a significant aquifer near to the surface
- inadequacies in the capacity of the drainage/sewage systems and in their maintenance

3. **Historical flooding events:**

Much of the village was severely flooded in 1947.

Some of the village was flooded in 2000—a 1:30 event. In both these events flooding was mainly from the River Trent but was exacerbated by water backing-up in the dumble as it was unable to flow into the river.
4. **Flooding in summer of 2007:**

Flooding took place in the village four times—on the night of 22–23 June, on 24–25 June, on 20–21 July and on 26–27 July. About 24 houses and a considerably larger number of garages, outbuildings and gardens were flooded.

5. **Sources of flooding in 2007:**

5.1 This time flooding was not caused by the river but by the other sources listed in paragraph 2.

5.2 Flooding affected different parts of the village in different ways.

5.3 The major source of flooding was the stream in the dumble which resulted in the flooding of property alongside the dumble. Exploration of this type of flooding suggested these causes:

- Unprecedented volumes of water in the dumble.
- Lack of capacity in the dumble to allow passage of such a high volume of water particularly under highways.
- Poor maintenance and possibly encroachment of gardens into sides of dumble
- Blockages in culverts and under highways

5.4 Flooding was also caused by run-off from the hills and roads. Exploration of this type of flooding suggested these causes:

- Drainage ditches—some that existed in earlier years on the edges of fields or alongside roads have been filled in or built over.
- Drains on roads—blocked or overflowing due to undercapacity.
- Paved frontages—a large number of front gardens have been converted into hard standing which now directs run off into the road.
- Additional housing—much housing has been added to the village over the years without upgrading the drainage/sewage capacity.

5.5 There were also problems where the drainage/sewage system overflowed into some properties.

6. **Flooding experience in 2000:**

6.1 In 2007, the River Trent did not rise high enough to contribute to village flooding but the village of experience of 2000 is relevant in relation to other potential causes of flooding in the village.

6.2 In 2000, houses were flooded by:

- Overflowing stream in the dumble as it backed up when unable to exit to the Trent because of high river water levels. This would not have occurred if the function of the drainage channel alongside the railway embankment had not been ignored and planning permissions given at various times for building on this site.
- High groundwater levels and seepage through the railway embankment on a site where new housing was built in 1980s—where planning permission was given against local knowledge and advice of the unsuitability of this site.

6.3 Both these instances highlight the contribution made to flooding risk by poor planning decisions which ignore local knowledge and advice and fail to understand the purposes of features such as drainage channels.

7. **Emergency arrangements:**

7.1 Residents generally praised the workers from the EA and the Council who dealt with the aftermath of the flooding. But there was criticism of the administration of the emergency arrangements, specifically:

- There was no information available on the spot about who to call for assistance or whether there was a general flooding assistance number
- Severn Trent Water had only one national number which deals with general inquiries about drainage and sewage as well as emergencies. One person reported a delay of 35 minutes to get through to the emergency number to report sewage backup into his property; others criticised their “nothing to do with us” attitude.
- Sandbags arrived from the local borough council about 12 hours after the waters had receded. Some people (including pensioners) phoning for sandbags were told there were none and that they would have to get their own from a builder.

7.2 It is understood that Nottinghamshire County Council has a Beacon Award for its emergency arrangements. None of this excellence was evident in the flooding event in our village in 2000 or 2007.
8. Concluding comments:

On the basis of the experiences outlined above we make the following suggestions for action by public authorities:

8.1 Watercourses and drainage systems must be properly maintained on a regular basis. It is not clear to the public which authority is responsible for which system and to whom problems can be referred.

8.2 Existing drainage channels must be retained. Where planning permissions are given that affect drainage courses, alternatives must be provided. But equally important is that developments that do not currently require planning permission—such as creating a hard standing in a garden—must not be permitted if they affect a drainage channel. Similarly farmers and other landowners must not be permitted to fill in land drainage channels.

8.3 The impact of additional housing or other development on the potential to overload the drainage and sewage systems must be understood and considered when assessing planning applications.

8.4 The impact on the drainage system of the creation of large areas or driveway or hard-standing where there used to be gardens should be understood and controlled. There is currently no requirement for planning permission for such developments. Consideration should be given to this—or to creating appropriate building regulations. These could take the form of restricting the proportion of hard-standing that can be created in a garden, or requiring hard standing or driveways to drain into a soak-away instead of into the drainage system.

8.5 Development should not be permitted in flood risk areas particularly where development will increase the flood risk to another property or another area. While government guidance requires this, it is often ignored by planning authorities.

8.6 There should be integration of the various agencies responsible for different aspects of drainage/sewage/flooding/watercourses as there was confusion and buck-passing in evidence in terms of responsibilities for the different sources of flooding.

8.7 Co-ordination of information and provision in times of emergency. There was a total lack of co-ordination of services and immediately accessible information which gave rise to a lot of anger and frustration as well as unnecessary multiple phone calls to various agencies. An emergency number should be established by the County Council, or the equivalent, through which inquiries should be channelled. At the local level, parish councils, or the equivalent, should hold up-to-date information about emergency arrangements and make this immediately available on the spot.

Burton Joyce Residents’ Association
August 2007

Memorandum submitted by Strensall and Towthorpe Parish Council (FL 39)

1. Strensall and Towthorpe parishes near York suffered severe flooding and sewage problems during the heavy rainfalls in June and July. The parish council (which covers both parishes) believes this exceptional flooding merely highlighted a long standing problem.

2. We believe these difficulties have arisen because a small village has had large housing estates grafted onto a Victorian system for disposing of surface water and sewage. As a result difficulties arise regularly all around the village and not just when there is exceptional weather. At the moment these problems are dealt with piecemeal and no-one appears to have a clear picture of the village’s problems as a whole.

3. Solution: Where such difficulties exist in old villages such as Strensall the Government should order all the organisations involved with drainage in that area to get together and carry out a comprehensive review of the whole surface water and sewage system. Firm decisions could be taken on whether the infrastructure is adequate or not.

4. We ask the Environment, Food and Rural Affairs Committee to urge the Government to adopt this procedure.

Councillor Peter Jesse
Chairman Strensall and Towthorpe Parish Council (York)
August 2007
Memorandum submitted by West Lindsey District Council (FL 135)

1. Executive Summary

1.1 This document sets out the main issues arising out of the flooding that affected the district of West Lindsey during the summer of 2007. The district of West Lindsey covers the area immediately north of Lincoln and forms the north west gateway to Lincolnshire. A number of areas across the district experienced varying degrees of flooding; the most severely affected were the wards of Scotter, Ingham, Nettleham and Glentham. In response to the flooding West Lindsey District Council decided to hold an Inquiry in order to reduce the impact of a similar event in the future. Stage one of the Inquiry involved sending a survey to every household and business in the district in August 2007. The purpose of this was to gather evidence of how residents were affected and how well they felt the Council and other agencies responded. In conjunction with this, a number of informal focus groups were organised between Parish/Town, District and Lincolnshire County Councillors. This allowed officers and community representatives to discuss a number of issues around flooding in severely affected areas. All of the information gathered will be used as evidence for a Citizens’ Jury to be held in January 2008 which forms the second part of the Inquiry. The Jury will be a chance to consider evidence and senior officers from both the Council and various agencies will be invited to account for their response to the flooding and outline what action will be taken to lessen the impact of future flooding.

2. Issues Raised as a Result of the Flooding

2.1 A number of perceived issues have become apparent from the evidence gathered by the Council so far. These are set out below:

2.2 Lack of co-ordination between agencies—residents reported being passed from “pillar to post” by the various agencies when trying to get a query resolved. This caused confusion as to who was responsible for what and in some cases, made residents’ situations worse as they didn’t know who to turn to for the help they needed.

2.3 Lack of, or problems with, communication—many residents reported being given little or no information from the Environment Agency as to the severity of the flood warning in their area which residents felt left them unable to adequately prepare. Some reported being unable to access the Environment Agency’s website for information as well as being unable to get through on the telephone. Residents also said that they were given contradictory evidence from the various agencies. In one example, a resident in Nettleham was told that the flood risk was low and there was no need to evacuate. He was then told two hours later that severe flooding was “almost certain” and the area would have to be evacuated immediately, therefore allowing no time to rescue belongings.

2.4 Confusion over who is responsible for drains, pipes and verges—there was widespread confusion over who is responsible for maintaining verges and dykes, as well as who is responsible for becks, waterways and drainage systems. Residents requested a “map” of who is responsible for what so that they can be held to account, or made aware of their duty to maintain waterways etc.

2.5 Waterways not being dredged and cleaned—an overwhelming number of residents reported that waterways had not been dredged for periods of time ranging from ten to 30 years. They felt that this caused the flooding to some extent and that there should be a return to the annual programme of dredging and cleaning waterways.

2.6 Planning Issues—many residents voiced concerns that poor planning decisions by the Council and new housing with inadequate drainage were responsible for the recent flooding. Questions were asked as to how old the drainage pipes were as it was felt that they were too antiquated and too small to cope with the sudden deluge of water.

3. Next Steps

3.1 It is anticipated that, as part of the Council’s own Inquiry, a number of lessons will emerge for both the Council and partner agencies to take into account. As part of the national Inquiry, West Lindsey District Council asks that the following be considered in order to lessen the impact of flooding in the future:

3.2 A clear definition of roles and responsibilities for each agency so that:
(a) members of the public are clear on who they should contact in the event of flooding; and
(b) each agency is clear about their duties so that they can undertake these accordingly.

3.2 That contingency plans are put in place so that agencies telephone lines and internet sites can cope with the surge in demand caused by severe weather.

3.3 One single agency to be responsible for publicising flood warnings and giving advice to residents re evacuation as early as possible.
3.4 That consideration is given to providing extra funding for local authorities to allow waterways to be dredged on an annual basis.

3.5 That the issues around planning are considered as part of the national Inquiry.

West Lindsey District Council

October 2007

Witnesses: Mrs Julie O’Neill, Chair, Burton Joyce Residents’ Association; Mr Peter Jesse, Chairman, and Cllr Keith Marquis, Councillor, Strensall & Towthorpe Parish Council; Cllr Reginald A Shore, Leader, and Mr James Nicholson, Director of Neighbourhoods and Health, West Lindsey District Council, gave evidence.

Q841 Chairman: With the speed of a quick-change artist we move to our second panel of citizens who have been kind enough to provide the Committee with written evidence. Can I formally welcome, on behalf of the Burton Joyce Residents’ Association, Julie O’Neill, their Chair, and from the Strensall & Towthorpe Parish Council, Cllr Keith Marquis and Mr Peter Jesse, their Chairman, and, from the West Lindsey District Council, Cllr Reginald Shore, who is their Leader, and James Nicholson, who is the Director of Neighbourhoods and Health. If we can follow the same procedure as we did with our previous witnesses, if one representative of each organisation would be kind enough to speak for about five minutes to set the scene about the issue from your standpoint and then, as before, the Committee will ask you some questions. Julie O’Neill, may we start with you, please?

Mrs O’Neill: Thank you. Burton Joyce is about six miles from Nottingham. The village stretches along the valley floor and up the hillside alongside the road. To the south is the River Trent. The village has got no formal flood defences, but a railway embankment serves as a partial informal defence from the Trent at a 1:30 year level. We have got several potential sources of flooding in our village: the River Trent, the stream that runs through the valley floor and up the hillside alongside the road. There are generally no drainage channels. These must be properly maintained on a regular basis by everyone responsible. In our village drainage ditches that existed in earlier years on the edges of fields, gardens or alongside roads have either been filled in or built over by farmers, house owners or developers who do not give any regard to the impact on others of new build. What I am highlighting here is the lack of maintenance to watercourses, dykes and drainage channels. These must be properly maintained on a regular basis by everyone responsible. In our village drainage ditches that existed in earlier years on the edges of fields, gardens or alongside roads have also been filled in or built over by farmers, house owners or developers who

villages the causes were the same: unprecedented volume of rain; unmaintained watercourses, ditches and dykes; blockages in culverts and in road gullies; and the drainage and sewerage systems unable to cope. The problems that we faced I have heard mentioned by so many people in different ways already today and I do not want to repeat them all, but I want to pick out a few particular issues that have become important to me since the flooding. Firstly, there is the issue of overall responsibility. I think we have all agreed it needs to be simplified and there should be one agency responsible for all kinds of water management. Secondly, there is the issue of the responsibilities of landowners. I know I did not pick this up initially in my earlier report but I have come to the view that many landowners, and by that I mean householders, do not respect their obligations as riparian owners. Many do not even know that they have got these obligations. Some use watercourses and ditches on their property for depositing rubbish and some fill them in to extend the size of their gardens. As a result, last summer one of the causes of flooding in our village was rubbish and debris, including tree trunks and wheelie bins, that came sweeping down into the village through the dumble and added to the existing blockages in the culverts. Those who do maintain their watercourses and drainage ditches complain that their neighbours do not. When individuals bring such matters to the attention of the local authority they are told this is a private matter between individual householders, they must sort it out themselves or take legal action against their neighbour. Other landowners do not give any consideration to the impact on others of developments they carry out. For example, the creation of large paved areas or building walls is often carried out with complete disregard for the impact of rainwater runoff. There are generally no planning controls over such development unless it is new build. What I am highlighting here is landowners’ ignorance of their responsibilities and lack of consideration for others. There is a need to do more to inform landowners of their obligations and for a regulatory authority to enforce action wherever appropriate. Thirdly, there is the issue of the lack of maintenance to watercourses, dykes and drainage channels. These must be properly maintained on a regular basis by everyone responsible. In our village drainage ditches that existed in earlier years on the edges of fields, gardens or alongside roads have either been filled in or built over by farmers, house owners or developers who
have either not understood or ignored their purpose. Drainage ditches should be fully mapped and protected. I understand that my neighbouring authority, Newark and Sherwood, has recently asked parish councils to map drainage ditches in their area. This is surely a step forward, but how will the protection of these ditches be implemented. I have raised this issue with my local authority which advised me there is nothing they can do to protect existing drainage channels except when a planning application which could affect drainage is before them. This seems very strange to me and it should be addressed. Fourthly, there are planning issues. In my village, developments have been permitted over decades in flood-prone areas or in such a way that drainage channels have been destroyed or interrupted. Currently, the practice of building an extra house, or two or three or ten, on a garden which once existed is taking place everywhere without apparently any regard being given to the capacity of the drainage or sewerage system or the increased flood risk as the amount of land available to absorb water decreases. Those of us who care about such things can only despair as our objections and the staggeringly obvious is ignored. We are numbed by the mindlessness of it all. This brings me to the issue of PPS25 and how local planning authorities are implementing this. Let us take the issue of Flood Risk Assessments. PPS25 sets out clearly when they should be required and the type of assessment appropriate for each type of planning application, but I am concerned that my local authority does not seem to be following the recommended practice. It does not necessarily ask for a Flood Risk Assessment at an early stage, and sometimes gives conditional planning permission with the later production of an assessment being one of the conditions. That seems like putting the cart before the horse and surely is not what PPS25 intended. Finally, there is the issue of the preference given to urban areas and the relative neglect of rural areas in terms of funding for flood defences. Summer saw large urban areas being flooded. Given the limited funding available for flooding defences, those in rural areas who have suffered flooding for years, and might have recently been given a glimpse of the possibility of a defence in the future, now suspect that their chances have been completely washed away by the summer floods. Given the points system operated by the Environment Agency and the inevitability that new emphasis will be given to renewing water and sewerage systems in urban areas that were flooded last summer, rural dwellers fear that the needs of large populations in urban areas will be given priority yet again. In flood defences, as in so much else, rural populations have reason to fear that their longstanding needs will be sacrificed at the urban altar.

Q842 Chairman: Thank you very much indeed. Who will speak for your Council? Mr Jesse, off you go.

Mr Jesse: Thank you, Chairman. Thank you for giving Strensall & Towthorpe Parish Council this opportunity to speak on behalf of the residents of our parish and for making our case heard in regards of the flooding circumstances in the Strensall area, which is part of the City of York unitary authority. We sit seven miles due north of York. Can I add a preamble and say that our problems, our issues, are not directly from flooding by rivers per se. Whilst we have the River Foss within the village our problems are far more long-term, as I will make you aware. Strensall’s history goes back to the Domesday Book, so clearly times have dramatically changed. The Parish Council believes this exceptional flooding merely highlights a longstanding problem which arises regularly and not just in times of unseasonal rainfall. Our problems are perhaps insignificant compared with other areas, such as last year in South Yorkshire and Gloucestershire, but are just as important to those affected by flooding of their property or the highways which have to be negotiated on a regular basis. Heavy and continuous rainfall is now becoming a regular feature of the weather in the Strensall and Towthorpe area, obviously country-wide, and it is common knowledge to us that the soil is predominantly clay which exacerbates the problems with surface drainage. During the past 30 years the village of Strensall and the hamlet of Towthorpe have been massively extended into what is now a community of the size of a small town with over 6,000 residents, most of which have had the new drainage system bolted on to the existing one. For many years, Strensall & Towthorpe Parish Council have communicated with the City of York Council on those occasions when flooding has affected parts of the parish, but because of restraints, presumably financial, and lack of detailed knowledge of the drainage systems, little has been achieved over this period. Our concerns are not only for the present but for the future insofar as every new property that is built has an effect on the mainly clay soil to deal with the surface water runoff, although when planning applications for infill or new developments come before the Parish Council the response from us to the planning officer is to take account of this aspect, yet in practice most applications receive approval. It is a fact that developers are required to allow 15 per cent of the development to be available for the purpose of the removal of surface water, however, as we all understand these days, many residents today put in applications for conservatories and drives so, therefore, that 15 per cent is quickly reduced with the obvious effect. Another aspect of this subject is that it appears when the local water services provider, in our case Yorkshire Water, is asked by the planning officer for any objections and whether their system can cope with the additional surface runoff from a new property or development, the answer is almost always “yes” as in many cases when surface water is piped into Yorkshire Water’s system it is often dispersed into either private, local authority systems or drainage ditches which pass the problem to the system or ditch owner. The latter, of course, do not get any recompense for the additional problems which can ensue but the utility raise sewerage
charges against the new property owners. Lack of detailed information is a prime cause of the local authority not being able to resolve flooding situations and in Strensall, if I can just give you details of one particular situation, there is a classic case of a system partially maintained by the Foss Internal Drainage Board for that length of the underground piped drain nearest to the River Foss, and it is a 24 inch pipe I understand. The remainder of the system which takes surface water from properties between York Road and Ox Carr Lane in a partially covered/partly open ditch arrangement is the responsibility of riparian owners, and you have heard about that today, including the MoD. Ditches alongside Flaxton Road and Scott Moncrieff Road fill with surface water but this does not subsequently drain to anywhere and results in highway flooding. The riparian owners are probably totally unaware of their legal maintenance responsibility for the system over or alongside their property as the developer who originally installed the system could well not have passed on to purchasers details of the ownership of the drain. Talking to the Internal Drainage Boards, they told us the pipe the developers use is a nine inch one. Local residents consider that the ditches should flow into Strensall Drain, but this is likely to be on MoD land and there appears to be an impasse between the local authority and the MoD to resolve this problem. I do have some photos here, Chairman, for your delectation.

Q843 Chairman: Thank you. Mr Jesse: Another example is the lack of dredging work on the River Foss in recent years. The Foss Internal Drainage Board dispute that dredging would improve the flooding problems and insist that channel profiling and margin maintenance is the only efficient way to tackle this problem. They did advise us that if you dredge out the bottom of the river nature just fills it up again and if you take away silt all the banks will fall in as well. Finally, the road gullies, which are the responsibility of the local authority, do not always cope with the amount of surface runoff that is prevalent in such wet conditions, and whilst those which do not drain freely are regularly reported and occasionally jetted, the basic problem returns time after time. In recent years, the maintenance of the road gullies has been reduced to annually, but pre-1999 it was twice a year. When this reduced programme is combined with not clearing fallen leaves in autumn, the result is more fire-fighting action to clear these gullies. Finally, Strensall & Towthorpe Parish Council believe that the problems we encounter are probably replicated nationwide and to resolve them will need massive investment in compiling drainage system records and a comprehensive review of the whole surface water and sewerage systems and ensuring among all the agencies involved regular and effective maintenance of the whole system is carried out. Thank you, Chairman.

Q844 Chairman: Thank you very much. Thank you very much for these graphic photographs, they certainly amplify some of the points that you were making. Let us move on to West Lindsey Council. Mr Nicholson, are you going to speak for the Council?

Mr Nicholson: Yes, Chairman. I am speaking on behalf of West Lindsey District Council which is a large rural area, the most sparsely populated district in the East Midlands. The district covers 447 square miles and serves 84,900 residents and employs 365 staff. The district was affected by the floods in June 2007. A number of areas across the district experienced varying degrees of flooding. The most severely affected were the wards of Saxilby, Scotter, Nettleham, Blyton, Ingham and Langworth. It is understood that some parts of the district over a two-day period experienced up to 80mm of rain. The Council operated an emergency control room from 25 to 28 June and continued to offer 24 hour standby which was covered by volunteers until 2 July. A district-wide independent survey undertaken in August 2007 identified that 434 properties were internally flooded. However, at 16 January 2008, 59 families were residing away from their home address. During the floods the Council received 567 requests for sandbags and distributed 14,000. There were 92 requests from residents to remove flood damaged goods, which the Council collected free of charge. 43 householders were awarded Council Tax rebates and, of those flooded, 190 received grant payments. The Council took a lead in co-ordinating an inquiry with its partner agencies to determine lessons learnt. This has been wide-ranging, including a full postal survey to all households and businesses, seven local meetings with Parish Councils, local councillors and flood wardens, and a public meeting in Middle Rasen, culminating in a Citizens’ Jury event on 19 January. All of the information was brought together for the successful event with over 50 members of the public, all affected by flooding, attending to listen to the evidence, to cross-examine the key agencies and to deliberate and reach recommendations. During this process, residents raised issues over the lack of co-ordination between agencies, lack of and problems with communication, confusion over who is responsible for drains, pipes and ditches, waterways not being dredged and cleaned, and poor planning decisions. Some form of central co-ordination point to manage the process of responding to flooding which has clearly defined roles and responsibilities for those involved would have alleviated some of the issues raised by residents and agencies. Provision of additional funding to allow for an annual programme of works which focuses on annual dredging of waterways would also have assisted with minimising the impact of floods. What has the Council done since June 2007? We have undertaken this survey work in flood affected areas along with looking at a number of flood alleviation schemes. The Flood Working Group, which is a multi-agency group which was set up in 2004 after flooding affected parts of Gainsborough, meets to ensure that agencies are sharing information and taking appropriate action to deal with drainage issues. The group has identified a
number of issues and taken action to resolve them. It identified that planning applications did not contain reference to or ask questions relating to watercourses. This was raised with central Government and now such a question is asked, but only on full applications. The group have led on ensuring adequate maintenance of a watercourse and major balancing ponds serving the most significantly affected area in Gainsborough resulting in the district taking over responsibility for the watercourse. It was also instrumental in establishing the need for the replacement of a trunk sewer and significant work at three major pumping stations during 2005-07. Two capital schemes to relieve critical throttle points will commence in 2008. Work continues to take property off “at risk” registers and two schemes related to internal flooding risks are currently being worked on, one in Saxilby. Since the 2007 floods the group has become more involved in complex issues of dispute and, where necessary, formed sub-groups to deal with local area issues. A new drainage system for Bransby has in principle been allocated funding by a number of agencies with the intention to commence before this bird nesting season. In Laughton, a poor maintained riparian watercourse, which was the cause of major flooding, has been cleared in partnership. The work of the Flood Working Group has geared up as a result of the 2007 floods and will continue to be a central focus for the ongoing improvements required by all agencies to minimise risks of flooding across West Lindsey. The 19 January Citizens’ Jury review was a successful event and well received by those attending. The 58 recommendations have provided a platform for agencies to work from. A number of key themes have emerged from those recommendations, and these include: the need for clearly defined roles and responsibilities; better access to information and communication both internally across agencies and externally with residents; better maintenance of the current infrastructure; planning issues linked to the built environment; and resources/investment to alleviate further flooding. Some of the recommendations offered possible solutions and these include: production of a central database containing vital flooding information with clearly defined areas of responsibility which is communicated widely across all agencies; purchase of flood barriers; better links between the agencies and flood victims; divide the Environment Agency into two parts, so one part has overall responsibility for flooding; emergency centres should be set up in each affected area as a point of contact and information for the community; and highways should regular monitor drains to inspect for damage and companies found responsible should pay for the damage. To take these recommendations forward, West Lindsey District Council will produce and monitor an action plan which will be reviewed by the relevant agencies through the Flood Working Group. Residents will be kept informed on a biannual basis by sending a newsletter to the people who sat as jurors on the Citizens’ Jury. Thank you, Chairman.

Q845 Chairman: Thank you very much. That sounds like a very interesting initiative. When, if you like, is the final version of this going to be available?

Mr Nicholson: In fact, it should be available within a few weeks’ time when this is going to be presented to the Council with the Citizens’ Jury recommendations.

Q846 Chairman: I am interested to know how you are going to follow it up. You have touched on the responsibilities of a lot of what I call big, sometimes national bodies who may be very polite in saying, “Thank you very much for sending us these very good suggestions”, but then they disappear from view. What is the plan for that?

Cllr Shore: If I can come in there, Chairman. One of the frustrations of everyone who has spoken to you today is the fact that you cannot nail things down. There is a lack of clarity, a lack of who has got responsibility. What we said we would do at West Lindsey District Council is take on, head-on, all the locations of any flooded areas in the West Lindsey District area and also as part of a database we would audit problems occurring at those sites. We would then look at the causes of those problems and, most significantly, we would look at the responsibilities. That could be a single person, it could be riparian ownership, joint riparian ownership, a whole plethora of people or, quite significantly, on paper it might be no-one because there are so many areas that are contested or disputed that no-one quite knows who is responsible. Just having a blank space there on the database will be significant. Then we move on to something which is another important one, possible solutions to these problems and the timescales involved. It is really important that the public, West Lindsey, and probably all flood areas, understand those perspectives because I do not think everyone does. I do not think they understand the cost implications of some of the work that has got to take place. All of those issues complicate it. At least if we have got these on a database people can access that database, see what is going on in their particular area, see what problems are being addressed, understand why their problem is not at the top of the list, which may require government funding never mind local funding to actually start to solve the problem, and at least they can keep track of that. From that database we will then be calling in all the agencies and sitting round a table we will literally go through the database looking at the responsibilities and where things are contested and try to establish some kind of relationship as we did in Bransby, indeed, when several people were involved in solving the problem. Some of the problems are going to be very difficult to solve. I have got a booklet here with some examples which are horrendous. There have also been strange planning decisions. The fact that no-one anticipated getting 80mm of water in 24 hours when normally we only get 50mm and no matter how good the systems were going to be they were never going to cope with that amount of deluge. However, I think we have established here today that there was a hell of a lot we could have done and
that would have made one hell of a difference and would have saved a lot of money for a lot of people. That is where we are going to. At the end of the day, I think it is going to take your powers, gentlemen, to deal with some of big picture issues but we will do what we can through structures like this database.

Q847 Chairman: I am sure the Committee are genuinely impressed by the work that all of you are doing and, although we propose to conclude next week we hope in taking our formal evidence, if in the meantime you wanted to, if you like, expand a little bit in the way you have done in your oral evidence and send us a little shopping list before then saying, “We hope the following points will be responded to”, we could put a note in our report saying we hope that all the agencies will respond positively. From the point of view of looking at a local area you have defined a pretty formidable work programme. I hope there is something else going on in the council, you are not doing that full-time, are you?

Cllr Shore: It is a high priority, Chairman.

Chairman: Good.

Q848 Paddy Tipping: I just wanted to pick up on the last point that Mrs O’Neill made which was about the view in rural areas that flood prevention measures were going to go to urban areas because of the cost-benefit analysis. I just wonder, Mrs O’Neill, whether you would spell out a little bit more the cost-benefit analysis. I just wonder, Mrs O’Neill, whether you would spell out a little bit more the cost-benefit analysis. Mrs O’Neill: Yes, that is right. I did not mention this in my submission because it was not relevant to the summer flooding, but I will say that there is a flood protection scheme for Nottingham, called the Nottingham Flood Alleviation Scheme, which will enhance the flood protection for Nottingham from a 1:50 level as it is at the moment to 1:100. I understand. The impact of that will be to increase the flood risks to downstream villages, including our own and about 12 other villages. This is a project which has been put forward by the Environment Agency, so we are in this interesting situation where the Environment Agency in protecting the urban area is prepared to sacrifice the rural area. Perhaps that sounds a little unkind because the Environment Agency do a lot of wonderful things for us but, on the other hand, a spokesman from the Environment Agency is on record as saying, “Well, the rural areas are used to being flooded so a little bit extra won’t make much difference”, to which we do not take too kindly, it is just not acceptable. There are villages downstream of Nottingham that have no flood protection at all and it is just going to be made worse. In the rural areas we do not find that acceptable. We cannot sit by while others say, “Okay, let’s all this money and all this protection go to the urban areas, the rural areas can just look after themselves”, because that is how we feel.

Q849 Chairman: I want to come back to a point, Mr Jesse, you were making on behalf of your council. You made the point at the beginning that many of the issues you had identified were of longstanding and no doubt, if you like, the summer rains last year and the flooding crystallised that view, but you must have made efforts in the past to get a response. Just give us a flavour of the negative responses that I fear you have had up until now? Who is the worst offender in saying, “Not here, please”?

Mr Jesse: Longstanding, this happens every time it rains every winter. Every winter the roads flood in certain areas, as per the photos, regardless of excessive rainfall. We perpetually, and my councillor friend here is one of the guys who does a lot of work, badger the City of York Council and Yorkshire Water in this regard. The excessive rains last year drove us to write to Defra as per we were invited to. Do you want to say anything?

Cllr Marquis: We started off by writing to the local authority about the situation with regard to flooding in general terms and we received a response from them saying they were fully aware of the problems but they have no money to put it right. We also wrote to Yorkshire Water in July last year and there has been a postal strike since and we have not had a response, we presume it is lost in the post. It is good housekeeping that is the cause of a lot of the problems in my view. The gullies that we understand were installed on the basis of a once in a ten year storm situation are not capable of coping with heavy, prolonged rainfall. Strensall is a peculiar area of the City of York unitary authority and as you come into Strensall you seem to cross over what we locally call the Towthorpe divide and you can have bright sunshine on one side of the line and heavy rain on the other. You do not need much more than half an hour’s continuous rain for some of the highways to become flooded. As the Chairman alluded to before, one of the worst areas of flooding is this business where the ditches, we are told by local residents, should go into a drain which ultimately is the Internal Drainage Board responsibility but part of it from this end, furthest from the river, is the responsibility of riparian owners. The local authority does not want to be heavy-handed with owners to force them to do things but where the ditch is open some of the property owners have created features in the water which interrupt the flow and exacerbate the problem. How do you deal with that sort of situation? The main problem is getting everybody together who is involved to come to a solution. I have been involved in the Parish Council for ten years now and these problems have been there for that length of time. Some were not able to proceed because of the conservation situation with the wetland areas and the great crested newt population in that area, but what concerns us in that particular area is the road floods, especially at this time of year, and if you have a heavy icy spell you have got an ice
rinking that motorists are driving on. The only solution that the local authority seems to have is to raise the level of the road but, you know, if you raise the level of the road eventually it is going to happen again, so it would be a waste of money.

Q850 Mr Williams: This relates to West Lindsey Council. Does an Internal Drainage Board precept operate or more than one Internal Drainage Board?

Mr Nicholson: Five Internal Drainage Boards.

Q851 Mr Williams: Are you happy with that arrangement? Given the fact you are taking a more proactive role in addressing these issues, do you have a good partnership with those bodies? What are your thoughts on that precept arrangement?

Mr Nicholson: I think the precept is fine, we do have excellent partnership arrangements with all the partners on the Flood Working Group and that has some good practice. We have got commitments from all those partners and we are working very well with them, including Joint Solutions, which is the partnership working body, and that is doing a really good piece of work. It has needed some dedicated resource and we needed a co-ordinator to pull the agencies together but it is working and getting the schemes together. £250,000 is the amount that we are looking at for draining water.

Cllr Shore: If you can help us in one way it would be to try and seek out some of the permissive powers and turn them into duties and, secondly, to help us solve some of the disputes that may be unsolvable, similar to the way planning appeals take place so that we have one place to go to in the case where there is a judgment to be made so and we can get on with the job. It is this blocking mechanism that we find most frustrating and I think the people on the panel have expressed that today.

Chairman: I am glad you have made that point because it was certainly one that occurred to me when I read your written evidence and it is a very positive note for us to end on. Whilst the Committee cannot sort out every individual problem, in terms of the collective recommendations that colleagues may come to, pointing a way to help people who want to help themselves, as you all do, to make certain there is a positive response by the big bodies to the problems of the small is a very powerful point. Can I thank all of you for what you have said to us and, importantly, what you wrote to us by way of your written evidence. May I say collectively to everybody who is in the room, who has given evidence, who has been stimulated by these proceedings, the door remains open for any further points by means of written evidence. As I said, we have a week to go before we finally close the door on taking information and then we have to sit down and deliberate and produce a report. I am very grateful to all of our witnesses for coming to us this afternoon. May I thank all those who have been involved in making the splendid arrangements, they have gone absolutely wonderfully, as long as we get our train back eventually! May I thank those members of the public in the audience who have come along, perhaps for the first time, to see what a House of Commons Select Committee does. You may be interested to know that some of the proceedings of our inquiry into flooding have been on the Parliament Channel. I know that because I have had at least one letter from a person who remained awake throughout the whole thing! If you want to carry on, the chances are that our remaining sessions will be on. We have got one on Monday and one next Wednesday, so there is a chance to maintain your stalwart interest. Thank you all very much indeed for your contributions, it is greatly appreciated.

Supplementary memorandum submitted by Strensall and Towthorpe Parish Council (FL 39a)

ADDENDUM TO ORAL EVIDENCE GIVEN TO THE EFRA SELECT COMMITTEE AT THE LAWNS IN LINCOLN SESSION HELD ON 30 JANUARY 2008

Following the session held at The Lawns in Lincoln Visitor Centre on Wednesday 30 January at which the Chairman of the Select Committee, Mr Michael Jack MP, stated that additional data could be considered by the Select Committee if sent.

Strensall and Towthorpe Parish Council wish to add the following and as requested by the chairman we hope the points in this addendum will be responded to:

— We whole heartedly agree with the suggestion made by almost every witness that the system to report/request attention to any drainage related problem should be dealt with by a single authority.
We also desire that such an authority should have powers to insist that attention is given by the various owners, including riparian owners, of drainage systems, ditches etc to ensure a continuous flow through such systems is maintained.

— Strensall and Towthorpe form part of the Unitary Authority of City of York Council and we understand that in exceptional circumstances that this authority must prioritise their resources to deal with those most at risk from flooding. However as mentioned previously our parishes have not suffered as badly as many others and there is little risk, at present, of properties being overwhelmed by the River Foss when in flood. However it is recognised that had the surrounding areas, such as the Vale of York and the Yorkshire Dales experienced the amount of rainfall which affected Gloucestershire, Worcestershire, Warwickshire, Humberside and South Yorkshire then
we would all have had a different story to tell. The situation does occur quite regularly where the highway is flooded especially at the hotspots shown on the map presented by us at Lincoln. Over the past week or so the rainfall in this area has been replaced by dry windy conditions which has seen most of the highway flooding disappear but after early morning rain on 31 January 2008 once again the hotspots were again affected by floodwater as the road gullies or verge grips/drainage ditches were unable to cope. Therefore in the recommendations made by City of York Council’s Advisory Panel to the Executive where the events of June 2007 were described as an “exceptional event” only exacerbated what we in Strensall and Towthorpe see as a regular occurrence with little or no hope of a solution being found. However we do note that recent cutbacks in the street cleaning of gutters (especially in the leaf fall season) were seen as a contributory factor and that due consideration is recommended to be paid to this aspect when setting the budgets for 2008–08 and future years.

— We also consider that it is imperative that steps are taken to compile records of all aspects of the drainage system as a matter of urgency as records held by the local authority are either limited or non existent. Local knowledge, particularly of the older residents, could be a source of data.

— We also believe that when planning applications are considered, due regard, must be paid to the drainage issues raised by individuals and Parish Councils and such issues are not dismissed by the Water Utility or the Internal Drainage Board’s when asked to comment on their ability to deal with surface water from new buildings thus leaving any restrictions on the builder/developer to be set by the Development Control department. The planning laws which allow the construction of conservatories, patios, driveways etc which reduce the amount of natural surface drainage be amended to ensure that due regard is made to this factor.

— A recent planning application has been granted in Strensall parish where agreement has been given to an application to demolish a bungalow and replace it with two large houses. A neighbour objected to the scheme and is concerned that the drainage system from his property passes under the garden of the bungalow to access the Yorkshire Water system. He has complained to the local authority that when his property was built, only three years ago, then a condition attached to that development was that a “freerain system” be installed to alleviate flooding but no such condition has been applied to the current application and the same local authority now says that if problems did occur with the new development causing flooding or drainage problems to neighbouring properties then this would be a civil matter between the parties involved. It is also another occasion when the water utility, although aware of potential flooding, made no comment when asked for input about the planning application during the consultation stage.

Such inconsistencies appear to be caused by the local authority and utilities but neither will accept any responsibility for their actions (or non-actions) but if a single authority was created to be responsible for drainage then surely they would take into account the problems that could ensue from their decisions/comments.

Thank you for giving the representatives of Strensall and Towthorpe Parish Council the opportunity to voice our concerns to the EFRA Select Committee.

Peter Jesse
Chairman

Keith Marquis
Councillor
Strensall and Towthorpe Parish Council

February 2008
Monday 4 February 2008

Members present:

Mr Michael Jack, in the Chair

Mr David Drew    Lynne Jones    Miss Anne McIntosh    Sir Peter Soulsby
Dr Gavin Strang    David Taylor    Paddy Tipping    Mr Roger Williams

Memorandum submitted by Central Networks (FL 159)

EXECUTIVE SUMMARY

1. Central Networks welcomes the opportunity to contribute to the work of the Select Committee. We believe it is important to identify lessons from the summer floods in order to improve our preparedness and resilience.

2. The flooding in July 2007 was unprecedented. The majority of the electricity distribution network was unaffected but we experienced localised disruption to electricity supplies in Gloucestershire. Notwithstanding this, our emergency planning and preparedness enabled us to respond effectively and efficiently to limit the impact on our customers and the community.

3. Working in extremely difficult conditions, Central Networks engineers made operational decisions to disconnect customers from our network to ensure safety and to avoid damage to our equipment in a controlled way. This avoided a prolonged loss of supply for customers.

4. Since the flooding in July, we have installed Hesco Bastion flood protection to Castle Meads substation and are actively assessing the risk and mitigation measures for other key strategic sites. In addition, we are supporting a review of flood resilience being led by the Energy Networks Association at the request of the Department for Business, Enterprise & Regulatory Reform (BERR).

5. Central Networks is a Civil Contingencies Act Category 2 responder and we supported the Gold and Silver Commands established in Gloucester during the event.

BACKGROUND

6. Central Networks distributes electricity to 5 million domestic, commercial and industrial customers in Central England. It is the second largest electricity distribution company in the UK.

7. We take power at 132kV from 29 grid supply points on the National Grid transmission system and distribute it through an extensive network of voltage transformers, switches and overhead and underground cables to individual customer premises.

8. Our network covers an area of 30,000 square kilometres from the Welsh borders in the West to the Lincolnshire coast in the East, Bristol in the South to the Peak District in the North.

9. The length of our overhead and underground cable network is around 130,000 km and we operate nearly 100,000 substations to reduce the voltage to the levels required by customers. Much of the network is inter-connected that allows us to switch supplies in the event of faults on our network and thereby provide a high degree of resilience.

10. In order to distribute electricity, we rely on secure supplies from the National Grid transmission system. Whilst our network is inter-connected, the extent to which we can redirect supplies is limited. Whilst we can reduce the impact by re-configuring supplies, a major failure on the transmission network will inevitably cause disruption to customer supplies.

11. Security of supply is the cornerstone of our strategy and we continually strive to improve the performance of our network by efficient operation, careful maintenance and targeted investment.

12. We employ 2,500 staff based at 8 sites across our region. Our head office is at Pegasus Business Park adjacent to East Midlands Airport on the outskirts of Nottingham. In addition, we have offices at Tipton, Gloucester, Worcester, Stoke, Hinckley, Sleaford and Moorgreen.

13. In addition to our own staff, we employ approximately 3,000 contractors primarily to support delivery of our investment programme.

14. Central Networks is owned by E.ON, the world’s largest investor owned power and gas company.
THE NATURE OF OUR BUSINESS

15. Our operations cover the following counties: Gloucestershire, Worcestershire, Herefordshire, West Midlands, Staffordshire, Warwickshire, Oxfordshire, Buckinghamshire, Northamptonshire, Leicestershire, Derbyshire, Nottinghamshire and Lincolnshire.

16. These regions include a mixture of rural, semi-rural and urban environments. In the rural areas, the network is predominantly overhead whereas in towns and cities, the network is largely underground.

17. The network was rapidly expanded in the 1950’s and many of our assets are over 50 years old. We have a major investment programme to progressively replace the worst performing assets. We experience faults either due to age and condition or due to damage by third parties. Typically we experience around 40000 faults per year on our network that are managed as part of our day to day operations.

18. Our overhead network is particularly susceptible to damage by extreme weather, in particular, high winds, snow/ice and lightning. Flooding presents an additional risk to the resilience of the network that needs to be considered alongside other weather related risks. Major weather events can cause significant disruption and require us to implement our emergency planning procedures to ensure efficient and effective return to business as usual.

PROVISIONS FOR EMERGENCY PLANNING

19. Central Networks maintains an emergency plan that has been developed in line with the Civil Contingencies Act. It is routinely tested to ensure all parties understand their roles in the event of an emergency.

20. In addition, we typically experience one or two major incidents every year for which we implement our emergency plan. As a consequence, our preparedness is high, enabling effective and efficient response in the event of a major incident.

21. Central Networks is a Category 2 responder and as such may be required to participate in wider emergency events involving other agencies such as the flooding at Gloucester.

22. Our extensive geographic footprint necessitates engagement with 14 Local Resilience Forums and 6 Regions.

FLOODING RESILIENCE

23. The major weather-related risk to our network is wind, snow/ice and lightning. Flooding has not hitherto materialised as a major risk and notwithstanding the events in July is not as significant as wind, snow/ice or lightning.

24. Our equipment needs to be installed close to the demand. Therefore, if development takes place in areas at risk of flooding, we will need to extend our network in those areas, exposing our equipment to similar risk.

25. It would not be practicable to protect every sub-station at potential risk of flooding and indeed there is no need to if the premises supplied by them are not themselves protected. Therefore, our primary focus is on protecting the major strategic sites supplying high number of customers (typically more than 10,000).

26. We are ensuring that flood protection is considered in the design of new facilities. An example of this is the new substation at Port Ham in Gloucester that has been constructed on stilts.

OUR RESPONSE TO THE FLOODING INCIDENTS IN WORCESTER AND GLOUCESTER

27. This section details the events leading up to, during and immediately following the significant flooding experienced in Worcestershire and Gloucestershire between 20th July and 2nd August 2007.

Worcestershire

28. Based on forecasts from the Met Office, Central Networks implemented its emergency plan on 19 July 2007, raising its level of preparedness in the Worcester area.

29. At 1730 hours on 20 July, Timberdine sub-station in Worcester experienced two faults resulting in disconnection of 12,676 customers. The supplies were restored within 2 hours 40 minutes by reconfiguring the network and transferring load to other circuits. The sub-station had been flooded, causing damage to some of the equipment.

30. Timberdine was repaired once the flood water had been pumped from the site and restored to normal operation on 26 July.
31. Timberdine was flooded by storm water run off (pluvial flooding) rather than river flooding (fluvial). At present there are no reliable techniques to predict sites at risk of pluvial flooding.

32. Silver Command supported Central Networks by providing temporary protection and pumping at both Timberdine and the adjacent Warden sub-station that was also at risk of flooding.

### Gloucestershire

33. On 22 July, based on forecasts from the Met Office we became aware of the risk of flooding in Gloucestershire. Central Networks staff surveyed key sites identified as being at risk of flooding to monitor water levels. Tewkesbury and Castle Meads sub-stations were found to be at risk due to rising water.

34. Water levels continued to rise at Castle Meads and we requested assistance from Silver Command. The Fire Service and Army commenced sand bagging the 132kV control room and pumping within trenches to keep the water away from essential equipment. This enabled us to maintain supplies throughout 22 July.

35. In the early hours of 23 July, the water levels at Castle Meads rose rapidly and the emergency services could no longer protect the site from flooding. Central Networks decided to disconnect supplies in order to avoid damage to the equipment. At 0639 hours the site was switched out, disconnecting supplies to five substations and 47,753 customers.

36. Supplies were progressively restored by switching to alternative circuits and within two hours, supplies to 33,400 customers had been restored. Supplies to the remaining customers could only be restored once Castle Meads had been reconnected.

37. Castle Meads was re-energised and all supplies restored by 0222 hours on 24 July.

38. Once the flood waters started to recede we visited 23,000 electricity meters to check their integrity and visited 20,000 premises affected and/or potentially affected properties to check electrical safety.

39. The experience of the flooding in both Worcestershire and Gloucestershire was unprecedented. It was the first time Central Networks had participated fully in Gold and Silver Command.

40. Notwithstanding this, our emergency plan and general preparedness meant that we were able to respond swiftly and effectively to minimise the impact on our customers and support the management of the incident.

41. We deployed resources from across the company and our contractors to ensure that our response was not limited by resource. The main constraining factor was access to affected properties and assets due to the flood water.

### Addressing Flood Resilience

42. We have invested £200k in flood protection at Castle Meads sub-station to minimise the risk of disruption to the site should an event of similar magnitude to the July flood occur in the future.

43. We have identified a total of 113 substation sites across our region which may potentially be at risk of flooding on the basis of a 1 in 1000 year event. Of these, 81 sites are within the 1 in 100/200 year flood risk areas. We are currently seeking to quantify the extent of potential flooding at these sites, commencing with the larger 132kV sites, to determine the requirements (if any) for additional protection.

44. In order to inform the above work, we are working to develop predictive techniques and models. We are also co-funding with National Grid and EDF a scoping study with the Met Office looking at how climate change will impact the electricity industry as a whole. We will take these findings on board and factor them into our future network design and investment plans.

45. The Energy Networks Association (ENA) has been commissioned by BERR to review the flood resilience across the industry and is due to report at the end of February 2008. Central Networks is supporting this review.

46. We will be seeking support from Ofgem to increase investment in flood resilience as part of the Distribution Price Review for 2010 to 2015.

47. It is important to recognise that flood resilience requires a long term investment and programme of work.

Central Networks

January 2008
SUMMARY

National Grid electricity and gas engineers worked to maintain security of energy supply throughout the adverse weather and heavy flooding affecting South Yorkshire and Gloucester during late June and July 2007.

As outlined in the report below, the effects of the weather conditions in South Yorkshire during the week of 25 June impacted on National Grid’s operations and assets in a number of ways:

— Firstly, risks posed by the potential breach of the Ulley Dam in South Yorkshire impacted on National Grid’s gas distribution operations at the Above Ground Installation (AGI) at Guilthwaite and in addition Ulley Dam posed a risk to National Grid’s electricity substation at Brinsworth.

— Secondly, as a result of severe weather, National Grid’s Neepsend electricity substation was affected by flood waters, which led to the local electricity distribution network, CE Electric losing electricity supplies from this supply point.

— Thirdly, National Grid’s gas distribution network was affected in the Sheffield and Toll Bar region by a number of weather related incidents affecting gas supply pipelines at Kilham farm and Toll Bar detailed in the report below.

National Grid’s operations and assets were also affected in July 2007, as a result of flooding in the Gloucester area.

— National Grid’s Walham substation was affected by the adverse weather conditions on 21 July which led to parts of the substation becoming inundated with water. National Grid engineers reconfigured electricity systems to ensure continued electricity supply to Gloucester and South Wales.

National Grid has a number of measures in place to assess flood risks to its electricity and gas assets and has carried out a number of assessments on infrastructure in recent years. Whilst flooding has not been a cause of significant unreliability or unsupplied energy, with concerns over climate change and rising sea levels, National Grid is working to understand the impact of any consequent increase in flood risk, and the requirement for further risk mitigation at our sites to ensure a high level of reliability is maintained.

National Grid is participating in an Energy Networks Association (ENA) review group, addressing electricity resilience issues, which has been established at the request of Energy Minister, Malcolm Wicks. This group will report to the Energy Emergencies Executive Committee.

NATIONAL GRID—WHO ARE WE?

1. National Grid plc owns and operates the high voltage electricity transmission system in England and Wales, and operates the Scottish high voltage transmission system. National Grid also owns and operates the gas transmission system in Britain and distributes gas in the heart of England, to approximately 11 million offices, schools and homes. National Grid also manages electricity and gas assets in the US, where it operates in the states of New England and New York.

2. In addition, National Grid owns and operates other energy infrastructure such as liquefied natural gas importation facilities at Grain and the electricity interconnector with France. National Grid owns around 20 million gas meters in Britain and is at the forefront of gas and electricity smart metering competition.

3. National Grid is pleased to have the opportunity to contribute to this inquiry and can report the following account of the effects of the flooding that occurred during summer 2007 on its electricity and gas infrastructure.

FLOOD CONSIDERATIONS IN PLANNING AND DESIGN PROCESSES

4. The majority of the electricity transmission system was designed and constructed in the 1960’s. Subsequent development has been incremental and generally in close proximity to original installations. Flood risk was considered during the original planning process in accordance with our procedures at the time, using the best information available at that point.

5. The majority of the gas National Transmission System (NTS) and Local Transmission System including fixed above ground installations (AGI’s) was constructed between 1965 and 1982. At construction, installations were frequently sited to utilise brownfield sites from pre-existing gas distribution installations. Flood risk was evaluated as part of their original design. As with electricity transmission, in recent years the majority of investment on the gas National Transmission System (NTS) has been associated with the development of existing sites.
6. In developing existing sites or establishing new sites National Grid is obliged to put forward designs which take into account a range of technical, environmental and commercial drivers with the aim of achieving:

— The requirements of the connected party (customer).
— Compliance with the relevant planning standards.
— Minimal impact on the public, particularly in terms of visual amenity or noise.
— The most economic and efficient solution.
— Compliance with the relevant National Grid design standards.

7. Within the last 10 years only a relatively small number of greenfield sites have been developed for either gas or electricity transmission. As part of the design process Environment Agency flood contour information is considered along with other available information to inform site selection.

8. The introduction of Planning Policy Statement 25 (PPS25) in 2006 placed additional responsibilities on National Grid as electricity substations and gas compressor stations are defined as “Essential Infrastructure” within the statement. Any proposed development in a Medium Probability Flood Zone or above (greater than 1 in 1000 risk of flooding) is subject to greater scrutiny with respect to site selection. Where development is to go ahead in a high probability flood zone the design must ensure that the site remains safe and operational during a flood.

9. National Grid’s overhead line, cable and buried pipeline assets are generally secure against flood risk, with the main risks posed by land erosion, and movement of structures caused by floods near transmission assets. However, electricity substations and above ground installations (AGI’s) associated with gas transmission are not immune and inundation can result in the need to disconnect critical plant and equipment.

ASSessment OF NaTIONAL Grid SiTES

10. Following the flooding that took place in the South of England during 2001, National Grid undertook a review of sites within “flood warning areas” as defined by the Environment Agency at the time. Whilst events drew attention to flood risk, National Grid’s response was focussed on mitigating the effects of our operations on the environment. To this end we have an on-going environmental investment programme, spending £108 million over the last 6 years.

11. Following the floods affecting Carlisle in 2005, National Grid reviewed flood risk at its transmission infrastructure sites using flood risk contour data available from the Environment Agency. In total, 23 sites were identified and considered to be at risk. This work has been revisited recently, using the latest Environment Agency flood contour data. It is now the case that 28 electricity substations and 7 gas installations have been identified as at significant risk of flooding (greater than 1 in 75 risk of flooding in any year).

12. In addition, during 2005, National Grid commissioned engineering consultants to consider methods of assessing actual flood risk at electricity substation sites. In 2006 National Grid initiated more detailed site survey work with our engineering consultants to establish indicative costs of mitigation against flooding at high risk sites.

13. National Grid reviewed gas transmission sites in 2006 to address installations at risk to flooding and also commissioned an engineering review in July 2007 to consider the risk posed by different levels of flood water.

14. Further work is on-going, for electricity transmission, gas transmission and gas distribution, to determine the level of flood waters necessary to render specific sites non-operational and to determine the specific equipment that will first become affected in the event of flooding.

CuRREnt AND FuTURE WOrk

15. Whilst flooding has not been a cause of significant unreliability or unsupplied energy, with general concerns over climate change and rising sea levels and the consequent increase in flood risk, further consideration is being given to risk mitigation at our sites to ensure a high level of reliability is maintained.

16. Recent events have provided the opportunity to test emergency response procedures and National Grid’s ability to react to unplanned events.

17. National Grid has initiated further research and development work to improve the understanding of the linkage between flood risk, weather events and levels of monitored waters so that we can better identify flood risk. Most recently, National Grid has collaborated and co-funded industry-wide research and development with the Meteorological Office Hadleigh Research Centre to understand and prepare for the wider impacts of climate change, including assessment of likely flood scenarios on transmission operations. The work is due to report initially in late 2008.
18. National Grid will take forward the procurement of mobile flood defences to provide interim cover catering for low probability events and to provide defence against surface water flooding not covered by Environment Agency risk models. The need for any further investment at our sites will be discussed with our regulator, Ofgem.

19. National Grid is participating in the Energy Networks Association review group, to examine the resilience of electricity substations. The review has been established at the request of Malcolm Wicks and will report to the Energy Emergencies Executive Committee. National Grid will work with the Environment Agency and other stakeholders to provide a co-ordinated input to this review.

Factual Account of Recent Events

Floods in South Yorkshire Monday 25 June—Friday 29 June 2007

Electricity

20. The “Sheffield Ring” is a group of circuits and substations which transports electricity to the Sheffield conurbation and allows the transit of power more generally across the country. The Sheffield conurbation is supported by the broader transmission system through connections principally at Brinsworth, Neepsend and Thorpe Marsh 275kV substations. (see appendix i). The flooding affecting these sites on week commencing Monday 25 June resulted in a loss of supply to the local electricity distribution network, CE Electric which is fed from National Grid’s Neepsend substation.

21. National Grid site staff became aware of the flooding at Neepsend substation at midday on Monday 25 June and raised the issue with their local management team at 12:30. Water levels rose rapidly and as such National Grid’s site staff were evacuated for safety reasons at approximately 13:15.

22. Due to the risk of loss of supply caused by the flooding, Electricity National Control Centre staff and CE Electric Control coordinated efforts to transfer as much electricity demand as possible away from Neepsend substation in order to ensure security of supply to the area.

23. At 15:23, approximately 20MW of demand was successfully transferred at which point circuit-breakers on the transformer circuits between National Grid’s substation and CE Electric substation opened without instruction, due to the effects of flood water on control and protection equipment. This resulted in the loss of approximately 38MW of demand, affecting an estimated 36,000 CE Electric domestic and commercial customers.

24. Further reports from National Grid’s site staff indicated that the floodwaters inside Neepsend substation had reached a depth of 1.2–1.5 m. The 275kV circuits connecting Neepsend substation to the rest of the transmission system were opened in order to de-energise the substation for safety reasons.

25. Following the flooding at Neepsend substation, a flood risk assessment at other National Grid substations in the Sheffield area was undertaken. The outcome of this assessment showed no risk of breach of flood defences at Brinsworth substation and whilst there were access problems at Thorpe Marsh, the sites operations remained secure (the 275kV and 400kV substations are raised relative to the local ground level and site access roads). National Grid staff remained at Thorpe Marsh substation in order to manage any potential further difficulties.

26. At 01:15 on the morning of Tuesday 26 June, National Grid managers joined the Gold Command and were alerted to the possible risk to Brinsworth substation from the Ulley dam. Staff were evacuated from Brinsworth substation and the local area. The substation remained fully operational under the control of National Grid’s Electricity National Control Centre (ENCC).

27. The impact of dam breach on Brinsworth substation was considered and contingency plans were prepared for the eventuality of having to make Brinsworth substation dead (in the event of deluge from the dam waters).

28. Concurrently, the flood risk at National Grid’s Thorpe Marsh substation was monitored through communication with field staff and engagement with the Environment Agency. At this time the advice was that National Grid’s substation at Thorpe Marsh was secure. However, water levels at Thorpe Marsh continued to rise and by the evening of Tuesday 26 June water levels were approached control and protection systems in the 400kV substation. Sandbags were ordered to protect most critical parts of the site and the army were engaged via Gold Command to provide boats to facilitate movement around the site.

29. By early morning on the Wednesday 27 June, flood water started to affect vital site controls and protection at National Grid’s Thorpe Marsh 400kV substation. At 07:30 National Grid engineers began to de-energise the 400kV substation circuits in a controlled manner. The 275kV substation at Thorpe Marsh remained fully operational as it is on higher ground than the 400kV substation, and de-energisation of the 400kV substation did not result in loss of supplies to any customers. A huge effort then ensued with National Grid site staff, the military and fire brigade focussed on constructing flood defences around critical plant and equipment. At the same time, National Grid engineers monitored the situation at National Grid’s Brinsworth substation and the overhead line circuit which was at risk from the potential breach of the Ulley Dam.
30. During Wednesday 27 June the protection and control systems at Thorpe Marsh 400kV substation were secured from flooding by National Grid field staff and the emergency services. The substation was partially restored to operational service by 15:00 and fully restored by 01:50 on the morning of Thursday 28 June.

31. By the evening of the Wednesday 27 June water levels in the Ulley Dam had dropped significantly and the risk of flooding at Brinsworth substation was significantly reduced.

32. At Neepsend substation, on the morning of the Wednesday 27 June, co-ordinated efforts between CE Electric and National Grid allowed restoration of electricity supplies to all customers by Thursday 28 June. By Friday 29 June at 23:19, National Grid restored sufficient electricity capacity to meet all the local distribution company’s energy demand.

33. National Grid engineers continued to service the remainder of National Grid’s Neepsend substation in order to provide security of supply at Neepsend and restore resilience on the electricity network.

Gas

34. National Grid operates the gas distribution business serving the heart of England, where it transports gas to over 11 million homes, offices and businesses. Events in Sheffield during the week of 25 June–29 June impacted on gas operations in a number of ways.

35. Following heavy rain on Monday 25 June, fears that the Ulley Dam near Rotherham would breach posed a severe risk to National Grid’s AGI (Above Gas Installation) at Guilthwaite, which is one of three primary supplies into the conurbation of Sheffield. A number of measures were put in place by National Grid managers and staff to ensure continuity of gas supply to the Sheffield area.

36. An engineering solution was put in place to protect gas supplies to Sheffield. Due to adverse weather conditions and significant risk of the dam failing National Grid personnel were not allowed on site at Guilthwaite, as such work took place on Tuesday 26 June at locations either side of the AGI to reduce pressure in both pipelines.

37. National Grid staff manned sites either side of the Guilthwaite AGI right through until Friday 29 June when the threat from the Ulley Dam subsided. At this point National Grid engineers were able to re-establish pressure at the AGI. Working with the Gold Command Unit, the Environment Agency and other utilities, National Grid was able to ensure there were no unplanned interruptions to gas supply as a result of the events that took place at the Ulley Dam.

38. National Grid’s gas distribution teams also worked on a number of river crossings around the Sheffield area affected by adverse weather and rising water levels in the river Don during the week of 25 June and the following week. Maintaining the safety of gas pipelines was the key issue with floodwaters potentially affecting critical infrastructure.

39. A National Grid 24 inch diameter seven bar pipeline at Kilham farm became exposed as a result of floodwaters rising, and was found by National Grid gas engineers floating in a field as a result of the breach of river Torne (appendix ii). National Grid engineers worked in difficult conditions in conjunction with control room and planning staff to prepare appropriate contingency arrangements to ensure continuity of gas supply was maintained along this route. In addition National Grid engineers worked in close cooperation with the Environment Agency throughout the operation at Kilham farm.

40. In spite of the significant flooding at Toll Bar during the first week in July, National Grid, through configuration of the gas network was able to prevent significant water ingress (ie. flooding of gas main) into the gas network thereby protecting supplies to customers in the Toll Bar area.

FLOODING AT GLOUCESTER

Thursday 21 July–Tuesday 24 July Walham

Electricity

41. Walham substation provides approximately 470MW of electricity supplies via four transformers to 450,000 domestic and commercial customers of Central Networks Power distribution company in the Gloucester area. Transmission circuits emanating from Walham form a part of the interconnected transmission network to South Wales supplying approximately 3,000 MW of demand (appendix iii).

42. National Grid engineers and staff working at Walham on Saturday 21 and Sunday 22 July carrying out planned repair work were alerted by Electricity National Control Centre (ENCC) staff that there was a risk of flooding in the area caused by rising river levels.

43. During Sunday 22 July, ENCC staff developed a contingency strategy in the event that National Grid’s Walham protection equipment was inundated by rising water. Through re-configuring transmission circuits at Walham substation, National Grid ensured that in the event of inundation of Walham substation,
only one of the two circuits feeding into South Wales from Walham would be lost. This route supplemented the three other available transmission circuits into South Wales ensuring that all demand in South Wales would be secure even in the highly unlikely event of the worst case scenario.

44. On Sunday 22 July water levels started to rise. National Grid staff placed sandbags around the critical circuit control cubicles and entry points to the protection (relay) rooms at around 14:00. The fire brigade were also in attendance to provide pumps working closely with National Grid staff to protect critical infrastructure.

45. Gold Command (Resilience) was established by the authorities in Gloucester at on the Sunday 22 July. The first Resilience meeting was held with National Grid in attendance. Following this meeting the Environment Agency provided emergency flood defence systems to be used at Walham later on the evening of Sunday 22 July. The military attended Walham substation to assist with the installation of the systems.

46. At 21:00, on the Sunday 22 July, one of the four Walham transformers was de-energised and isolated due to rising water levels.

47. The temporary flood defences withstood the peak water level which occurred at around 05:30 on the morning of Monday 23 July. However, it was expected that the river level would peak again during the night of Monday 23/Tuesday 24 July at the same or a higher level than had been seen the previous day. National Grid engineers began switching operations to implement the contingency strategy to protect electricity supplies to the area.

48. On Tuesday 24 July National Grid took the decision to implement a more resilient flood defence system at Walham substation, thus freeing up temporary resources which were in place. This entailed the construction of the Hesco Bastion barrier with the help of the armed forces (see appendix iv). This structure was completed at 21:15 on the Saturday 28 July and remains in place as a more permanent barrier. No further flooding was experienced at National Grid’s Walham substation after water subsided on Tuesday 24 July.

49. The circuits at Walham were returned to their normal operational configuration by 18:15 on the Tuesday 24 July. Through the implementation of contingency strategies, and as a result of a significant effort by the armed forces, fire brigade and National Grid engineers, electricity supplies were maintained to the areas of Gloucester and Cheltenham.

APPENDICES 1

(i) Sheffield
   (a) Geographic map of Sheffield and neighbouring cities—National Grid electricity substations marked in yellow.
   (b) National Grid diagram of its electricity system configuration in Sheffield—Monday 25 June.

(ii) Gloucester
   (a) Geographic map of Gloucester and neighbouring cities—National Grid Walham substation marked in yellow.
   (b) National Grid diagram of its system configuration including Walham substation.
   (iv) Photograph of Hesco Bastion wall erected at National Grid’s Walham substation.
   (v) National Grid Network magazine for employees “Flood response special” July 2007

National Grid
August 2007

Witnesses: Mr Alan Raymant, Director of Operations and Asset Management, Central Neworks, Mr Nick Winser, Executive Director, Transmission and Mr Chris Murray, Director of Asset Management, National Grid, gave evidence.

Q852 Chairman: To quote a very old radio phrase; if we are all sitting comfortably, then we will begin. Can I welcome to our inquiry this afternoon from Central Networks—this is not, I must add, a railway company that is before us, it is to do with electricity distribution—Mr Alan Raymant, the Director of Operations and Asset Management, and from National Grid, Mr Nick Windsor, the Executive Director of Transmission, and Mr Chris Murray, the Director of Asset Management. Gentlemen, the facilities that you have responsibility for certainly hit the headlines in the flooding last summer and a lot of questions about resilience and preparedness to protect these valuable assets from the inundation and the effects that they would have have been raised by none other than the many thousands of members of the public who had their power cut off, but let me just go back a little bit before last summer’s flooding. When the former Chief Scientist, Sir David King, produced the Foresight Report, in which he put

1 Not printed.
forward a number of scenarios as to what could happen in the United Kingdom due to climate change and extreme weather events, what did your respective organisations do when that report was published?

Mr Raymont: From Central Network’s perspective we had identified as part of that a number of sites that were at potential risk of flooding, and we identified 81 potentially critical sites depending on the extent of the flooding. The next step of work was to identify exactly what the risk was, quantifying the risk and the precise likelihood of flooding and, therefore, damage to the equipment. That work was commenced then and is on going.

Chairman: What about National Grid?

Mr Winser: From the National Grid perspective, we have always taken account of the possibility of flooding to our assets right back in our heritage to the Central Electricity Generating Board. Of course, a lot of our sites, in fact virtually all of our sites, were a product of going through siting and planning in the 1960s. There have been a number of things that have focused us in recent years, not least Sir David King’s work but also the floods in Carlisle, and we have been working with the Met Office Hadley Centre which was to look at what might be the overall effects on our system. We had also, as a result of the Carlisle floods, commissioned a study looking at all of our assets once again to check, as the understanding of these effects was becoming greater, how they would be resilient against those risks.

Chairman: So Foresight did not trigger, in your judgment, any new activity but added to your knowledge about existing activity?

Mr Winser: Yes, I think so. We had been spurred on to a significant degree of activity by the Carlisle floods actually in 2005, but this had always been very much part of the way that we planned the system, and we have been working with the Met Office.

Chairman: If you had done all this work and spotted all the potential risk sites, why did we have any problems in the summer?

Mr Winser: From our perspective there were two events which are worthy of debate. Firstly, the floods in Sheffield, which Chris will talk to you in a second about if you would not mind, Chris, and, secondly, the events round Gloucestershire. Of course, we did lose some supply in Sheffield, a very rare occurrence on the transmission system, by transmission standards quite a small loss of supply. Of course, at Walham, despite there being, as was well covered in the media, quite a close shave, there was no loss of supply at all from our facilities in Walham. It is important to make that clear, I think. Chris, do you want to talk about Neepsend?

Chairman: Before we leave Walham, what did that show up, in terms of all this work you were doing, if you like, post Foresight: because the one thing that got us very concerned about extreme weather events and one, I think, could say with some accuracy that last summer was extreme. You seem to be working very hard with the Met Office doing all of these things, but you just told us it was a close shave. Did Walham come up as a risk site?

Mr Winser: Walham is a very interesting sort of example of the history of this. Walham, as far as we can understand, when it was sited in the sixties and, indeed, thereafter as we looked at the likely flood contours from the EA, was something of the order of quite a low risk actually. Although it was quite close to the flood plain, it was deliberately on raised ground. We have not managed to surface documents from the sixties to say exactly what went into its siting, but it was on raised ground and actually featured at something like one in a thousand, which is, by the way PPS25 works, pretty remote. In recent years (and these are very recent years), as we have got better and better understanding from the EA publishing better and better flood contours, actually the assessment of Walham has gone from one in a thousand to one in 200.

Mr Murray: One in 75.

Mr Winser: One in 75.

Chairman: Over what time period was that?

Mr Murray: That is over about the last two years, Chairman. One has to remember that this site was built in the 1960s. The whole area around it is subject to flooding, but this site has never flooded.

Chairman: The area is subject to flooding, the risk factor has gone down from one in a thousand to one in 75. What did you do when you discovered that this was now a more vulnerable site? Did you actually take any specific additional measures to protect it? As you said, you ended up with a close shave. What I am probing for is to find out how, in the light of all of the information that has become available (and some of it you have alluded to), we still end up with a close shave at one in 75? I can understand one in a thousand. That is a pretty extreme event by anybody’s standards.

Mr Winser: Although it had only dropped to one in 75 in literally the last year or two, a period in which we were doing intensive work following Carlisle which revealed, as is in our submission, that there were about 28, quite a small proportion, less than a tenth, of our sites that were in areas which may have some vulnerability to flooding. Therefore, it was a matter of engaging with our colleagues in the distribution networks and in particular with the EA to understand the impact on supplies.

Chairman: Was Walham one of the 23 that you mention in paragraph 11 of your evidence?

Mr Murray: Not at that time.

Mr Winser: Not at that time, because it was still up at one in 200 at the time. The development of this may seem curious to the Committee but this is as we have had access through much better IS, I guess, as we have seen the use of GIS and flood contours become more available. Whilst this is a capability these days, it is a relatively recent one actually, and that probably explains why Walham has moved so much in the probabilities. Of course, having had the events of the summer, we have spent a considerable
amount of money not only putting up a semi-permanent barrier around Walham, which is there today, but also we have spent over a million in total buying a relocatable flood barrier which can be deployed as we get warnings from the Environment Agency.

Q860 Mr Drew: I was going to say, by pure chance I drove past Walham a week last Friday when we had our second dose of water, and there was an awful lot of water lapping up against the sides of the HESCO barriers.

Mr Winser: I do not think that is right.

Q861 Mr Drew: There was quite a lot of water.

Mr Winser: Not up at the HESCO barrier. It was still a meter short of the site, and actually the HESCO barrier is on the site.

Q862 Mr Drew: I am just saying there was a lot of water that day.

Mr Winser: There was not water up against the barrier, no.

Q863 Mr Drew: Unfortunately I do see water everywhere nowadays. I meet a lot of constituents at weekends who are paranoid about it.

Mr Murray: I think the fact that we had the close shave back in July at Walham, the fact that we did not rely on just having a temporary barrier there but did invest in the HESCO barrier and given the events of a week last Friday, when indeed the water levels around the site were rising quite rapidly, we did take the precaution of making sure that the whole site was then sealed off and secure in the event that the flood waters did rise again. On this occasion they did not. Had they risen again, this time the HESCO barrier is there, is deployed and, as Nick has mentioned, we have also got now this portable barrier, identical to the one the EA deployed on our behalf at Walham the first time round, so that if we get flooding elsewhere we can deploy that very rapidly, in advance of the conclusions of the ENA study which is going to the Energy Minister at the end of February, and, of course, the final conclusions from Sir Michael Pitt.

Q864 Chairman: As far as back-up is concerned in terms of these potentially vulnerable sites, have you now addressed all 23 of the sites you identified and, in a more general question, where you believe there may be vulnerability at a site, have all of them got some alternative way, if they were inundated, of bypassing them to get consumers their electricity?

Mr Winser: That is what the ENA work is all about, to work as an industry with the Environment Agency to understand what is the most economic way of providing a greater degree of resilience against both our sites and the sites of the distribution companies. Clearly, in this case, although we did not lose any supply from Walham, it is a good example of this feature that the distribution side also has sites which are fed from Walham. There is no point in protecting one without protecting them all, in a way.

Mr Raymant: Yes. Coming back on the previous question in terms of protection of the sites, for a distribution network flood risk is just one of the weather risks we have to consider, and typically most of the interruptions we see are not down to flooding, they tend to be down to wind or lightning. So, when we are looking at our whole approach to risk assessment where we focus our attention, it has tended not to be flooding. The issue that has come to light now is that with what we would call low probability but high impact incidents like this we are having to factor those into our risk assessments in a completely different way by basically giving them a higher weighting. So that is how we are approaching this and that is the way we are looking at the risk we have got. Picking up on Nick’s point about the distribution network, an analogy we can apply to that is more like the local road network compared to, say, the motorway network of the grid company. What that enables us to do is to provide a greater degree of interconnection so, if there is an incident on the network, we have got ways of feeding supplies alternatively, and actually we deployed that very successfully at Gloucester, which is why we were able to restore two-thirds of the customers within a couple of hours. But there does come a point where, if there is a major incident on the National Grid network (which, fortunately, we did not have), but if there had been, it would have been impossible for us to provide alternative supplies to meet that shortfall.

Q865 Chairman: We spend a lot of time trying to make our special services like electricity, gas, sewage resilient to a whole range of risks, whether they be natural or man-made. Are we getting to be in a situation where these facilities are more or less resilient to threat? How do you actually deal with some of the planning for things like terrorist activity; now we have potentially extreme weather events. How reassured can the public be that their infrastructure is going to be properly protected?

Mr Murray: I think they can be very well assured, Chairman. The resilience on the electricity network is already 99.999% in terms of its delivery, and the reason that we worked with the Hadley Centre EDF and E.ON a couple of years ago to kick off a study of the long-term impact of climate change and the impact on the energy sector was because we recognised that we were not looking at a static position, things are changing. We do have regular contingency exercises, we have got one actually with London this month, and going forward, of course, we have further hardened our resilience, not only just at Walham by the installation of the HESCO barrier but by the investment in the portable barrier elsewhere and, indeed, the on-going investment we are making in our networks in terms of the replacement and refurbishing of the National Grid over the next ten, 15 years.

Mr Winser: Alan made an excellent point, which is that there are many requirements for us to invest in our networks and we are investing at a higher rate than we have ever invested, and that is a lot to do with connecting up new sources of low carbon
generation. Obviously we are also entering into a major phase of asset replacement anyway, a lot of the assets are getting towards the end of their lives, so for our part we are investing in our networks currently at a rate, over the next five years in this network, of about three and a half four billion pounds, so this is really accelerating, and, as we do so, we are trying to pick up all of the risks that you have highlighted there, but inevitably there is a degree of balancing against them. We are giving great emphasis to the risks of flooding because of the work coming out of the Hadley Centre.

Q866 Dr Strang: On that point, you are making the point that there is a whole range of hazards and threats that you have got to try to protect our infrastructure from. On the terrorist threat, I think we all agree that, obviously, the threat now is of a different order from the one posed by the IRA. So, if you look in the last ten years at this issue, has that become quite prominent? Obviously, it is not something you necessarily discuss with the media, but has that become much more prominent in your planning and thinking? When it comes to investing in new facilities, is this a major factor in terms of recruitment, in terms of staff and labour? Is this really a major factor in increasing your costs legitimately?

Mr Raymant: Do you mean specifically with flooding?

Q867 Dr Strang: No, I mean in terms of all your investments.

Mr Raymant: Like Nick said, I think the whole industry is investing significantly much larger amounts of money in the network, and that is recognised in the fact that the network is very old. Even at current investment levels, you are talking in excess of 50, 60 years implied life for the assets, so it will take a long time to turn round the asset-base that we have got into something different and, therefore, we have to look at the specific risks of individual investments very carefully to decide exactly where we are going to allocate our funds. Going forward, we would be expecting to allocate further resources to flood resilience. What we are trying to do at the moment is quantify exactly which sites are at risk and then what investment we need to make to protect those sites, and that will be informed by the work that the ENA are doing that Chris referred to earlier as well as work that the EA are doing in terms of improving their predictive methods for assessing flood risk. All of those things have to be considered and we have to come up with a balance in terms of our investments to make sure we are managing all of the risks effectively.

Q868 Dr Strang: Obviously you cannot do all of this by yourself, but things like reservoirs and dams and all these things are major considerations that you are concerned about?

Mr Raymant: Yes.

Mr Winser: From our perspective, thankfully, transmission reliability is, by international standards, right up there at the top of the pile. As Chris was saying, it is six-ninths reliable. We have to be balancing the variety of risks to it, and flooding is the latest thing that we really do need to focus on and we are doing so through the ENA study. That will have to be judged carefully for its effectiveness at providing resilience against the variety of other risks that the Chairman raised.

Q869 Paddy Tipping: We were given a promise that you were going to give us a snapshot of what happened in Sheffield, because there were problems there both with substations for electricity and gas as well. Perhaps you would just tell us what happened? You had not expected it to happen in Sheffield.

Mr Murray: No, as I think the Committee will know, we had unprecedented weather conditions this summer and in Sheffield we actually did lose some supplies. The water levels at our Neepsend substation rose extremely rapidly on 25 June. At 12.30 we found that the water was starting to come into the substation, by 1.45 we had evacuated the substation and by 5.30 it was under four feet of water. Around two hours earlier, at 3.30, we actually lost supplies to the local distribution network outlet, CE Electric. Because we knew this was happening, the water levels were rising, working with the local DNO, CE Electric, we transferred as much load as we possibly could away from that site so that, as Alan mentioned, they could reconfigure their network. Unfortunately, when the site tripped, we lost 35,000 customers. Very quickly CEE were able to reconfigure further to bring that number down to 12,000 customers, they were then able to do some rota disconnection while we did repair works and they did support works, and everybody was back on within 36 hours, and by the Friday evening, about 11.30, we were able to get back into the site and actually restore the supplies from that site. Since that time, of course, we have spent several million pounds repairing the site and bringing it back up to normal operations as well as improving the defences there. That was the gas side of things. Very close to that we had the Thorpe Marsh site, which again was subject to water inundation, but we did not lose any supplies from there, we were able to get it switched out and to do some protective works—we had great support from the Army, the Fire Brigade—and then switched it back in without any loss of supply; and on the gas side we had some low pressure areas where domestic customers, because of water ingress, had to have their supplies off and we got those back on quite quickly. Frankly, the biggest issue that we might have had, which, thankfully did not come to fruition on the gas side, was the risk of the failure of the Ulley Dam at Rotherham, because we had a gas installation at the foot of that site, but, once we became aware of that risk, we isolated it and were feeding the local area by other routes. Thankfully the Ulley Dam did not fail and so that site was not a risk ultimately.

Q870 Paddy Tipping: But within Sheffield none of these sites were on your radar screen, as it were. Is that right? How do you view them into the future?
Mr Murray: One of the things that we think about in terms of Neepsend, of course, was that this was due really to two things: first of all the extreme rainfall and water levels coming up anyway and then actually the impact of that rainfall washing away a bridge which then diverted lots more water into the site. I think we have to think of second consequences and not just think about what happens if the rain level comes up. We have to think about the infrastructure around it, and that is what a lot of the work has been doing since that time with both our own consultants and the ENA, and that is why we have chosen to deploy the temporary barrier both north and south so that in the intervening period, while we await the results of the ENA recommendations, we can have the capability to protect our sites. One of the recommendations from Sir Michael Pitt’s Review is that we engage with our regulator and look at what further investments should be made, but I think one has to look at this holistically in terms of investments that the EA might want to make in providing flood defences, the investments that we might want to make and the investments that the DNO might want to make: because we should not have people paying twice through maybe tax and their energy bill for investments which, if they were looked at holistically, could have been done once.

Q871 Paddy Tipping: Are those discussions taking place?

Mr Murray: They are indeed.

Q872 Mr Drew: Could we go back to Gloucestershire—really these are questions for Mr Raymant—and what happened with Castle Meads? In the same way as Mr Murray outlined the Sheffield experience, would you give us a quick elucidation of what happened in the Castle Meads substation?

Mr Raymant: Sure. The main events, as it were, started on the Sunday evening when the water levels started to rise at that site. We had assistance from the Fire Brigade but it was becoming quite clear that the water was going to be very difficult to hold back the flood waters and ensure that the site was fully protected. Going back two days, in Worcestershire we had had an incident at the substation called Timberdine, which had flooded not by river flooding but by rain water run-off, and in the process that substation actually tripped because it flooded. The consequence of that was it caused significant damage to the substation and it took us four days to repair it. Going back to Gloucestershire, on that Sunday, early on the Monday morning, we were faced with a similar situation. We actually took what we considered to be a difficult but quite brave and courageous decision to switch the substation out, and the reason we wanted to do that was because we were confident that if we could pump the water out, as soon as we had pumped the water out we would be able to switch the circuit back in and get the customers back on. The consequence of that was that at 5.00 o’clock in the morning we switched the substation out. We lost supplies to 47,000 customers. We progressively, over the next two to three hours, brought about two-thirds of those customers back on by redirecting supplies and that left us with about 13,000 customers that we had no other means of supplying. We needed to get Castle Meads back on. Whilst we were doing that, with the assistance of the Army and the Fire Service, we put protection around Castle Meads substation and pumped the water out to where we were comfortable we could actually switch the circuit back in and maintain safe supplies, and we did that at just after midnight on the Tuesday morning and all supplies were then restored. The maximum impact was that we had about 11-13,000 customers off for around about 20 hours. In the circumstances we think we could not have done any better than that.

Q873 Mr Drew: Why did you not, before the Gloucester County Council Inquiry, give them the same information you have given to us?

Mr Raymant: Part of that, to be honest, was a misunderstanding. We had been supporting the debriefing of the Gold Command meetings. There were a number of those meetings and we took the decision that we had actually provided all of the briefing material we needed to provide and, therefore, did not see the immediate need to support that particular investigation as well. So, that was the reason why we did not go. I think, in hindsight, we would have preferred to have gone, but, as I say, it was a judgment at the time, having many requests to attend a series of debriefing sessions, that we focused on the Gold Command meetings.

Q874 Mr Drew: You put written evidence in but you did not appear in person?

Mr Raymant: Yes. As I say, I think our focus at the time was on the Gold Command debrief.

Q875 Mr Drew: What have you done about those customers who lost power? Have you compensated them in any way or have you explained what has happened so they know directly what the repercussions were of your decision?

Mr Raymant: Two things. One was that in the immediate aftermath of the incident we were very proactive in terms of checking out properties round the Gloucestershire area that had been affected by flooding so that we could at least give the customer some comfort about the safety of their supplies once they returned into their properties. That is what we felt was most important, because we are talking about vast numbers of customers at that point. So that was our immediate focus, as well as making sure that they had the general safety information for when they returned to their properties. In terms of those immediately disrupted, as part of the industry regulation there is an established compensation mechanism which customers are entitled to call on.

Q876 Mr Drew: You have done that, or you have allowed them to do it?

Mr Raymant: Yes. It is for the customers to actually claim, but, yes, to the extent that they have we will have met those obligations in full.
Q877 Mr Drew: In terms of the costs of the emergency services, obviously the Army and the other emergency services, have you recompensed them in any way?

Mr Raymant: In short, no. We certainly have not been asked to, and it certainly was not our expectation that we would have been either. I think at the time the main driver, the main requirement, was for us to effectively move as quickly as possible to business as usual and, therefore, not be reliant on the emergency services, and that was the position and the strategy we adopted.

Q878 Mr Drew: But they played a key part in some of the logistics to allow you to get to the stage where you were able to put the substation back on again.

Mr Raymant: Yes, they were absolutely critical to the process on that Monday of sandbagging the site and pumping the site out. That is absolutely right. That was the first part of the strategy. The second part of the strategy was making sure that we could stand on our own two feet once we got the site back on and, thereafter, that is what we did. We had sufficient pump capacity of our own to manage the site.

Q879 Mr Drew: Moving on to the Pitt Review, the interim report, it would be very interesting to know from both organisations: what have you done so far? There is obviously a lot of mention of the role of Category 2 responders. Michael Pitt is not uncritical of the role that you played both during the emergency and post emergency. Perhaps starting with the National Grid, what have you actually done so far? Of those immediate recommendations that Michael Pitt highlights, how many of those have you got responsibility for and what have you done in response to that?

Mr Winser: His immediate recommendations were largely not to us, although PPS25, which zones the sites and has recommendations for how to deal with the different types of resilience required to flood, we have implemented in full. We have also undertaken the work with the ENA and the rest of the industry to understand what is the best overall approach to increasing resilience going forward.

Mr Murray: I think the emergency or urgent recommendations that Sir Michael Pitt has put forward, as Nick says, largely do not apply to National Grid. However, there are a number of the other 72 recommendations. Many of them are related to the closeness of working with the local and regional fora, and I am pleased that we do work very closely with them. We have also worked very closely with Sir Michael on his work for the interim review. I have met with him personally, and I am meeting with him again within the next two weeks, in support of the work towards his final conclusion. We have no difficulty whatsoever with the recommendations that he has put forward. As I mentioned, one of the other recommendations that he has made is that we work with the regulatory authorities to consider what further investments should be taken to physically harden any other sites that might be at risk going forward.

Q880 Mr Drew: And Central Networks?

Mr Raymant: From our perspective, the key interim conclusion relates to making information available about critical sites. I mentioned earlier, we are working on those 81 critical sites across our patch. In terms of the Pitt Review itself, we are very supportive of the conclusions and recommendations that are coming out of that. I think probably two threads from me. One is the emergency preparedness: in the event of an incident, how we respond to that as a Category 2 responder. I actually feel that in terms of the Gloucester floods we responded very well. We participated in all of the Gold Command meetings at senior level and that worked very well for us. I think the point I would draw out from this is that as an organisation we manage probably one to two emergencies a year, on a fairly significant scale, associated with bad storms and, therefore, we are in quite a high state of preparedness anyway for managing emergencies, and that was actually borne out in the management of the Gloucester incident. The thing that was different about Gloucester was that the nature of the event was very different, it was flooding, and also it was the first time we had engaged actively with Gold Command—it was the first time we had to do that—and we learnt a lot from that and we have built that into our own emergency plans and updated those and, subsequently, tested them again since that event.

Q881 Mr Drew: Have either of you sought to look to move any of the critical infrastructure or have plans to do so following your re-evaluation of the flood risk? You are nodding.

Mr Winser: We certainly have done work on that, and that will be further informed by the work with the industry and the ENA because it does come back to making sure that it is an holistic solution. In fact, relocating our substations, which are pretty big pieces of equipment, overall is a very expensive option. It is much more likely we will see some expenditure of just increasing the resilience of the current footprint rather than actually lifting it up or moving it to another site, although as we get into the asset replacement phase we will keep that absolutely under review because we will over the next decade, 15 years be looking at a lot of this equipment again.

Mr Raymant: Our position is very similar. When we are looking at replacing sites we will clearly look at the location and we will also look at the permanent protection that is required given the flooding risk. You cannot get away from the fact we have to locate these sites near the point of load; so if we have developments going on in those areas, then naturally we have to follow. That is one point I would make. The other pitfall of information I would share with you is we did actually upgrade a substation in the locality called Port Ham two years ago—that has now been operational for a year—and we did purposely build that on elevated stilts, knowing the flood risk, and we were able to build that into the design of the substation, but, as Nick said, it is very
difficult to do that in retrospect. The only option really is to build more permanent protection around the site.

**Mr Murray:** May I add one supplementary point on this which is really driving why it is more expensive to move something than to protect it. Of course, one has to remember it is not just a question of moving a substation: one would then have to move all the overhead lines that come in and out of the substation, with all the associated planning issues that would go with that as well; so although we cannot pre-empt the outcome of the ENA work, our expectation is that we would invest in further protecting sites rather than moving them.

**Q882 Mr Drew:** One final point on that then. Is there a time frame for this? Here we are talking about humanity being threatened by 2050. If you were to say we will be doing this over the next 40 odd years, then some of us might say that is not really within the parameters of the state of emergency we now face. Can you give us a feel for how quickly you could re-evaluate the site that you have got at the moment?

**Mr Winser:** Our thoughts are five to seven years. As we get through the detailed understanding of what, overall, is the best economic solution, we will need to engage with Ofgem about how that is to be funded; so although we cannot pre-empt the outcome of the ENA work, our expectation is that we would invest in further protecting sites rather than moving them.

**Q883 Mr Drew:** Finally, would you welcome any clarification in law about your responsibilities? Clearly we have got the Civil Contingencies Act which we are looking at with a range of interested parties, but do you feel that you know that the law is clear enough in your area or would you welcome some further clarification in how that particular Act and all the legislation operates regarding what expectation there is on yourselves?

**Mr Raymant:** I think from a distribution perspective we are very clear what our obligations are and would suggest the legal framework is robust enough for that. I think what we have learnt from this incident is the need probably for Category 2 responders to work more closely with Category 1 responders, which the existing legislation provides for, so clarity in that respect is probably the most valuable thing.

**Mr Winser:** And, I think, the introduction of PPS25, which gives a greater degree of clarity about the sort of sites you need to provide greater resilience to flooding is also helpful, so we are in the same place.

**Chairman:** Gentlemen, thank you very much indeed for your oral evidence, thank you for your written submissions and we will reflect very carefully on what you have had to say. Thank you very much.

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**Supplementary memorandum submitted by National Grid (FL 80a)**

Many thanks to you for your letter of 18th February. My colleague Nick Winser and I welcomed the opportunity to update the Committee on the impact of the summer 2007 floods on our operations during our evidence session.

As you are aware National Grid owns and operates the high voltage electricity transmission system in England and Wales and operates the system in Scotland. In addition, we manage the gas transmission system in the UK and distribute gas to 11 million homes and business in the heart of England.

Following the summer floods, we have invested £1 million in mobile flood barriers to be deployed to electricity substation sites at risk of flooding. In addition, we invested £300,000 for a medium term Hesco Bastion wall at Walham 400KV substation. We have undertaken a full review of all our electricity and gas sites, and are working closely with the Energy Networks Association to review substation resilience to flooding—a report on the findings of this group has been submitted to BERR this week. In addition, we continue to work closely with Sir Michael Pitt and his flood review team on resilience issues.

One of the issues raised by the Committee during the evidence session which we would very much like to take the opportunity to address once more, is that National Grid has a 99.9999% reliability rate in its operation of the electricity transmission network. To date flooding has not posed the most serious risk to the reliability of the network; however, we work closely with the Met Office and Environment Agency to assess the impact of weather on our system and we are therefore undertaking R&D to understand future requirements.

Addressing the impact of flood waters on our gas network has also been a significant work stream for National Grid in the last few years. In 2006, we commissioned a review to assess our gas transmission sites analysing the assets at risk from flooding. This study examined our four broad asset groups on the gas network—Pressure Reduction Stations, Holder Stations, High pressure Pipelines and Low pressure gas networks. We also commissioned an engineering review in July 2007 to consider the risk posed by different levels of flood water.

As I mentioned in the evidence session to the Committee, we do look at the issue of moving assets at risk of flooding, particularly those of a critical nature. In terms of electricity substations the majority of transmission network was built in the 1960s based on best information available, any new site will be constructed to latest standards and will be designed to be safe and operable to 1 in 1,000 year floods. The research we have commissioned to date shows that it is not cost effective to relocate all sub stations in high
risk zones. As such we will be taking steps to enhance defences around critical substations, and following the Energy Networks Association review on substation resilience we will be taking advice on which sites may need permanent barriers. We estimate that these will cost in the region of £30–£75 million and take 5–7 years to install.

On the issue of resilience and our obligations under the Civil Contingencies Act, I would like to take the opportunity to reiterate that National Grid has a well developed emergency framework which it frequently tests. The framework has been developed in liaison with other energy sector companies and the lead government department BERR. In turn, the BERR emergency framework dovetails with COBRA. These arrangements are currently reviewed and improved through the industry planning body, the Energy Emergencies Executive Committee (E3C) which is chaired by my colleague Chris Train. E3C reports to E3 which is chaired at an executive level by BERR.

It is with pleasure and pride that I reflect that a number of our operational engineers who worked extremely hard through the summer floods have received honours for the hard work and dedication to National Grid and the communities in which we operate. I particularly would like to note and give thanks to Andy Wilson, a National Grid First Call Operative who saved the life of a kidney patient, when their dialysis machine was affected by localised power cuts; Dan Bailey, a National Grid Transmission craftsman who set up a support rope and negotiated a flooded road to deliver insulin to a diabetic youngster trapped in a nursery; and Paul Jones our Distribution Operations engineer who was first on the scene at Ludlow, where a bridge had collapsed leaving a gas main exposed. He ensured the safety of the public and coordinated the response of the emergency services when they arrived.

The flooding events of 2007 clearly demonstrated that our commitment to and close working with the Silver and Gold commands ensured effective response in managing events at Walham and South Yorkshire.

I would also like to thank the emergency services, army and all those who provided tremendous support to National Grid during summer 2007.

Many thanks to you for the opportunity to appear before the Environment Food and Rural Affairs Committee.

Chris J Murray
Director of Asset Management
UK Transmission

Witnesses: Baroness Young of Old Scone, a Member of the House of Lords, Chief Executive, Mr Phil Rothwell, Head of Flood Risk Management Policy, and Mr David Rooke, Head of Flood Risk Management, Environment Agency, gave evidence.

Q884 Chairman: This is a bit like sort of completing the sandwich. We started our inquiry with the Environment Agency, we have had a lot of meat in between, so I hope, Baroness Young, you do not mind me describing the Agency once again as the other piece of bread on our proceedings, but I think it helps to round things off. Can I welcome you again, with your colleagues, before the Committee (for the record Baroness Young, the Chief Executive of the Environment Agency, Mr Phil Rothwell, the Head of Flood Risk Management Policy and Mr David Rooke, Head of Flood Risk Management). Mr Rooke and I seem to be bumping into each other all the time in various ways in this inquiry, so it is a delight to see you again. Can I put on record, first of all, the appreciation of the Committee for the arrangements you made last week for our visit to Lincoln. Not only were the arrangements for the public hearing extremely good, the arrangements went very well, but the trip that you provided us with to have a look particularly the Washlands and the Lincoln flood defences were very helpful in enabling us to understand in real life what it is that we have been discussing, both in terms of the written submissions and oral evidence that we have had, so thank you very much for enabling that to happen. Let us get on with our first question. The Pitt Review seems to have followed a number of the views that you put forward in September 2007 with your own “lessons learned” inquiry. Did you have a lot of discussion with Sir Michael about your own views ahead of him publishing his interim report?

Baroness Young of Old Scone: We had a lot of contact with the Pitt team, because, obviously, they were interested in getting quite a lot of information and evidence from us and also they wanted to make sure that what they were proposing was actually practical and doable, but they were very much their own people, so we do not entirely agree with everything that is in the Pitt Report but we are pleased with many of the—

Q885 Chairman: What do you not agree with?

Baroness Young of Old Scone: I think it is fine tuning rather than big recommendations. We want to take a very careful look at the issue, for example, of surface water flooding, mapping and warning. We think that we can do something on a fairly broad scale for key emergency partners, but we are not sure, in fact we are pretty unsure, that the technology is either there sufficiently robustly for meteorological predictions about where the rain is going to fall or, indeed, for having fine-grain information about what impact that rain will have on surface water flooding, bearing in mind how complex all these urban settings are and how even a few hundred yards makes a difference,
depending on where the rain falls, and also some of the issues of the dynamic nature of urban systems. It just takes somebody to concrete over their patio or drop the edge of the pavement and water will flood in very different ways. We want to be moving forward on the surface water issue as far as we can, but we are perhaps a bit less sanguine than Sir Michael about what is or is not possible at this current time.

**Q886 Chairman:** Sir Michael has gained a lot of knowledge in a very short space of time about flooding and he has produced a very long shopping list of things which effectively constitute his recommendations, but it is a menu without prices at this stage. Have you done a back-of-the-envelope costing, by any chance, of any or all of his recommendations?

**Baroness Young of Old Scone:** The only work that we have done so far is some very, very immediate stuff on the things that we have been asked to do within the next three to four months basically. We did not see any point in trying to second-guess the work that he is now undertaking to put prices against his recommendations for his final report. Phil Rothwell may want to comment.

**Q887 Chairman:** It looks quite pricey though, does it not? There is a long list.

**Baroness Young of Old Scone:** Flood risk management does not come cheap at all. I think, certainly for the areas which we are interested in, Pitt does a couple of things. One is it is about focusing and sharpening the collaboration and the focus of things that people are doing already: so it is about spending the existing money more wisely. I think also it is about how we get a better sense of priorities in all of this amongst partners, but there is certainly, in terms of particularly the urban flooding setting and the surface water issue, quite a range of work that needs to be done. The blessing, if there is a blessing, is that it is spread amongst quite a wide number of actors. If you look at some of the surface water issues, they have got water company actions, there are local authority actions, there will be some that can be funded through developers or re-developers, there may well be some that arise from the Highways Agency need to carry out, and, of course, many of the Pitt recommendations are not going to be solved within a three-year period of the Spending Review. We have always made the point that the Spending Review funding that we got from the Prime Minister in the midst of the floods was the right trajectory but that we were not yet at the right end-point. Even the Foresight study, some years ago now, pointed out that there needed to be about a billion pounds in flood risk management. Of course we are at the upper end at £800 million at the end of the three years.

**Q889 Chairman:** So, that is ten million a year to implement Pitt over the next three years.

**Baroness Young of Old Scone:** No, I think that is annual. Is that an annual figure, David? It is a total figure. It is really only going to kick off some of the big national things that Defra will have to fund. A huge amount of the Pitt recommendations, of course, will not, in my view, be for Defra funding to carry out, and, of course, many of the Pitt recommendations are not going to be solved within a three-year period of the Spending Review. We have always made the point that the Spending Review funding that we got from the Prime Minister in the midst of the floods was the right trajectory but that we were not yet at the right end-point. Even the Foresight study, some years ago now, pointed out that there needed to be about a billion pounds in flood risk management. Of course we are at the upper end at £800 million at the end of the three years.

**Q890 Chairman:** We will come back to that, because I am struggling to understand how Pitt can be implemented so cheaply over a three-year period at a time when you also, rightly, pointed out to us that Sir Michael’s next range of tasks was to cost out his proposals. It is almost as if Defra have jumped the gun and said, “Well, Sir Michael, you can have £34.5 million. That is all you are getting. Get on with it.”

**Baroness Young of Old Scone:** No, I think the reality is, if you look at what Pitt is proposing, it is only a proportion of that that will come from Defra funding or, indeed, from the public purse nationally, from taxation funding, and there are quite a number of Pitt recommendations that will have to be funded through the normal funding mechanisms.

**Q891 Chairman:** Let me ask you about one that is not in his list, but we asked Sir Michael when he came here whether he relished the idea of almost being the nation’s flood Tsar? In other words, he is in a very privileged position because he has spent his time so far talking to everybody who has got anything to say about flooding, he has been out and about, he has seen flooding for himself, he seems to have very quickly acquired a great deal of knowledge about flooding and one of the thrusts of what you said, what local authorities have said, just about everybody has said, is there has got to be some kind of new co-ordinate mechanism to improve the nation’s response to flooding, so has Defra had any words with you about modifying the Environment Agency to incorporate Sir Michael in some new role as the flood supremo?
Baroness Young of Old Scone: No, and I think it would be rather unwise to predicate the coordination for flood risk management all on one person. Sir Michael might get run down by a bus tomorrow, and that would be unfortunate, but, nevertheless, it is a rather high-risk strategy to put all your eggs in one basket. Certainly, if you look at what needs to be co-ordinated, it will depend on medium to long-term relationships being developed between a whole variety of organisations that can neither be simply swept up into one organisation nor could be co-ordinated, I think, by a single person or a single responsible secretariat.

Q892 Chairman: I was thinking it might be when we asked him the question as to whether there would be a role for somebody like him within your agency because of the body of knowledge which he has built up. In other words, he has got an overall picture and he is not already part of the current superstructure, if you like, so here we have a new broom sweeping clean in the world of flooding who could bring things together. I was just interested to know whether Defra had probed you about having somebody like that. Maybe not him specifically, but a role created within your organisation to achieve this bringing together which everybody says is so important.

Baroness Young of Old Scone: I would hesitate to propose that role, because though Sir Michael is a very fine man and has got a lot of experience now, the reality is that we want mechanisms that will be robust for several years, many years, and unless he takes a job that is totally about flood risk management, he is going to get quite rusty quite quickly. As soon as you are out of the inquiry, as you well know, things move on and your experience becomes less relevant. But certainly, if Sir Michael would like to join our Board, I am sure he would be very welcome, though I think we have to make sure that we are not setting up some sort of parallel decision-making and strategy formation mechanism that would cut across the role of the Board of the Environment Agency and, indeed, the role of other organisations that have got to play a key part in flood risk management.

Q893 Chairman: It is not often you get a job offer like that advertised in the select committee!

Baroness Young of Old Scone: We pay extremely badly.

Q894 Chairman: Splendid. Can we look critically for a second at Pitt before we move on. You have been very kind about what he has had to say, but, seriously, are there any weaknesses in any of the recommendations that you feel you ought to draw our attention to?

Baroness Young of Old Scone: Phil Rothwell, who has been working very closely with the Pitt team, will probably want to comment. I think the only concern we have got really is that we do not become over confident about the ability to warn people about surface water flooding, both because the meteorological input is not yet there and may never be either. These things vary with very small geography, the predictions about weather vary slightly slower than the weather varies, so if you have got fast-moving weather fronts dumping large quantities of water in a rather unpredictable way on systems that are also quite unpredictable because they are dynamic and you have then got to translate that into a warning to people who may be miles away at work and who we know, from experience, as yet do not do enough when they are warned, you have got to question the cost-effectiveness of a big amount of investment in that. We are moving ahead on mapping for the risk and carrying forward the Pitt recommendations, the urgent ones, but we really need to bottom out what the spend looks like.

Q895 Chairman: We will have some more specific questions later both on communication and on the question of mapping, but Mr Rothwell, do you want to add to that?

Mr Rothwell: The mapping one is particularly pertinent.

Chairman: We are going to come to talk about mapping. If you can stay your hand on that until we get there, then you can have full rein.

Q896 Paddy Tipping: Remind us: big new capital schemes are allocated and decided nationally on the basis of a cost benefit analysis. That is right?

Baroness Young of Old Scone: They are allocated on the basis of a priority scoring system, one element of which is a cost benefit analysis. There are two other elements, one social and one environmental, and then there is a thing we call a moderation process, which is basically looking at the programme that that produces and thinking: is this sensible? Are there other issues that need the application of the human brain and judgment in order to produce a balanced programme?

Q897 Paddy Tipping: How do the Regional Flood Defence Committees fit into this?

Baroness Young of Old Scone: Of course, we are in a period of change from the old system which existed five years ago whereby Regional Flood Defence Committees were allocated funding and made decisions within that funding on schemes, so there was a regional programme rather than a national programme. The changes that were made under the Making Space for Water strategy were about creating a national approach to prioritisation and a national role for the Agency in making sure that we had a consistent way of operating and a consistent way of deciding on priorities across the whole country, and that is the transitional point we are in. On a national basis, we very much work closely with the Regional Flood Defence Committees: they prepare their medium term plans, we look at what they have put forward by way of proposals. In the interests of forestalling questions about some of the allocations this year, inevitably what they put forward is more than the money that will be available. We try to restrain over exuberance on that point, because there is no point working up schemes that simply are not going to be able to be funded, and then the prioritisation process takes place, both
through the priority score process and through the moderation, and we end up with a national programme which, hopefully, meets many of the needs of the medium term programmes that the Regional Flood Defence Committees have drawn up but will not meet all of them because the bill is always bigger than we have got, even with additional funding.

Q898 Paddy Tipping: The focus of public policy at the moment is around devolving decisions and devolving resources, and it seems to me that you are running counter to that, taking decisions nationally. The second point is you talked about the EA Board. That is appointed by the Secretary of State but, as I understand it, the regional bodies are composed more than half by local elected politicians who are in touch with people who are making a levy locally. There just seems to be some tension in this arrangement.

Baroness Young of Old Scone: I think it is quite a useful split, to be honest. The reason why the changes were made to go to a national system from a local system was because, with the size of the programmes we have, and bearing in mind the size of the local system was because, with the size of the changes were made to go to a national system from a local system was because, with the size of the changes were made to go to a national system.

Q899 Paddy Tipping: Could you remind us what the total amount of the local levy is, and what proportion it is of the national pot? If you cannot do it now, you can drop us a note.

Baroness Young of Old Scone: I can do it now but David will probably remember it much better.

Mr Rooke: It is £27 million. So for the forthcoming financial year our committees have raised £27 million locally.

Q900 Paddy Tipping: Some of them are precepted by over 10% next year.

Mr Rooke: There are a range of increases. There are some reductions. One committee has certainly made a reduction in the levy for next year compared to this year but the biggest increase was 50% in one of the committees.

Miss McIntosh: How much of the national fund in the press release today is top-sliced?

Chairman: Can we just leave that because Gavin has some questions on it and I would like to keep all the ones on the budget together.

Q901 Miss McIntosh: Can I just ask on the flood levy, the local flood levy? Yorkshire, I think you will accept, was probably one of the top two worst affected areas last summer, and yet it appears that Yorkshire is having to raise its own money for flood defences to the tune of £260,000 from the Yorkshire flood levy, with some extra money from the RDA. Did you make representations to the Government when the national priority scheme was introduced? Would it not have been better to have done it on the basis of those areas most likely to be at risk of flooding?

Baroness Young of Old Scone: The prioritisation process takes account of costs and benefits, which include the economic costs of flooding, in particular, what would happen economically as a result of a flood, the social costs and the environmental costs. The catchment flood management strategies and also the shoreline management strategies that we are developing do give a steer towards the priority areas where funding should be allocated. Generally speaking, the regional flood defence committees will have identified most of their highest priorities through their medium-term programmes and we will be looking at schemes that are flowing from those. As we get more work done on the strategies and catchment flood management plans, we will be able to target more effectively towards the highest priority areas. Certainly, as far as Yorkshire was concerned, it is getting growth from the central funding over the next three-year period, quite substantial growth. The way in which funding was allocated nationally means that in any year it will depend on what schemes are coming forward as to how much money goes to a particular region, and Yorkshire is at the point where there are some schemes about to come forward but not quite coming forward yet into that period. Almost
4 February 2008  Baroness Young of Old Scone, Mr Phil Rothwell and Mr David Rooke

certainly, there are a number of schemes that will then tip the balance the other way and Yorkshire will go up and other regional flood defence committees will go down. It is wholly dependent on what schemes are funded for particular years as to what the total amount of money is but we are very pleased to say that the Yorkshire regional flood defence committee will have something like £14 million additional funding over the three-year period.

Q902 Mr Drew: We had the debate when we met first about the issue of whether there should be a specific floods agency and you were very clear that you wanted to keep responsibilities within the Environment Agency. However, we still have some difficulties in terms of what we need to improve in terms of the co-ordination of the key agencies as they operate in this brave new world that we now live in. You already mentioned in your introduction the forecasting of potential risks and areas that would be put at risk. Can you just explain to us your relationship now with the Met Office and the division of responsibilities, and whether that is something that we need to look at in terms of our report, or is this now delineated in such a way that there is clarity of understanding of who does what?

Baroness Young of Old Scone: Our relationship with the Met Office is very good. It has been all the way through the events of last summer and indeed into January. I would not have said that there was a lack of clarity about who does what and certainly we are working very closely on all the recommendations that have come from our lessons learned report and the Pitt recommendations. We have quite distinctive roles but I do think there are some common areas that we work in where we need to be sure that we are actually providing a united service to the public. David may want to talk more about particular issues.

Mr Rooke: There are some specifics. We and the Met Office have realised that some people get confused between the Met Office issuing a severe weather warning and when we issue a severe flood warning. So we are working closely with the Met Office to see how we can improve the way we communicate to get an understanding across so there is clarity on what people are being warned about and what people are expected to do when they get one of those two warnings. That is an example that came out of the floods that we are working closely on with the Met Office.

Q903 Mr Drew: In terms of the science base, because clearly there is a need to recognise that where we are going to go forward in terms of understanding of the flood risk is in terms of being able to really work collectively to get as good a scientific understanding of what is going on as possible. Do your scientists work hand in glove with the Met Office? How does that relationship operate? Are there regular seminars to look at the latest scientific evidence or is that really more a management issue?

Mr Rooke: We have a number of working groups where we discuss that the Met Office what products might be required. A good example would be developing the weather radar system where, again, we partly fund improvements to the weather radar system and the Met Office partly fund. There is a whole programme of improvements planned for the weather radar network using the latest science. We have recently installed some wave buoys out in the North Sea, which again is in collaboration with the Met Office, to feed one of their models that we then use for local forecasting and warning. There is a lot of collaborative work going on and a lot of joint funding of projects going on between ourselves and the Met Office.

Q904 Mr Drew: If we can go on to look at the issue of surface water flooding, which, as you can imagine, I have become a bit of an expert on. I was out again yesterday morning with some of my constituents looking at the implications of what happened last July and what happened a couple of weeks ago, because they did flood once more. How much we welcome both what the Pitt report says and also what has already been alluded to by Ministers and others, that in a sense, the Agency is going to get new responsibilities but in advance of those new responsibilities, how do you respond to some of the criticism I got yesterday that whenever the EA is now asked for help, the first response is “We haven’t got any money”? 

Baroness Young of Old Scone: We welcome the overview of all inland flood risk, which will include surface water, but we see our role very much as providing an overview, providing the tools and techniques, providing a way of assessing priorities and risk, some of the mapping stuff that we have already talked about, and really working with local partnerships to produce a strategic way forward on flood risk from all sources inland. If you look at the causes of the surface water flooding, as you say, communities do feel that they are always getting the brush-off because there are a whole load of people involved who all have responsibilities. I do not think that we can see a way that that would ever change dramatically because the reality is, if it is to do with drains, it will be the local authority; if it is to do with sewers, it will be the water company; if it is to do with road run-off, it may well be the highways authority. There will be a whole load of issues to do with development and redevelopment. What is needed is a strategic look at the flood risk from all sources around a particular location, particularly in the urban areas, not only those surface water issues but also issues from river flooding and a process to coordinate that. That, we believe, is best done by local authorities because they have most of the levers already in their hands. They are the planning authority, they already work with the highways agency or they may be the highways authority themselves. They will certainly need to work with developers and redevelopers and, of course, the water companies are very much involved with that process because it is about how we re-engineer the drainage and sewerage systems to reflect climate change and also urban growth. The local authorities have a much stronger ability to harness all of those partners. We will play a very strong role in helping
them, in helping provide ways of thinking that through, and the technologies and the techniques of drawing up surface water management plans and taking account of flood risk from all sources. That is the piece of work that we are setting off, to develop that overarching role but Defra will be consulting on what the nature of our role will be, and that will be an opportunity for everyone to comment on what that role needs to be.

**Baroness Young of Old Scone:** I do feel that this overview role will provide a means of coralling all the agencies and organisations that need to play a role but I do not think there is any quick fix that simply says that one organisation can take over all of those responsibilities, because they are embedded in the roles that these organisations already have.

**Q906 Chairman:** Hang on a minute. It is a lovely expression: “Let’s corral them altogether.” It is the great flood round-up led by Baroness Young on the back of her large horse, now she is back riding again. I can just see a picture of you lashing the whip and they are all coming into the great corral and they are all there saying “We have been rounded up, Baroness Young. What do you want us to do?” I am just looking at this list. You say the local authority is the planning body so it has lots of power but, to pick up Mr Drew’s point, you have different responsibilities with different local authorities and, unless there is somebody who is going to crack the whip on accountability, you can have all the strategic overview in the world but, unless there is a plan and somebody is actually responsible, point by point, for the plan to deal with flood risks at a local level, you will have, again, lots of reports, lots of good intentions but very little action. Who is the person who is actually going to not just crack the whip but hold the ring from the accountability point of view?

**Baroness Young of Old Scone:** I think that will be an important part of the consultation that Defra goes to on the role because you could give us an overview role that said we would quality-assure all local authorities’ surface water management plans and we would have some powers over local authorities to insist that they did them better if they have not done very well. I am not sure, bearing in mind Paddy Tipping’s recent question, that that is what people want, that they want a national organisation that is going to do that quality assurance.

**Mr Drew:** What they want is real local co-ordination.

**Q907 Chairman:** Let us look, for instance, at a situation—I suppose Sheffield might be an example but perhaps I am going to literally get out of my depth. Let us take a situation where you have a serious highway flooding problem and your co-ordinating body, whoever it is, run by whoever, looks at an area and says, “We can see now that there are some strategic problems of dealing with run-off on to the highway from surrounding land,” and the local authority says, “Yes, we accept that but the local district council have now sanctioned all these developments, they are going to increase the run-off, and we, the county council, who have the highways responsibility, I am afraid we just have not got the money to re-scope the capacity of the highway drainage system to deal with this problem. Yes, we think it is a really nice idea that we do something about our end of the problem but I’m afraid we haven’t got the cash to do it. Goodbye. We are out of this.” I do not know how you are going to get this integration of action, which is what I think Mr Drew is going on about.

**Baroness Young of Old Scone:** I think there is a number of bits of process that can be put in place. Catchment flood management plans, as they say, are on a catchment basis; they are pretty high-level and strategic but they will identify some of the big issues that need to be resolved but they can only be resolved by a whole load of organisations working in partnership, not by us directing them. What does work is that, if you look at some of the issues we have dealt with already, where we have managed to get voluntary gatherings together or coralling or whatever you want to call them, where we have got voluntary action, if you take the post Carlisle floods, generally speaking there there has been excellent collaboration between ourselves, the local authority, including authorities outside the boundaries of Carlisle, the water company and indeed some of the business community in Carlisle to actually produce a surface water management plan and a flood plan for Carlisle, which we are now investing in our bit of it, the water company is now investing in its bit of it, the local authority is now investing in its bit of it and that is, I think, a model for the future.

**Q908 Chairman:** Given that Carlisle had to respond to a pretty horrendous situation, I could imagine everybody saying “Ooh, we have not just seen the red light; we have really got to do something about it.” In many other areas they have not had quite that
experience and I can see that with local authorities now, who are under considerable financial pressure, they have many demands on their scarce resources, if in the model you have described some of them would duck and weave not to do quite what has clearly happened in Carlisle, I am still not clear about who is going to crack the whip. In Carlisle the event perhaps caused the concentration of minds and the commitment to action but there will be many areas where there has not been such an event.

**Baroness Young of Old Scone:** There are a number of statutory requirements, under planning legislation, for example, or under the Civil Contingencies Bill, the local resilience fora, where the local authority takes the lead in bringing together all of the bodies to look at what local resilience looks like, and flood resilience, if that is an important issue in that particular locality, will be part of that statutory requirement to produce local resilience plans and there are ways in which government quality-assures those. So there are a number of mechanisms. I think the big issue for us for the future will be whether we are given a role in quality-assuring local flood risk management plans. Now, if we are given that role, it needs to be thought through what the sanctions are if our quality assurance process reveals that these plans are not up to scratch, and also it needs to be thought through what it feels like having a national body do that to local authorities, and also what we do then. If a plan is not up to scratch, what will be the mechanisms if the local authority increasingly, in a devolved way, is being given authority to spend its money much more flexibly on the priorities that they identify as the highest. If you look, for example, at the local authority performance framework, though there will be flood risk management performance indicators in the wider suite that will be audited by the Audit Commission, they may not come particularly high in the four or five priorities that an individual local authority is being encouraged to identify as being its highest focus. So I think there are some big issues that need to be resolved in the surface water role. The one thing we do not want to do is to be given this role and any quality assurance role with it without getting any funding to do it, because that is another one that is not going to be cheap.

Q909 Mr Drew: Let us go on to that. We talked earlier about Michael Pitt’s recommendations and the immediate agenda he has, and obviously, he will be outlining his final agenda when he comes to the end of his inquiry. To what extent now is flooding writ large in all the Environment Agency does? You have other responsibilities which clearly could lose out. You are not a flood agency but you are an agency responsible for flooding. How do you measure now the prioritisations? There is a real problem now that this is a huge impact area that you are responsible for, so give us a feel for how you are now trying to deliver your responsibilities.

**Baroness Young of Old Scone:** Clearly, flood risk management is an important part of our responsibilities because it is now more than half our budget for the first time but it is not, as you say, our only responsibility. We do have a very well-structured system of objective setting and performance management to make sure that all of the objectives that we have agreed with Government to hit get fair attention. Where there is any pressure on the system, the way we are structured is that there are people who deal with flood risk management, there are people who deal with waste, there are people who deal with the other environment protection issues, there are people who deal with fisheries and there are people who deal with navigation, so the weight is not falling on everyone. The one important thing that we do need to make sure is that all of the impacts of climate change, including flooding, are built into everything we do, and that is something that is fundamental to what we do. There are climate change issues in waste, there are climate change issues in navigation, in fisheries and in environmental protection, so we are making sure that we have taken account of these climate change issues. If there is any pressure, it is probably in two places. One is people like me and the Chairman and the senior people—not the flood risk management dedicated senior people but senior people who have a generic role. We have not done a lot in the last six months except floods but, on the other hand, there is a big agenda that we have kept going at the same time. I spend a lot of my time, for example, on the waste strategy, nuclear new build and nuclear waste, so though it looks like flood is the only thing in town there are an awful lot of other things in town as well. The other place that we do need to just take account of the pressure is our regional directors and area managers. They have a generic job, covering all our functions, and at times of high drama on flood risk management they do have to put more of their time into that. If we had another issue—we have had occasions when things like waste incineration have been the biggest show in town and that has been where they have had to put their time. That is what they are there for. They are there to keep all the rest of our activity going while making sure that they put a particular focus on whatever is the most important issue at the time. So we are in fact well on the way to delivering the vast majority of our outcomes that we agreed with Defra at the beginning of this financial year at the end of this financial year.

Q910 Mr Drew: All this is good to hear but it does depend on the people on the ground. I just wonder what your strategy is for ensuring that you have sufficient people with the right skills mix so that they can deal with flooding issues, and maybe they have other responsibilities but you can bring these people in in times of crisis. This is not just within the organisation of the EA but also outside. My own local authority is about to lose its flooding person. He has been headhunted by Tewkesbury—talk about going from the frying pan into the fire! He does not like an easy life. Those are not easy jobs at all. You have got clearly key jobs because local knowledge with regard to flooding is really of crucial importance. What is your view of the sort of skills agenda out there and can we fulfil that, or are we going to have to look
very hard at higher education, bringing people forward and also making sure that they have appropriate experience to be able to deliver this knowledge.

Baroness Young of Old Scone: Could I just say a couple of things and then David can talk in more detail about the work we are doing on skills? One of the things that we are involved in at the moment is looking, as our flood risk management budget goes up and our activity increases as a result of that, at how best structure what we do in flood risk management at a regional and area level. That is a piece of work that is going on at the moment on how we help beef up the support to flood risk management in those areas. We have also, of course, in terms of the emergency phase of flood risk management, got a system whereby we can pull people in, experienced people, who may not have local experience but can bring experience from elsewhere, and also using ordinary staff who are not necessarily flood risk management staff but who can take over routine duties from staff who need to be applied solely to the emergency at the time. So there are ways in which our cross-regional support can help with that but there is a lot of pressure on some scarce skills like flood risk engineers, and David can tell you about the work that we are doing on that.

Mr Rooke: There is a shortage, and we decided some three or four years ago, in anticipation of that shortage, that we ought to train our own staff. So we have developed a foundation degree in River and Coastal Engineering at the University of the West of England. That is going extremely well. Fifty-six graduates are already working for us. We have another 30 in training at the moment and we are recruiting a further 30.

Q911 Mr Drew: This is a job for life, is it? If you get through the course, are you going to headhunt these people?

Mr Rooke: We have sufficient vacancies in the organisation to take all the people who graduate from that course.

Q912 Mr Drew: All MPs are retraining now!

Mr Rooke: We have also, again with the University of the West of England, started a BSc course in River and Coastal Engineering and we have eight employees who are on that course. We are sponsoring undergraduates who are taking Masters engineering courses. We have 15 MEng graduates under professional training and we are launching a diploma later this year. We are also, working with the professional institutions like the Institution of Civil Engineers, the Chartered Institution of Water and Environmental Management, looking at inspiring more school leavers to take up engineering, so we are working with the Royal Academy of Engineering, we are working with the universities and we are working with organisations that develop school curricula such that we can attract more young people into the sciences, then into engineering and then obviously to specialise in civil engineering and ultimately river and coastal engineering.

Q913 Mr Drew: Is this also happening with local authorities? Are they similarly investing in their awareness of people having sufficient flood knowledge so that they can either as a full-time job or certainly as a job that they can come into... Mr Rooke is trying to indicate.

Mr Rothwell: You asked earlier, Chairman, about anything we disagreed with Sir Michael Pitt about. This is not something we disagree with him about but we do feel that there is now increasing pressure on local authorities through the PP525 and through flood risk assessments and surface water management plans to have the right qualified people in place, engineers in particular, and I think that, given the shortfall we have just discussed, it is going to be quite a challenge for local authorities, and indeed ourselves, to deal with this increasing requirement for knowledge and specialties, if you like, and this is something I think we will have to look at very carefully as to whether the agenda that is now being set is one that we have the capability to deal with in terms of the expertise and skills that are necessary.

Baroness Young of Old Scone: Chairman, can I just go back to a point that we touched on which Phil Rothwell touched on there, and that is what should our role be and what should the role of local authorities be in this urban and surface water issue.

We have a paper, which I am not sure the Committee has seen yet, which we have provided as an appendix to our Pitt submission which tries to lay out with reasons why we think it would work and the way it would work. Perhaps we could provide that for the Committee.

Q914 Chairman: Did you look at any models outwith the United Kingdom of the way co-ordination is achieved before coming to your conclusions?

Baroness Young of Old Scone: We have not, because we are aware that when you look at other countries—France, Holland, America and I cannot remember where else Pitt looked at—the model of government is so different and the model of governance is so different that it is quite difficult to draw conclusions from that.

Q915 Mr Drew: We went to Lyon, and I think it is fair to say that we were generally impressed by the way in which a city region has really got hold of its problems with the confluence of two rivers and has thought very hard about where it should develop, where it should not develop, and the way in which the local communities are key to the way in which the city region operates. Are there not some lessons to be learned from that experience?

Baroness Young of Old Scone: I am sure that is the sort of collaboration of a number of local authorities with ourselves and other bodies that we would want to see under the proposal that has been put forward because it can only be dealt with in that respect.

Q916 Mr Drew: Who does that? We obviously will feed that into our report.
Baroness Young of Old Scone: This is the role that to date has not been given as a responsibility to anybody and which the Government’s proposal about us having a strategic overview would help bring together but we will very much need it, as it is in the city region model, to be led by groups of local authorities working together.

Q917 Lynne Jones: We have heard about your efforts to recruit more engineers and scientists to improve your science base, which has been criticised. Are there job vacancies waiting for these people to take up, or are you going to have some reorganisation to allow you to change what has been described as a top-heavy structure with a pure science base? Are you looking to address that problem, if you see there is a problem, and will you be looking to become a much more science-focused lean machine to make sure that you keep within your budget if you are going to take on all this new scientific expertise?

Mr Rooke: On the current remit, rather than what might be coming our way, we have sufficient vacancies at the moment within our budget to accommodate the trainees that I talked about earlier, and we are still actively recruiting.

Q918 Lynne Jones: How many vacancies are you talking about? What proportion?

Mr Rooke: At the moment we have about 100 technical vacancies out of about 1,200 technical staff.

Q919 Lynne Jones: Is this due to high turnover or have you simply not been able to recruit them?

Mr Rooke: We have struggled to recruit to some of the engineering posts. Some of our specialist engineering posts we have struggled to recruit to.

Q920 Lynne Jones: What have you done with the money that you are saving from all these job vacancies?

Mr Rooke: We have used some of that money to employ consultants to fill the gaps and to employ some temporary contractors as well.

Q921 Lynne Jones: How much is being spent on consultants and who are the consultants?

Mr Rooke: The consultants are engineering consultants. I do not have the figures, I am afraid, on how much we have spent on consultants.

Q922 Lynne Jones: Perhaps you could give us some figures on your expenditure on scientists and engineers and what proportion is out-sourced.

Baroness Young of Old Scone: Could I just comment? There has been an implicit assumption that we are top-heavy and that we spend too much on head office. I cannot quite recall what the total of our head office spend is but it is primarily on what we would call national-once projects, which is something that we do once on behalf of the country as a whole rather than having it replicated around the regions and the areas. For example, developing our flood warning developing system, which is clearly based done on a national basis. There would be a number of projects like that.

Q923 Lynne Jones: You will have to do a lot more work in terms of surface water drainage in future, will you not, if you have this responsibility?

Baroness Young of Old Scone: We will certainly have to put some investment into establishing what the frameworks are, what the processes are, that will help local authorities take this work forward. The standard methodologies, the modelling techniques and all those things will need to be funded and they will be done once on the basis of that being the most effective way of doing it for the country as a whole, developing the techniques, not actually using them in practice down at local level.

Q924 Lynne Jones: Some of our evidence has suggested that, because of the weakness of your science base, maybe responsibility for the strategic overview should be given to the Met Office. How do you respond to that? What is the advantage of the current split in responsibilities?

Baroness Young of Old Scone: I would reject any criticism of our science base, quite frankly, because it is a science base that has been developed over the years with Defra as a joint programme. It is also in partnership with a wide number of other very reputable scientifically credible bodies, and also draws widely from European-wide science programmes that are right at the cutting edge of flood risk management science and some of the other techniques, like modelling of risk assessment, so I am not sure where the criticism of our science base comes from. I suspect, if it is from other scientists, it may well be because we have not necessarily done what they wanted or funded what they wanted but, to my knowledge, until very recently, I have not heard any criticism of the science base. It is probably one of the better run science programmes between a government and an agency and has been for a number of years. In fact, as a compliment to our science ability, Defra has just devolved more of the funding for science in flood risk management to the agency which previously was held centrally by Defra.

Q925 Lynne Jones: You do have 100 vacancies, which perhaps would be an indication that those qualified people are not rushing to be employed by you.

Baroness Young of Old Scone: That is not in science. That is in terms of our engineering capability. In terms of science, the vast majority of our science is not done in-house because that would not be the most effective way of doing it. The vast majority of our science will be conducted on the basis of us funding reputable bodies and academic institutions and other science delivery organisations and to provide the right sort of science for programmes as a whole, agreed with us and Defra and other bodies so that we are using our money most effectively.
Q926 **Lynne Jones**: Do you have sufficient in-house expertise to commission that research effectively?

**Baroness Young of Old Scone**: If we do not, I do not know who would, because the reality is we are the flood risk agency and Defra has policy responsibility for flood risk, and the secret of successful science commissioning, in my view, is knowing what the real issues are that you want explored and knowing the right place to go to get the right sort of expertise, and making sure that you have good, well-defined projects that you manage properly and we do have expertise in that latter set of skills as well.

Q927 **Lynne Jones**: So you think you have sufficient expertise for the commissioning function?

**Mr Rooke**: Perhaps I could add that we have set up a number of themes and we have external people who advise us in terms of those themes, so the science programme is developed jointly between ourselves and the industry in terms of what the industry feels it needs. We are also funding a consortium led by universities, who again take a view in terms of what the science needs of the country are, and we are supporting them.

**Baroness Young of Old Scone**: Can I just comment on the engineering vacancies as well? The reality as far as engineers are concerned is we are all struggling to recruit enough engineers at the moment right across the public and the private sector, which is why the Institution of Civil Engineers and various other of the engineering professional bodies and ourselves are working together to try and create interest in the school population and in university in engineering as a profession in future life, because there is a real problem of a shortage of children going into engineering degrees and a real shortage of engineering graduates, which is why we have tried some of the remedies that we have. It is acknowledged that that is potentially going to be a problem for everyone, even more so as we see big investment programmes coming forward, for the Olympics, for example.

Q928 **Lynne Jones**: In previous evidence sessions though you have also acknowledged that you have difficulty in recruiting environmental scientists.

**Baroness Young of Old Scone**: I am not aware of difficulties in recruiting environmental scientists.

Q929 **Lynne Jones**: You have certainly sat there and told us that.

**Baroness Young of Old Scone**: Most of the environmental scientists I know would bite their arm off to come and work for the agency, to be honest, because we pay reasonably well for science posts though we are not nearly so competitive for engineering posts.

Q930 **Chairman**: Do not apply for the job yet! Can we move on to the question of the mapping of surface water flooding? That was obviously a feature of last summer’s activity. Can you give us an update on where we are in developing our knowledge in this area of modelling and mapping the risks of surface water flooding? Have you, in doing that, involved local authorities in making an input to it, and are we likely to see any kind of mapping and indicative risk analysis during the course of this year?

**Mr Rothwell**: Yes. We responded to Sir Michael Pitt’s urgent conclusion or urgent recommendations that we took surface water mapping seriously and tried to find ways of forecasting where problems might lie. It is extremely difficult and I would counsel against too much optimism. However, we feel that we can produce some indicative maps this year, probably by August, by putting in place a mapping system which we can buy off the shelf, if you like, and by accompanying that with real data, which is our own experience of where flooding occurred, where local authorities understand flooding might have occurred in the past and also the water companies. We are about to embark on a series of meetings with local resilience fora where our staff will present what information we have and ask others who might have information also to marry it with ours and embellish the maps. So we are hoping by August to be able to deliver some rudimentary mapping system. Where it becomes more difficult and more complicated is that, to make this really accurate, if you ever can in fact get it to the point where you can forecast flooding ahead and warn people, is extremely difficult. Urban mapping is fraught with problems. It is a combination not just of rainfall but of the existing drainage system that is with the local authority or water company. Often water companies and local authorities do not know where the culverted streams are that carry water or that do not carry sufficient water. It is very difficult to marry all that data together in any meaningful way to give a forecast of where urban flooding might occur. At a very local level, that can also be fraught with difficulty where even speed bumps in the road or a skip parked over a drain might be sufficient to cause flooding somewhere, which is very difficult to monitor. So mapping itself is very tricky and, to add to that, currently it is very difficult to forecast the intensity of rainfall in any one area either spatially or temporally to give you the confidence that you could forecast and warn ahead of where urban flooding, surface water flooding, might occur but we are confident that by the middle of the year we should be on the way towards providing some indicative maps.

Q931 **Chairman**: That is going to put a question mark with reference to flood risks in areas which hitherto have not been the subject of your mapping exercise. How is the insurance community, in your judgement, going to look at this? Up to now—and we will come on to ask some questions about this in a second—they have developed and embellished a mapping system which has been developed for coastal and river flooding which, if you like, is a proven piece of technology. Here we are going to get maps for the first time which in perhaps a rather “crude” way will identify risks in an urban situation. What are you doing with the insurance industry to enable them to understand this and deal with the risk that you now identify?
Mr Rothwell: We talk very closely with the insurance industry and share data with them to help them with their business, and indeed, this very week on Thursday I am meeting with the ABI to talk about urban mapping and what is the art of the possible and what is not. It is extremely difficult and I do not think we have all the answers by a long way yet as to how we might provide information. For critical infrastructure we think we might be able to provide more information than we have at the moment but it is subject to ongoing discussions with ABI as to how we might use that data in the future.

Baroness Young of Old Scone: Can I just comment because I think there are some sort of gross areas where you could say there is a really frequent risk of deep flooding which people have to take account of. One of the things that got me about the January floods was just how many roads and railways that have flooded traditionally flooded all over again, yet we do not seem to have quite grasped the messages that we have to do something to make our roads and railways more resilient. So there are areas, low spots in the roads, low spots in the railway, where the likelihood of frequent deep flooding is something that we have really got to start taking account of. The risk, I think, of mapping surface water flooding is that—and as a non-technical person, if I get this wrong, David will have to sort me out—at least when you have mapped the flood plain, you have a pretty good idea of where a river is going to ultimately go in terms of spreading out from its course, depending on a whole variety of different scenarios, and so if you are a number of feet above the thousand year outline in the flood plain, you can be pretty certain that you are not going to flood from the river. That is not the case with surface water flooding. If you get the right conditions, with a big enough downpour and something blocked, some drain or some recent development that has prevented water from flowing in the way that it used to, you can have some quite strange, unexpected surface water floods occurring, as we saw during July. That, I think, is going to be the tricky thing, that we must not in surface water flooding give people the belief that we know where every surface water flood could be, because we will never know that because of the unpredictability of it.

Q932 Chairman: That I understand but I just want to pick you up on a piece of language you used. I wrote it down. “We have really got to start to be accountable for...” and you put those words in the context of road and rail flooding.

Baroness Young of Old Scone: That was the royal “we”.

Q933 Chairman: It may be the royal “we” but, to come back to the line that Mr Drew was posing to you earlier, which I was following up, about coordination, would not that type of phrase be a bit like a red rag to a bull to Mr Drew’s constituents, saying who is going to get to grips with these very basic, fundamental issues of the type of road and rail disruption which they encounter? I am not clear, again, who is going to be doing the “we”; who is the “we” that is going to get to grips with it?

Baroness Young of Old Scone: There is a current statutory mechanism for that at the moment, which is under the Civil Contingencies Act and the role of the local resilience fora, who ought to be looking at all of the potential causes of lack of resilience in a local area and the highways agency and the providers of essential services are part of these fora.

Q934 Chairman: I think if you asked people, they would think that those issues were not being addressed, and this comes back to who is going to sit and make certain that those jobs are actually done? Just tell me now, under the Civil Contingencies Act, who checks up if all of these things that you think ought to be being done are actually being done?

Baroness Young of Old Scone: This is one of the reasons why we believe that the Climate Change Bill should be strengthened to provide a duty on a whole variety of local authorities and providers of critical infrastructure to take account of the impacts of climate change, whatever they might be. In some cases they will be floods, it could be heat, it could be a whole variety of things, because at the moment they do not have that responsibility.

Q935 Chairman: No, but even if it were there in law, you are still going to have to have somebody to say “Have you done it?”

Baroness Young of Old Scone: The local resilience fora are the place where the local resilience plans should be drawn up, led by the local authority.

Q936 Chairman: You are saying “should be”. I was very interested in what you said when you identified, almost in a moment of personal frustration, about road and rail. You said “I am so surprised.” You are Mrs Floods, and you are so surprised that we have not actually done anything.

Baroness Young of Old Scone: Let us correct that. We are at the moment the agency that has a responsibility for flooding from the coast and from rivers, and at the moment we do not have a responsibility for the overview of all flooding.

Q937 Chairman: Yes, but you are in this. This is what you do for a living. You look after flooding, and you have made it very clear that you are the repository of a great deal of the knowledge about flooding in the country. All I am saying is that I think the public will be very interested to hear you, Baroness Young, express the kind of frustration that they feel that some of these localised but nonetheless very important issues do not seem to be being addressed, in spite of the fact that there are statutory bodies and obligations which have been there for some time, which should be leading to action on the ground, which they do not see.

Baroness Young of Old Scone: Which is why I would strongly advocate the need for a statutory role for these bodies, a statutory responsibility, a duty for all of these bodies under the Climate Change Bill to take account of the impacts of climate change and
ensure that their services have made adequate provision to adapt to them, because unless there is a statutory duty, we may well find that different bodies are at different stages of preparedness and at different stages of being willing to collaborate with their local resilience fora.

Q938 Mr Williams: Mr Rothwell pointed out the difficulty when you are doing mapping for surface flooding of identifying actually where these culverts are and where these drains are. Another problem, as I see it, from local experience is not only once you have found out where the drains and the culverts are, but whose responsibility it is for maintaining them. Individuals find it very iniquitous that when a drain that is taking water off a road then goes through their land that they then become responsible for maintaining that culvert. Are you taking the opportunity when you do this work to try to get some understanding of who is responsible for individual drains and culverts as well as where they are? Part of the problem is that you would have localised failure, like your skip parked on the drain or whatever, but ownership and responsibility for these structures is important as well, is it not?

Mr Rothwell: Yes, absolutely and, as I mentioned, I think, we have been doing some initial work this year. Once you get into identifying where every culvert is and what condition it is in and who owns it, you get into much greater expenditure and much longer time horizons to do it. It would require some of the data that was held by a number of other players who have to also work with us. So I think to get the picture that you have outlined and that we would all wish to have would take a considerable amount of time and cost.

Q939 Mr Williams: Surely, that is the key to actually finding out what the remedial action that needs to be taken is and who is responsible for taking that remedial action. When we visited Lincoln, there were issues about riparian ownership and riparian responsibility but the same problems with subsurface structures as well.

Mr Rothwell: I think that is right. We have mentioned surface water management plans and local authorities having responsibility for writing these in places where there are critical drainage failures or drainage problems which again are identified as critical drainage areas in the planning legislation and from our own catchment management plans. PPS25, the guidance which is now being written on planning development in the flood plain, does touch upon some of these issues about how we know where water is going and who manages it, and I think part of the outcome of those surface water management plan consultations will be to bring those other players in to understand the drainage system in much greater detail than we can do at the moment.

Q940 Mr Drew: You have correctly said we have identified the flood plain and actually got some sense into the way in which we treat the flood plain. The problem is, if you take the Severn Vale, which is earmarked for huge development, it is not as though we have a flood plain that we are either protecting or that the flood plain as such is so easy to define. The problem of the flood plain is not just the main river; it is all the tributaries and all the water flows that come into that flood plain and yet we are quite blasé.

I was at a planning inquiry this morning and the idea that we have learned anything from the July floods—you would have to pinch me to understand what the people who were actually debating this had learned at all, because it was as though July had never occurred, that January, again, was something that was a minor problem, but whether that would affect anything in terms of the overall distribution of houses and jobs and so on is really something that I just think is left to the imagination.

Baroness Young of Old Scone: Can I say that that, in my mind, reinforces the need for a very strong role for local authorities in holding the ring locally on this stuff because they hold the planning—

Q941 Mr Drew: But they have not learned anything, Barbara.

Baroness Young of Old Scone: I know but unless we get them responsible, David, if we are trying to do it from outside and we have none of the levers in our hands, it will not work. We have to get to the point where local authorities see what flood risk means and begin to operate PPS25. We are getting there in terms of gross development of flood plain and development of flood plain that will cause flood risk to other properties. One of the things we are going to do is start taking a much tougher line on the surface water provisions in PPS25 and simply objecting to development proposals that have not been able to demonstrate that the surface water issues have been properly thought through. So we can put a bit of pressure on local authorities but, at the end of the day, if we are really going to adapt to climate change, we have to get local authorities to the point where they understand, as much as they understand development and economic development and social issues, what climate change risks look like and they are building that into the things that they do.

Q942 Mr Drew: Should you have a statutory responsibility to be able to object to a particular planning proposal that, if and when you go in there and say “This is a definite flood risk”, the local authority only agrees to that at its own risk and is clearly liable for a decision that it took given that it ignored your pleadings? At the moment, as you know, too often the pleadings of the Environment Agency are ignored or are put in a box to say “hypothetical” and yet we saw in Gloucester brand new housing estates under water. Somebody should be held responsible for that.

Baroness Young of Old Scone: The thing that I think we can go even further on is, as we have in the past objected to development proposals because there is not a proper flood risk assessment, we will increasingly object to development proposals if there is not a proper surface water risk assessment as well. Getting an understanding that developers and planners need to think about surface water is going
to be part of what we will be doing. We now have
tougher powers under PPS25 that if a local authority
does decide to go against our advice, we can ask for
the Secretary of State or ask the regional
Government Office to ask the Secretary of State to
call the proposition in. So we have more powers than
we have ever had. Clearly, if there were wholesale
planning applications going ahead against our
advice, we would have to seriously ask the
Government to review PPS25 but at the moment,
on the issues of riverine flooding that is not the case. We
are getting better understanding with local
authorities, we are getting developers developing a
better understanding of the need to have flood risk
assessments and we have less major developments
going ahead against our advice. We now need to
replicate that on the surface water issues.

Q943 Mr Drew: But you would accept that there is
a degree of interconnectedness to this? You cannot
just isolate river flooding to water run-off to all the
other causes of flooding. The problem here is—and
this is where people do get heartily sick of being told
that their problems will be dealt with—it is because
of the interconnectedness of these problems, and
that is where, I have to say, all power to your elbow
because you have to educate local authorities that
this is a new world and they must not take the risk,
even if it is a risk which looks to be relatively minor,
because you have heard some of the previous
interviewees when we were talking about critical
infrastructure. It is all well and good to talk about a
one in 100 year flood but a one in 100 year flood is
becoming a twice a year flood now, and they have not
really caught up with what that means in terms of
the implications.

Baroness Young of Old Scone: Certainly, as far as the
infrastructure is concerned, I do not think we should
just be looking at the inconvenience and disruption
and economic impacts of things like roads and
railways and power stations and water treatment
works going offline. I think we have to start looking
at the wider ramifications, particularly in the
electricity distribution sector, where it is not
necessarily the degree of risk or the frequency of an
event occurring that is the issue. It is the fact that
knocking out distribution to a very large number of
people for a considerable period of time would have
such huge ramifications right across everything that
we do in life these days that it is really unthinkable
to run that risk in any way.

Q944 Dr Strang: I think that is a good cue to put it
to you that we agree that there is a need for a
substantial and ongoing increased programme of
investment in this area. That is presumably common
ground. We recognise, obviously, that you have a
confused role in this but in terms of investment that
is only part of it. We have—and you have these as
well—the Secretary of State’s statement today on
allocations and projected outcome targets for this
area for flooding and coastal erosion risk
management. Looking at these figures, let me put
two observations to you. First, they do not seem to
take into account likely increases in construction
costs. These are cash figures we are looking at so in
real terms, the real term impact on this investment
programme may fall short of what the response
should be to the recent flooding. The second point I
would like to put to you is that the increases are in
the last year; the major increases come in the last
year of the CSR period, that is, 2009–10, 2010–11.
What is your comment on these two observations,
recognising that, at the end of the day, you can only
spend what the Government gives you?

Baroness Young of Old Scone: To take the last point
first, if they had given us £200 million straight off, I
think we would have had quite a lot of difficulty
getting enough schemes in place to spend it
effectively. You have to have a period when you are
planning. We try not to bring too many schemes to
a point where we are able to press the button on
them, as it were, if we do not have the money to do
that, because it means they sit on a shelf, they get out
of date and all those things and it also raises hopes
locally. A trajectory upwards is the right way. A
steady increase year on year on year is what is best
and we have had that with the last two spending
rounds. We have had increases and we have got this
increase and we do not think it should end there. We
think the next spending round needs to give us more
after that. Whether we could have lifted off faster,
perhaps, but a trajectory up the way is the answer. In
terms of inflation, there is no doubt that
construction inflation runs ahead of general
inflation. We have put about 5% into our
programmes as an assumption for inflation costs.
There is a view that we are probably in some
instances running at about 6½% inflation costs, so
though we have allowed for some inflation, that will
probably run ahead and we are not clear what the
inflationary impact will be of a very large number of
schemes, like schemes for the Olympics, like the
Thames super-sewer, like some of the big
construction projects coming forward from the
water industry. We do, however, in
counterbalancing that inflation, have a commitment
with Defra to deliver an efficiency programme each
year, and we have been successful in delivering
substantial efficiency in the way that we both plan
and deliver capital schemes and maintenance in the
Environment Agency in our flood risk management
programmes, and I believe there is more to come. I
do not think we are at the end of the road yet on that
efficiency programme, which delivers about £15
million a year in improved efficiency, which will help
counteract some of the impacts of inflation on the
capital programme. We are now looking at a
long-term investment strategy which would look 20 years
forward, and certainly the best advice we are getting
from external bodies who should know about these
things, like Partnerships UK, is that if we can give
longer-term certainty to the market and if we can
clump some of our projects into much bigger deals,
we will be able to drive even greater efficiency out of
procurement processes. So there are ways in which
we can try to mitigate some of the impacts of
inflation but there is no doubt about it: it does bite.

Q945 Dr Strang: I am assuming the construction
costs and inflation figures you have mentioned there
are basically Treasury figures.
Baroness Young of Old Scone: They are figures taken from some of the external market commentators and also from our own experience with our schemes.

Q946 Dr Strang: Finally, accepting that if you are given a lot of money quickly there is a limit to the extent to which you can wrap up this programme and make the most efficient use of additional resources but, looking at these figures again, is it fair to say that there is huge emphasis on capital? In terms of the actual maintenance expenditure, it does not look all that impressive. Is that fair?

Baroness Young of Old Scone: One of the difficulties of the government accounting system is what you call capital and what you call resources, and in fact, many of the schemes that we have in our capital budget will contribute a considerable amount to improving the standard of our assets because they will be rehabilitating, rejuvenating assets and raising the quality for the future. So the capital programme is not just about completing new flood defence schemes; it is also about re-energising, refurbishing existing schemes, and that will also contribute to the standards of our assets. David may want to comment on exact numbers. About £64 million worth of the capital programme also contributes towards asset maintenance, so the figure that is in the quality for the future. So the capital programme is not just about completing new flood defence schemes; it is also about re-energising, refurbishing existing schemes, and that will also contribute to the standards of our assets. David may want to comment on exact numbers. About £64 million worth of the capital programme also contributes towards asset maintenance, so the figure that is in our budgets under maintenance per se is not a true reflection of the total amount that goes towards maintenance.

Q947 Dr Strang: Is it part of your role to encourage local authorities to make sure that they come up to scratch at least in terms of these figures?

Baroness Young of Old Scone: Where we have a joint piece of work with local authorities that involves assets that they are responsible for as well as assets that we are responsible for, we will of course be looking at how best to get investment into both sides of the equation, and certainly, on the work that we do in allocating flood risk management money to local authorities, we will be primarily looking at capital schemes rather than maintenance, which is very much for the local authority to make decisions about on the flood risk management systems that they have a responsibility for.

Q948 Chairman: It all sounds very nice, this money that is coming along but are you not being a bit kind on the Government? For example, the ABI have vacillated a bit but they offer around the Foresight number of needing to spend at least £1 billion a year to achieve the level of flood defence which they, as insurers of risk, feel comfortable with. The nearest we get to that by 2010-2011 is a grand national total of £804 million. What I have never seen and I just wondered if in your quiet moments you have actually sat down as an agency and said “Look, let’s just forget money for a minute. If we had a free hand and a blank piece of paper and we could do all the things that we thought we ought to do—we cannot protect everything but let’s just have a root and branch whiz through the whole of flood protection—this is what we think we would like to do over, say, the next five years and 10 years?”

Because you are quite right; these are long-term schemes. First, have you done such an exercise? Secondly, what did it cost?

Baroness Young of Old Scone: We are involved at the moment in working up our long-term investment strategy. You can have different views about what a long-term investment strategy is. One is you could say you wanted to start and do the kind of thinking that you describe, which is, knowing what we know about flood risk, knowing what we know about climate change, knowing what we know about future development and all that, what is it going to cost to get everybody who needs to be protected to a certain standard protected to that standard, and proper maintenance and proper warning and all that? That is part of what a long-term investment strategy approach could be but, on the other hand, one could take the view that we will never reach a point where all of that investment is able to be afforded by the country. I think there is a big issue for the country as a whole, and that is, knowing what we know about climate change and the need to adapt to it, what is the level that can be afforded by the public purse?

Q949 Chairman: You have to do that exercise now, which is why you have your current prioritisation scheme, because not everybody can have a slice of the action. So you are doing that now.

Baroness Young of Old Scone: We focus on the highest priorities. Under the long-term investment strategy I think what we will end up with is a realistic view about what the level of funding might be over the next 20 years and how we best could spend it, the priorities within that and how best we can deliver that but it will be informed along the way by work on looking at what the need is for funding for the future over a 20-year period.

Q950 Chairman: I am still uncomfortable that there are a lot of members of the public who would like to know candidly what the difference is between what you are doing now and what you think might need to be done, because the job of Ministers is to answer why they cannot necessarily have the gap between the two.

Baroness Young of Old Scone: I was interested to hear that you said I was being kind on the Government. I have been accused of many things in the past but being kind on the Government is not one of them. Yes, we have pressed hard, as you are aware, for at least approaching the £1 billion a year investment mark, and I believe that that needs to happen in the next spending round but, beyond that, we want to have a look at this 20-year process.

Q951 Chairman: What we have today is an announcement by the Secretary of State that he is going to provide £34.5 million to implement Sir Michael Pitt. Is that what you were hoping for or has it been sliced out of the existing budget? Are you aware of that?

Baroness Young of Old Scone: That is money out of the £200 million additional funding that the Prime Minister announced in the middle of the summer.
Q952 Chairman: So you could say it is additional but a lot of people perhaps thought that was money that was going to go to the programmes that you and others were responsible for notwithstanding the extra things which Pitt has come up with. Anyway, thank you for clarifying that. Let us just have a look because I was intrigued; for the first time we have had presented by the Secretary of State a detailed table showing how the various amounts of money annually are made up, and I was interested to see on local authorities—and we put a lot of weight on what they were saying—we have roughly a level spend over the next three years of £87 million. That effectively means in real terms the local authorities' spending on flood alleviation is going to drop. Is that right?

Baroness Young of Old Scone: If one took account of inflation but I hope the local authorities are also going to be delivering with increasing efficiency so that will offset the—

Q953 Chairman: But what it means is that they are not able to increase the amount. They can hold steady, if they are lucky, in real terms their expenditure.

Baroness Young of Old Scone: If they choose to increase, they can, of course, because this is only an estimate of local authorities' own spending. Many of them would choose to put money, for example, into our levy.

Q954 Chairman: These are your words again. “This is only an estimate.” So when we are looking at the global sums which the Government advertise, we have to put a health warning on that, for example, in the forthcoming financial year the £87 million that is down for local authorities is only an estimate.

Baroness Young of Old Scone: It is for local authorities to decide what they are going to spend.

Q955 Chairman: Let us move on to the next bit because the National Audit Office identified that you are short of about £150 million to bring all our flood defences up to target maintenance standard. So that is £150 million over this three-year period. Looking at the numbers that are identified, I am not seeing an increase over the CSR period of £150 million in the column headed “Environment Agency resource, maintenance and operational costs.”

Baroness Young of Old Scone: David Rooker will no doubt want to tell you what is in that £150 million. We are, as I said, doing some work at the moment to look at how best we can raise the quality of our assets over a period of years, which is in fact already proving successful in that more of our assets are in serviceable quality, and we have targets for the next three years to improve the serviceability of our assets, so the £150 million was an estimate some time ago.

Mr Rooker: The £150 million was our estimate in discussions we had with the National Audit Office in terms of how much money would be needed to spend per year for a 10-year period, so it came to £1.5 billion altogether to get our asset systems up to their target condition. That does include some capital money within that £150 million. It is not just all resource money.

Q956 Chairman: I understand that. It is not all resource money. If I look at the numbers that are down here, compared with the baseline figure for your resource, maintenance and operational costs, you get £4 million extra in the forthcoming financial year, you get another £7 million the next year and then you get another £21 million in the year after. Even if you carry on for 10 years, you are still not going to get your assets up to the right level. Something does not add up in the numbers here.

Baroness Young of Old Scone: I think you have to take account of the fact that in the capital programme the improvement of defences, which is listed there because it is for new and improved defences; in many cases that improvement of defences will in fact be changing the quality of that asset markedly, taking it from being in poor or moderate condition up to being in good condition because we have refurbished it. So in fact the maintenance targets are hit not just from the maintenance funding but from the capital funding as well. You do have to bear in mind that we are talking about looking at a ten-year programme, which is one of the things that we want to look at in the long-term investment strategy.

Q957 Chairman: It is all right talking about we are looking at a 10-year programme. That is the classic excuse: “I will not be here in 10 years’ time so I will duck and weave.” What we are looking at is, the Government have talked about a Comprehensive Spending Review and they have talked about spending money. Every time Ministers are asked, “We are spending more money,” they say and the difference between where we are now and where they are going to be is roughly £200 million. I want to know really what that represents as real extra expenditure against a background that you lot are behind with the maintenance of your assets; the public expectation for action, as we have teased out during our discussions, rises with every passing period of heavy rain that they want to see some action; with Sir Michael Pitt having got at the moment an un-costed shopping list, which looks huge in terms of what needs to be done, and so far he has had £34.5 million top-sliced off this budget against a background of level local authority expenditure where they may or may not spend that. In other words, this number, this big number that is being quoted in 2010–11, looks increasingly illusory in terms of actually providing real net extra expenditure on flood alleviation prospects.

Baroness Young of Old Scone: I think we have to correct that one because it is real money and it will deliver real things. We will have protected 145,000 minimum more properties. We will have taken 45,000 properties that are vulnerable and at highest risk out of that category.
Q958 Chairman: By the end of the CSR period?  
Baroness Young of Old Scone: By the end of the CSR period, we will have delivered a series of other targets that we are required to deliver through our flood risk management programme, including improving the standard of our assets. So there will be some very clear deliverables that you can say at the end of this three-year period that is what this money bought and it will be more than was bought in the previous three years.

Q959 Chairman: I would hope it would do, because these are not inconsiderable sums of money in total, but in terms of meeting the anticipated “Now we need extra money,” because everybody said, “We need extra money spending.” What you have described are the projects that are in the pipeline. What I would like to see is a refinement of these numbers so that we can really have an understanding of just exactly what it is we are going to be able to buy because I am not clear.

Baroness Young of Old Scone: We can certainly give you the details of the outcome measures that we will be delivering from this money, i.e. the targets for number of houses protected and all that. What we will not be able to give you at this moment is absolutely every scheme that is going to be done over the next three years because the nature of the programme is not sufficiently flexible.

Q960 Chairman: You know because people have to apply what schemes have been applied for which your current system is going to slice off.

Baroness Young of Old Scone: No, that is not the way the system is intended to work. In the past, I think wrongly, there used to be a system whereby everybody drew up as many bids as they possibly could and they were all loaded into the system and there was then an almighty collision as bids waited for money and local communities were given the prospect that they might get schemes and then there was no money for them. I hesitate to use the example of Pickering but poor Pickering has waited for many years with a pretty low-priority score and they have still got no money for them. We have a much better system whereby everybody drew up as many bids as they possibly could but we have then been able to process them all and work down the list. So we might be able to help more people and it is a better system, but it is not a good way to engender the confidence of local people.

Baroness Young of Old Scone: I cannot recall what the date was that the Foresight study said we needed £1 billion a year. Was it 2015? 2015, I think they said they wanted £1 billion. I personally think that the next spending review needs to take us up to £1 billion a year and the spending review after that will probably need to take this further.

Q962 Chairman: You said that last time about the current spending review.

Baroness Young of Old Scone: No, we said that the ultimate target that the Foresight study, which was the best available information then, laid out was this £1 billion a year.

Q963 Chairman: So the best thing you can advertise at this stage is between the close of the latest CSR, which is 2011, you are going to want another £200 million to get you to £1 billion by 2015. That does not exactly sound like rocket-like progress.

Baroness Young of Old Scone: I am pretty certain that, as we work through our long-term investment strategy, that will give us better information about what the size of the hill is that we are trying to climb, as it were, but it is only when we have that better information that I think we will be able to bottom out the next Foresight number.

Q964 Chairman: So when are we going to get this perfection? When is the plan going to be revealed?

Baroness Young of Old Scone: We have only just started on it so it will be certainly all of next year before we are in a position to have worked that through.

Q965 Chairman: You have only just started on it, and yet we have had a Comprehensive Spending Review that went on in planning for the last two years.

Baroness Young of Old Scone: We have, of course, in the Comprehensive Spending Review used all of the evidence that has come from a variety of sources to indicate that the direction of travel needed to be up, and considerably up. The Foresight study said £1 billion a year. There was an ABI study that came to a conclusion about a funding level which was approximately similar though based on different criteria, so not comparable. There was the work we have done on our own capital programme that showed for every £1 of investment we are saving £6 worth of cost. We had put all of that evidence into the debate for the spending review and we got in total, not solely to us but to others as well, the £200 million. I believe the next spending review will have to be as robust, if not more robust and by then we will be in a better position because we will have done the very detailed work that is needed to look at what a 20-year investment strategy looks like.

Q966 Mr Drew: Can I just ask one specific question? In terms of the capital programme, is this all public money or is there an assumption that there will be developer contributions, for example, to make good some of the capital projects that you would like to see occur?

Baroness Young of Old Scone: Increasingly I think we will see the need for contributions from all sorts of people. If you look at some of the surface water issues—and I should just come back—

Q967 Mr Drew: So this is not public money then?

Baroness Young of Old Scone: This is all public money.
Q968 Mr Drew: This is all public money, so we can add to that a private contribution?

Baroness Young of Old Scone: Can I go back to Michael Jack’s point about what the ultimate sum is? The one thing we need to remember about all these £1 billion a year figures is that they are entirely for coastal and riverine flooding and do not really take account of some of these surface water issues, so there is going to have to be a recasting of the long-term target to take account of what we have all learned from the summer.

Mr Drew: That is a huge change in emphasis.

Q969 Chairman: In other words, are you going to be including any of that or, bearing in mind where the responsibility lies, have you got to look to other people to formulate an estimate to deal with the surface water flooding issues?

Baroness Young of Old Scone: Absolutely.

Q970 Chairman: So the Government are really on a bit of a false agenda here, advertising £200 million extra for flooding and none of it really addresses the question of surface water flooding. Is that right?

Baroness Young of Old Scone: I think it would have been rash to have put money into the Pitt-type arrangements issues until some preliminary work has been done to work out what the art of the possible is on things like mapping and warning, who needs to do what and how it is best funded, because I do not believe that all the surface water issues should be funded by grants and aid direct from government to tax payers. We have to get local government and groups of local authorities working together to look at those issues and to lever money from a range of sources, as we did in Carlisle, where the water company paid some, we paid some, the highways agency paid some, the local authority paid some, businesses themselves paid some. Lots of people contributed, and that is going to have to be the name of the game, otherwise the bill for the taxpayer will go up exponentially.

Q971 Chairman: You say the bill for the taxpayer, but the taxpayer is also the person who funds local authorities, the water companies. The taxpayer, one way or another, is the same payer. It just may be a different heading on the bill but they still have to pay if they want to be protected.

Baroness Young of Old Scone: Which will raise some other issues, and that is the balance that Sir Michael Pitt pointed out between personal responsibility and authority responsibility. Should we—I think we should—be encouraging individuals to take more responsibility for flood resilience and flood-proofing of individual properties? We need the insurance companies and the ABI to help incentivise that. I still do not know what a five-lever mortise lock is but I tick the box every year—

Q972 Chairman: Do not tell your insurance company that because you might have ticked the box and you are protected.

Baroness Young of Old Scone: I tick the box every year and I get a smaller excess as a result of having a range of security products.

Q973 Chairman: You are on the record now! The ABI will be crawling over your policy now.

Baroness Young of Old Scone: I have every confidence that when my locksmith tells me I have five-lever security locks I do have five-lever security locks. We do need the way in which insurance products are constructed to incentivise people to make more flood-resilient and more flood-proof individual properties. You can reduce the average damage on a property from £26,000, which it is at the moment per flooded property, to less than £10,000 with the right sorts of resilience measures.

Q974 David Taylor: You referred, Baroness Young, to avoiding the need for exponential growth on behalf of government, to use your phrase, but if the £800 million a year that is in our table here by 2010–11 is to grow, and you seem relaxed about it, only by 2015 to £1 billion, that is only cumulative growth of about 5% a year, is it not? That is hardly exponential growth. It is relatively unambitious in every sense, is it not?

Baroness Young of Old Scone: I would hope that the next spending review would add funds on top of that and that we will also find our—

Q975 David Taylor: On top of the £1 billion?

Baroness Young of Old Scone: On top of the £800 million.

Q976 David Taylor: Yes, I have said that. If that £800 million grows over a further four-year period by 2015 to £1 billion, it will give growth of about 5% a year. That is all. That is not exponential growth, is it?

Baroness Young of Old Scone: We would hope first, that the next period will only be three years.

Q977 David Taylor: You referred to 2015, which is four years beyond the end—

Baroness Young of Old Scone: That is the target that the Foresight study placed. We think that £1 billion needs to come sooner and we think that pretty soon, both in terms of the costings that Sir Michael Pitt will be doing on the surface water issues and the work we will be doing on our long-term investment strategies, we will have a much clearer view about what the sums that are needed are, and that that will inform the next spending review to the point where the £1 billion that has been the kind of accepted wisdom to date may no longer be the accepted wisdom within the next year or 18 months as that further work is done.

Q978 David Taylor: Five per cent is hardly RPI and the actual cost of some of the capital works that are envisaged might be going up at a greater rate than RPI anyway because of all sorts of factors. So it is a relatively unambitious programme that the
Government is spelling out, is it not?

*Baroness Young of Old Scone:* We do need to offset the inflation against our efficiency programme, because every year we find ways of becoming more effective and more efficient in the way we deliver these programmes.

*Chairman:* You are going to have to motor very hard. There are lots of other things we would have loved to ask you but time is against us. The Committee will be writing to you about the technical feasibility of providing people with some degree of warning for surface water flooding. We will be interested in your observations about who will be responsible for maintaining and funding sustainable urban drainage schemes, of which we have heard quite a lot, and we will be writing to you about some aspects of the Water Framework Directive and current flooding issues. Can we, as always, thank you for your patience and forbearance with our questions, for your original written submission and for the considerable help that you have given to the Committee in making this inquiry. We have effectively one more evidence session on Wednesday afternoon, which will include Ministers and then we will retreat to consider and report. Thank you for your contribution to our inquiries.

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**Supplementary memorandum submitted by the Environment Agency (FL 121b)**

**FURTHER QUESTIONS**

1.0 *A paper outlining the respective potential future roles of the Agency and Local Authorities in relation to surface water flooding (appendix to the Agency’s Pitt submission) (Q 913)*

**Background**

1.1 Surface water flooding is not easy to predict and the division of responsibility between Local Authorities, water companies, the Highways Agency and the Environment Agency makes coordinated management very difficult. This is recognised in the Government's Making Space for Water Strategy and is also highlighted in Sir Michael Pitt's interim report on last summer's floods. With no single organisation having the strategic overview role for all flooding issues the differing approaches and responsibilities mean that there is no common approach to the management and operation of drainage systems, a lack of joint strategic outcomes and failure to optimise expenditure, particularly within urban drainage systems.

1.2 We believe that the Environment Agency should be asked to undertake a strategic overview role for all forms of flooding to provide national leadership, co-ordination and advice to bodies that have roles to play in the management of flood risk for the future. Local Authorities will need to take a lead role in the local management of surface water flooding. Defra's *Making Space for Water* initiative and the Pitt Review have come to the same conclusion. These roles will need to be supported by appropriate powers and resources.

1.3 On 7 February, Defra published its Water Strategy “Future Water”. The Strategy sets out a vision for water management and includes consideration of more effective drainage of surface water, given the pressures of climate change, development and the analysis of last summer's flooding. The Government also announced a consultation on ways of more effectively dealing with surface water flooding on the same day. This consultation focuses on the mechanisms for developing Surface Water Management Plans (SWMPs), encouraging the use of sustainable urban drainage systems (SUDS), and considers the role the Environment Agency should play. We have been developing our ideas on the consultation, including the relationship SWMPs could have with our Catchment Flood Management Plans (CFMPs) and the role of other undertakers. The consultation has been informed by the Making Space for Water programme and the initial findings from the Integrated Urban Drainage pilots. Detailed consideration of the role that the Environment Agency can play is presented in a paper agreed by the EA Board in November 2007. This is reproduced in full as an appendix to this note and covers both the EA role and the cost implications.

2.0 *How much is spent on flood risk management scientists and engineers and what proportion of this is outsourced to consultants? (Q 922)*

2.1 The Environment Agency currently has 45 individuals contracted as engineer consultants, compared with 538 employees in specified engineering roles in flood risk management. We have nine scientist contractors as consultants, compared with 266 employees in specified scientific roles in flood risk management. In addition, many of our other flood risk management and other staff may have scientific or engineering qualifications, even though they do not perform a scientific or engineering function. Less than 8% of our engineers are contracted consultants and the equivalent figures for scientists is approximately 3%. The cost in 2007–08 is approximately £2.5 million.
The Outcome Measures that the Environment Agency will be delivering from its additional flood risk management money over the CRS 07 period (Q 959)

3.1 The following Outcome Measure targets have been set for the Capital Programme in the period April 2008 to March 2011. These targets reflect the contribution of all operating authorities. The Environment Agency is responsible for compiling the overall programme to achieve them:

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Definition</th>
<th>Minimum Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>OM1 Economic Benefits</td>
<td>Average benefit cost ratio across the capital programme based upon the present value whole life costs and benefits of projects delivering in the CSR07 period.</td>
<td>5 to1 average with all projects having a benefit cost ratio robustly greater than 1</td>
</tr>
<tr>
<td>OM2 Households protected</td>
<td>Number of households with improved standard of protection against flooding or coastal erosion risk.</td>
<td>145,000 households of which 45,000 are at significant or greater probability</td>
</tr>
<tr>
<td>OM3 Deprived households at risk</td>
<td>Number of households for which the probability of flooding is reduced from significant or greater through projects benefiting the most deprived 20% of areas.</td>
<td>9,000 of the 45,000 households above</td>
</tr>
<tr>
<td>OM4 Nationally important wildlife sites</td>
<td>Hectares of SSSI land where there is a programme of measures in place (agreed with Natural England) to reach target condition by 2010.</td>
<td>24,000 hectares</td>
</tr>
<tr>
<td>OM5 UK Biodiversity Action Plan habitats</td>
<td>Hectares of priority Biodiversity Action Plan habitat including intertidal created by March 2011.</td>
<td>800 hectares of which at least 300 hectares should be intertidal</td>
</tr>
</tbody>
</table>

3.2 In addition, we have introduced a target for 2008–09 to ensure that 70% of our high-risk asset systems are serviceable, an improvement of 5% upon our current position. The increase in delivery in comparison with the previous spending review period is evident in the new targets, but since a typical project might take three to five years to complete, the increased funding has a bigger impact towards the end of the target period. In fact, the increased expenditure during SR07 will also be used to start projects that will deliver benefits in future periods.

4.0 What preliminary work has been carried out on issuing flood warnings to people affected by surface water flooding in urban areas? Is the provision of such warnings technically feasible?

Background

4.1 A Making Space for Water project examined the feasibility of establishing flood warning services to cover all forms of flooding. Two forms of flooding, groundwater and surface water, have been studied in detail. The study concluded that a form of service is feasible for forewarning flood responding agencies and responsible bodies of the potential for surface water flooding, so that they can take actions to mitigate or minimise the effects of flooding on the public. The service proposed relies upon pre-identification of surface water “hot spots” and accurate forecasts of causative rainfall from the Met Office. The Environment Agency and the Met Office are currently working together to establish plans for testing this proposal and will deliver a strategy for implementing such a service on the success of the proposed trials.

Future position

4.2 The suitability of using the information to provide the public with this warning service needs testing. In its current proposed form the coverage of the rainfall forecasts are very broad-scale (circa 30km²) and there is a likelihood for a high number of false alarms. Also the study has so far only investigated the “alerting” part of the warning service. For a flood warning service to be effective, people require information on what the flood is doing when it is happening. For this we would need to invest heavily in methods for determining the extent and potential duration of a flood, so that people know what actions to take and how long the situation will last. As such further work is required to understand the requirements of the people who will receive any proposed service to ensure that it meets their needs. Any proposed service would therefore be very different from that which the Environment Agency currently provides for flooding from rivers and the sea. There will be technical difficulties in implementing any service and a well considered strategy for doing so will be vital if it is to be successful.
4.3 At the moment it appears that an effective flood warning service for service water flooding may be some way off. In the meantime, a sensible investment is in mapping areas at high risk of surface water flooding, so that we can identify where the need for intervention is greatest.

5.0 Who should be responsible for the maintenance of sustainable drainage systems?

Background

5.1 The Environment Agency view is that ownership should rest with a durable, accountable organisation that can be expected to have the financial capacity to meet its responsibilities in the longer term, if our strategic outcome of improved water quality and minimised flood risk is to be achieved.

5.2 When considering surface water drainage, we have specific responsibilities for water quality, flood risk and for protecting water resources. We believe that the SUDS approach to surface water drainage offers the most sustainable solution for draining built-up areas in the future. It is our policy to promote the SUDS approach. We strongly advocate integrated drainage planning to respond to issues such as development pressures, climate change and deliver the requirements of the Water Framework Directive in an effective manner. Drainage issues (both foul and surface water) need to be considered early in the planning system (preferably at spatial strategy stage) and Building Regulations to ensure issues are dealt with before development commences.

Future Position

5.3 Our submission in response to the Defra surface water management consultation will cover these issues in detail. In brief, we believe that allocation of long term responsibility for SUDS is an institutional issue (and not a technical one) and may be case specific but that both Local Authorities and Water Companies have key roles. We call for:

— The Government to provide leadership and support for SUDS in Government policy, in particular building on the position outlined in Defra’s water strategy, Future Water, published in February 2008.

— Action by Government to seek opportunities to make appropriate amendments to legislation, in particular those identified in the Improving Surface Water Management consultation which accompanied the Future Water strategy.

— Support from OFWAT in taking forward SUDS approaches in all improvements undertaken by sewerage undertakers, and in particular a recognition of the wide benefits of this approach offers, not only for provision of effectual drainage but also for water resources and wildlife.

— Regional and local government to embed SUDS in the planning process and to ensure a consistent approach to drainage across planning, building control, engineering, parks and highways functions.

6.0 How do you balance the conflict between your Water Framework Directive objectives, your role as protectors of the natural environment, and your responsibilities for managing flood risk?

Background

6.1 To understand the challenges and opportunities resulting from the Water Framework Directive (WFD), water bodies and their current status have been identified and assessed across England and Wales. We recognise that flood risk management activities have the potential to significantly impact the status of water bodies and the wider natural environment. Our flood risk appraisal processes consider the consequences of flooding on both people and the environment and assess the impacts from measures to reduce flood risk. In this way we can identify ways to reduce unacceptable risks to life and property in ways which do not harm the environment.

Future position

6.2 The WFD places new requirements upon flood risk management specifically to protect and enhance water bodies, while allowing for the continuation of appropriate flood risk management activities. Our current appraisal processes are being revised to include the specific tests required under the WFD. This will ensure that we continue to reduce flood risk in ways that avoid harm to the environment.
Many witnesses to the Committee’s inquiry have provided examples and evidence of occasions where inadequate maintenance of rivers and watercourses seems to have contributed to local flooding last summer and on other occasions. Some criticise the Environment Agency for not having cut weeds in channels and cutting bank side vegetation. How do you respond to claims made by many organisations and people who highlight the lack of maintenance of water courses and rivers under your jurisdiction as contributing to local floods?

Background

The Environment Agency approach to all flood risk management activities, including vegetation clearance and dredging, is risk-based, meaning that our resources are focussed where need is greatest. We must also ensure that our activities take appropriate account of public interest and the environment. We consider carrying out channel maintenance work where it is technically sound, economically viable, and environmentally acceptable and sustainable to do so. We spend around £3 million per year on dredging in England and Wales. A further £8 million is spent on weed removal to let rivers flow freely in their natural channels. We also de-silt rivers at critical locations, where we are also the navigation authority, to allow passage for boats.

Dredging and aquatic vegetation clearance are not always effective flood risk management tools, however. Both activities have serious, and potentially extremely detrimental, impacts on the environment. It is important to keep channels clear of blockages in built up or urban areas where the impact of flooding is greatest and where a watercourse may be confined to a single, narrow channel. However, in other locations, water courses may have both a channel—containing low to medium flows—and a floodplain, which contains the excess water during higher flows. De-silting channels in these circumstances would not increase the flow in the channel sufficiently to prevent the water from spilling out onto the flood plain, and may increase flooding in other areas downstream. Any benefits would be short-term as channels would rapidly silt up again.

Future Position

We have developed improved analytical tools to determine where we need to carry out work and we are still working to deliver the full potential of these tools. Our work thus far, however, has not identified the need for wholesale changes in practice. The Water Framework Directive does not prohibit dredging or channel clearing. On the contrary, the Directive calls for the reinstatement of natural river channels, as far as possible. Where we can demonstrate a need for flood risk management activities in the public interest, then these activities will continue. In light of the learning from the summer flooding, the new tools available to us and the emerging requirements of the Water Framework Directive, we are taking stock of some of our practices.

Appendix 1

OPEN BOARD PAPER
ITEM No. 8
PAPER REF: EA (07) 64
MEETING DATE: 21 NOVEMBER 2007

PAPER BY: THE DIRECTOR OF WATER MANAGEMENT

SUBJECT: URBAN FLOOD MANAGEMENT AND WARNING: A STRATEGIC APPROACH

1.0 BACKGROUND AND INTRODUCTION

1.1 This paper sets out a mechanism through which strategic overview of urban flooding and quality assurance of key processes supporting management of all inland flood risks could be achieved.

1.2 Defra’s Making Space for Water programme promotes the Environment Agency as the sole body capable of taking on the strategic overview of all inland flooding. This paper deals with the elements of that role involving management of flooding within the built environment.

1.3 We agree that there is a need for one organisation to take a strategic overview, provided appropriate powers and resources come with the new responsibilities, and that Local Authority and utility company responsibilities are made clear. We believe that the Environment Agency should be that organisation. Defra, prior to the summer floods had gone out to consultation on the Environment Agency taking such a strategic overview role.

1.4 Two key issues need to be addressed in order to deliver effectively a strategic overview of urban flooding. Firstly, there must be an assessment of risk posed by all forms of flooding that is shared by all key operators. This is critical to identify where risks are greatest and intervention most urgent. Secondly, a
common action-planning process that can coordinate responses and investments across the broad range of organisations involved, but which has sanctions to ensure compliance and standards of output, needs to be agreed.

1.5 We do not seek a significant delivery role, and see Local Authorities being best placed to co-ordinate local planning and delivery. This is because:

— they operate the planning system—a major lever in the management of the urban environment;
— they are a key stakeholder;
— the scale of response will be at the local level; and
— they represent the communities and individuals affected.

2.0 A SHARED ASSESSMENT OF RISK

2.1 Under Planning Policy Statement PPS25 (and TAN15 in Wales), Strategic Flood Risk Assessments (SFRA$s$) are required for all areas. They are currently variable in quality, often not providing a good assessment of the risk from surface water, sewer and other forms of flooding. This is principally due to use of inappropriate methodology and lack of suitable data and information on some forms of flooding—either because it does not exist or it has not been provided by others, such as water utility companies.

2.2 We propose that the Environment Agency takes responsibility for developing an industry standard toolkit of methods for preparing a SFRA that includes data and models provided by water utility companies. The Environment Agency position should be to object to Local Development Frameworks (LDF$s$) that are not accompanied by a SFRA that is fit for purpose. We understand that this approach is broadly supported by Communities and Local Government (CLG) and Defra officials and representatives of Water UK.

2.3 Water utility companies may need to be compelled to share their data and models required to make a proper assessment of the overall flood risk. We are exploring how this might be achieved with Defra, CLG, Ofwat and Water UK.

3.0 MAPPING, FORECASTING AND WARNING FOR SURFACE WATER FLOODING

3.1 The technical and practical challenges of mapping where flooding from surface water, sewers, drains and run-off may happen are much greater than for flooding from rivers and the sea. To achieve an accurate result will rely substantially on data, information and models being provided by water utility companies, the Environment Agency, Local Authorities and others. However, even with this data available, local conditions as seemingly trivial as street furniture location, kerb height or new buildings can have significant impact on local flow, depth and longevity of urban flooding.

3.2 However a rapid, GIS-based national topographic screening technique has been developed and tested in four locations over the last two months by the Environment Agency in partnership with the Met Office. It demonstrates that it is possible to identify the most susceptible locations where there is potential for surface water to collect and cause flooding problems.

3.3 We are currently assessing the feasibility and potential costs of applying this approach more widely to give a rudimentary national picture of susceptibility to flooding from extreme rainfall. But to be fully effective, such an approach would need also to incorporate information about the drainage infrastructure, overland flood routes and other routes water could take. We see the Surface Water Management Plan (SWMP) as the driving force to ensure these data are incorporated in locations where the risk is greatest. The need for such plans would be identified by Environment Agency Catchment Flood Management Plans (CFMP$s$) which by 2009 will cover all of England. CFMP$s$ in turn inform SFRA$s$, which will trigger Surface Water Management Plans (SWMP$s$) and local area action.

3.4 Early warning systems can help reduce the impact of flooding, provided they trigger an effective response, either by people or in key emergency response organisations, but we are currently unable to provide meaningful warnings for imminent surface water or sewer flooding.

3.5 It is difficult to predict accurately where the heavy rainfall that would cause severe surface water flooding will actually fall. While the current Meteorological Office severe weather warnings are helpful in raising awareness, the majority of areas issued with heavy rainfall warnings by the Met Office in June and July 2007 did not experience the rainfall forecast.

3.6 We support early conclusions from the summer floods that a form of warning service for surface water flooding caused by very heavy rainfall should be available to the public and our professional partners. However the difficulty of achieving a high degree of accuracy of rainfall quantity, location, timing and impact cannot be over estimated.
3.7 A joint Defra/Environment Agency study considering the technical feasibility for such a system was completed shortly after the summer 2007 floods. It concluded that a form of warning service was technically feasible for flooding from groundwater and very heavy rainfall, but it raised a number of questions which are currently under further investigation, regarding forecasting, surface water flooding, run-off in different rainfall levels, and drainage infrastructure conditions.

3.8 Early proposals include a rudimentary service that could provide an early warning of problem rainfall. To be effective, such a system would rely on triggering different stages in previously agreed emergency plans. The need for such plans would be identified in the SWMP process and delivered as part of Area Action Plans or our own flood warning plans. This approach could offer a more effective response by professional partners in highest risk areas, but—in the short and medium term at least—would be subject to a much greater degree of uncertainty than the current system for river and coastal flooding (see 4.2).

3.9 It must be appreciated however, that in order to provide warnings that give people at household, street or community level the time required to take appropriate action, much finer spatial scale weather forecasts will be required from the Met Office. The case still has to be made that more precise forecasts that could come with more computer power would provide the level of resolution required, and translate into better warnings of surface water flooding and result in effective action by people and authorities. It is therefore unlikely that a household-level warning system for flooding caused by run-off from heavy rainfall will be practical in the near future.

3.10 To be effective, warnings would need to be received by a more informed and aware public who are prepared to take action, but who tolerate a high false alarm rate. The challenges of effectively delivering such a system should not be underestimated. For example despite substantial investment over several years to promote it, only 41% of people are signed up to our Flood Warning Direct service, and only around 75% of those receiving a warning take appropriate action. In order to be effective, significant effort to promote such schemes and the expected response will be required.

4.0 PLANNING FOR MITIGATION

4.1 PPS25 technical guidance allows for the preparation of SWMPs in areas where urban drainage is a critical problem. They are considered by CLG to be an important new planning document that would become part of the Local Development Framework.

4.2 SWMPs are the mechanism by which stakeholders should agree responsibility for different elements of urban flooding, and the actions to tackle it. It is expected that they would inform Local Government’s Area Action Plans (an integral part of the land use planning process), as well as the investment strategies of the stakeholders involved. They represent the opportunity to put in place the broad range of implementation tools which we believe the summer floods identify as policy or operational gaps.

4.3 We propose that SWMPs are prepared by Local Authorities. Locations where they are required would be identified by the improved SFRA process, and through our own CFMPs which are developed in discussions with Local Authorities and other key stakeholders.

4.4 The Environment Agency’s sanction would be through objection to a Local Authority’s Local Development Framework if it were not accompanied by an appropriate SWMP.

5.0 CLARIFIED RESPONSIBILITIES

5.1 It will need to be broadly accepted that SFRA should cover all forms of flooding and that water utilities companies (and others) will be required to share data and models to ensure they are fit for purpose. This could be achieved through PPS25 technical guidance. A requirement for water companies to share data and models could be delivered through Ofwat guidance and PR09, the water price round.

5.2 For any sanction of objecting to a local development framework to be effective, we will need support of the planning inspectorate and the Secretary of State. It will also need to be made clear that SFRA and SWMPs must cover existing as well as new development and that the intentions of PPS25 in restricting new floodplain development are fulfilled.

5.3 Other quality control and monitoring options could be considered through the extended role of the National Audit Office given its ability to investigate Local Authority activity, although we have not investigated this option fully to date.

5.4 We believe that there is a clear and logical extension to the existing system of flood management and warning developed and operated by the Environment Agency. Flood mapping, modelling and data analysis, coupled with risk assessments, should be carried out or facilitated by the Environment Agency where currently most expertise lies. Strategic plans, such as CFMPs, inform the planning process and associated plans developed by tiers of Local Authorities and would trigger planning and management actions. The roles of other operators and their responsibilities have to be made clear.

5.5 Flood warning in urban areas prone to localised flooding remains difficult and further work is required to establish whether technological advances both in rainfall forecasting and in on-the-ground flow modelling pioneered by the Environment Agency may make this possible.
6.0 INCIDENT MANAGEMENT

6.1 The multi-agency approach to emergency planning and management, established under the Civil Contingencies Act, stood us in good stead during the flood emergency. We believe these need little further development to focus on particular flood emergency issues.

6.2 The data, information and emergency planning scenarios that operate through this framework will need to change to reflect the risks posed by surface water and other forms of flooding. An effective programme of surface water management planning, supported by more comprehensive strategic flood risk assessments should highlight areas where these risks need to be managed, in part through more robust emergency planning and response. Examples would be locations where extreme rainfall would result in overland flood flows, the filling up of natural depressions with rainwater, or the likely failure of drainage infrastructure.

6.3 Whist we expect the Environment Agency would continue to provide authoritative information on flood risk from all sources in the planning and emergency management phases, we expect there to be a need for greater involvement by others—particularly water utility companies in providing core data, models and information to support the Environment Agency’s flood forecasting.

6.4 We do have concerns that the readiness and responsiveness of key responders to warnings of potential flooding could be improved. We would expect this to be tackled through the current Cabinet Office/Defra Flood Emergencies Capability Programme. This should be reinforced by a greater involvement of the Environment Agency in helping ensure emergency plans are fit for purpose. Joint exercises may help promote better understanding of each responders’ roles.

7.0 FUNDING AND RESOURCES

7.1 To be successful, the SWMP will require effective influence over the investment and operational plans of a range of organisations. Whilst the specifics will differ between areas with different problems to be tackled, we expect that the key organisations would include Local Authorities, water utility companies (including sewerage undertakers), the Environment Agency, the Highways Agency, Regional Development Agencies, developers and major landowners (for example key non-governmental organisations, the National Health Service, and the Ministry of Defence).

7.2 It will be important that the key players in a particular location are involved in the planning process from an early stage, and that the recommendations in the SWMP can be delivered through changes to their respective activities. In extreme cases this could include re-design and replacement of sewer systems to higher standards, or changed management of public green spaces to protect them as overland flood routes.

7.3 Funding and resource requirements to deliver this approach will be a hurdle. The approach outlined in this paper requires Local Authorities to take on a body of work which has to date been given little attention, even though the mechanisms for strategic plan production are in place. It is estimated that each SWMP could cost between £50 and £150k. The practical action then required on the ground could also give rise to significant costs but these could be spread across the Environment Agency, Local Authorities, developers, Regional Development Agencies, water companies, the Highways Agency and others, depending on location and response. Local Authorities would be expected to coordinate these, given that other operators would need to be made compliant through legislation or existing planning or pricing routes.

7.4 Costs could also be significant for the Environment Agency. Developing and maintaining a toolkit of flood risk assessment methods, and providing advice on their use would require technical staff and investment in science and technology to support it. We are carrying out work now to estimate the level of resource such a duty would require.

8.0 CONCLUSIONS

8.1 The approach proposed would allow more strategic management of inland flood risk, led by the Environment Agency but in partnership with Local Authorities, water utility companies and others. It locates operation in the hands of Local Authorities and others, whilst giving the Environment Agency sanction over quality and output through the land use planning system and PPS25.

8.2 To be successful, the approach would require Local Authorities to take flood risk management seriously, and for it to be supported by Government as a fundamental part of the planning system and its examination. It requires other operators such as the utilities to share data, and take responsibility for action. This in turn will require the support of regulators and Government. It would also require significant investment in better forecasting, more detailed urban flood mapping and a new approach to flood warning. The Environment Agency is the lead organisation in this area and would welcome the opportunity to help Local Authorities and others develop this new approach.
Appendix 2

CLARIFICATION OF THE EFFECTS MOORLAND GRIP BLOCKING AND FLOOD RISK MANAGEMENT

BACKGROUND

1. A recent review of research on land management and flood risk, carried out as part of the Government’s Making Space for Water initiative, concluded that we are unable to predict the effects of land management strategies such as grip blocking on flood risk management. The impacts of moorland management are difficult to predict because of multiple land management interventions that can occur within a catchment. For example, grip blocking may be combined with changes in grazing practices or heather burning in the same catchment. Therefore, without prior knowledge and investigation of the catchment in question, predicting the effects of management intervention on flood risk management would be very uncertain.

2. The Environment Agency has noted that Natural England’s verbal evidence to the Committee suggested that “15% is the estimate in attenuation that would reduce the flow of water off the hill” where moorland drainage grips are blocked. We understand from Natural England that this figure was taken from a draft unpublished report commissioned by English Nature in 2005 for two upland catchments in Yorkshire. Our own view is that it is not appropriate to extrapolate the figure from English Nature’s draft report to suggest that extensive upland grip blocking will give the reduction in flows suggested.

FUTURE POSITION

3. Research shows that grips in moorland can capture large areas of water and siphon it off into the drainage network. Flows in the grips can be up to two orders of magnitude faster than overland flows. Consequently, in some situations, the rate of runoff and therefore flood generation increases (Lane et al., 2003). The majority of studies show an increase in annual flood peaks following the creation of grips. However, some have also shown a decrease.

4. Tools are being developed that help to predict the effect of grip blocking on the timing and magnitude of downstream runoff. Modelling has also helped dictate which grips should be blocked to achieve maximum impact on flows downstream. These should help in the future to target land management approaches which more effectively deliver public benefits.

REFERENCES


Environment Agency

March 2008
Wednesday 6 February 2008

Members present:

Mr Michael Jack, in the Chair
Mr David Drew Miss Anne McIntosh
Mr James Gray Sir Peter Soulsby
Patrick Hall David Taylor
Lynne Jones Paddy Tipping
David Lepper Mr Roger Williams

Memorandum submitted by the Department for Environment, Food and Rural Affairs (FL 139)

DEFRA CONTRIBUTION TO THE INDEPENDENT LESSONS LEARNED REVIEW OF THE SUMMER 2007 FLOODS

1. INTRODUCTION

1.1 As the Lead Department for Flooding in England, Defra wishes to take this opportunity to contribute its views on issues being considered in the Independent Review of the Summer 2007 floods (“the Pitt Review”).

1.2 The flooding very sadly caused a number of deaths and had severe impacts on many thousands of householders and businesses. It presented major challenges for all responders and others involved in the flooding. This includes the Environment Agency, emergency services and local authorities as well as the insurance industry, utility services and the voluntary sector. The Regional Government Offices and central Government Departments (including Communities and Local Government, Civil Contingencies Secretariat as well as many parts of Defra) also played a significant role. Defra pays tribute to the extraordinary work that was done by all organisations involved in the flooding and recognises that many individuals within them made personal contributions that were well above and beyond the call of duty.

1.3 As with all major floods, and whilst each event is to some extent unique, there will always be lessons to be learned that should help make the response next time even more effective. That is the purpose of this report; it is intended to offer constructive comments on what worked well and what could be improved for next time. Defra is separately identifying lessons for its own internal management of future flood events and some communications issues between Defra and the Environment Agency are being pursued bilaterally.

1.4 Some of the discussion in this report reflects comments about the demands that the flooding created for Government Office Regional Resilience Teams, made at an event hosted by Defra’s Contingency Planning and Security Division in September 2007. Regional Government Offices will clearly be making their own contributions to the Pitt Review but some of the issues they raised, especially on the demands created by Central Government, and the limitations on their ability to provide full and detailed information on the floods and their impacts, have been recognised in this report.

2. DEFRA ROLE IN RELATION TO FLOODING

2.1 Defra is the Lead Government Department for flooding in England. Our role is to:

— Set the policy, administrative and legal framework for delivery of the flood (and coastal erosion) risk management service in England.

— Provide most of the funding (£600 million in 2007–08) for delivery of that service and set the outcomes and targets that should be delivered for that investment. Funding is directed mainly at the Environment Agency to build and maintain physical defences and also provide flood warning systems. Funding is also provided to local authorities and internal drainage boards for their flood and coastal erosion risk management activity.

— Lead on emergency planning, ensuring that effective planning for flood emergencies takes place at national, regional and local level including by leading the flood emergencies work-stream under the Cabinet Office led Capabilities Programme. This includes assessing the capability of all responders to deal with a range of emergencies.

— Ensure that the cross-government response to flooding and recovery is initiated when floods occur, including collecting and disseminating information on the causes and impacts of the floods. This continues until such time, if at all, that central machinery within Civil Contingencies Secretariat takes over and CLG takes over the recovery role.
2.2 The operational role in managing flooding incidents is entirely the responsibility of local emergency responders led by the police in the Gold, Silver and Bronze commands.

2.3 Defra is reviewing its internal procedures for responding to serious flooding in the light of experience of the Summer floods.

2.4 As part of our Making Space for Water (MSW) programme, Defra is engaged in a major review of its policies for flood and coastal erosion risk management. This will set a new, long-term strategic direction which aims to ensure a fully sustainable, strategic and holistic approach. This includes a number of key issues of which the Pitt Review will wish to be aware, including:

- Extending flood warnings (which currently apply only to river and sea flooding) to other forms of flooding eg surface water and groundwater.
- Extending risk mapping to those other forms of flooding (as well as to coastal erosion).
- Creating a new Strategic Overview by the Environment Agency for all flood and coastal erosion risk management which would embrace—but not be limited to—the above issues. In June, stakeholders were consulted on the role that the Agency should perform in relation to all forms of inland flooding. Parallel consideration is being given to managing surface water flooding as part of the Defra Water Strategy.

2.5 This is clearly relevant to much of the experience of the Summer Floods and we ask the Pitt Review to consider how surface water flood risk management could be improved.

2.6 Defra is also the Lead Government Department for drinking water and sewerage emergencies and the Department’s Water Supply and Regulation Division has response plans in place. These plans were last fully exercised in December 2005 and most recently revised in April 2007. Defra works closely with water company emergency planners and the Drinking Water Inspectorate (DWI).

3. Preparation for Flooding and Response by Emergency Responders

3.1 The Pitt Review will consider in detail the response to the flood emergency, including the adequacy of flood warnings and the way in which Category 1 responders acted. As a contribution to the Pitt Review, a separate report on the way in which the Fire and Rescue Service (FRS) responded is being led by Sir Ken Knight. The Environment Agency and others will also be providing inputs to the Pitt Review. Para 7.1 sets out some particular further issues which the Pitt Review is asked to consider, while the following lesson applies to information available to the public.

Lesson 1—Defra considers that the (somewhat variable) information available to local residents should be improved, with local radio playing a vital role.

3.2 Defra keenly awaits the findings of the Pitt and Knight reviews and will work across Government, and with the Environment Agency and others in responding as positively, and as quickly, as possible to the recommendations. This has been the approach to lessons learned reports from previous floods and emergency exercises with action taken to implement or otherwise address lessons identified.

4. Central Government Response

Across Government/Agencies

4.1 From its standpoint, Defra considers that there was strong collaborative working and cooperation across all Government Departments and Agencies and that there was an equally strong central response. The major pressures that the floods created did not impose any barriers or resentment; indeed the sense that “we are all in this together” seems to have engendered a spirit of cooperation and mutual support.

4.2 We also consider that the arrangements for escalation of the Government response to the Civil Contingencies Committee/COBR worked well, including joint working between CCS and Defra in establishing the Pitt Review. We also welcome the way that Communities and Local Government readily accepted responsibility for leading on recovery issues and we consider that the Cross Government Flood Recovery Officials Group has provided an invaluable network in support of that role. However, we would ask the Pitt Review to form an independent view of the arrangements that operated between Departments.

4.3 We also consider that lessons can be learned in terms of improving briefing and information sharing which are considered in Section 5.

Lesson 2—Cross Government/Agency Relations Defra’s emergency planning for flooding should be amended, including to set out more clearly the arrangements for:

(a) escalating the response to flooding within Government;
(b) making clear the relative responsibilities of Defra (flood protection and emergency management) and CLG (recovery);
(c) maintaining networks with officials across all Government Departments; and
(d) establishing Lessons Learned reviews.
5. Briefing and Information

Introduction

5.1 These floods demonstrated the importance of ensuring that there are clear and robust arrangements in place for capturing and sharing information on the floods and their impacts, and also for responding to questions from the media and others. Defra acknowledges the significant effort that was made by the many people and organisations involved in providing and collating briefing often against extremely tight deadlines and in the face of competing priorities.

5.2 This section identifies possible changes in the procedures for briefing and information which should both improve its quality and utility while reducing the burdens on those who have to produce and collate it.

Flood Reports

5.3 Information on what happened and the impact came in from three main sources:

— Regularly updated situation reports from each affected Government Offices for the Regions.
— Regional Environment Agency “HELP” reports which were collated twice daily by the EA National Incident Room in Bristol to produce a national Sitrep.
— Common Recognised Information Picture (CRIP) reports produced by the Civil Contingencies Secretariat which collated information contained in the EA and GO reports.

5.4 The EA and GO Sitreps, and the CRIP reports, generally provided invaluable information on the floods and their impact. However, the sheer quantity of the information, arriving at different times during the day, was often difficult to assimilate and use in eg accurate and up to date Ministerial briefings. This reinforced the need, identified in previous floods and in Exercise Triton (2004), for timely access by all to reliable data on the floods. This might be facilitated by an Extranet site for live provision and receipt of briefing material on the flood event which is accessible to Ministers and officials. Prior to the floods, CCS and CLG had been working on proposals for such an Extranet site to handle a range of emergency incidents and this work should be taken forward urgently. The establishment of a “battle rhythm” reduces the demands for ad hoc briefings, sets a timetable to work to, and provides assurance that the response is being managed. It also ensures information is delivered at particular times; allows it to be assimilated for briefings and meetings, and sets realistic expectations.

Lesson 3—Timely shared briefing and possible Extranet site Defra, CCS and CLG should work together to identify means of achieving timely access by all relevant recipients to reliable data on the floods within an established “battle rhythm”. This might be through an Extranet site for flooding and possibly other emergencies.

Ministers and MPs

5.5 Ministers, from all affected departments visited affected areas; kept Parliament informed in regular Statements on the developing flooding situation and the Government’s response; and then, during the Summer Recess, held weekly phone-ins for MPs to raise constituency concerns. This open and accessible approach by Ministers helped MPs to raise issues and to feed back information.

Lesson 4—Public and Parliamentary access to Ministers These floods demonstrated the value of Ministers being open and accessible including visiting affected areas, making regular statements to Parliament and hosting weekly phone-ins for MPs. Such arrangements could be firmly embedded in future emergency planning.

Reporting responsibilities

5.6 The EA reports tended to concentrate on the causes of the flooding, flood warnings and possibilities of future flooding taking account of weather forecasts and river peak flows. EA provided some information on other flood impacts and the management of incidents that were within the Agency’s responsibilities (e.g. the potential breaches of Ulley Reservoir and Bentley Flood Bank). However, a much wider range of material was provided by the GOs, covering for example loss of water and power supplies, impacts on industry and agriculture and school closures. GO reports also provided details of how particularly serious incidents (actual or potential) were being managed eg the risks to Walham Switching Station and the impact of the loss of Mythe water treatment works. The management of such incidents, and their possible impacts, were a major concern and were often included in Statements to Parliament so requiring absolutely up-to-date and accurate assessments of the position.

5.6 There were significant differences in the scope of the information provided by EA and the Government Offices in relation to properties flooded. EA reports were of 3,000—4,000 properties affected by fluvial (i.e river) flooding whereas several days later the GOs were reporting over 30,000 houses flooded from all sources, including surface water. This contributed to some delay in the reporting of the scale of flooding in Hull.
5.7 Later on, a “flooded property” was only regarded as one where the habitable part had been affected (ie excluding those where the only damage was to outbuildings, garages and gardens). This substantially, and entirely reasonably, reduced the numbers counted. A similar definition might have been applied to exclude those business premises which had suffered little impact.

5.8 There were some calls for greater clarity of roles between Gold commands and the Department. Defra were asked for local operational detail on the use of tankers for agricultural water which might have been directed at Gold as that is where the relevant players were and where operational detail is owned. The information flow from Gold up to London could encompass that sort of detail—perhaps in an agreed template—rather than leading to a series of ad hoc questions.

Lesson 5—Reporting responsibilities

Clear arrangements should be established setting out which organisations are responsible for reporting on what, when (ie timing during the day) and on what basis (eg to count households only where the habitable condition has been affected and perhaps only those businesses suffering interrupted trading). As a broad demarcation, GOs might report on all impacts and the emergency response; EA might report on the causes of the floods, predictions of future flooding, and response to incidents being managed by the EA.

Core briefing

5.9 Defra, CLG and CCS each produced sets of “core briefing” material for use in responding to policy and media enquiries. Inevitably these sets of briefing contained much similar information but often also something that the others didn’t. We could consider whether alternative arrangements are feasible that might avoid duplication and a risk of conveying different messages.

Lesson 6—Shared and rationalised briefing

The briefing produced by central Departments might be reviewed to see whether it could be rationalised and shared to ensure consistency and avoid duplication of effort. An Extranet site as in Lesson 3 might help achieve both objectives.

CCS Briefing

5.10 The CRIP reports produced by CCS were adopted as the authoritative source of cross-Government briefing. Defra consider they were very useful for that purpose but wish to consider some minor issues, eg on the content and format of the reports, with CCS. CRIP reports might be absorbed into any future Extranet site.

5.11 We would also ask CCS to review the purpose of their “Top Lines” brief which seemed to comprise a mixture of quotations from Ministers and general advice but was given restricted circulation.

Lesson 7—CCS Briefing

CRIP reports should remain the primary form of cross-Government briefing (subject to consideration of some detailed issues with Defra and a more significant review if an Extranet site as in Lesson 3 comes to fruition). The “Top Lines” brief should be reviewed.

Demands on Government Offices for the Regions and local authorities

5.12 Government looks to GOs to provide information on the floods, and their impacts, which is necessary for understanding the major issues, responding to questions from the media and Parliament and for generally managing the central response. However, GOs and other core responders will be heavily involved in the operational response to flooding and this must be their top priority.

5.13 GOs have also said that it was often difficult to obtain information on impacts, especially in the detail sometimes requested by central Government. GOs had to rely heavily on local authorities to provide the information. LAs were themselves generally heavily involved in managing the flooding impacts and could not devote resources to eg counting properties and schools affected, even though central Government regarded this as key information. Moreover, GOs said that the number of houses affected was still not final by mid-September. These limitations on data completeness and accuracy need to be understood and “health warnings” applied to its use.

Lesson 8—Demands on GOs etc

Central Government should:

(a) work with GOs to ensure that effective arrangements exist for provision and coordination of briefing that do not adversely affect the local emergency response—again an Extranet site as referred to in Lesson 3 may help provide a solution; and

(b) recognise that any information provided by GOs etc may be incomplete, involve significant estimation, and may therefore need health warnings when used.
6. MAJOR FLOOD IMPACTS ON DEFRA POLICY AREAS

Reservoir Safety

6.1 The transfer of enforcement responsibilities to the Environment Agency and other changes in the Water Act 2003 have been a major step forward in improving the reservoir safety regime. However, the significant possibility of failure of the Ulley Reservoir highlighted a number of issues relating to reservoir safety which should be considered by the Pitt Review. In particular it raised questions about the inspection regime and risk classification. The Environment Agency has submitted a number of recommendations to the Pitt Review Team for reform of the legislation and other approaches to reservoir safety. Defra recognises that these are valid issues for consideration and looks forward to seeing the resulting recommendations from the Pitt review.

Lesson 9—Reservoir safety Defra considers that the Environment Agency proposals for legislative and administrative reform of the reservoir safety regime are worthy of careful consideration.

Lesson 10—Ulley reservoir We invite the Pitt Review to consider the effectiveness of the way in which the Ulley Reservoir incident was managed and assessed.

Water supply and sewerage

6.2 Defra’s role as the Lead Government Department for drinking water and sewerage emergencies is explained in para 2.6.

Communication

6.3 During an emergency, water companies will be subject to demands for information from Defra, DWI (in their regulatory role) and the local Gold command. Defra takes as its lead Section 208 of the Water Industries Act 1991, from which the Security and Emergency Measures Direction 1998 (the “SEMD”) was issued. This Direction places planning and reporting requirements on water companies in the event of a drinking water or sewerage emergency. Defra needs timely and regular reports for use in briefing Ministers and for Ministers to use when reporting to Parliament. Consistency in reporting would best be achieved by companies adopting and maintaining a core “script” for all their communication needs. There may also be lessons to be learned in respect of managing expectations: partial use of data, without the qualifications applied by the originator, can falsely raise hopes and then discredit the good work that is being done in difficult circumstances.

Lesson 11—Communication In responding to any emergency, it will be necessary for water companies to quickly put in place arrangements for ensuring information flows to Defra and the Drinking Water Inspectorate (in their regulatory role) and to Gold Command are consistent and frequently updated.

Alternative water supplies

6.4 The figure of 10 litres minimum per person per day is a planning requirement notified by the Secretary of State. It was set at the time of the 1998 Direction after consultation with water companies, Department of Health and DWI. This is regarded as a minimum amount and for smaller incidents over a 2–3 day period may be exceeded. Mythe was exceptional in terms of the number of people without water and the time period that they were without mains drinking water, with alternative supplies having to be provided for approximately two weeks. The rationale for this 10 litre target, and its adequacy in absolute terms, should be reviewed in the light of the Mythe experience.

Lesson 12—Alternative water supplies The adequacy of 10 litres/person/day as the minimum requirement for alternative water supplies should be reviewed in the context of a major and sustained emergency such as Mythe.

Resilience of water and sewerage (and wider) infrastructure

6.5 Water companies are responsible for making sure their assets are protected against flood risk and receive advice from the Environment Agency, and against security risks on the advice of the security services. Action by water companies may include making improvements to connectivity to allow re-zoning of their networks in the event of loss of part of the infrastructure, and this is a commonly used technique in incidents. The floods also showed the need for all critical infrastructure, including power and telecommunications, to be resilient to flooding.

Lesson 13—Resilience of water and sewerage (and wider) infrastructure In light of the Mythe incident to examine whether there is a need to reconsider the measures taken to reduce vulnerability of the water and sewerage infrastructure to flooding and other threats. There is also a need to consider resilience to flooding of other significant infrastructure eg power and telecoms installations.
Water company responsibilities for sewerage

6.6 If there is no mains water then householders will not be able to flush toilets, except with buckets of water. To what extent is it reasonable to expect other sanitation facilities (portaloos and other such equipment as may be used at festivals, pop concerts, etc) to be available and deployed? Should tankered water supplies to local facilities such as schools and community centres be used to maintain some sanitation facilities within the community? If sewage treatment works have failed, then sewage will keep flowing through the system, rather than being allowed to back up. This may result in pollution of watercourses, but this avoids sewage backing up into homes.

Lesson 14—Water company responsibilities for sewerage In the light of the experience of the recent floods, what might reasonably be required of water companies and other agencies in the event of failure of the sewerage system as a consequence of the loss of mains water supply? What are the statutory responsibilities?

Water Company Mutual Aid

6.7 The water industry has set up arrangements for companies to help each other in the event of an emergency. This is in the form of identified Mutual Aid that can be loaned to the company in difficulties, under agreed terms. Companies may loan tankers, bowsers and personnel, etc according to what is needed. They also make use of the service provided by Water Direct. It has already been recognised that there is a limit to the size of incident that can be managed by a company's efforts together with Mutual Aid. These larger incidents are termed Major Incidents. A generic framework has been produced for planning for such incidents, in which it is recognised that a multi-agency response is required. During the Mythe incident Severn Trent Water made full use of the water company Mutual Aid available to them and purchased bottled water from Water Direct. In addition, and beyond the Mutual Aid arrangements, additional tankers were sourced from food industry companies, as were additional supplies of bottled water. At the time, there was some criticism of the logistical arrangements for maintaining these alternative supplies of water. Severn Trent Water engaged the services of DHL to help with this and, later, further support was provided by the MoD. Defra's requirement for planning for Major Incidents means that companies will have to have put in place arrangements covering these sorts of eventualities. The water company plans are independently certified each year and the next round of certification reports will be received in April 2008. These will outline the extent to which companies have examined scenarios and have put a multi-agency response in place.

Lesson 15—Water Company Mutual Aid In the light of the Mythe incident there is a need to consider whether water company Mutual Aid is sufficient. There should be a review of whether there are sufficient resources of key equipment within the industry and of any logistical issues in relation to access, mobilisation and use.

Regulatory role of the DWI input to local Gold command centres

6.8 Established procedures are in place between water companies, DWI, and relevant local health officials namely HPU (CCDC) and LA (EHO) regarding water quality incident management and consumer warning notices. Using its powers under the Water Industry Act 1991, DWI is investigating whether any offence was committed or any regulations were breached following the loss of water supply from the Mythe water treatment works and will report independently. DWI is also in dialogue with HPA nationally and the water industry about improved advice to health professionals. Defra welcomes the action that DWI has set in train and recommends that the DWI findings and conclusions, which will be made public, are included in the lessons learned review.

Lesson 16—Regulatory role of the DWI and input to local Gold command centres The DWI is the regulator with statutory powers in respect of drinking water quality including the testing that water companies are required by law to carry out normally or during abnormal operational circumstances including emergencies. DWI is also the technical advisor appointed by SoS to advise government on such matters. This responsibility may not be sufficiently well-defined in the existing operational guidance on health and related matters that is available to local Gold commands dealing with a water supply emergency.

Water for livestock

6.9 There is no statutory requirement for water companies to supply water to industrial premises and offices or to farms or livestock units. The statutory obligation only extends to the supply of domestic customers but the SEMD requires that in a water supply emergency, companies must have due regard to livestock. Some farms have private drinking water supplies or winter storage reservoirs but others, particularly those with large indoor pig or poultry units or large dairy herds, are largely dependant on the public supply.

6.10 In the aftermath of the flooding of the Mythe Water Treatment Works, animal welfare issues became a serious concern at a number of livestock farms in the area affected by the loss of the public supply. Animal Welfare is the responsibility of the farmer and farmers should have contingency plans. But the industry norm is for plans that enable them to survive a short term interruption of supply of eg 48 hours. The RSPCA and
NFU, with assistance from Defra, the Government Office for the South West, Severn Trent Water and Welsh Water, put in place arrangements for supplying tankered supplies to vulnerable units. But it was an ad hoc response rather than a considered part of the plan.

Lesson 17—Water supply for livestock farms We could review the arrangements for ensuring adequate water supply to livestock farms.

Agriculture

6.11 The floods had a major impact on agricultural crops and livestock. Defra agreed various measures to ease the impacts, for example cross compliance rules were eased to allow machinery onto recently flooded land. Lessons identified from the actions taken will be absorbed when there are future floods or similar events impacting on farmers.

6.12 Current approaches to flood risk management already provide for payments to be made where agricultural land provides “planned” flood storage. Defra will review how crop etc values are factored into cost:benefit appraisals for investment in capital and maintenance work. Consideration should also be given to the adequacy of the Environment Agency’s flood warning service in relation to farming businesses (eg to enable attempts to save livestock). Lesson 17 addresses the provision of emergency water supplies to livestock.

Lesson 18—Flood Management and Agriculture Defra should review how crop etc values are factored into cost:benefit appraisals for investment in capital and maintenance work, taking account of predicted future flooding/rainfall patterns (especially the balance between summer and winter floods).

Lesson 19—Flood warnings for agriculture A review could be carried out of flood warnings for agricultural businesses.

Food distribution

6.13 There were no widespread losses of mains power during the floods but, where these occurred, supermarkets responded well and in several cases already had emergency facilities or were able to bring them in. There was no loss of power to food manufacturers and transport problems (eg from flooded roads) tended to be localised. The threatened loss of Walham Switching Station led to Defra setting up contacts with the food industry to deal with potential displacement of people.

Lesson 20—Food distribution The floods did not seriously challenge the food distribution industry and supermarkets demonstrated a reassuring ability to cope with relatively short-term power losses. Defra will consider issues surrounding emergency food distribution through supermarkets, drawing on the experience of emergency water distribution in Gloucestershire.

Waste management

6.14 The main waste issues from the floods were the impact of increased waste arisings on local authority costs (of disposal including landfill tax liability) and performance measures for landfill diversion and recycling targets. However, the additional waste arisings resulting from the floods within affected councils are no more than around 2% of annual arisings which is well within the normal annual variation. Some issues were however untested in the floods (eg flooding of landfill sites).

Lesson 21—Waste management Defra and HMT have concluded that there is no case for increasing waste management funding to local authorities; nor for altering their liability to pay landfill tax; nor for changing their performance targets.

7. OTHER ISSUES WHICH DEFRA INVITES THE PITT REVIEW TO CONSIDER

7.1 There are some other significant issues that Defra ask the Pitt Review to consider:

Flood Forecasting and Warning

— The performance of the Environment Agency’s flood warning service against lead time etc targets.
— EA had flood warnings in place for areas that had been under water for some time. There may be merit in creating another category such as “Currently Flooded” which could be coupled with important safety messages such as “Don’t play in the flood water” and “Be careful when switching the electricity back on”.
— Met Office severe weather warnings were provided in good time. However, their long term forecasts might be reviewed against knowledge that the El Nino effect was apparent last year and the Jet Stream was apparently much further south than usual.
— The arrangements in place for rapidly assessing and communicating the scale of the event so that appropriate escalation of the Government and other response can take place.
The capacity of the Environment Agency website to deal with escalated levels of enquiry during a major flood and whether in the event of the site crashing the contingency arrangements which show only essential information (eg flood warnings and the Floodline number only) should be improved to be more informative.

Response to, and management of, the flooding

The call from some (including parts of the FRS) for all flood response to be coordinated by a national emergency centre or single agency. (This would apparently be rather than the multi-agency response, and Gold/Silver/Bronze commands led by the police under the Civil Contingencies Act 2004. The current arrangements are consistent with national policy that the responses to emergencies are best handled by those who know the locality and are familiar with its geography and disposition of resources—the Lead Government Department provides the central coordinating role for national emergencies.)

The adequacy of the powers available to emergency responders.

The adequacy of the equipment available to emergency responders (including rescue boats and pumps), for different levels of event, and how any additional equipment should be deployed.

Whether Gold Control might in future be established in an event such as Hull.

Whether the Environment Agency’s flood response role is clear and appropriate.

Issues surrounding the Environment Agency’s difficulty in deploying temporary defences in Upton upon Severn because of road flooding.

Department for Environment, Food and Rural Affairs

October 2007

Witnesses: Mr Phil Woolas MP, Minister of State (Environment), Mr Martin Hurst, Director of Water, and Mr David Wright, Resilience and Institutional Framework Programme Manager, Department for Environment, Food and Rural Affairs, gave evidence.

Q979 Chairman: Can I welcome you to the final public evidence session of the Committee’s inquiry into flooding. For cult viewers of this, because we do recognise we have built up quite a following on parliamentary television, unfortunately this will be the last time that you will be able to see flooding in all its glory. I must congratulate the members in the public gallery for the way that they have doughnutted the Minister to give the impression that there are large numbers of people here to hear the Minister. It is a secret between the Committee and yourself, Minister, that there are one or two seats that have not yet been filled, but we are always hopeful that people will come along. Can I formally welcome the new Minister of State in the Department for Environment, Phil Woolas. It is the first time in your current guise that you have been before the Committee and you are very welcome indeed. Also, can I formally put on the record that you are accompanied by Mr Martin Hurst, the Director of Water, and Mr David Wright, who is in charge of Resilience and the Institutional Framework Programme Manager. That is a wonderfully long title, Mr Wright, that no doubt we will learn more about. I know tradition is that the Minister, who has spent a long time becoming an instant expert on this subject, always does his very best to answer the questions, and I am sure you will do just that, Phil, but if your officials do want to chip in, if you would catch my eye we would be genuinely very interested to hear what you have to say. I do not say that in any way to depreciate the Minister’s contribution but sometimes I know officials do have important things to say. I think it would be quite useful, Minister, as you have been getting up to speed in the Department, to ask you a very straightforward and simple question about how you would describe Defra’s flood responsibilities.

Mr Woolas: Thank you very much indeed for inviting me to your Committee. This is a very, very important session for us, as I know it is for the Committee, and I am sure the public interest is very high. I can give my reflection, Chairman, by saying in my previous role before the machinery of government change, the reshuffle, one of my responsibilities was as Minister for Civil Contingencies, so I had some perspective of the relative strengths of the Department and the Category 1 responders. My impression has been strengthened in the time I have been at Defra by two observations. One, there is a partnership with the Environment Agency and that organisation, although not formally part of Defra, is absolutely critical to our ability to plan and respond. Two, there is a very strong technical engineering and science base in the Department. That is not to say that expertise does not exist in other departments but I think it is particularly strong in Defra. That was on the upside. On the downside, my experience has been since the Civil Contingencies Act 2004 the mechanisms of planning and response have been in the foothills of learning. It has improved, and is improving, but I see it in that context, Chairman.

Q980 Chairman: If we look specifically at the term “flood risk management”, and you are quite right to emphasise the Environment Agency and we have become aware during this inquiry that there are a
number of players and the fact that you talk about civil contingencies obviously underscores the role of the local authorities and other bodies which have a drainage responsibility, but how would you specifically describe Defra’s responsibility in terms of flood risk management, the hierarchy of decision-making?

Mr Woolas: I would say that the buck stops with us. I have to say it is our responsibility to make sure that flood defences are adequate, maintained and up to speed. As you rightly say, there are a large number of organisations and agencies, some in the private sector, of course, as well as in the public sector. The public have a right, and Parliament has a right, to expect that Defra, as the lead Department in this area, can give confidence that the plans are there, the flood defences are there and there is a proper long-term programme to ensure as we move forward with predictions of worse weather to come that those are adequate.

Q981 Chairman: But if you were encountering a member of the public who said, “I am still flooded where I am and I am not seeing any sign of protection or programmes coming along”, since you have taken office have you had any discussions in general terms about what, in the nicest sense, the public should be protected from? What are their expectations that might be realised and what about the ones that will not be, because not everywhere under every circumstance can be protected from flooding whatever its source?

Mr Woolas: That is a very fair question. I think the English public have a deeper and broader understanding than perhaps some public commentators appreciate. Many of the areas that flood, particularly from river flooding, are, if I may say, used to it. There are parts of the country where they have suffered, particularly in the last ten years, with increasing rainfall, repeated flooding, and have experience of that. The difficulty in this policy area for any government in any country is the answer to the question, how much is enough? The flooding last summer was the worst we have had for 60 years and the rainfall was the highest we have had since records began, I think, in 1776. The public have an understanding that there were exceptional circumstances. Two things, I think, are expected of us, and I accept the responsibility because I think they are quite right. The first is to ensure that measures are put into place to protect the communities, villages, towns, farms and areas from flooding where that is possible, that the flood defences should be up to scratch, the drains should be up to scratch and the kit, as it were, should be up to scratch. If there are remedial measures that can be taken in people’s homes and businesses, the state, if I can put it that way, should be there to facilitate those and insurance should be available in those areas. I think those are the three categories that the public would require of us. Thank goodness the English public, and I say “English” because my remit stops at the border,—
Mr Woolas: I do not think there is an answer to it. That is the difficult policy question in this area that we face for two reasons. One is what level of probability is sufficient. I am very conscious that if one’s household is flooded one is not mindful of how many other homes are affected, whether it is 1,000, 100,000 or just one, it is a tragedy for the family affected, so the talk of probabilities and outcome measures, which we have to use to judge those criteria—

Q986 Chairman: Can we just come back. Let us just have a look at what specific things Defra has done in the light of the surface water that occurred. You have got your existing programmes and you are carrying on with them. What else is on the list of activities that were christened, apart from Sir Michael Pitt’s inquiry, as a result of last summer’s activities that were christened, apart from Sir Michael’s inquiry, as a result of last summer’s events?

Mr Woolas: The instruction to produce a national flood plan, both a framework plan and a flood defence plan, that involves not just coastal and river flooding but the whole of the surface, the rolling out of the urban drainage pilots and the signing off of the Comprehensive Spending Review resources.

Chairman: That is very helpful indeed.

Q987 Paddy Tipping: Can we come on to the Pitt Report, a good report which was out before Christmas. It has got a lot of recommendations in it, 72 recommendations, 15 urgent. How are you going to ensure that all of those recommendations are put into effect? I know it is an interim report and there is more to be done, but what is the process of monitoring and implementing Pitt?

Mr Woolas: The Committee may be aware that by coincidence in terms of the timing of this week, but not in general terms, the Government tomorrow will be launching its future Water Strategy, which is a comprehensive policy framework for water from the cloud through the water cycle back to the sea, if I can put it as I learnt it at O level, Chairman. That policy statement will be the context in which we will ensure that the Pitt recommendations in other areas are implemented. Again, clearly the framework of activity with the Environment Agency, but also with local authorities, Internal Drainage Boards and water companies, provides us with the opportunity for regular implementation, monitoring, public information of flood defence measures in their areas and the flood framework in terms of what measures are in place to prevent and inform. My own personal view, Chairman, if I may say this, is the predictions are that the weather will get more extreme and, therefore, there is a greater urgency to this. The major mechanism will be the relationship with the Environment Agency.

Q988 Paddy Tipping: Pitt acknowledges that there are lots of different players in this field. I guess somebody might come forward and say, “When Sir Michael has done his work, do you not want to employ him as a tsar?” Do you not have to have somebody cracking the whip from the top to ensure all these recommendations are taken forward?” because you are reliant, as a Department, on other people doing some of those things for you.

Mr Woolas: My attitude is that my greatest allies are the people sitting behind me. By public information, by making the plans for each river basin and catchment area public, by publishing the criteria as far as we can, the timetables and, of course, the resource allocations, the public and their Members of Parliament will ensure that the pressure is kept on. My plans are 25 year plans and I do not expect, nor indeed hope, to be here at that time. I think on average we last about two years, Chairman. I am trying to use this opportunity to put into place that long-term plan. In the short-term, of course, we have working parties across Government to implement the Pitt recommendations. We did accept all 15 of the immediate interim recommendations.

Q989 Paddy Tipping: I ask this question because I can remember the report Making Space for Water in 2005, and that was a good and smart report. I have to say some of the things in Making Space for Water are in the Pitt recommendations and they were never implemented, never implemented quickly. Can you give us an assurance that this time around things are going to happen?

Mr Woolas: Yes, I can, and, indeed, that was one of the first questions I asked when I took up the job. I think the reassurance is seen in the timescales that are involved in this policy area. Making Space for Water led to the urban drainage pilots, for example. These are not pilots that you can just launch and undertake in a short period of time, it is not a 12 week consultation, it involves rivers, lakes, concrete, flood defences and all the paraphernalia that goes with it. The Making Space for Water strategy is being implemented. Where we have had to recognise the need for a step up is in how comprehensive the plan is in terms of the geography of the country and what real reassurances we can give to Members of Parliament and the public that those plans are being implemented. I hope it is accepted by the Committee, Chairman, that we are far from complacent, that our attitude is we need and wish to learn from all experiences, but the experiences from the weekend before last and the North Sea surge, again without being complacent, were good lessons.

Q990 Paddy Tipping: You mentioned the 15 Pitt urgent recommendations. I do not want to push you on it now but it would be helpful if you could let the Committee have a note about how far you have got on the 15 urgent recommendations and what progress has been made so far, because these were to be done as a matter of immediacy.

Mr Woolas: Perhaps I could ask Martin to come in on the detail. We announced on 4 February, and I absolutely assure you, Chairman, that was not an announcement in anticipation of my appearance here, although had I realised it would have been—

Q991 Chairman: What a pity! We always like to be the catalyst for action on this Committee.
Mr Woolas: The Secretary of State announced an allocation of £34.5 million to implement the Pitt Review recommendations. This is not the total amount for the country’s defences, that runs into 2.15 billion over the next three years, but specifically a ring-fenced fund for the implementation of the Pitt recommendations. On the 15, perhaps I could ask Martin to come in here.

Q992 Paddy Tipping: Martin, do not go through them all now, just one or two highlights and drop us a note saying how you got on with them.

Mr Hurst: There are two things that I would say briefly. One is that as Defra we are responsible for co-ordinating Government action on Pitt, so we do know where progress is on all of the recommendations and we can give you a note. Just on Making Space for Water, very briefly. There have been some big changes in the way that we do flood management in this country as a result of Making Space for Water. I would not want it to be thought that this was a report which was had no effect. Just to single out two: the new planning guidance, PPS25, which has very much changed the way that we plan for new development where it might go over floodplain, was a Making Space for Water recommendation and another example was the Environment Agency taking a strategic lead on the coast as well as on the areas it traditionally covers. I could give you chapter and verse on where we are on all the recommendations but there has been real progress.

Q993 Paddy Tipping: Let me just ask you about the other reports that have been put forward. The Environment Agency has done a report, the Audit Commission has done a report, lots of local authorities have done reports and you will be getting a report from us when we get round to writing it. How are you going to deal with the welter of information that comes in?

Mr Woolas: The approach that we take is that this is, as it were, above politics. This is about the security of our people and our communities. One of the experiences I found last summer was that local authorities and Members of Parliament from whatever part of the country and across the political spectrum wanted to find solutions to people’s problems. We have a genuinely open attitude, and I hope that is recognised, to try to learn what lessons we can. This area brings to policy making above all else the issue of geography and the geography of the different parts of the country has to determine the plans. That is true right down to street level and each stream and beck. Anybody who has experienced flooding knows what goes on. That means the balance between ensuring that there is a fair approach, and we are talking about allocating significant amounts of taxpayers’ money and local consultation, local involvement, local plans, is important. Briefly, Chairman, what I am saying is that river basins do not follow administrative boundaries; life would be a lot easier if we could have designed them in that way but we did not.

Paddy Tipping: Finally, let me be cheeky about the announcement tomorrow. There has been a long promise that private sewers are going to be adopted. Can I just ask you to think about that.

Q994 Chairman: You are allowed to consult a friend, or even phone one if you need to, we are very helpful like that.

Mr Woolas: I am sure you remember, Chairman, sometimes it is difficult to remember when you have agreed something, when it has been announced and what stage it is at. We have already consulted on that point.

Q995 Paddy Tipping: I know that, I want the final announcement.

Mr Woolas: The response from the respondents was pretty unanimously positive, I think. That is the situation as we sit here today.

Q996 Paddy Tipping: I have got to wait until tomorrow, have I?

Mr Woolas: We have requested permission of the Speaker to place a written Ministerial Statement tomorrow, a policy announcement. I am not trying to hide anything, I am in a difficult position, and I think that is appreciated, but that will be in time for the Committee to be informed. One can see the commonsense of the respondents to the consultation.

Q997 Chairman: Just a point of detail, because we are going to come on and talk about money later on. Who actually undertook the costing exercise to decide that £34.5 million was the right number to implement the 15 key priority recommendations of Pitt?

Mr Woolas: Who did it? My officials. Martin, did you do it?

Mr Hurst: It was produced in consultation with Sir Michael himself and produced as part of our Spending Review divvy-up. Inevitably, this is not a final number, we have to decide what he needs. If he decides he needs more then we can put some of that money into the main flood defence pot. If he decides that there are still pressures to be funded then that will be an issue for the next Spending Review.

Q998 Chairman: Just to be clear on that, in the note perhaps you might be able to indicate the deployment of those resources because we have not seen any kind of breakdown in the ministerial announcement as to how that money is actually going to be used and it certainly was not clear in the ministerial announcement as to whether the 34.5 million was new money, or does it come from within the existing overall CSR settlement for floods?

Mr Woolas: It comes from the settlement. It is not—

Q999 Chairman: So it is a redeployment of monies?

Mr Woolas: It is new money in that the settlement gives us new extra money but, you are absolutely right, it is within that—
Q1000 Chairman: So something, technically speaking, is going to be a loser?

Mr Woolas: Well, no, because we were very successful in the settlement. We were able to get a larger settlement than even the ABI had asked for before last summer’s floods. In that sense, the money for implementing the Pitt recommendations is money that has not, therefore, been passed on to the Environment Agency and others.

Chairman: We will come back to that. I do not want to anticipate looking at—

Q1001 Lynne Jones: Can you remember what the most expensive item in the Pitt recommendations was?

Mr Hurst: Bear in mind we do not know what Sir Michael Pitt’s recommendations are yet. We know what the 15 urgent ones are and we have 72 interim recommendations that he will firm up for better or worse in the summer.

Q1002 Chairman: We understand that, Mr Hurst, but the question was very specific about how the £34.5 million of redeployed money is going to be spread out across the 15 priority issues. Lynne Jones was asking a very specific question: out of those 15 priority areas, what is going to get the most resource?

Mr Hurst: I think what I am saying, with my apologies, is that the 34.5 million is not for the 15 priority issues, it is for the totality of what Sir Michael Pitt concludes in his final report, of which those 15 issues—

Q1003 Chairman: Let us ask a more straightforward question. What is it going to be spent on?

Mr Hurst: The answer is that we do not know yet.

Q1004 Chairman: So you make an announcement of spending 34.5 million, with Sir Michael Pitt you sit down and cost this sum of money but you do not know what it is going to be spent on. This is a rather unusual way of allocating public funds.

Mr Woolas: We have not spent it yet.

Q1005 Chairman: This is not fantasy money for a fantasy programme, is it?

Mr Woolas: The decision that was taken was looked at the other way round: if we had not set aside money for a report that we are taking very seriously and during the course of the financial year we would have had to—

Q1006 Chairman: Minister, with respect, Mr Hurst was very straightforward. He said that you had not costed out everything because clearly Sir Michael has not come to his firm and final conclusions, and that is fair enough. He produced a list of some 70-odd interim conclusions which initially had no money, it was a menu without prices, and then your Secretary of State announced that 34.5 million has been allocated towards helping the implementation of Pitt and you said that as a Department, in concert with Pitt, you had sat down and costed out something which came to 34.5 million. All I am asking is what is it that adds up to 34.5 million?

Mr Woolas: Chairman, Martin did not use the word “costed” in that regard.

Q1007 Chairman: I asked him the question who costed Pitt and he said it was a combination of your Department and Sir Michael Pitt. Mr Hurst, is that not what you said?

Mr Woolas: Yes, it is what Martin said. Chairman, but the implication was that it was a detailed budget that had been worked out.

Q1008 Chairman: He said it without moving his lips! Mr Woolas: Let me just put it into context for you because obviously the question you are asking is an extremely fair question. We have a budget of £62.5 million, of which £34.5 million that we are talking about for the Pitt Review is retained to fund a range of work around helping communities adapt to flood and coastal erosion impact and the measures that flow from that. How that money will be allocated is not yet determined, but the decision was taken that it would be sensible planning at this stage before the beginning of the financial year to allocate money to flow from Pitt’s recommendations specifically. If we do not need that money it will go into the mainstream budget of the 1.8 billion. My view was if we did not have some money set aside and if people asked the question, “You have accepted Pitt, how are you going to pay for it?” and I had to say to you, “I am sorry but I am taking money off your constituents’ flood defence funds”, then I think you would perhaps have had a different point of view.

Chairman: That is very interesting, Minister, because although I was not going to go into the funding, let us just tiptoe into—

Lynne Jones: You could hardly be taking it out of the additional monies.

Q1009 Chairman: Lynne, just a second. By all means ask a question. I have got in front of me the breakdown that the Secretary of State issued in terms of your budget and the 62.5 million is in the column, as you rightly say, “Retained for now in Defra”. So you have now spent, if you like, 34.5 million of it but the profiling of that money shows that none of it, bar four million, is going to be spent until 2009-10. If this is supposed to be the commencement of the implementation of Pitt and the 34.5 is just slightly over half the 62.5 that you have retained, I conclude from that, if the profiling is correct, the best we are going to see in 2008-09 is two million spent on implementation of Pitt.

Mr Woolas: No, that would not be the correct interpretation.

Q1010 Chairman: That is how much it is. That is what your press notice says, I have it in front of me.

Mr Woolas: That is in relation to the money specifically for the Pitt recommendations that is taken from that 1.8 billion.
Q1011 Chairman: Sorry, Minister, you said you kept back £62.5 million.
Mr Woolas: No, I did not.

Q1012 Chairman: --- to help communities adapt.
Mr Woolas: No, I did not say I had kept back. I said I had kept back 34.5 million from the 1.8 billion.

Q1013 Chairman: Out of the 62.5.
Mr Woolas: Out of the 62.5 budget that is from Defra’s core budget.

Q1014 Chairman: In the second column of figures in the press release it says, “Retained for now in Defra”. I presume that is where this money has come from. Are we agreed on that?
Mr Woolas: Yes.

Q1015 Chairman: If you have used 34.5 of that to kick off the Pitt process, is that the correct number?
Mr Woolas: Yes.

Q1016 Chairman: The profiling of that goes 2008-09 four million, 2009-10 20.5 million and 38 million in 2010-11. I am assuming that this profile of expenditure was informed by the way that you are going to use 34.5 million of it because that is just over half of this money. On that basis I surely cannot be wrong that, if you like, Pitt implementation does not kick in until 2009-10.
Mr Woolas: The profiling of that schedule over the CSR period reflects the fact that most of the work that we expect will be done will have a time lag on it.

Q1017 Chairman: That is why I was asking what is it going to be spent on and what is the timescale. It sounds like things are going to happen instantaneously but not according to this.
Mr Woolas: The timetable that Sir Michael is working towards, as I am sure the Committee knows, is to produce the final report in June/July of this calendar year, which is obviously during the next financial year. That is the first point. So it is reasonable to assume that the bulk of the expenditure will be in the next financial year. What I want to emphasise, Chairman, is the money that is available for the Pitt recommendations, should we require earlier money, money from core Defra budgets, would be available. My intention with this was simply prudent planning to ensure we had a pot of money to implement Sir Michael’s report, but it is not necessarily the only sum of money.

Q1018 David Taylor: I wonder whether we can turn to surface water drainage. In your introductory remarks you focused on assessing the infrastructure, the existing assets of the system, if you like, overland drainage, underground drainage, what state they were in, what needed to be done and how much investment was needed. This area is quite messy, is it not, quite muddy you might say, because you have got a patchwork existence of Internal Drainage Boards, you have got the historical riparian responsibilities, and you have got privatisation of the industry not all that long ago. The blend of those three factors means that the current situation in terms of responsibility is both physically difficult to define, and Water UK said it is sometimes very hard to know when a highway drain becomes a public sewer, and it is also organisationally muddled. This Committee went to Lincoln and heard from local residents, and this would be true in almost city or area, that they did not know who was responsible for maintaining particular parts of the overall drainage system. Pitt responds to that by saying a local register should be compiled with condition assessment and so on and details of responsible owners and that is a vital first step. Do you accept that? That was interim conclusion 21. Is that something the Department has taken on board?
Mr Woolas: It is something I have taken on board, yes. My view is exactly the same as yours, that there is a complicated picture. I did the same as the Committee in a number of areas of the country, particularly learning lessons in Hull and East Yorkshire, to look at the pattern and answer the question whose job is it to ensure that this is fit for purpose, so the ensuring of the mapping, the coordination of the plan to bring up to speed, if that is what is needed,—

Q1019 David Taylor: And the legal responsibility?
Mr Woolas: --- and the legal responsibility for those processes is part of our responsibility and something we are taking on board.

Q1020 David Taylor: So to draw order out of what is national chaos to an extent, some very strong minded leadership is needed. Who do you think should supply that?
Mr Woolas: I am not sure “chaos” is a fair word. It is probably fair in some parts of the country. Similarly, with reservoirs, when one looks at it across the piece there is a vast range of ownership of reservoirs. There are two answers to the question. The expertise in terms of mapping, technical knowledge, geographical knowledge and climate knowledge is clearly with the Environment Agency. The leadership has to come from us and the local authorities have a very important role indeed bearing in mind the point I made before that the systems do not necessarily follow local authority boundaries.

Q1021 David Taylor: Pitt says that local authorities should lead that process.
Mr Woolas: Yes, that is right, he does.

Q1022 David Taylor: You do not seem to be convinced of that as if your Department should have general oversight.
Mr Woolas: The local authority as the democratic local body is the obvious choice. The reason why I am hesitating and looking at this is this very important point about responsibility across boundaries. I will take the example of the East Riding. Sorry, am I allowed to call it the East Riding? It is still the East Riding as far as I am concerned.
Q1023 Chairman: Some of us who were brought up in Yorkshire know what you are talking about.
Mr Woolas: East Yorkshire and Kingston-upon-Hull are two separate single tier authorities but—

Q1024 David Taylor: You can have a lead authority on that surely.
Mr Woolas: Yes, you could do that.

Q1025 David Taylor: You do not need to have territorial disputes or spats. You warm to the idea that local authorities could and should lead this process of establishing ownership, condition and legal obligation, do you?
Mr Woolas: In terms of responsibility for there being a plan, I think that is the way the ball is bouncing.

Q1026 David Taylor: Siren voices suggest that one of the key changes that will occur because of what happened last year is the Environment Agency will be given overall responsibility for all sources of flood risk. We will not come to a conclusion about whether or not that will be announced, but do you accept if you add it on to an already straitened agency with financing difficulties that are well understood then their capacity to absorb that new responsibility might be very limited indeed. Do you believe that the Environment Agency is up to it?
Mr Woolas: Yes, I do. I think there is another policy consideration that has not been included in the debate and that is the relationship to the river basin management plans.

Q1027 David Taylor: If we could stick with surface water drainage, we will come on to other areas later.
Mr Woolas: My point is in planning flood defences, be they river or surface water, you have to do that in the context of your other plans. In lay person’s terms, if the policy is as it is, which is to try to ensure the natural river course as best we can in order to clean up the environment rather than having artificial manmade channelling and so on, the physical relationship between that river basin and the drains and the channels and so on is part of the planning.

Q1028 David Taylor: Minister, are you saying that you have every confidence the Environment Agency do have the capacity to absorb this very significant new responsibility and are able to operate in a more satisfactory way than the patchwork of organisations that has preceded them?
Mr Woolas: Yes and yes, Chairman.

Q1029 David Taylor: We had the Environment Agency in front of the Committee on Monday and Pitt’s interim conclusion three—to take forward urgently work to develop tools and techniques for predicting modelling surface water flooding—was put to them, and you mentioned in your earlier remarks how complex that is to accurately map, model and forecast surface water flood risk. Even though it is complex, surely some attempts have got to be made to take us down that path because surface water flooding, and we heard from Sheffield in particular, was the key factor that split that city in two by a stretch of water several hundred metres wide. Are you agreeing with the Environment Agency who said, and I will quote their phrase if I can find it, that Pitt had not fully appreciated these complexities in his interim report? That to me sounds like civil servant-ese for “the man’s mad”. Are you in that camp?
Mr Woolas: I am certainly not in the camp that the man’s mad. Sir Michael Pitt is a formidable operator and has a deep knowledge. He is a civil engineer by profession and the chief executive as well, so he is an ideal choice. I am sorry, I am not quite clear what the question is.

Q1030 David Taylor: They are saying that the Pitt recommendation to develop tools and techniques of that kind is not really a short to medium-term option but that more basic data should be used to try and at least improve the forecastability of surface water flooding taking place. I am just putting to you their reaction to Michael Pitt’s conclusion.
Mr Woolas: Can I just ask Martin to help me out on this.
Mr Hurst: I think there is a distinction between the urgent recommendation number two that you are talking about, which Government has accepted, and the Environment Agency has already taken forward to do high level surface water mapping where it can be done, and the complexity of doing detailed surface water maps and detailed meteorological mapping across the whole piece. My understanding is that the Environment Agency are taking forward Pitt recommendation two enthusiastically but they are still talking to Michael Pitt about the generality of the issue.

Q1031 David Taylor: High level forecasting, we are really talking about fairly crude maps, are we not?
Mr Hurst: Yes.

Q1032 David Taylor: They are better than nothing, is that what you are saying?
Mr Woolas: Well, we have got the Met Office work as well. The point I was making was we have advanced research in terms of the Met Office and climate modelling to try and provide the public and agencies with better information as to what would happen if X amount of rain fell in Y area and what the relationship of that would be.

Q1033 David Taylor: Over a set period?
Mr Woolas: Over a set period and what the relationship of that would be. Then we have the lower level, as it were, estimates and plans for what would happen given the capacity of the drains and gulleys and so on.

Q1034 David Taylor: We do have the topographical data necessary, do we not, Ordnance Survey and other modelling techniques.
Mr Woolas: That is a very good point and it is one I would have thought the Committee would want to look at. Yes, in general we do but I think one of the things that Professor Coulthard taught us in the
whole report, and certainly taught me, was the information was not as good as the agencies would have wanted and that was because of this fundamental point that has been made by Sir Michael and commentators, and by the implication of your questions, that the co-ordination was not there in some instances.

Q1035 David Taylor: My final point would be that you said earlier the scale and solution to the problem is a matter of geography at national level to a certain extent, but at local level it is topography, is it not, is a matter of geography at national level to a certain extent, but at local level it is topography, is it not, is it not, is it not?

Mr Woolas: It is, yes.

Q1036 Miss McIntosh: Reverting to a point you made earlier, Minister. I think you accept, and you put it in response to my parliamentary question, 50 per cent of the drains in the country are privately owned. If you respond positively to Mr Tipping's point in tomorrow's statement, where are you going to get the budget from to adopt these private drains?

Mr Woolas: Let me draw the distinction. There are private drains that are in people's gardens, on people's land, and at the moment the practice is if those drains are damaged, blocked or whatever, water and sewerage companies take responsibility. That is the practice, it is not clear-cut but it is not a statutory obligation. Then there are those private drains that are owned by companies, organisations and other bodies. What we clearly have to do is to provide for the maintenance and repair, where necessary, of those drains. These are resources which have to be deployed anyway by somebody, unless we are to have broken sewers and drains everywhere, so it is not really a question of allocation of money, it is a question of allocation of responsibility.

Q1037 Miss McIntosh: But the money surely must follow responsibilities.

Mr Woolas: Yes, but the money is already generally spent by the water companies.

Q1038 Miss McIntosh: But, if I were to take you to a street in east Yorkshire, East Riding, and show you a whole row of riparian owners who were flooded last year and who risk being flooded again, where are they going to get the money to have those drains adopted? It is a whole row of houses. As you know, the title to many of these houses did not reflect that they were responsible.

Mr Woolas: The general principle that we will try to address will be that the private owner of the property in the case of a house should not have the responsibility to repair the drain.

Q1039 Miss McIntosh: Could I just ask about the Pitt recommendation on the abolition of the automatic right to connect. I think you would probably agree that the Department will sign up to that recommendation. It is the interim recommendation.

Mr Woolas: It is a very attractive policy to give strong consideration to.
strength of the argument in the greater good. My caution is that there may be indirect consequences to the negative and they would need to be looked at and consulted upon.

Q1043 Miss McIntosh: I would probably say that I think there would be resource implications for the water companies in this and it is probably too late for you to adjust your statement tomorrow in this regard, but, going forward, we might make the recommendations, but the Department have already got to take this forward.

Mr Woolas: Yes.

Q1044 Miss McIntosh: Just moving to urban drainage and the 15 pilot schemes that you have; I notice that there is a fair geographic spread. What preliminary findings have come out of the ongoing pilot drainage schemes?

Mr Woolas: We have not got the findings yet.

Q1045 Miss McIntosh: But you are actually expecting to produce a final report this autumn when the pilots are meant to be completed by spring 2008, so could you give us a date when you might be able to share the results of the pilots?

Mr Woolas: I think the timetable, if I remember correctly and I will let the Committee know if I am wrong, is that we expect to produce the interim findings by the summer recess, I think is the timing. I am sure that is right.

Q1046 Miss McIntosh: Do you believe that the work on the pilots will be benefiting from what you have learnt from the summer floods?

Mr Woolas: My attitude to that is that we have this coming together of evidence, of recommendations and of expertise of the pilots. The timing of our policy report tomorrow was due to be before Christmas and we decided to put it back to allow us to look at the interim recommendations from Pitt, and that was a difficult decision because the water companies are producing their 25-year plans and the earlier notice they get of our wider policy framework, the better it is from that point of view, so, as ever in these decisions, it was a balance on the one hand and on the other, but we decided that what really mattered, the most important priority, was to ensure that there was a framework in place to implement the national flood defence plan, to give that a statutory financial policy framework so that the Agency and the other authorities could do that job. I would not say this area has been bedevilled by short-termism as I think the short term in this area is quite a long period of time, but we need a stable, long-term framework to get this into place if we are to do what, you could argue, we should be doing anyway, especially if you take into account the predictions of increased rainfall and problems of water shortage.

Q1047 Chairman: Would I be correct in assuming that the resource implications which will come out of the conclusions will have to be met, if there are any, from within the existing Comprehensive Spending Review settlement?

Mr Woolas: That is a very, very fair and astute question.

Q1048 Chairman: So what is the answer? Is it yes or no?

Mr Woolas: The answer is yes, that in our submissions to the Treasury we were of course aware of the policy developments and aware of the pilots that we are undertaking.

Q1049 Sir Peter Soulsby: In the evidence we have had so far, we have had a lot of enthusiasm expressed for what are described as ‘sustainable drainage systems’.

Mr Woolas: Did you say “enthusiasm”?

Q1050 Sir Peter Soulsby: Enthusiasm, yes. We have also had considerable concern expressed that there is a lack of clarity about responsibility for maintaining them once they are developed. I wonder if you could give us some indication as to the degree of enthusiasm you share for so-called ‘SUDS’ and whether the issue of responsibility for their maintenance is something that you are addressing.

Mr Woolas: I am a complete convert and anorak for this.

Q1051 Sir Peter Soulsby: I heard you mention your roses and guessed you might be!

Mr Woolas: Please do not think I am teaching my grandma to suck eggs, but the situation is really serious, that we will face in parts of the country severe water stress, we will face, as we did two years ago in the South East, potential droughts, and the climate change implications as weather patterns move from north Africa through continental Europe to north Europe mean that we will have much more rain in the winter and much less water in the summer, crudely put, and there may be exceptions to that. I mentioned the Victorians earlier on and the problem in the modern world is almost that the Victorians were too good, that they built an infrastructure that has lasted which takes surface water and puts it into rivers and not into the land. Now, as a temperate, north-Atlantic climate, we have put up with that for centuries, but with climate change we cannot and that is why we are enthusiastic about SUDS.

Q1052 Sir Peter Soulsby: It has been suggested to us that responsibility for maintaining systems once developed was far from clear, I think it was one of the Pitt recommendations, and that that actually is severely inhibiting their development which, quite rightly, they are enthusiastic about.

Mr Woolas: It does, and one of the questions that I think your evidence has been looking at is that, as well as the need to co-ordinate the maintenance, there is also a need to have consistency of policy. There are parts of the country, for example, in
agricultural areas, where drainage has been subservient to agriculture and one reaches a border and the drainage system becomes subservient to an urban area, and there are different policies even within that. That does not necessarily make sense and this is the debate we have been having, as you have, with the internal drainage boards, where they exist, but also between water companies and local authorities as well, and two-tier areas present an even greater complexity. Again, to answer your question, I think very enthusiastic, and it is certainly an area that we have looked at in depth and again it is an area that will be commented upon tomorrow.

Q1053 Sir Peter Soulsby: You mentioned earlier, or you reminded us earlier, that your responsibility of course in this context is England. It was suggested to us, I think, by Thames Water that they do things differently and, it was suggested, better in Scotland and that the responsibilities were actually clearer there. Is that your understanding of the situation? I think they said that local authorities had responsibility above ground and drainage authorities below ground and, therefore, everything was sweetness and light north of the border.

Mr Woolas: Well, they have a lot more rain relatively and they do not quite face the problems we face, although they may well do in the future. They benefit from, if I may say in a non-partisan way, a unitary authority structure that was imposed on them some time ago, but which makes sense from that point of view, so I would say that the organisational structures in Scotland and the water resources they have make it easier, but I still think it is very complex. Other than that, in perfect honesty, it is not an area that I have looked at in depth, so, if there are lessons to be learned from the Scotland situation and indeed Wales, I will read them with great interest.

Q1054 Mr Drew: Could I pick up one point before I go on to talk about planning which brings you back to your previous incarnation, and that is the role of the IDBs. As someone who used to be quite critical of IDBs, I have begun to realise that certainly in rural areas they can play a crucial co-ordinating role. The problem is that they are limited of course in rural areas they can play a crucial co-ordinating role.

Mr Woolas: The answer is yes, they are. We are looking at the geographical configuration of them. I attended the annual meeting of the IDB in Peterborough and spoke in depth with them about that. I think that they rightly are looking to us for clarity of policy guidance, which reverts back to the answer to Sir Peter before. There was a fear, I think, at the end of the summer last year that we would throw the baby out with the bathwater, if I am allowed a pun, apologies for that, but I certainly do not intend to do that.

Q1055 Mr Drew: The added advantage of course is the precept—

Mr Woolas: They have the added advantage that they bring resources.

Q1056 Mr Drew: —so it is a cost-free opportunity, dare I say.

Mr Woolas: They levy their fees and they have incredible local knowledge of the watercourses. They tend, for very good reasons, to have empathy with the agriculture sector and the land, and that is very important because one cannot have a flood defence policy that is pro-urban and anti-rural or pro-agriculture and anti-urban, but you have to get the water control right and I think the IDBs bring a real level of expertise and, finally, they bring incredible commitment, and I am sure it is pretty much a thankless task, but it is very important.

Q1057 Mr Drew: Moving on to flooding, as part of this inquiry, you may know, we went to Lyon to have a look at effectively their sustainable urban drainage. Besides the organisation which was very impressive, I think the other thing that struck us was the fact that they have red zones which means no development in those zones and they have other zones which clearly have become the opportunity to be able to disperse water into. Really what we learned was that their hold on development, even though they have got a much more dispersed system of government in France than we have in the UK and given they have greater land space which in that area does help, their ability to manage that space was impressive. To what extent, looking at PPS25, have we got to become much more assertive in deciding where we do not develop? One of the things that I raised with previous interviewees, and I raise with you, is the problem that it is not just the measurement of the potential flooding in the area where the development takes place, but the consequence of that flooding further down the valley or further down the flood plain. Now, is that something that you are talking to DCLG, your previous Department, about?

Mr Woolas: Very much so. I think our attitude is that the policy changes that we have made have been in the right direction, and I think there is a consensus around that, that there is clearly a learning curve and there is a need for pushing hard to ensure that the powers are used properly. The debate around the flood plain, do not develop on the flood plain which is often used, misses the important point in the question that David raises. Bringing the expertise again of the Environment Agency into the equation has benefited the situation enormously. The expertise of planning officers needs to grow, and I think it will, but I think we need to push it on the point that is being made, and the fact that you can have a development not in a flood-risk area that causes floods in existing areas is a lesson that is being learned right across the country.

Q1058 Mr Drew: So in terms of the role of the Environment Agency, agreeing that that role is enhanced by PPS25, is it not worth now just pushing
that bit further to say that, where the Environment Agency has clear misgivings about a particular development, they do have statutory powers? At the moment we have the powers where you, as the Minister, could call something in, but up until this point the Environment Agency has been regularly overturned in terms of advice and quite simply you can get some planning results, adverse as they are, some years later.

Mr Woolas: It is something that we have obviously talked to the Environment Agency about, both the Chief Exec and the Chair, it is something that the Board raised, it is something colleagues raise and it is something that Sir Michael addressed himself to in terms of the enforcement. The picture seems to be that the number of objections that are honoured, as it were, by planning committees or recognised by planning committees is on a steep curve upwards, and it started very slowly, so it is far from ruling out the point that you make. The question of course is whether the power to ask the Secretary of State to call it in outweighs in the minds of the planning committee the other consideration which would be whether the system could cope with current resources, but the picture seems to be that one that is improving and I think we should have a very open mind and keep that monitored, and, if I may say, the Sustainable Communities Bill will help in that regard.

Q1059 Mr Drew: I am sure it will and we will be working on that in due course. Finally, while we are on the Pitt Review, the recommendation that flood risks should appear in home improvement packs, has the Government accepted that or is it thinking about it or has it got misgivings about it?

Mr Woolas: It is thinking about it. Again, part of our strategy is to call upon the public, and the statement in principle which is with the Association of British Insurers is of course very, very important indeed. Our policy goal of being able to improve, at household level, resilience and protective measures is important, and clearly the point that is being made could be argued to help towards that. In official language, it is under active consideration, I think is the phrase that we would use.

Q1060 Chairman: PPS25 puts quite a considerable burden on local authorities having the expertise to apply the guidance that is contained in it. What is being done within government to ensure that local authorities have actually got that expertise?

Mr Woolas: It is slightly outside my remit, but the strategy of improving the expertise of planning officers that has been undertaken in the last few years from undergraduates through to resources in local authorities is pertinent to this, and the working together of the planning authorities, the Environment Agency and indeed other bodies is part of that. Of course, there is the opportunity also of resources through developers where section 106 and similar arrangements can come into play, so, as in all of these efforts in climate change adaptation, and that is how I see it, there is a transformation that we require in the country to increase the expertise and there are specific programmes of training the planning officials that have been undertaken, but I would not pretend to you that it is perfect; it is a learning curve.

Q1061 Chairman: Let us move on then to an area which we touched on briefly which is the question of the budget which your Department has at its disposal. Can we just start by making certain that we understand the elements of the budget which were helpfully listed in the ministerial statement of 4 February. In the first column, I notice that some £261 million across the current CSR is listed for “local authorities’ own spend (estimated)” and it is a level trend, so that says to me that in real terms it is actually a falling estimation of how much local authorities are going to be spending. How did you derive that 87 was the right number?

Mr Woolas: We took what they did now and we looked at the DCLG RSG settlement and we extrapolated the flat line.

Q1062 Chairman: So you are quite happy that in real terms local authorities are projected to reduce their real terms expenditure on flood matters at a time when you think that the risks are increasing?

Mr Woolas: No, I am a devolutionist and I believe that for local authorities the less ring-fencing they have, the better it is.

Q1063 Chairman: But in terms of adding up the total national budget, this number is included in it, so it is really a bit of a cock-shy.

Mr Woolas: It is an estimate based on a three-year period and the alternative policy would be to attempt to ring-fence capital and revenue budgets and I do not think—

Q1064 Chairman: But it is a formula that determines how much money local authorities receive within their revenue support grant and, when the formula cranks out the results, obviously factors affecting individual authorities, I presume, are taken into account in determining allocations. I do not blame you for saying, “I’m a devolutionist”, but, against a background where the Government has made a considerable amount of play in global terms in saying that its overall expenditure through the Comprehensive Spending period is going to go up, I think a lot of people will be rather surprised to find at the local level, when lots of little smaller-scale works, for example, might be required, that you have got a level cash figure as part of your estimate because there is no guarantee that any one local authority will spend anything on flood protection. Mr Wright, perhaps you could assist us. If you are the man with the detailed answer, help me out of my lack of knowledge on this and give me the facts.

Mr Wright: Approximately half of the total of £87 million is levies that the local authorities pay to the Environment Agency and internal drainage boards, and they do fluctuate from year to year, so, as the Minister said, they are based on past trends, and they do fluctuate from authority to authority, but overall the level is pretty stable. The other
Chairman: That is not the answer because we do not know that the 34.5 million—

Mr Woolas: We do not know. We do not know the mechanism that has come up with the 34.5 million? 

Chairman: It is a guesstimate. Without wishing to be in danger of repeating myself, it seems prudent to me to have an amount of money from the total amount available to be there to implement specific recommendations from an independent review, and I cannot justify the particular 62.5 as opposed to 60 or 70 or 50 or 80, but I would point it out as evidence of our commitment to the independence of that review and to the importance that we place upon it. If you take, for example, the coastal erosion area where we are further down the line in terms of development, we have allocated in that area similarly, from the total package, some 30 million—

Mr Woolas: The figure is 62.5 million.

Chairman: No, I am talking about Pitt. The 62.5 million is the “retained for now in Defra”, which is in column 2 of your Department’s press release.

Mr Woolas: I am sorry, I am just saying that the 34.5 is part of that 62.5.

Chairman: I got that from the earlier answer. I am just still interested to know how you decided that 34.5 was the right number.

Mr Woolas: It is a guesstimate.

Chairman: But, given what happened last summer, there has certainly been a stirring of very considerable interest at local authority level in having to do something about what has transpired. I suppose my question is that within the way that the Grant Settlement Scheme works, is there any way in which it can be amended over this CSR period to reflect a heightened need for activity at a local level?

Mr Woolas: Well, of course in many cases the mechanisms for both coastal erosion and flood defence are joint schemes between authorities and other partners, so the plans are agreed between local authorities, but what this represents, which I think you are also saying, is an estimate of what they are doing based on previous trends and I suppose we can exhort them to do more, but the policy option would be to ring-fence—

Chairman: It looks like local authorities are stuck. Let us move on to the next column then, “retained for now in Defra”. We discussed the fact that, out of that pot, you have preliminarily allocated £34.5 million for Pitt, but we do not know how much the rest of Pitt is going to cost, so will the final proposals of Pitt be fully costed by the same mechanism that has come up with the 34.5 million?

Mr Woolas: We do not know.

Chairman: But you knew enough to decide the 34.5 as a number, so do not say you do not know. All I asked was about a mechanism. What I did not ask is how much is Pitt going to cost. How are you going to work out what the rest of it is going to cost?

Mr Woolas: When we get it, we will sit down with it, but we do not know that the 34.5 million—

Chairman: That is not the answer because you gave us an answer earlier on to say that your officials and Sir Michael’s team had so far made some kind of cock-shy, particularly with reference to the interim findings. It says here, “We are also making an initial provision of £34.5 million which may be needed to implement Sir Michael Pitt’s recommendations”. Well, I think it is definitely going to be, but it is funny language, that. What I am interested in is how are you going to work out what the rest is going to cost?

Mr Woolas: For the record, we did not say it was a cock-shy, I think it was somebody else who said it was, but it is not a science. Obviously we are waiting on those recommendations.

Chairman: I am sorry. I know it is not a science, but I asked the question of how are you going to do it. This 34.5 million as a provision, you did not pluck that out of thin air. It must have some basis.

Mr Woolas: For the record, we did not say it was a cock-shy, I think it was somebody else who said it was, but it is not a science. Obviously we are waiting on those recommendations.

Chairman: I would love to see the note that you got from your officials where it said, “Ministers are advised that Sir Michael is coming up with a very long list and there might be a big bill attached to it, so we had better make some provision for some of this”, and inside that note I would be wholly unsurprised if there was not an estimate, to use your own word, of what you thought the global total might be. Somebody else might have said, “Well, it’s going to be spread out over a period of time, Minister. It ain’t all going to come in one fell swoop”, so you got a recommendation as to how much you should put by out of the 62.5, so at least you could say you were doing something over the three-year period of the Comprehensive Spending Review and that would give you a defensive position because the bill will no doubt come to more than the 34.5 million, but you are doing your best. Is that not what you actually had on your desk?

Mr Woolas: Had I done the opposite and not allocated any money, then you, I think, would have a very strong criticism—

Chairman: You did not answer my question. You have had that submission and I am quite certain there is a mechanism where somebody will have costed out, roughly speaking, back-of-the-envelope stuff, what Pitt is going to cost, and you have decided as a Department how much in the next three years you can actually put towards that bill. Is that not true?
Mr Woolas: No, it is not. Defra officials never do anything on the back of an envelope, they do it comprehensively and—

Q1075 Chairman: Well, let us say it is on the front of an A4 piece of paper as a ministerial submission, “Pitt’s interim findings”. You have must have had a note on that.

Mr Woolas: My experience—

Q1076 Chairman: Did you not have a note from your officials about Pitt’s interim findings?

Mr Woolas: Mr Jack, your experience is greater than mine in regards to this Department. Weighty submissions are—

Q1077 Chairman: No, I had the same two years that you are going to have, so we are about on a par!

Mr Woolas: You had a year earlier as well to give you some knowledge that prepared you for your period, if I am correct, but my serious point, if I can use the parallel please of the coastal defences situation where one has revenue and capital allocations for the programme and a pot of money made available of £28 million for what is called ‘the adaptation toolkit’, that is a pot of money that is available for communities, local authorities and flood defence committees where they can say to us, “Look, in our part of the country there is a specific problem and it needs some resources to solve it”, and it may be as simple as moving a caravan park in order to sustain the tourist industry in that area. Now, that is not something that is part of my capital programme to defend the sea in a particular pot, so yes, it is a guesstimate. How much do we need for that? It is a guesstimate, but I think it is responsible planning because it is taken from the total which, in terms of the weight of the submissions in this period, in the box, the 1.8 million, were a lot heavier and a lot more substantial even though the 62.5 and the 34.5 were also comprehensive.

Chairman: Well, we will come on to the bit in the further right-hand column. You have tweaked the interest of a number of my colleagues.

Q1078 Patrick Hall: Just quite simply, when Pitt’s final report is available in June/July, there will be a fresh assessment and it will not be a guesstimate then presumably, it will be a bit more definitive. If that comes up with a figure that is higher than the 34.5, does that additional sum come from the 62.5? Secondly, is it then expected that, whatever it is, the spending will be mainly in the financial years 2009/10 and 2010/11, the first full financial years after this June?

Mr Hurst: The first point to make is that, as I said before, there are two sets of recommendations from Sir Michael Pitt. There are 15 urgent recommendations, many of which are main budget recommendations, things like talking to people, putting together plans, et cetera. There are then 72, if I remember correctly, interim conclusions. The 34.5 million is meant to address the costs for both and it has been put aside as a guesstimate, as the Minister said, to cover both. Now, obviously it is as guesstimate because we do not know what the final recommendations of Sir Michael Pitt will be. When Sir Michael Pitt comes up with his final recommendations, the Government will have to consider its response and it would not want to make a response without costing that response. There will be some decisions to be made, I am sure, because for some of the response, there are different times when you may want to do it. You cannot say, for example, in surface water that you would necessarily do so much in the next two years and so much in the two years after that, so there is no definitive number. When he comes up with his definite conclusions, people will have to make a judgment about whether it needs more than we have currently allocated within the Spending Review period, in which case it has to look to its own resources, whether it is from its own reserves or whether it is from reallocating programmes or whether this is something that we ought to look to the next Spending Review to sort out, so there is no definitive answer because we do not know what the conclusions will be.

Q1079 Patrick Hall: But we will know later on this year.

Mr Woolas: But my priority will be to give certainty and stability to the flood defence plans for communities and what I want at all costs to avoid is allocating money to the Environment Agency and others and what I will not do is go and ask for it back.

Q1080 Mr Drew: What I am interested in is how you will allocate these monies. Now, presumably this is at a fairly stage, but will it be the same sort of approach that the Environment Agency currently takes to main river structural programmes which works according to a cost-benefit analysis so that you can prioritise schemes according to risk? Let us just pontificate a little bit on this because this is actually quite important to an area like mine. Clearly you have to balance those areas that have flooded against those areas that could flood, and it would be interesting to know how you work to that sort of prioritisation arrangement, but you also have the situation, as happens with main rivers, that there will be some areas that will never be entitled to a structural solution, but which might need some help in other ways, so how do you sort of tease out some of these complications? It is much easier with a main river where you have at least got one common feature, whereas here you have got a whole series of different flooding scenarios that could occur and which, with the best will in the world, are going to mean that resources are heavily over-demanded.

Mr Woolas: My experience has been that this is one of the most difficult policy areas, how one prioritises this allocation of resources, and what we have tried to do is to put together, obviously with significant consultation, a series of criteria that are providing the taxpayer with the best value for money and providing the best fairness that we can across the people who may be affected. Obviously there is the scientific advice on what the risk of flooding is, the definitions that we have talked about, and then we
go straight to the difficulties that you have already asked about in regards to surface-water flooding, and then there are the criteria themselves, the outcome measures, as we call them. There are 15 altogether and there are nine which are directly relevant here, and there is coastal defence as well which we have a similar process for. They are the economic benefits of providing protection, the number of households protected, the number of deprived households protected in order to ensure fairness, the natural environment, the important wildlife sites that could be affected and the biodiversity action plan habitats, so there are those criteria. Now, of course the economic benefit is of course the most subjective judgment because one has to balance different commercial activities as well as the value. In general, flood defences give good return to the taxpayer, about five to one, and that is not a bad return.

Q1081 Chairman: The National Audit Office were critical of the inability of the Environment Agency to spend about £120 million bringing various existing flood defences up to a proper standard and from the analysis of the third column of monies that you have put forward entitled “Environment Agency resource maintenance operational costs”, it did not seem that there was any of this catch-up and that their submissions about poorly maintained watercourses, flood defences, etc., do not represent the true picture. I believe that the criteria that have been used by the Agency could provide you with evidence of that, I am not complacent about that, but the evidence from real-world events in the past period rather indicates that the maintenance levels have been adequate to do the job, and I am not aware of any evidence from last summer that that is not the case.

Q1082 Chairman: What, the NAO’s?

Mr Woolas: Yes. I think that the Environment Agency, which is of course independent, their judgment of themselves is pretty harsh and we have been in discussion about that and I do not think the picture is, and I have checked some examples randomly myself so that I could speak to you and to the House with confidence on this point. On the other hand, the difficulty, and this is a point that I have made very, very strongly to the Agency, is that of course you only need one bit of a flood defence to fail for it all to fail, water behaving as it does. The amount of money that we have allocated for capital programme—

Q1083 Chairman: Well, let us stick to maintenance and operational costs. We will come on to capital in a minute.

Mr Woolas: Well, the maintenance and operational is gradually increasing, it is the highest we have ever had and it represents a sustained programme to increase the maintenance levels, but—

Q1084 Chairman: But, if I can ask you a question, what do you think the current level of construction industry inflation is?

Mr Woolas: Well, the current level of construction industry inflation over my timescales is something that these policy decisions will affect and, therefore—

Q1085 Chairman: But do you know what it is?

Mr Woolas: No, not off-hand. The last time I talked to the Construction Products Association, it was—

Q1086 Chairman: Well, the Environment Agency gave us figures of anything up to 8 per cent per annum.

Mr Woolas: Well, I met with the CPA about this and other matters and I think their estimate then, and that was just before Christmas, was 8.2 per cent. That was construction products, not construction, so there is a slight difference.

Q1087 Chairman: The reason I asked that, Minister, is that, if you look at your figures, you are giving to the Environment Agency in the financial year that begins on 1 April this year an extra £4 million more than last year and the next year they get £7 million more than the year 2008/09 and then in the third year it goes up by plus £21 million. Given the pressure on maintaining the resources against the background where this Committee has received a legion of submissions about poorly maintained watercourses, flood defences, etc., and with the construction industry inflation running possibly up as high as 8 per cent, £4 million, £7 million and £21 million over a three-year period does not strike me as an adequate way of increasing the maintenance budget to actually look after what you have got against the kind of real-world pressures that are there, so we are going to go backwards on this.

Mr Woolas: Well, no sensible economic policy in the world would try to second-guess sectoral inflation figures because, if you did, it would become a self-fulfilling prophecy, I would imagine, so I accept the reality of the pressure that you point out to me, but one cannot, I think, responsibly plan on that basis. In any event, the allocation of resources by the Department, given the scale of the monies that we are talking about, bearing in mind that the water industry’s investments have to be taken into account and that their effect on construction inflation is important and that the scheduling of capital and maintenance works, just to come back to your stricture that we are talking about maintenance, does have a direct impact and, therefore, part of our calculation in the allocation of monies has to be borne in mind and of course that runs across to other areas of government expenditure, and one could look, for example, at school building programmes, the figures represent a sustained increase in the amount of maintenance and of course capital. I believe that the criteria that have been used by the Agency, and reported upon by the National Audit Office, do not represent the true picture. I believe that the Agency could provide you with evidence of that. I am not complacent about that, but the evidence from real-world events in the past period rather indicates that the maintenance levels have been adequate to do the job, and I am not aware of any evidence from last summer that that is not the case.
Mr Woolas: I think we are moving towards Sir David’s view, but the serious point is that, in allocating public resources, we are trying to take into account the feared future patterns as well. Again, I hope this is not point-scoring, but way back last June I was faced with a demand from the Association of British Insurers of £750 million and we got more than that, and I think that shows that our ambition was right.

Q1095 Chairman: The ABI have vacillated. When Foresight came out, they endorsed the £1 billion and then, when £800 million came out, they said that was very good and then they issued a press release saying it was not enough, so they cannot quite make their minds up how much money ought to be spent. What I wanted to know was whether somebody sat down with a clean piece of paper and said, “If we have a look over a period, these are all the capital works that we might like to do, but we recognise we can’t do them all, so this is where the cut-off comes”. I am still not clear how you decide that, for example, £308 million is the right number for the capital programme for this coming year.

Mr Woolas: Well, we did a zero-base review for the Comprehensive Spending Review in all matters and Martin was heavily involved.

Q1096 Chairman: Well, come on, Mr Hurst, tell me why £308 million is the right number. It is a very precise figure. 308, not 309, not 307, but 308.

Mr Woolas: It had to be a figure!

Mr Hurst: There is of course no universally correct figure. What we did was we looked at a number of factors. One of the things we looked at was, as you said, the Foresight Report and the Foresight Report said that over 20 years we ought to achieve about £1 billion of spend in real terms, so actually that would require, by the end of 20 years, more than £1 billion in cash terms, so you cannot quite compare the two. The profile that we have here, particularly the third-year number, is being judged broadly in keeping with the Foresight recommendations in that it is on the trajectory to the £1 billion over 20 years in real terms, so that is the first thing we looked at, and that was very heavily influential in the zero-base review because, if you are starting from asking the question of what in the perfect world do you spend, you start from the best evidence you have got. In terms of the profile between years, there are two judgments. One is what the total settlement is obviously and what we should allocate to different parts of Defra, but the other thing is that we went through with the Agency a number of scenarios for the projects that they might or might not bring in over time. We are acutely aware that, if you bring projects in too early, you can generate the construction price inflation that you are trying to avoid. The other thing we are aware of is that many of these projects require detailed planning, contracting with procurers and, in some cases, planning permission, so it makes sense to have a profile that is rising over time. As I said, within that there is no unique answer, but the general profile is...
the one that best fits both the Foresight Report and the kind of profiling of projects that we and the Environment Agency thought was the most sensible.

Q1097 Chairman: Minister, finally on the question of resources, your Department continues to be under a great deal of financial pressure, so are the figures which have now been quoted, if I can use the term, set in concrete? Are they ring-fenced from any further pressures on your Department’s budget? In other words, is this area immune from further cuts?
Mr Woolas: Yes, it is.

Q1098 Mr Drew: A very simple question: when are we going to abolish riparian ownership? Are they fit for purpose?
Mr Woolas: When are we going to abolish riparian ownership? That is a matter under consideration.

Q1099 Mr Drew: That is a good answer! It is better than saying, “We’re not going to abolish it”!
Mr Woolas: It is true as well.

Q1100 Mr Drew: But you would accept that there is a significant problem now, given what you said earlier? In my area, you have two-tier authorities, you have got water companies, you have got the Environment Agency, you have got British Waterways, you have got other utilities and you then get riparian ownership with 20 owners, 19 of whom are all willing to do something to take responsibility and one is saying, “It’s not my problem”, and then the other 19 flood.

Mr Woolas: My view is that we have got to get real about the problem we are dealing with here. I do not think the country, well, the public are actually, but I do not think the body politic, outside of course of this Committee and people directly concerned with these issues, appreciate the seriousness of the problem that we are facing. The people who live in the flooded areas of last summer, they of course understand it, but that surface-water flooding that happened in Hull and happened in other parts of the country, what happened in south Yorkshire and where the river flooding coincided with surface-water flooding, those sorts of patterns are happening all of the time all over the country, and we have had surface-water flooding in the last two weeks in the country. If the scientists’ predictions are right, that this extreme weather is going to continue apace and indeed increase, then we have to radically change the policy and statutory framework that we operate in this area, and this is why it is such an exciting and important debate, and the specific on Mr Drew’s question is not yet answered, but you can see my attitude and the Secretary of State shares that attitude, as I believe the Government more generally does.

Q1101 David Lepper: We went to have a look at the washlands scheme last week, which was a very interesting scheme, and in our discussions afterwards with Natural England, they expressed some frustration about the lack of progress on the 25, I think it was, schemes that came out of the Making Space for Water document. All of them are schemes which have a multiplicity of functions, in part controlling the flow of water, in part flood defence, but also to do with biodiversity plans as well. One of the issues, I think, was that putting together packages of funding for some of these schemes was difficult because the money allocated for one aspect of the scheme could be transferred to be used elsewhere within a scheme. What is the view of Defra about that? Does it sense that frustration that is felt by Natural England and others?
Mr Woolas: Yes, I think it is fair to say that we do, and it is a very fair question actually. I think the attitude to that is reflected in some of the answers I have given on surface water, that the need for a transparent public plan, national and local, the need for horses for courses, if I can use that phrase, the need to stop some of the local bureaucratic obstacles getting in the way, and one group of residents I meet from Yorkshire last week explained to me that there was a local authority boundary that had stopped the upstream storage, flood meadow storage, and their village was hit as a result, that sort of obstacle we have to address, and I believe that our national flood framework and our national flood plan will do that. Again, with permission, perhaps I could ask Martin to give some more detail.
Mr Hurst: I think the basic point is a very astute one, that, to be fair, government finds it easier to do single sources of funding for single outcomes than it does for multiple outcomes. I think we are addressing that with the caveat on floods that, with many of the things we are talking about, it is very hard to demonstrate a catchment-scale effect; it is a local effect and you have to appraise it as such. If you look, for example, at the way that the catchment flood management plans from the Agency and the river basin management plans are working together, so we take water quality and flood benefits together, if you look at the way that Natural England are running and developing environmental stewardship, which is using money with landowners to deliver multiple outcomes, and if indeed you look at the money on catchment-sensitive farming which Natural England and the Environment Agency jointly deliver, there are all examples where we are acutely aware of the need to bring agencies together and work together for more than one outcome.
Chairman: Minister, there are a couple of other small things which we will drop you a line about that we would have liked to have asked you, but I am conscious of the passage of time. May I thank you and your officials for your assistance in helping us with our enquiries. We have had an unprecedented response from members of the public and organisations from as wide a field as local authorities to internal drainage boards; it has certainly captured the public imagination. While we might still have some public interest, I would just like to put on record my personal appreciation on behalf of the Committee for the tremendous interest and input that we have had on this particular inquiry. I do not think I have known as much public interest on any inquiry, certainly during my time on the Committee, as this particular one. The BBC have also helped
with the programme You and Yours where they
certainly exposed to a much wider audience the work
that a lot of people, including government and
agencies, are undertaking to try and deal with the
very difficult situation on flooding, so with those
words of thanks I now draw to a conclusion this last
oral session. The Committee will soon be
considering its heads of report and I hope that it will
not be too long before we are able to produce our
final thoughts, but the Committee are now going
into closed session to deal with another vexed issue,
namely our report on bovine TB. Thank you very
much indeed for coming and for contributing to
our inquiry.

Supplementary memorandum submitted by the Department for Environment, Food and Rural Affairs
(FL 139a)

REQUESTS FOR FURTHER INFORMATION AND ADDITIONAL WRITTEN QUESTIONS

REQUESTS FOR FURTHER INFORMATION

During the 6 February evidence session, the Committee asked the Department to provide the following
information:

1. A note about the progress being made with the 15 Pitt urgent recommendations (Q 992)
   Attached separately [Annex A].

ADDITIONAL WRITTEN QUESTIONS

“Managed Realignment” from urban areas

2. How will “Managed Realignment” be implemented in urban areas without creating planning blight?

   Managed realignment is the process by which the operating authorities deliberately breach or otherwise
   remove an existing defence so as to incorporate the land behind the original defence into an inter-tidal area
   or river flow corridor. Where this is undertaken it is always by agreement with the landowner and often the
   land concerned is purchased outright. The process of deciding which areas are to be accepted for managed
   realignment can lead to some uncertainty and therefore some possibility of blight but we are not aware that
   this is a major issue.

   The process that which we understand the Committee are referring to is much more likely to be
   “withdrawal of maintenance” or “do-nothing” options where notice is given but there is no provision in
   current legislation for any land purchase or compensation due to loss through the ensuing natural erosion
   or flooding.

   Approaches to helping such communities adapt to flooding and coastal erosion are being considered in
   a project1 under our Making Space for Water programme to assess the scale and effect of these concerns
   and investigate the need for a broader portfolio of options for addressing them. This work is still under
development and we hope to start discussions with Local Authorities and Councils in the Spring about ways
forward. All levels of government have a role to play in promoting adaptation and local authorities can
already help, for example through the planning process and wellbeing powers.

Provision of water during an emergency

3. How soon will the requirements for potable water provision be revised upwards from 10 litres per day?

   Defra welcomes the interim conclusions and recommendations of the Pitt Review and is already taking
   action to address specific recommendations. Defra is leading a review of the current guidance on the
   provision of alternative water supplies during a water supply emergency and this will include a review of the
   minimum supply requirement.

   The review is looking into the adequacy of current planning provisions for alternative water supplies and
   the methodologies by which they are delivered and maintained. This review will draw on expertise from
   water companies, the Drinking Water Inspectorate, Ofwat and other government departments including the
   Welsh Assembly Government. The review group is expected to report by the end of June 2008.

   Defra will use the report to produce updated Guidance under the Security and Emergency Measures
Direction 1998. The Direction sets a legal requirement on water companies to plan to deal with emergencies.

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4. Will the figure of interruption of supplies to 200,000 people as the requirement against which the water companies are to plan be revised upwards?

The aim of this planning guidance document is to provide a generic framework that water companies can use in approaching their local Category 1 responders. This enables them to develop a multi-agency response that would be required in the event of major water or wastewater incidents. The Guidance adopts a value for up to 200,000 people without a piped water supply for a week, or three days without power as a planning threshold. The intention is to develop further guidance for larger incidents in incremental steps. However, 200,000 was a reasonable incident size applicable to the water industry as a whole, but does not limit those that could have larger incidents. Those water companies are already planning for incidents affecting greater numbers of people.

The guidance is additional to, and supports any existing national, regional and local generic command and control protocols. The National Risk Assessment process identifies hazards that may impact on services and people. For the 2008 NRA two scenarios have been identified, one of which is an event affecting a population of 350,000 people for up to two weeks.

Department for Environment, Food and Rural Affairs

March 2008

Annex A

<table>
<thead>
<tr>
<th>Urgent Recommendations</th>
<th>Outline of activity to support the Recommendation</th>
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| REC 1—The Review recommends that more frequent and systematic monitoring of groundwater levels at times of high risk should be undertaken by the Environment agency, which should begin as soon as possible to predict and mitigate further serious ground water flooding from this winter onwards. | The Environment Agency has a long-term initiative to develop its groundwater flooding capabilities, to take forward the Making Space for Water (MSFW) programme and prepare to implement the EU Floods Directive. In response to this urgent recommendation, the Agency is pursuing a number of additional short-term actions:
1. The Environment Agency has completed 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 by the Agency for Southern England, so as also to include the chalk aquifers of Yorkshire and North Lincolnshire, thus covering all major chalk aquifers in England. The most recent analysis found that overall levels in the south and east are likely to be higher than average for the time of the year, but neither unusual nor likely to present any major concerns. The Environment Agency is considering the scope to undertake such national forecasting on a more regular or systematic basis.
2. Associated with this forecasting, the Environment Agency is looking at a more systematic approach to warning key stakeholders and increasing public awareness—this is ahead of the longer-term consideration under MSFW of a consistent groundwater flood warning service. |
| REC 2—The Review recommends that the environment Agency, supported by local authorities and water companies, should urgently identify areas at highest risk from surface water flooding where known, inform Local Resilience Forums and take steps to identify remaining high risk areas over the coming months. | The Environment Agency does not presently have responsibilities in relation to surface water flooding, but is keen to take this on as part of the expected Strategic Overview role. In response to this urgent recommendation, the Agency is taking a number of actions in the short-term:
1. The Agency will meet with Local Resilience Forums to share knowledge of historic surface water flooding.
2. The Agency is determining what information is required from Local Authorities, Water Companies, etc on historical surface water flooding and will then write to them requesting the information. Once collated the Agency will provide the information to Local Resilience Forums to allow a multi-agency risk assessment of surface water flooding.
3. The Agency is looking to put a simple mapping system in place by around August 2008 for the initial identification of locations at high risk of surface water flooding. This is aimed at providing indicative information to Local Resilience Forums in the interim period before more comprehensive surface water flood mapping is developed to implement the Floods Directive. |
| REC 3—The Review recommends that the Environment Agency should urgently develop and implement a clear policy on the use of temporary and demountable defences. | The Environment Agency policy on the use of demountable defences is in place. Policy of the use of temporary defences will be consulted at the April Regional Flood Defence Committee meetings and with external partners. [Note—demountables use fixed foundations in specific locations; temporary defences are entirely mobile without fixings.] |
| REC 4—The Review recommends that all Local Resilience Forums urgently review their current local arrangements for water rescue to consider whether they are adequate in light of the summer’s events and their local community risk registers. | CCS/Defra have written to Local Resilience Forum Chairs asking them to review their arrangements locally to consider whether they are adequate, in light of the guidance issued in the recent Chief Fire Officers’ Association Circular on how they should assess adequacy, and to advise Defra/CCS on this by 20 March. |
### Urgent Recommendations

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<thead>
<tr>
<th>Recommendation</th>
<th>Outline of activity to support the Recommendation</th>
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<tbody>
<tr>
<td>REC 5</td>
<td>CCS/Defra have written to Local Resilience Forum Chairs asking them to review their arrangements locally to consider whether they are adequate and to advise Defra/CCS on this by 20 March.</td>
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<td>REC 6</td>
<td>The CCS have commissioned a study to scope the problem (ie establish what arrangements may be required in future 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.</td>
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<td>REC 7</td>
<td>DoH issued in December 2007 a revised NHS Strategic Command Arrangements guidance which updates 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. DoH is continuing to work closely with CCS to develop further STAC guidance at the local, regional and national level, including clarifying the roles of central advice and that of other health agencies.</td>
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<td>REC 8</td>
<td>CCS guidance on the identification of vulnerable groups issued to local responders on 3 March.</td>
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<td>REC 9</td>
<td>Defra has completed a current review of its Lead Government Department Plan to take account of the Pitt Interim Report findings and reissued this in January 2008. This provides a basis for developing a flood emergency framework for England. Feedback and recommendations in the final report from Sir Michael Pitt in June 08 will be incorporated into the national Framework with a view to finalising the output in the Autumn. Work can then begin on a planning national exercise that will test key components of the arrangements set out in the Framework and the Defra Lead Department Plan.</td>
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<td>REC 10</td>
<td>More than one agency/department is involved but they will work together as a matter of urgency to find secure ways of sharing the relevant information with the key Category 1 responders. CCS will coordinate this process, and expect to write to LRF Chairs in March, outlining standardised procedures for sharing this information.</td>
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<tr>
<td>REC 11</td>
<td>Environment Agency are keen for take-up of their flood warning services to be increased and will pursue this recommendation. Obtaining all telephone numbers of those at risk of flooding is complicated, and the Environment Agency is working closely with the Office of the Information Commissioner, the Ministry of Justice and the Electoral Commission to understand how this recommendation could be taken forward.</td>
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<tr>
<td>REC 12</td>
<td>CCS/Defra have written to Local Resilience Forum Chairs asking them whether they have developed plans to review their flood warning systems in this way, and to advise Defra/CCS on this by 20 March.</td>
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<tr>
<td>REC 13</td>
<td>CCS/Defra have written to Local Resilience Forum Chairs asking them whether they have developed plans to involve local media in this way, and to advise Defra/CCS on this by 20 March.</td>
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<tr>
<td>REC 14</td>
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<tr>
<td>Urgent Recommendations</td>
<td>Outline of activity to support the Recommendation</td>
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<tr>
<td>REC 15—The Review recommends that members of the public increase their personal state of readiness and resilience to floods by following the Environment Agency’s practical advice, where appropriate, as summarised below:</td>
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Written evidence from Members of the House

The following memoranda were received from Members of the House whose constituencies were affected by flooding in the summer of 2007.

Memorandum submitted by Colin Burgon MP (FL MP 01)

My constituency is bordered by the river Aire and the river Wharfe. The river Aire, especially, gives cause for concern.

During the recent bout of terrible flooding, it would appear that the flood prevention schemes held up reasonably well. The major problems were caused by the overburdened drainage system. One of the problems that desperately needs to be resolved is the lack of accountability. It is very difficult to track down who is responsible between the local authority or the private water companies.

It would be very helpful if the committee would consider this point when carrying out it’s inquiry.

Thank you for contacting me.

Colin Burgon MP
Elmet
August 2007

Memorandum submitted by Nigel Evans MP (FL MP 03)

The Rt Hon Michael Jack MP invited me to write to you since my constituency was affected by the recent floods.

In Ribble Valley, the villages of West Bradford, Waddington, Ribchester and Bolton-by-Bowland were particularly affected.

With reference to current flood prevention policy, it strikes me that there are two outstanding issues in Ribble Valley:

First, many local villages have rivers and brooks running through them which lack sufficient capacity in instances of flash flooding or near- flash flooding.

In some cases this is because the waterways have not been maintained and have become overgrown.

Second, the relationship between Lancashire County Council and the Environment Agency is not as efficient as it could be. Incidences of buck-passing at the expense of preventative and remedial action are all too common.

Nigel Evans MP
Ribble Valley
August 2007

Memorandum submitted by Martin Salter MP (FL MP 04)

BACKGROUND

A clear distinction needs to be made between surface water flooding and the over-topping of rivers and streams. It has been estimated that overloaded Victorian sewers and drains account for around half of preventable floods.

River flooding is a natural occurrence and there is little that can be done to reduce the amount of water that will find its way down our river valleys. Flood defences can protect some communities but can also increase the risk of flooding further downstream. Relief channels such as the Jubilee River in Berkshire can divert water at times of high flows and protect communities in low lying areas.

Intensive farming practices have created less capacity to hold back water in the upper reaches of river valleys. The destruction of functional water meadows which retain flood water and release it slowly back into the catchments has been caused by both farming and development. Flash flooding in many rivers is now more commonplace as a result, adding to problems further downstream.

Land drainage policies for the 60s and 70s have exacerbated the problem by straightening and dredging the smaller upstream tributaries resulting in faster run off. Fortunately, the EA now has a more enlightened policy.
Building in the flood plain has left 1 1/2 million homes at risk of flooding. The new planning guidance PPS 25 seeks to protect functional floodplain (ie water meadows etc) and yet 20% of applications objected to by the EA still receive approval regardless.

Currently there are four or five different authorities responsible for the maintenance of drains, ditches, culverts and streams all of which carry surface water run off. These are: Local councils (country and/or district), the Water companies, Riparian owners, and the Environment Agency. The E.A. is only responsible for streams and rivers designated as Critical Ordinary Watercourses (C.O.Ws).

The July floods of 2007 overwhelmed the existing outdated drainage infrastructure. In many areas it is true to say that no system would have coped with the sheer volumes of water but in others increased capacity would have provided some relief.

**Suggestions**

Should we incentivise farmers to recreate the peat bogs and water meadows that act as natural sponges to hold back floodwater?

There should be a comprehensive mapping exercise to identify every drain, culvert and watercourse to establish ownership and assess capacity to handle high volumes of water.

A competent authority must exist to enforce the maintenance and upkeep of these watercourses. Should this be the E.A. or local councils?

Developers should be required to make financial contributions to the costs of improving drainage. How could this be implemented?

Should the E.A. have the power to veto significant planning applications which increase flood risk?

We need substantial investment to increase drainage capacity, create flood relief schemes and improve flood defences where appropriate.

Should we create more flood relief channels rather than flood defence barriers?

How effective were the emergency planning arrangements in the flood hit areas?

Do sandbags make any difference? Are there more effective methods of protecting flood hit properties?

*Martin Salter MP*
Reading West
*August 2007*

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**Memorandum submitted by Chris Huhne MP (FL MP 05)**

I am writing in response to the letter from your chairman Michael Jack MP of 24th July, and your timely examination of flooding. My constituency has thankfully not been affected, but I visited Hull and Oxford at different times to see the problems for myself as part of my portfolio responsibilities.

I think the key issues are

(a) coordination of flood defences, prevention and warning across all the current agencies and particularly the failure of the government to deliver on its response to the Making Space for Water consultation of March 2005 concerning the overarching strategic role for the Environment Agency;

(b) consistency of investment across the agencies including water companies and OFWAT on surface water drainage issues with many different risk factors being taken into account (one in thirty years events for sewerage and drains, one in a hundred for river defences);

(c) government budgets both capital and current and the extent to which sensible investment projects are being delayed;

(d) proofing of key infrastructure against flooding notably national grid switching stations, water treatment plants and pumping stations; and

(e) the change in risk assessments due to climate change.

*Chris Huhne MP*
Eastleigh
*August 2007*
Memorandum submitted by Peter Luff MP (FL MP 06)

I am grateful for your Chairman's letter of 24 July about flooding.

As Chairman of the old Agriculture Committee at the time of the 1998 floods I particularly hope you will pay attention to the recommendations of the report we produced “Flood and Coastal Defence” in July of that year.

The latest floods in Evesham are the most severe the town has ever had, and certainly a good deal more serious than the dramatic events of 1998.

I have heard little criticism of the work of the emergency services, but one issue I think your committee does need to consider is the effectiveness of cross border communications between different regions. The second series of floods this year affected three government regions and three counties all adjoining each other, or very nearly so—West Midlands, South West and South East, or Worcestershire, Gloucestershire and Oxfordshire. The emergency services feel that the coordination could have been better across these regional boundaries.

The increased risk of flooding in Evesham and Droitwich apparent from the statistics does suggest that the Environment Agency will have to look at the feasibility of erecting flood defences in areas previously considered not to have a sufficient cost benefit figure to justify such constructions.

I am also becoming concerned about the increasing uninsurability of properties that are regularly flooded. While I acknowledge that inappropriately constructed buildings may not be able to attract insurance, buildings erected in good faith and particularly buildings that have been there for a considerable period of time, should be able to be insured. The impact of climate change should be fairly spread among society and not targeted on a few properties.

The long term economic consequences of floods also needs to be born more carefully in mind—both my town centres flooded in my constituency and the long term damage done to the economy of these towns could be very serious indeed. The adequacy of support programmes to re-establish the economies of flooded areas looks to me to be an important question.

Obviously we are concerned about preventing future floods and in this context building on the flood plan is a controversial area now in my county, facing ambitious housing targets set out in the Regional Spatial Strategy. It is difficult to see how such houses can be constructed without a further adverse impact on the flood risk both to those houses and to those houses around them.

Another point that should be born in mind is perhaps the increased tendency of new housing development to be more concrete-intensive than it used to be, with smaller gardens and those gardens that are constructed are often concreted over. This means that such housing developments are even more likely to cause enhanced flood risk. Detailed planning regulations probably need to be revised in this area.

The funding arrangements for assisting local authorities is also a matter of considerable concern. The current estimate in Worcestershire is that some £5 million worth of capital damage has been done to our highways and additional sums for our schools. Our schools may be insured, but the highways certainly aren’t and a hard-pressed county council like Worcestershire can’t suddenly find £5 million to make good damage to existing structures.

Finally, a word about mixed messages on health warnings. There has been some confusion in this area as people have heard that the sludge is too dangerous to touch and bugs can even be transmitted through rubber gloves, while others have just got on the job of cleaning up in their properties. This is a small point, but one worth clarifying.

I hope these comments help, but if further issues come to light as I receive further correspondence from my affected constituents I will of course let you know.

Peter Luff MP
Mid Worcestershire
August 2007

Memorandum submitted by Graham Stuart MP (FL MP 09)

Thank you for your letter dated 24th July. I am delighted that your committee will be examining the recent flooding when the House returns.

The East Riding of Yorkshire has been devastated by the floods. Four towns in my constituency—Beverley, Hornsea, Withernsea and Hedon—have been affected, along with many village communities in between, such as Thorngumbald and Ottringham. At one stage, residents of Hornsea were cut off entirely by flood waters.

During the initial downpour, the local area received one sixth of its annual rainfall in 12 hours. Humberside Fire and Rescue Service received more than 3,000 phone calls and the Police received a further 4,800 calls. According to the East Riding of Yorkshire Council, 5,700 homes have been affected. In my constituency, the most conservative estimate is that at least 1,200 homes have been flooded.
Much went right with the response operation. All the agencies involved worked incredibly hard to deal with the emergency and individual staff went above and beyond what could be reasonably expected of them. Communities came together to help out their neighbours.

The following are issues that I think could usefully be investigated by your committee:

1. Flood Rescue. No one agency is responsible for flood rescue. This duty, in my opinion, should be given to the fire service. This may not need to be a statutory responsibility so long as a decision is taken and funding is provided. Officers should not enter water again in equipment designed purely for fighting fires. Mazen Khuri (Deputy Chief Fire Officer, Humberside Fire & Rescue Service) has helped establish a scheme for marine rescue which, he believes, could be used as a model for flood rescue. Perhaps he could be asked to contribute.

2. Maintenance of drains and outlets by the Environment Agency (EA). Internal Drainage Boards including the Beverley & Holderness IDB believe that the failure of the EA to carry out proper maintenance contributed to the length and extent of floods caused by overtopping of drains such as Burstwick Drain. The EA say that lack of maintenance, the failure of outlet doors and the non-installation of pumps made no material difference. This dispute needs to be resolved.

3. Protection of critical infrastructure. Power, sewage and other systems need to be more resilient to flood threats.

4. Need for a central register of drainage pumps. No one in the East Riding knew where they all were and who owned them.

5. Responsibility Gaps. Identify any areas in addition to flood rescue where responsibility is not clearly assigned to a specific agency or agencies.

6. Call handling. What can be done to improve ability of emergency services to cope with huge spikes in calls? Evaluate likely impact of regional call centres and loss of local control over asset use and priority setting for the fire service.

7. Emergency planning. Does this need to be more ground up rather than top down? Should parish and town councils have their own plans in place?

8. Flash floods. Flash floods and the failure of sewers to cope with them is little understood. Should there be increased research and does one agency need to be made responsible for all surface water issues?

I hope these points are of use and that you have a successful inquiry.

Graham Stuart MP
Beverley and Holderness

September 2007

Memorandum submitted by the Rt Hon John Redwood MP (FL MP 10)

Thank you for the invitation I recently received from Michael Jack MP to help frame the terms of reference for the floods inquiry. I think the inquiry should include the following issues:

1. Why were so many of the flood defences, ditches, culverts and land drains in poor order, whether owned and maintained by the Environment Agency or by others under the supervision of the Agency?

2. What could be done to ensure all drains, ditches, culverts and flood defences are in future maintained to a higher standard?

3. Why did so many recently constructed properties flood? How can the planning process (including on appeal) be improved to take flood risk seriously, so that flood plain applications are either turned down or have conditions attached to improve drainage to prevent flooding?

4. Which new flood prevention projects should take priority from here to give more protection to families? In my area the Maidenhead project in place worked, but there has been no attempt to handle regular flooding from the River Lodden between the M4 and the Berkshire/Hampshire border.

Rt Hon John Redwood MP
Wokingham

August 2007
Memorandum submitted by Paddy Tipping MP (FL MP 11)

I am pleased that the Select Committee will examine the recent floods. I wonder whether attention might be given to:

1. the role of highway authorities and the adequacy of the surface water drainage system; whether maintenance has been adequate; the need for further investment and the possibility of new systems such as sustainable drainage systems (SUDS) and the factors that restrain their development.

2. the responsibilities of riparian owners; their awareness of these responsibilities and how the profile can be raised.

3. responsibility for bringing forward improved flood proposals in villages where the water course has not been designated to the Environment Agency. Lambley in Nottinghamshire has been flooded repeatedly recently. The Environment Agency is not responsible for the watercourses and the Borough and County Councils are reluctant to bring forward proposals.

Paddy Tipping MP
Sherwood
August 2007

Memorandum submitted by Sir Peter Tapsell MP (FL MP 14)

Thank you for your letter dated 24th July.

I did have an exchange of correspondence with Anne McIntosh MP about the flooding of agricultural land.

However, although for each individual household which is flooded it is a disaster for the family, the scale of flooding in my constituency was fortunately in no way comparable with Hull or the West Country.

I naturally visited many of the flooded properties at the time and have since had much correspondence with the Environment Agency and my local Councils, but I do not think that I have any information or ideas to put to you that will not have already reached you from many other sources.

There is, as you will have been told, a widespread belief that drains and rivers are not kept as clear of obstruction as they were some years ago before the Environment Agency assumed responsibility for this. I have no way of checking on the truth of this.

Secondly, it has been suggested to me that modern agricultural methods, particularly because of fertilisers and new machinery, have meant that many fields adjoining rivers which, “in the old days”, were regarded as water meadows and could be used as flood plains (if locks were in place and working) now have crops growing right to the river banks. Deliberately to create potential flood plains above river from market towns such as Louth and Horncastle (in my constituency) would be deeply unpopular with farmers. This problem could, perhaps, be overcome by paying the same subsidy for “water meadows” which are kept permanently under grass for Summer grazing if the same level of subsidy was paid to the farmer as for acreage growing cereals or root crops?

Sir Peter Tapsell MP
Louth and Horncastle
August 2007

Supplementary memorandum submitted by Sir Peter Tapsell MP (FL MP 14a)

This is a good summary by a constituent of mine of the packed public meeting we had on 3 October, at my instigation, in Louth Town Hall, following the recent flooding in my constituency which I attended and which I thought you might like to see.

Sir Peter Tapsell MP

11 October 2007

All official representative at Louth Public Flood Meeting held on 03.10.07.


Further to the public meeting held at Louth Town Hall on 03.10.07 in regard to the recent floods:
At this meeting the floor was packed with local residents, many of whom remain devastated by the recent floods. We all wanted questions answered and firm promises made with confidence about the strategies that will be taken to prevent such a large-scale disaster from recurring.

Having listened to and spoken with fellow members of the audience on the floor and having put two questions to the representatives on stage myself, I have to report, through publishing this letter wherever possible, that questions were not answered and our confidence in the authorities on stage was not inspired.

In general terms the authorities seem to be resting behind a degree of complacency. For example the quote “A flood like this only happens once in 200 years” was mentioned by representatives of the Environment Agency at least twice but they made no reference whatsoever to “Climate Change”. In fact the statistics quoted have been proved to be no indicator whatsoever as we had two serious floods within two months. All informed and observant citizens are aware that the climate is indeed changing and that the predictions are that flooding is going to be a serious problem in the future. We cannot afford to be complacent and we cannot have confidence in authorities that hide behind unrealistic statistics. We need immediate action, forward planning and a lot of funding to meet the challenges ahead. We need to know that the authorities have employees with the required abilities to meet these challenges.

Some questions the “authorities” did not even attempt to answer. They just sat on stage, staring at each other with open mouths. They simply did not know what to say and had no answers. This caricature vision could have struck the audience as being very funny if the frightening reality that the “authorities” were uncoordinated and uninformed was not so deadly serious.

Clearly the “authorities” need galvanising into action. They need to do the jobs they are paid for and do them conscientiously and well. They need to be shaken out of this complacency and realise they are dealing with intelligent human beings with a lot of common sense and justifiable concerns. They need to listen to these people and instead of finding excuses to get by with not putting in maximum effort, they need to take up this campaign with zest and enthusiasm to ensure Louth is protected, as much as is humanely possible, from future flooding. They would then find it is far more rewarding to do their job well. Once the “people” know they can trust and work with the “authorities”, instead of feeling bucks are being passed and excuses made, everyone would be able to work together constructively. If employees of these “authorities” are not up to their job they should be replaced.

As a result of the meeting clear issues were raised that did not receive clear answers. These issues are as follows:

— Waterways need to be dredged regularly and need to be seen to be.
— There needs to be a central co-ordinator at times of risk of flooding.
— Additional drainage/reservoir engineering works in the Wolds to prevent surges of flood into Louth need to be funded urgently.
— Drains in Louth need to be cleared regularly with forward planning there should be no lame excuses (such as were made at the meeting) that parked cars over drains prevents this vital maintenance.
— Building on the flood plains is a hazard that has not and it not being adequately addressed. Had the planners employed even elementary common sense the plans for any hard landscaping on the flood plain should never have been passed.

In conclusion I would like to raise again the two questions I raised at the meeting which the “authorities” failed to answer.

1. I have supplied the Environment Agency with photographs of the June flooding on the flood plain building site adjacent to the canal at the end of Riverhead Road. When those buildings are actually erected and the site covered with hard landscaping, where will that flood water go in future floods and exactly what measures are being taken to protect third parties/neighbouring areas (which is a requirement in law), such as Thames Street, which at present is not at risk of flooding, but could be in the future as a result of this new development?

2. How come I got a phone call from “floodline” early in the morning and well before the flood, on the day of the flood, to warn me of imminent danger to life and property, so that I was prepared, yet the person responsible for sounding the siren which could have warned and prepared others who were not registered with “floodline”, did not know there was imminent danger and failed to sound the siren in time?

Prisca Furlong (Mrs)
Further supplementary memorandum submitted by Sir Peter Tapsell MP (FL MP 14b)

Clearly, what is needed is greatly increased capital investment to reduce the danger of inland flooding, particularly near rivers, and a centralisation of responsibility which is at present spread among too many organisations which, in the cases of both Louth and Horncastle in my constituency, seem to have had rather poor liaison between one another. Also, when I recently visited the fire station in Louth, the Chief Fire Officer for Lincolnshire told me that the fire brigade has no duty to act where flooding is concerned and that they would have gone to help in Louth earlier but had to wait to be asked to do so despite the fact they had equipment for sucking water out of the river to reduce its level.

Sir Peter Tapsell MP
October 2007

Memorandum submitted by the Rt Hon David Cameron MP (FL MP 15)

Thank you for your letter of 24th July, giving me notice that the Environment, Food and Rural Affairs Select Committee will be examining flooding when the House returns.

I am most grateful for letting me know about this inquiry, particularly because my own constituency of Witney was so badly hit during the recent floods. I am sorry for the delay in getting back in touch with you, but I have been keen to consult with both members of my local community in Witney who were affected by the floods, and also with the Shadow DEFRA Team.

Please find attached some issues that the Committee might like to consider in their upcoming inquiry.

Thank you, once again, for taking the time and trouble to get in touch with me. I hope these suggestions are useful.

Issues that the EFRA committee might like to consider in their upcoming inquiry:

— The vulnerability of our public infrastructure to flooding and the siting and resilience of key water and electricity installations (for example, Walham Power Station, which supplies 500,000 homes, was very nearly inundated).
— The impact of last year’s £14 million cut to the Environment Agency’s maintenance budget.
— Co-ordination—both at Government level and regionally/locally. Chief fire officers have commented on institutional confusion between the numerous agencies involved in dealing with floods. There appears a need for a much clearer line of responsibility for flood prevention and tackling emergencies.
— Communication between the Environment Agency, Met Office, emergency services and local authorities.
— Building on flood plains. Half the post-war building in the UK is on flood plains, and a lot of new building is destined to be so built. At present, a quarter of all planning applications opposed by the Environment Agency still go ahead. The Environment Agency was given new powers in January to refer such developments to the Secretary of State.
— The priority accorded by local authorities and the highway agencies towards the essential work of properly maintaining drains and culverts.
— The adequacy of early warning systems and information available to the public, given the specific and advance warnings of extreme weather that the Met Office can provide.
— The efficacy and location of temporary flood barriers (there were reports that the Environment Agency was unable to install vital flood defences because they were stored too far away from where they were needed and got caught in the general chaos that made the roads impassable).

Rt Hon David Cameron MP
Witney
September 2007

Memorandum submitted by Clive Betts MP (FL MP 16)

I received a letter from the EFRA Committee Chair, Michael Jack, at the end of the Parliamentary session with regard to your committee’s forthcoming enquiry into flooding, as my constituency has been affected. The following are issues of general relevance which have arisen out of the floods which I believe would benefit from investigation.
1. DIVISION OF RESPONSIBILITY

The division of responsibility for drainage between local authorities, the Environment Agency and water companies needs to be examined. Flooding problems in an area can often be due to a combination of different factors for which different authorities have responsibility and it is often not precisely clear who is responsible for what. There may even be some matters for which no-one appears to have responsibility. In general there is no overall authority which can act as the lead co-ordinator. This is an issue which was raised with me very strongly by officers of Sheffield City Council and one which I think requires further investigation.

2. POWER STATIONS

The siting of electricity sub-stations near to rivers needs to be examined. One of the problems in Sheffield was caused by the flooding of the Neepsend power station and others were at significant risk. This could have led to sections of the city being without power for several days if floods had been even marginally worse.

3. INSURANCE

(a) Many people in low income households appear not to have had insurance. It was obviously right to try and provide assistance to them but, where assistance is offered, should it only help those who did not have insurance? In the longer term does it not then discourage people from taking out insurance? On the other hand, should state funds be used to help people who have their losses covered by insurance?

(b) Most companies that I came across had insurance but many were not insured to replace older equipment damaged in the floods beyond repair with new equipment, which was the only replacement available. Also a great number of firms were not covered for loss of business and many of them were closed down for several weeks, during which time they received no income, and there could possibly be a knock on effect in that loss of customers could become permanent. The whole issue of insurance for loss of business is one which I think needs investigating and hopefully given some publicity.

I hope this is helpful to the Committee's enquiry.

Clive Betts MP
Sheffield Attercliffe
October 2007

Memorandum submitted by Norman Baker MP (FL MP 17)

Thank you for your letter dated 24 July regarding your Select Committee’s inquiry into flooding. I welcome the opportunity to share with you my ideas for what aspects of current flood prevention/defence policies are working and where they need to be reviewed.

The Associate Parliamentary Group on Flood Prevention last met in April 2007 when representatives from the Environment Agency and the Department for Communities and Local Government gave a presentation on Planning Policy Statement 25, which aims to ensure that flood risk assessment is made an integral part of the planning application procedure.

I have divided this submission into the four sections I believe are in most need of attention: government spending, the points system, planning and lessons learned from the floods this summer.

GOVERNMENT SPENDING

The Committee is encouraged to consider:

— Whether the recently announced increase in spending on flood management and prevention is sufficient, particularly in light of recent events.
— How available funds should be spent.

The Group welcomes the Secretary of State’s announcement to the House on 2 July 2007 that spending on flood management and prevention would be increased from £600 million in 2007–08 to £800 million in 2010–11. However, whilst it is not yet clear when or how this funding will be allocated, it is clear that the level is still not enough to protect the UK. The cost-benefit ratio of government spending on flood defences would appear to be enormous; the money put in is more than repaid by the avoidance of floods and I would encourage your Committee to consider this aspect. Taking the recent floods as an example, the Association of British Insurers has estimated the costs to the insurance industry alone to be in the region of £3 billion.
This figure is four times that committed by the Government for future flood management and prevention, and I therefore believe there needs to be a realisation that government spending on flood defences is money well spent and does reap benefits in the future.

I look forward to hearing further detail about how and where this increase in government spending will be spent. For example, what does the Government believe constitutes as a flood defence, and what constitutes as its maintenance? I look forward to seeing a timetable outlining when this money will be invested, and believe the urgency illustrated by the adverse weather conditions this summer requires it be spent sooner rather than as the three years is coming to an end.

In response to a Parliamentary Question (PQ151147, 26/07/07) regarding progress made on flood defence schemes announced for construction in 2006–07, we have learned that of the 33 schemes announced with a construction spend greater than £250,000, only 13 have been completed or are likely to be completed in 2007. In his reply the Environment Minister, Phil Woolas MP, stated that “the overall programme of flood and coastal erosion risk management works is prioritised on an annual basis in the light of demands on the system and the budget available”. This statement causes some concern, and I believe the Committee should inquire as to what assurances the Government will give that the backlog of schemes will be carried out as a matter of urgency, and that future schemes will be carried out on time. This point was echoed by Members in a Westminster Hall Debate on 11 July 2007, including by myself, when concerns were raised that Government promises made in 2000 and 2003 in reaction to flooding, were no longer kept once the issue had fallen out of the public’s mindset.

POINTS SYSTEM

The Committee is encouraged to consider:

— Whether the present points system is the correct means of allocating funds for flood defences and whether alternative systems should be considered.
— How smaller communities can be better protected from flood risk.

As highlighted in the National Audit Office report entitled “Building and Maintaining river and coastal flood defences in England” (published on 15 June 2007 prior to the severe floods), the points system by which helps the Environment Agency to decide which schemes should receive funding for flood spending is recognised as complex. The current system is based on three key components (economic, people and environment) with a maximum award of 44 points. This scheme attributes the same importance to the number of people and homes protected, as it does to the creation or improvement of existing wildlife and the protection of the existing conservation designated areas. Undoubtedly the protection of the environment is extremely important; however I believe further examination is required as to whether it should be deemed at the same level of importance as protecting life or property.

Additionally it could be argued that the present system is unfairly weighted against smaller communities. My constituency in Lewes suffered severe flooding in 2000. It caused devastation with hundreds of people driven from their homes and the financial centre of the town left in ruins. Lewes was divided into six cells and seven years on, only one of the six cells has seen adequate improved flood defences provided. The Cliffe area in the middle of town, the financial and shopping centre, has not been protected because the points system has determined that too few people live there. It has not made any allowance for the fact that the whole town depends on the prosperity of Cliffe. This is a disgrace and further supports the need for this system of funding allocation to be reviewed.

PLANNING

The Committee is encouraged to consider:

— Whether planning authorities should be able to ignore Environment Agency advice on new developments and, if so, what conditions should be put on mitigating flood risk on such developments.
— Whether flood risk can be reduced through better property design and whether tighter standards should apply.
— Whether HIPs should have a greater role to play in warning home buyers of potential flood risk.

In December 2006, the Government published Planning Policy Statement 25, which made the Environment Agency a statutory consultee to ensure that flooding would be taken into account in the planning application procedure. The Government should be congratulated for ensuring flooding is an integral part of the process. However under PPS25, the “exception test” allows planning authorities to effectively ignore the Environment Agency’s advice if the benefit of development is deemed to outweigh the risks of flooding.

In addition, it is clear that one of the Government’s top priorities is building for a sustainable future. However, what is not clear is where this building will take place and at what cost environmentally. Aside from the risk of building on flood plains, a significant flood risk remains in modern house building.
standards. The fashion trend has changed over the last decade or so to have smaller gardens, paved driveways and conservatories. All of these features post a significant risk to flooding, as surface water has nowhere to drain away. The Government needs to take this into account when it considers its future plans.

On 1 August 2007, the Government’s long awaited Home Information Packs came into force for properties with four or more bedrooms. Stepping away from the political debate, it is disappointing that a “flood” search, in respect of river and coastal flooding, is only part of the voluntary Home Condition Report element of the pack and I believe this is an important piece of information that homeowners have an automatic right to know when they are purchasing a house. In addition it is disappointing to see that only Environment Agency maps can be used within the flood report element of the Packs. Other information is available on the market, both from the insurance industry and other independent organisations, and it is therefore unclear why the Government has taken this decision.

LESSONS LEARNED FROM THE FLOODS IN JUNE AND JULY 2007

The Committee is encouraged to consider:

— The potential dangers caused by small watercourses.
— The effect of overburdened sewers and traffic calming measures on flood water.
— Flood-compatible building materials.

Some of the areas hit by flooding during the summer of 2007 had already been fortunate enough to benefit from effective flood defences from the major rivers but were nevertheless profoundly affected. This was in many cases as a result of flash flooding from extremely heavy rain on the catchment areas of normally very small watercourses. The Group would therefore like to encourage the Committee to look into ways of protecting buildings located near relatively minor watercourses from flash flooding and, in hilly areas, from potentially devastating landslips.

Another aspect worthy of the Committee’s consideration is the exacerbating effect on flooding that comes when surface water drains and sewers cannot cope with the volume of flood water and the potential for adapting these systems in flood-prone areas. Similarly, some traffic calming measures, such as sleeping policemen, also had an unexpected, adverse “damming” effect on water flow.

Finally, the Group believes that it would be helpful if the Committee looked at the potential for using “flood-compatible” building materials in new construction projects in flood prone areas, such as paving materials that are porous and underground storage systems that are far more effective than conventional soakaways.

In conclusion, I would like to congratulate your Committee for holding this important inquiry. It is clear that the summer floods of 2007 have raised the profile of the issue to the top of the Government’s agenda, and pressure should be applied to ensure this is where it remains.

I hope this is helpful.

Norman Baker MP
Lewes
Chair, Associate Parliamentary Group on Flood Prevention
September 2007

Memorandum submitted by Rt Hon David Heathcoat-Amory MP (FL MP 18)

I write in response to your forthcoming report on flooding and land drainage. I represent the North Somerset Levels which adjoin about five miles of coastline on the Bristol Channel. We are vulnerable to flooding both from the sea and from rainfall which can overwhelm the drainage system on the Levels. Large parts of the Somerset Levels are actually below the mean sea level.

Some farmers in areas designated as SPAs receive enhanced payments to keep the water table up for a defined period of the year. This control regime only works if the drainage ditches (or “rhynes”) are properly maintained and if surplus water can be pumped into the larger drainage rivers at times of high rainfall. These rhynes are the responsibility of the local drainage boards and the system works reasonably well.

The Environment Agency is responsible for the rivers into which the rhynes discharge. It is here that the problem arises. In recent years the EA has regarded this drainage network as primarily an environmental resource. The rivers are not being properly maintained and weed growth is not adequately cleared. Overhanging trees are allowed to grow along the banks and, if they fall over in flood conditions, they can block the rivers, which are often narrow.

I have had several meetings with the local EA recently and it is clear that they regard their flood prevention duty as being to protect larger urban areas. However many of my constituents live in the rural areas at risk and are already finding it difficult to obtain flood insurance. Certainly if Somerset had experienced anything like the heavy rainfall seen further north in July, the result would have been extremely serious.
The risk could be substantially reduced if the EA rebalanced its duties and took more seriously its obligation to maintain the drainage network which is the result of centuries of work and is now threatened. Perhaps the fundamental problem is that the EA has an unresolved conflict of interest between its environmental and land drainage functions. I can provide you with further information from those with expert knowledge in Somerset or can I invite your committee to visit the Somerset moors and levels to see for yourselves.

I understand that the EA is to take on additional coastal defence functions which would make the Agency even larger and more unwieldy. May I suggest that your committee takes a careful look at whether it is appropriate to put all these different responsibilities under one agency, particularly as some of them conflict.

Rt Hon David Heathcoat-Amory MP
Wells
October 2007

Memorandum submitted by David Kidney MP (FL MP 19)

You wrote to Members in the summer to ask us for our experiences of the flooding that affected many parts of the country this summer.

In Stafford constituency, I conducted a survey of residents in areas that had last been badly affected by flooding in the year 2000.

I enclose a copy of the report that I have produced as a result of that survey (Annex A).

My reading of the responses suggests that, second time around, people are more aware of the causes and effects of flooding and they expect a more comprehensive, proactive and mature approach to coping with the danger of flooding from the relevant agencies, including local authorities.

After the 2000 floods, I secured a number of significant investments in improved drains and flood prevention measures. In areas where there were new protections in place this summer, there were fewer incidents of water entering people’s homes.

What this tells me is that there is a need for (a) a much more focused approach to works of adaptation; (b) a precautionary approach to any proposed flood plain development, with the onus on the developer to show a positive flood prevention outcome otherwise the development should not be permitted; and (c) better co-ordination of the services that residents need in respect of advice on measures to protect their individual properties, flood alerts and who to call for emergency help (and the response to such calls, such as providing sandbags, closing roads and pumping out water).

I hope this is helpful.

David Kidney MP
Stafford
October 2007

Annex A

SURVEY OF FLOODING PROBLEMS IN STAFFORD—JULY 2007

Summary

1. Majority of all the people who responded to the questionnaire felt that the cause of the flooding was the development of housing estates on the flood plain areas. Further developments of this type must be stopped.
2. That drains, manholes etc are not cleaned or inspected regularly enough.
3. Brooks, streams and watercourses are not dredged and cleared and are dumping grounds for fly tippers.
4. Regular inspection of highway drains should take place to ensure that there has been no collapse of them due to large vehicles and extreme traffic.
5. That agencies need to get together to sort out the issue of flooding before it becomes worse.
6. Farmers should be encouraged to maintain land drains and clear ditches.
7. Roads should be closed if they become flooded. Consideration should be given to people and homes in these areas.
8. Attention should be given to Sewage Pumping Stations when heavy storms are forecast to ensure that they cannot fail and sewage in gardens, homes, roads etc do not occur again.
**Flooding Questionnaire of July 2007**

**Methodology and results**

As a result of the prolonged violent rainstorms during June/July 2007, David Kidney MP sent 3991 questionnaires to residents living in Stafford Constituency where flooding has resulted in the past. This was done to evaluate the current impact of flooding in these areas.

The areas that received a letter and “flooding” questionnaire were:

<table>
<thead>
<tr>
<th>Area</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doxey</td>
<td>Doxey Road, Great Haywood (Main Road), Little Haywood (Main Road), Colwich (Main Road)</td>
</tr>
<tr>
<td>Haywoods</td>
<td>Newport Road (No responses were received from this area. This may have been due to the fact that Newport Road was closed to traffic during this period, which would have helped the flooding problems.)</td>
</tr>
<tr>
<td>Rising Brook</td>
<td>Including (Wolverhampton Road, Brook Glen Road, Hawskmoor Road)</td>
</tr>
<tr>
<td>Sandon Road</td>
<td>Including (Peel Terrace, Victoria Terrace, Albert Terrace, Tenby Drive, Coronation Road, Fonthil Road, Bertelin Road, Oxford Gardens, Frinton Close, Charnley Road, Peter James Court, Sandon Mews, Chesham Road, The Haybarn, Fairfield Court,)</td>
</tr>
<tr>
<td>Silkmore Lane</td>
<td>Including (Meadow Way, Meadow Road, Exeter Street, Rickerscote Avenue, Pioneer Way, Silmmore Crescent, Prospect Place, Lancaster Road, Hall Close, The Rockeries, Rickerscote Road, Old Rickerscote Lane, Mallard Avenue)</td>
</tr>
</tbody>
</table>

Of the 3,991 questionnaires sent to the areas mentioned above 345 people responded (8.64%). A minority of the forms were returned stating that the flooding had not affected them.

While some resident’s homes or gardens had been directly affected by water, many people who responded were affected by the flooding due to road closures, public transport cancellations etc.

**Doxey—Resident’s comments on the flooding situation in Doxey are summarised as follows:**

- Recycling Point at Sainsbury’s was flooded by several feet of water which caused skips to float around like boats. This situation continued into August.
- Flooding in 2002, River Sow backed up at Doxey Road Bridge, flooding road. Water re-entered river over grassy bank next to Conservative HQ. Recent work on cycle path next to river, this grassy area has been used to distribute the surplus earth thus raising its level and creating a “dam”. Concerns that this now puts homes nearby at greater risk of flooding in the future.
- Sewers smelt badly in the Castletown area.
- Fears that development on the Railway Inn pub site will be more than the old sewage system can cope with.
- Future plans to build on Sainsbury’s Long stay car park is folly given the times it floods, displacing flood water nearer to existing homes.
- The River Sow has been allowed to “silt up” banks have increased reducing flow. Reeds and debris need removing. Regular checks made on its condition throughout its length through Stafford.
- Planners allowed to develop on flood plains have caused these problems.
- Signage needed when Sainsbury’s car park is flooded informing people. Also signage on M6 informing people that Long Stay Car Park is closed.

**Haywoods**

- Mill flooding problems known by Severn Trent and Stafford Borough Council, but still houses are being permitted to be built.
- Ensure that all streams/water courses/ditches are kept clean and dredged at least once a year.
- In 1960s Water Authority used to dredge rivers regularly, silt that built up was used to build up banks, rivers flowed more freely. The water was managed into flood plains like Radford and Baswich. This does not happen now. The river backs up from Radford Bank to Penkridge putting thousands of acres out of use and homes/businesses in danger.
- For the first time in 60 years Baswich Lane at St Thomas Mill (now being developed into homes) closed due to 1’ water.
- Dredge rivers again, manage water like it used to be!
Government to blame too many immigrants so more houses needed, more concrete, more tarmac roads (using food producing land) — the fields act like sponges holding vast amounts of water which seeps away slowly giving drains more time to work at intended.

Not seen a dredger at work for 50 years — so come down heavy on water authority which should be run as a non-profit making concern by the Government.

Rising Brook

Live 40 yards from Severn Trent new flood alleviation tank, which according to their engineers is about as much use as a “chocolate” fireguard.

Work done after flooding in 2003 to put tank in, groundwork has left land at the back of 94 Rising Brook raised so the natural drainage does not take place.

Sandon Road

Money should be spent on preventative measures — this seems to have been done locally and is an example to rest of the UK.

Drains in the area seem to be redundant — drainage seems to be a big part of the problem.

Brook along the back of homes carries storm drain excess, responsibility for this is not known? Fly tipping causes increased risk as water does not flow freely.

Sandon Road/Peel Terrace nicknamed “Little Venice” due to it flooding so frequently.

Speeding cars through flood water showers the water against front doors, causing more problems for home owners. Roads should be closed when road is flooded.

Drains in Sandon Road seem never to be cleaned.

Request for Culvert to be dug/dredged deeper.

Drains do not work in Fonthill road, gutters are lower than the drains, drains higher than gutters, water cannot go down the drains easily, stays in gutter until evaporation.

Above problem seems to have been created when road and pavements were resurfaced.

Comment that concrete went down the drains at time of resurfacing and set!

Roads should be regularly cleaned.

SBC were responsible for the brook now another agency, in previous years vegetation allowed to become intense. Clearing brook would reduce the risk of flooding.

By raising the level of some roads eg. Doxey Road, Sandon Road, Silkmore Lane, Mill Bank, this would then prevent these roads being closed during flooding.

Floodings always occur in same areas of Sandon Road in heavy rain. Poor service from council for high council tax.

Floodings on Sandon Road near Shell Garage always happens. Must be a known problem but nothing is done about it.

Floodings on roads where a high level of traffic movement should not be allowed. These roads should be closed.

Work carried out on Sandon Road in the past seems to have made problems worse.

Future problems perceived in future with brook overflowing on Astonfields Road and Peter James Court.

People at 357 Oxford Gardens fly tip which was reported to Phil Gammon, SBC but nothing was done about this.

Static brook at the bottom of garden which after heavy rain overflows and floods the garden.

Brook causes Sandon Road/Crooked Bridge Road to flood is not kept clean. Should be kept clean from Sandon Road to Queensway this would help flooding.

Garden under water since June 4’ deep due to old stream bed becoming flooded.

Bring back the Road Men that cleaned out the ditches and drains.

Building more houses but now the sewers needed for them.

Pleased that improvements along the lower part of Sandon Road at junction with Corporation Street seem to have worked. Eternally grateful for this. Balancing pools clearly working, just petrol station area still a problem.

Don’t allow construction of new premises without a full impact study.

Floodings in Sandon Road caused by housing constructed on the Lotus site.

Town drains must be cleared of debris if similar situation is to be avoided in the future. Cost cutting on maintenance is not an option.
Housekeeping on the brook is needed, also balancing lakes behind Sandon Road, vegetation needs attention, good for wildlife no good for humans.

— Serious look at the drainage system in Sandon Road is badly needed.

— Severe rainstorms makes for flooding in the area even though improvements were made to the culvert running under the road. Feel angry that as a ratepayer do not get value for money.

— Due to flooded roads pavements disabled scooter user was housebound for five days.

— Drains between Anslow’s Butchers and Fish and Chip shop drain very slowly in heavy storms.

— Drains at junction of Sandon Road and Fairfield Court do not seem to work properly.

— Slight dip in the road near the petrol station causes water to collect. Cars drive fast through this spraying pedestrians and school children on pavements.

**Silkmore Lane**

— Silkmore Lane road is low lying, causes water to hang. Very busy road emergency vehicles had difficulty during floods.

— Concerns over treeed behind 80 Silkmore Lane, overhang gardens 50–60’ high branches break off. Branches also cover street lights. Path at the rear is now overgrown and youths hang around there.

— Sow & Penk Board made reference that tributary drains are not maintained by them, this affects the area increasing the depth of silt build up.

— Environment Agency stated that the development at the end of Exeter Street had been factored into calculations and that flooding would not be significant due to the development. As a condition of this development a wetland was created by lowering a piece of land to the NW of Meadow Road. This has not worked as my home 156 Exeter Street was surrounded by flood water.

— Radford Meadows, development in Pioneer Way, Meadow Close, Old Rickerscote Village, Prospect Place have caused flooding problems which have now increased.

— Rarely see grid/drain cleaning vehicle in the area.

— Leaves and debris from trees etc block the drains and more attention should be paid to them.

— Drains in Silkmore Lane and surrounding areas overloaded.

— Stop builders from building on brown field sites known to flood.

— Trapped in home due to flood could not get out of home on foot or by car.

— DO NOT BUILD ON FLOOD PLAINS.

— Further housing on the flood plains will undoubtedly cause additional flooding problems in the region.

— Clean ditches behind houses on Prospect Plant of reeds and sludge on an annual basis.

— Council looked into turning part of the Marshland into a lake many years ago, but did nothing because of cost, could this proposal be initiated again?

— Severn Trent have failed to clean the Penk Drain at the rear of 121 Rickerscote Road over the past years. Previous clearances have resulted in the creation of a high bank on one side of the drain. This causes floodwater to be forced into garden because of the natural flood plain is obstructed.

— Concrete works and Freedom Caravan site forcing water to go other places than it did previously.

— Lived here 21 years in Meadow Road until this year never flooded before.

— Sewage pumping station bottom of Meadow Road broke down during the floods and sewage escaped into the brook and South End field. The smell in the houses and around the area is disgusting. South End football field is brown from sewage.

— People caused traffic jams coming to look at the flooded area.

— Work should be done on the brook bank to sort it out and help alleviate flooding.

— Sort out the sewage/drainage plant to help with flooding and blocked drains as they smell when flooded and it is really dreadful.

— Manhole at the back of 57 Silkmore needs to be made bigger to take away sewage. Back entrance from Pioneer Way needs to be tarmaced instead of soil which was promised by house builders.

— Make sure any flood prevention methods used to not transfer water to someone else’s backyard. Eg. Barratt Homes built on sitet in Silkmore Lane, the water is now pushed from that site to adjoining properties.

— New flood prevention measures through Stafford probably causing heavier flow down stream to where rivers join near Baswich are and flooding occurs.

— Queens Court was like an island surrounded by water, the smell was awful.
Recent development in Silkmore Lane resulted in ground level being raised by a metre. This area always flooded in the past, now it does not and the water goes onto the flood plain or towards Stafford town. Floods were of unprecedented heights at the back of my home for the time of year don’t know how the wildlife coped. Accessing work in centre of Stafford was impossible due to road closures and traffic chaos ensued. Amazed in 2007 that town like Stafford has a problem. Parties should consult something, can be done but won’t be cheap or easy but is possible. Study what has been done overseas and apply it here solve a very sever problem and fee up a great deal of currently useless land for practical purposes. Start dredging the rivers again to give flood water more depth. In past rivers could be 10–15’ deep in the centre, not only 5–6’. Flooding I feel was worse because brook under Silkmore Lane has not been cleaned out. Field opposite the lane also use to have a ditch running through it but it is full of silt and rubbish. Drain cover outside 110, 112 and 114 Rickerscote Road higher than the road level. Causes water to collect and pond. Camera survey would discover why drains cannot take the water as they should. Three properties at right angles to my home 8 Prospect Place have “cess pits”.

Sewage Pumping station needs relocating or protecting to ensure it does not fail again. Sewage still around the street stinking two weeks after this happened. Knock down all the houses that have been built on the flood plains. Developer’s assurances over flooding history of area that extreme measures had been taken to prevent this were Useless words.

Could water up stream be held back? On septic tanks would help flooding if we could go on main drain. 151 Rickerscote Road. According to Flood Line I am in a flood danger area. Interesting information given the fact that over the past seven years building of houses has been taking place on the flood plain adjacent to my street. Dig out the whole area so the water has somewhere to go. Flood plains have very fragile eco-systems that need to be protected at all costs both for the environment and local wildlife. Hope an acceptable compromise can be achieved in protecting homes with this in mind. Waited days for Severn Trent to disinfect the area. Rang giving reference number each day they seemed to have no record of my previous calls, kept being given new reference number. Agencies need to take a tougher stance on building with the flood plain area.

RESULTS OF QUESTIONNAIRE SURVEY ON FLOODING

Results in detail

Doxey (6 people responded)

“Did the flooding affect your home”?—6 people answered no. One person had 2’ water in their cellar.

“Has your home flooded in the past?”—6 people stated no. One person said yes in October 2000.

“Did damage occur to either their home/garden/property”—6 people said no. One person said contents of cellar damaged.

“What help did you receive?”—2 people said had no help but contacted the council.

“Were your roads affected by flooding”—all 6 mentioned Doxey Road, and Doxey Road at the junction of Castle Tavern and the Sainsbury Car Park.

“Do you feel that the manholes are blocked”—One person said yes that Doxey Road Drains were full of litter. One person said yes but did not specify which. 4 people said No.

“Did you contact any agencies or monitor situation?”—4 people contacted the Flood Warning Line, 2 Stafford Borough Council, 2 Staffordshire County Council, 3 the Environment Agency, 2 Severn Trent, one person did not contact anyone.

“If you answered Yes to the above was the help/information given to you helpful?” Pre recorded flood message was helpful. 3 people said the help was not good, one received call about the flooding after it had happened, 2 people said that there was a shortage of sandbags which they needed.
Haywoods (22 people responded)

- “Did the flooding affect your home?”—20 people stated No to this question. One said there had been five major floods over the past years. One person said flood water and sewage were up to their gate. No one mentioned their house being flooded.
- “Has your home flooded in the past?”—20 people answered no to this. One person said yes whenever there is heavy rain.
- “Did damage occur to either their home/garden/property?”—20 people said No.
- “What help did you receive?”—No one answered this question.
- “Were your roads affected by flooding”—5 people said Mill Lane was flooded. One person mentioned Coley Lane, 2 said Bishilton Lane and Meadow Lane were flooded. Also the road from Great Haywood to Tixall was flooded.
- “Do you feel that the manholes are blocked”—8 people thought drains were blocked. Manhole at the bottom of St Mary’s Abbey is always blocked. One drain near the Lock House Restaurant seems blocked. Drains blocked both sides of the Main Road in Little Haywood near Heather Brae. 9 people felt that there was no problem with the drains.
- “Did you contact any agencies or monitor situation?”—14 people answered No to this question. One person contacted Severn Trent.
- “If you answered Yes to the above was the help/information given to you helpful?”—Severn Trent have been helpful in the past.

Rising Brook—(21 surveys were received completed)

- “Did the flooding affect your home?”—8 people stated that their homes had been affected, mentioning 2 sewage drains lifted, sewage went over garden. The rest stated that their gardens had flooded. No one mentioned their homes flooding.
- “Has your home flooded in the past?”—6 people responded, one mentioned front garden flooded, one said cellar had.
- “Did damage occur to either their home/garden/property?”—6 people answered. One said their fence had gone over, one said raw sewage had killed lawn and plants, one that their lawn had been damaged.
- “What help did you receive?”—6 people completed this section. Severn Trent hosed and disinfected garden, 2 said that they had contacted David Kidney’s Office and got help from a member of his staff, One said they had no help, one said they had cleaned up themselves, another mentioned help from Severn Trent.
- “Were your roads affected by flooding”—17 responses. 6 people said there road had not been flooded. 2 said Brook Glen Road Flooded. The rest mentioned Silkmore Lane.
- “Do you feel that the manholes are blocked”—8 responses received. Rising Brook manholes overflowed. 76 Brook Glen Road, manholes outside neighbours filled up. 42 Brook Glen Road manholes back house seemed to be filled up. 9 people answered No to this question.
- “Did you contact any agencies or monitor situation?”—13 People answered No. 2 People said they contacted Severn Trent, (one was told nothing could be done until it stopped raining, one said it was beneficial). Two people said they contacted David Kidney’s Office for help.

Sandon Road (100 returned the survey sheets)

- “Did the flooding affect your home?”—8 People stated that their gardens had flooded—one mentioned that they had also had sewage in their garden.
- 15 people responded to the question “Has your home flooded in the past?” Of these 15 people only two actually mentioned water in their home, which was cellar flooding.
- 13 People said that “Did damage occur to either their home/garden/property?” Water and sewage on garden damaging plants, water stayed on bay window causing a leak, electricity tripped, garden produce lost, dog was ill, had to lay a new lawn were all mentioned in this category.
- “What help did you receive?”—10 people answered this question. One had no help, only from neighbours, two mentioned a roofing specialist for their window, one said that Severn Trent had visited but had not received help.
- “Were your roads affected by flooding?”—84 people responded of which 2 said their road had not been affected. The others mentioned, Sandon Road, Fairfield Court, junction of Peel Terrace and also junction with Charnley Road.
— “Do you feel that the manholes are blocked?”—38 answered Yes to this question. They mentioned drains/manholes at Sandon Road by Shell Garage, Albert Terrace/Corporation Street/Sandon Road junction. Drain outside 27/28 Charnley Road, 142 Sandon Road to Astonfields Road, drains seem blocked. Person at 276 Sandon Road says weeds are growing out of the drain. 11 people responded by saying they did not know if any were blocked.

— “Did you contact any agencies or monitor situation?”—10 people said they had made contact either with Severn Trent, Environment Agency, Stafford Borough Council, Staffordshire County Council or Monitored Flooding through Floodline. 48 people said they had not contacted anyone.

— “Was it helpful?”—6 people answered this question. One said the help was a waste of time, one said that the help was very professional and helpful, one said that the information given was helpful, one person said they had checked the “flood warning line”.

Silkmore Lane (167 people responded)

— “Did the flooding affect your home?”—48 people said there gardens had flooded, some within 6’ of their home, others said within metre of doors. One person said that the water was thigh deep over their pathways. 114 stated No to this question.

— “Has your home flooded in the past?”—19 people answered this question, some saying that this is the first time flooding in 15 years. Someone said last time was 7 years ago. Garage has flooded before 4–5 times. Garden has flooded in the past but not as severely. If it rains heavy garden floods.

— “Did damage occur to either their home/garden/property?”—42 people said some damage had occurred. One person had car damaged. 2 People said Garden Shed had been damaged. One said septic tank had been damaged. One conservatory was under water. Garage and downstairs toilet/floor damaged. Branches fell of tree. Garden tools, garden plants, lawns damaged.

— “What help did you receive?”—34 people answered this question. 10 people said they either had received no help or did not require any. 18 received sandbags from either SCC or SBC. Comments made that SBC were late delivering them. Severn Trent gain help to one home week after the floods. 2 people received help from family/friends/neighbours. 2 people said had help from automated flood warning line.

— “Were your roads affected by flooding?”—158 answered this question. 130 stated Silkmore Lane was badly flooded. 12 People said Meadow Way was flooded. Others mentioned flooding in Pioneer Way, Brook Glen Road and various combinations of these with Silkmore Lane. Also Rickerscote Hall Lane.

— “Do you feel that the manholes are blocked?”—71 people responded of which 2 said they did not know if the drains were blocked. Other mentioned 59 Silkmore Lane drain on back track? Drains blocked at the back of 73 Silkmore Lane, drains at 34 Meadow Road seem blocked. Drains along Silkmore Lane seem to be blocked. The first drain inside Meadow Road seems blocked. Sewage coming from drains at bottom of Radford Bank. 61 Silkmore Crescent, manholes at back of property seem to be a problem. Manhole near 18 Pioneer Way was overflowing. Drains at Rickerscote and junction of Pioneer Way look blocked. Poor drainage at Milford fields. Drains opposite Prospect Place and those at the junction of Exeter Street don’t seem to function correctly. Drains in the service road at the back of Silkmore Crescent seem to be a problem. One person said the drains in Exeter Street seem permanently blocked. Meadow Way appears to have overloaded drains and manholes.

— “Did you contact any agencies or monitor situation?”—37 people contacted various agencies. One person said it was a few days before anyone came. 19 people contacted the automated flood warning line. 12 contacted the Environment Agency, 23 people contacted Stafford Borough Council, 25 people contacted Staffordshire County Council, 11 people contacted Severn Trent. 100 people said that they had not contacted anyone about the flooding.

— “If you answered Yes to the above was the help/information given to you helpful?”—20 people responded. One said they were not informed as to when the flooding would peak. Excellent under the circumstances. Staffordshire County Council were helpful, Stafford Borough Council less so. Flood Warning Line was useful. Stafford Borough Council gave inadequate service, flood warning line was useless information. Telephone number given, next day leaves cleaned up. Few days before anyone came.

David Kidney MP
Memorandum submitted by John Maples MP (FL MP 20)

I would like this letter to be a formal submission to your committee in its inquiry into the recent flooding.

My constituency of Stratford-on-Avon was badly affected by the July floods, as it was in 1998. This year some 2,000 properties (including mobile homes and caravans) were flooded. The cost of repair work runs into tens of millions. Some properties will become uninsurable against this risk. I have been in discussions with both the District and County Councils and hope soon to have a meeting with the Environment Agency.

There seems to be no clear overall responsibility for flood preventions and defence. Many agencies seem to be involved including the Environment Agency, Severn Trent, the County Council, the District Council and possibly individual landowners. We all think that the Environment Agency should be given the lead agency role in co-ordinating flood prevention and defence. Some agency needs to have this role and the EA seems the most appropriate. Much is already their direct responsibility and they seem best placed to perform this role.

At my request, the District Council is compiling a comprehensive catalogue of property damage in the July floods and the causes of the flooding in each case. Large areas of some towns were flooded, damaging large numbers of properties, but at the same time there were isolated local floods affecting very small numbers of properties. We think that we now need an analysis of what flood defence and prevention measures could be taken, what they would cost and how much property damage they would save in relation to each flooding incident. We would then need a flooding frequency estimate to enable a cost benefit analysis to be done in each case.

The local councils cannot afford to undertake this work, though they could commission it if funded by the government to do so. I suggest that the government commission and finance such studies of all areas flooded in July. Without this, it will be impossible to assess what can be done to prevent future damage. I imagine that quite a bit of this work will already have been done.

In Stratford, we have had two “one in thirty year” floods in nine years. The frequency estimates clearly will need to be revised if accurate cost benefit analyses are to be done. Such analysis would then enable us to assess what is practical and cost-effective and then to priorities projects.

I also feel that the issue of development on flood plains needs to be addressed. With flooding becoming more and more frequent it is essential that we do not build houses that are going to flood.

I have raised these points with the Secretary of State and attach a copy of my letter. I look forward to seeing your committee’s recommendations.

John Maples MP
Stratford-on-Avon
October 2007

Letter to the Secretary of State for Environment, Food and Rural Affairs from John Maples MP

I have recently met with representatives from both Warwickshire County Council and Stratford on Avon District Council to discuss the recent flooding which damaged over 2,000 properties, each with an estimated cost of between £10–£40k.

Both Warwickshire County Council and Stratford on Avon District Council have agreed that the Environment Agency needs to take a lead role in the co-ordination of flood prevention. At the moment there seems to a lack of clear responsibility for any flood defence work, and I, like many fear that this could result in another flood, especially in light of climate change. To really be able to examine the current situation, and to be able to plan for the future it is necessary for a study to be conducted looking at: what areas are at most risk; what can be done to prevent future damage; the cost of such schemes; and the cost effectiveness of such projects. At the moment neither Warwickshire County Council nor Stratford on Avon District Council is able to fund such a vital study and therefore it would require a government grant. Warwickshire County Council would be willing to help co-ordinate the other authorities, however they feel that the Environment Agency would be the best authority to be the overall lead on such a project.

I would also be grateful if you would agree to meet with a delegation of Warwickshire MPs to discuss the effects that the recent floods have had on the area, as well as to discuss proposals for the future.

I look forward to hearing from you.

John Maples MP
October 2007
Written evidence

Memorandum submitted by Dennis Woodman (FL 01)

NFCDD: National Flood and Coastal Defence Database

1. “Alan Gairns, head of property insurance at Royal & Sun Alliance, who also leads negotiations with the government on flooding on behalf of the Association of British Insurers, told The Sunday Telegraph: ‘There’s a National Flood and Coastal Defence database that the Environment Agency has constructed which has details of all flood defences, when they were built, when they were inspected, what condition they’re in. That’s the information we’re trying to get—which we believe we’re entitled to under the terms of our existing agreement.’”—Sunday Telegraph, 8 July 2007.

2. The NAO in its recent report on flood defence management, predating current events, says:

   “2.13 The asset data base was designed as a place to store asset location and condition information . . . It is not a work management system so maintenance . . . records of completed work are kept by area on paper based records.”

   “2.14 We found various problems with the operation of the asset database . . . (Agency) staff commented on the difficulties they had down loading information . . . the system can still fail when large volumes of data are extracted . . .”

   “2.15 . . . the reporting tool only enables the Agency to report separately on structures and defences so it is not possible to produce a definitive list of systems not at their target condition.”

3. As a member of the public I asked the Agency for access to the database1. I may be one of the first individuals to do so. I was given access to a terminal at the Thames Barrier. Staff commented on the limited scope of the database. It can only record two (jpeg type) images per defence. It does not log riparian planning applications, so Agency staff cannot call up flood defence matters on which they may be required to comment. In fact I could not view any data on my visit. The system routinely crashes in the lunch hour, when Agency staff, off site, attend to administration unconnected with the database.

4. There is a good degree of public awareness of the database but it is of little use to third parties. There is mismatch between expectation and provision. I invite you to ask that some of the promised increased flood defence funding is allocated to upgrading the database and its servers.

Dennis Woodman

July 2007

Memorandum submitted by Peter Collier (FL 02)

Taking advantage of this opportunity to put my comments in, I have to say we here on the Waddon Estate had only one small flooding/lake which was caused by the failure of a drain, not being previously cleaned, but when cleaned the flood water soon disappeared, but not before at least 3 houses where flooded to about a depth of two inches. So we were very lucky, some parts of Croydon were severely flooded.

As for comments as a local activist, I have some.

1. Extra drain clearance operations should be put into place where known flooding takes place, especially before winter sets in when falling leaves from public trees tend to block up drains. I understand drains are only cleaned out in this borough once a year unless local residents complain about the state of their local drains.

2. Get Councils to look at how many drain clearance vehicles they have, with a policy put in place as to where they can get extra ones in an emergency or budget to purchase extra vehicles, if they do not already have such a policy.

I will as a local Scrutiny participant, be asking questions to Croydon Council concerning future flood protection and drain clearance operations. And I will be following the Select Committees enquiry.

Hope my little submission will be of some use.

Peter Collier

July 2007

1 My interest in the database stems from a view that accountability for public safety dictates that there should be a register of third party flood defence owners in the public domain. 83% of defence owners on the tidal Thames are third party, many unidentified, and incapable of being identified with legal certainty and attributable legal liability.
FLOODING: GRANDPONT OXFORD

Following my experience the recent flooding in Oxford I would like the Commons Environment, Food and Rural Affairs Select Committee to recommend more action on the part of the Water Companies. Although my house did not itself flood (water coming up only under the house and in the rear garden) sewage was within two cm. of overflowing from my kitchen drain into the garden as the sewers in South Oxford were backing up. I have a shared sewer and only in the preceding week had had the sewer dug up because my neighbour didn’t understand that cooking oil could block the trap. The operatives who dug up the sewer were clear that putting anything other then toilet soil and dirty washing water down our old drainage system should not happen. Also at the time the drains were backing up people in the locality were quite happily having baths and doings loads of washing though the situation was so critical for me and my neighbours we virtually stopped putting anything down our drains.

Whilst I have nothing but praise for the Environment Agency and its telephone advance warnings and the Fire Brigade and the Councils during this critical time, I really think Thames Water should ensure that every house in areas where the sewers are at risk of backing up should be told to limit their use of drains to soil when a severe flood warning is imminent. I also think there needs to be campaigns to ensure that people at all times do not put down anything that is likely to silt up or block the drains. I would point out that a certain toilet wipe (I mean substantial wipes not toilet paper) company that sponsors “The Bill” on ITV shows someone putting a wipe down the drain as acceptable practice. Apart from this point these floods with three major ones in my area in seven years illustrate the need to cut down on carbon emissions which has not been given as much prominence as these floods would suggest the need for and which hope the Select Committee will emphasise.

I have insulated and double glazed my house, given up flying, hardly drive my car, thus substantially reducing my carbon footprint and am planning for a solar panel. Government action is required so that others act similarly. Government action is also required to manage farmland to absorb more water and if necessary be turned into temporary holding reservoirs with new physical constructions upstream from cities like Oxford. It would surely be cheaper to pay out farmers than the cost involved in getting houses habitable again after the floods.

Judy Chipchase (Mrs)
August 2007

Memorandum submitted by Lorraine Smith (FL 04)

My home was recently flooded in Abingdon Oxfordshire. I signed up to the flood warning service a few years ago as I live 50 yards from the River Ock and had plenty of notice from the service to take our belongings upstairs before the river came into our house. However, the drain outside our house flooded our road and lots of our neighbours homes four hours before the river reached us. I am a town councillor for the ward I live in and lots of homes in the ward flooded with no warning whatsoever. Homes that have never flooded. Whilst out and about in the ward talking to residents and helping to give information to them I am frequently being asked why drains are no longer cleared and why rivers are not dredged anymore. I think the government needs to look seriously at these questions and not just fob people off with ask your local authority. Everyone seems to be passing the buck on issues and too many agency responsibilities overlap so no one seems to be wholly responsible for anything. Floodplains shouldn’t be housing estates they have a purpose, to flood! so why are we still building on them?

Lorraine Smith
August 2007

Memorandum submitted by Roger Martin (FL 05)

1. SUMMARY

I submit three points:

(a) There is a neglected link between flood risk and population growth;
(b) Building Regulations should require all new development and major refurbishments, in any areas at possible flood risk, to include built-in flood resilience features.
2. RELEVANT EXPERIENCE

I am a former senior diplomat, turned environmentalist. I was the first “green” member appointed by the SoS to the new NRA Wessex Regional Flood Defence Committee in 1989, and now am again; I have been a member of FDCs and/or REPACs for 18 years; I am also for 10 years a SoS-appointed Member of Exmoor National Park Authority; as I was previously on the MAFF Regional Panel. I was the founder “green” member of the Regional Assembly; a Wildlife Trust Director for 12 years; CPRE Regional Chair and National Trustee for 5; and am now the elected NGO representative on the regional Water Framework Directive Panel. I lecture on water policy at UWE, from whom I have an Honorary Doctorate.

3. POPULATION GROWTH: THE ELEPHANT IN EVERY GREENROOM

Over 18 years of environmental activism, I have become increasingly bewildered, despairing, and angry at the mad taboo that prevents everyone mentioning the common factor constituting half of every environmental equation, namely population. I thus feel obliged to mention it in every relevant context. It is, after all, blindingly obvious that: total human impact = average impact per person x number of people; total water consumption, CO₂ emissions, housing and transport demand, waste generation, etc = average per person x number of consumers, emitters, people to be housed and transported, waste generators, etc. Similarly, total flood risk to homes = average risk per dwelling x number of dwellings/people to be housed. Our population is currently growing by roughly 1,000 more people every day (globally it is 10,000 per hour), which means there are 1,000 more people potentially at risk in the UK every day.

4. In the absence of any awareness that all population growth exacerbates all environmental problems, and thus of any policy aimed at stabilising our numbers, all our environmental policies are doomed to fail. The all-party Population Panel concluded unanimously in 1973(!) (Cmd 5258) that: “Britain would do better in future with a stationary rather than an increasing population” (para 33); and “The time has come when the government should consider whether, and if so how, to influence the rate of population growth” (para 35). By far the greatest contribution your Committee could make to improving the sustainability of the UK would be to give a lead in breaking the taboo, and resurrecting this central issue.

5. BUILDING IN FLOOD RESILIENCE

Giving evidence recently on flood defence to the EiP on our Regional Spatial Strategy, I was struck again by the extraordinary, bone-headed inertia of the house-builders in the face of any suggestion they might change their methods in flood-risk areas, as many of us have been urging for decades, for instance: bringing the power supply down the wall to waist height rather than up to ankle height; laying flood resistant cement rather than wood flooring; coating outside walls with a water-proof rendering; designing in pluggable air-bricks, loos, and flood doors; etc. There are a very few, very simple techniques, well short even of building on stilts or over ground-floor garages, which would greatly reduce losses when the inevitable floods strike. Building Regulations should require them, (along with the obvious energy- and water-efficiency features), anywhere within the (increasingly irrelevant because purely historic) “1:200 year” flood risk area.

6. AGRICULTURAL LAND USE/ MANAGEMENT

Both in policy and in practice, past problems of excessive agricultural land drainage exacerbating urban flooding (because flood defence was a MAFF/farmer quasi-monopoly from the war to the mid-90s) are now easing. In any case, sustainable food security (from less oil-intensive farming) should be a much higher priority than it is, given: our current mere 60% self-sufficiency in food as a result of over-population; the imminence of peak oil and climate change; and the centrality of food in human needs, after only water. (Current blind faith in some abstraction called the “world food market” to feed us for ever is dangerously naïve). So the balance to be struck between protecting good soils from permanent damage and occasionally flooding mis-placed housing is not self-evident; and I thus do not join those conservationists who advocate widespread wetland restoration on fertile silts. (I also strongly oppose bio-diesel cropping—“Would you rather eat or drive?” will eventually become a serious question).

7. Having said which, there are some places where shallow up-catchment flood storage areas for emergency use can flatten the hydrograph enough to spare a town downstream from flooding without damaging more than a current crop; in which case, while of course negotiated land-owner cooperation is always preferable, the public interest may require non-cooperation to be over-ridden—particularly where it was public money post-war that funded the farm drainage in the first place.
8. There are also, alas, a few very irresponsible farmers around, who manage their soils so badly that they flood roads or their neighbours. In such cases, where a farmer has ignored site-specific written advice on how to avoid repeating harmful water or soil run-off, the law should be tightened to aid prosecution and conviction "pour encourager les autres".

Roger Martin
July 2007

Memorandum submitted by Janet Marrott (FL 07)

I live in a community (Coleford, West Gloucestershire) where culverts built in the 1800s are now collapsing due to the speed and quantity of water being forced through them.

My local authority (Forest of Dean District Council) claims that responsibility for repairs lies with “riparian owners” who, until culverts erupted within their land, had no idea they existed.

There are no definitive maps of where these exist and I maintain that the Statutory Authorities should be made to accept the responsibility for them as often the eruption is caused by a blockage in another area.

To my knowledge there has never been any publicity to make landowners aware of this responsibility and no plan for ongoing maintenance has ever been proposed.

I recommend that your committee take such cases into account in their debate.

Janet Marrott
August 2007

Memorandum submitted by Dudley George (FL 08)

RECENT GLOUCESTERSHIRE FLOODS

If future housing needs force us to build on land that may be subject to flooding, it seems inexplicable bordering on negligent that Building Regulations are not altered to force new homes to be built with the appropriate safeguards. There are technologies—some going back to the Middle Ages—that could be updated and applied at minimum cost if a standardised requirement was met by mass production eg UPVC doors that could accommodate a flood board to half way up that could be screwed watertight, walls treated to withstand water up to around 4 ft deep on the outside etc. Why is the UK having to bear billions in insurance costs when most of these homes could have avoided flooding altogether?

There is another benefit in that if these standard products were created to serve new house building, then prices would fall and availability rise to owners of older properties as well. After our (1870’s) property flooded in the recent problems we bought a pump that will spring into action if water begins to fill our rear patio again. We had to buy a pump imported from an Italian manufacturer as “there is nothing as good from the UK”, yet Lister Petter of Dursley has only recently closed and it had a worldwide reputation in pump technology.

Dudley George
August 2007

Memorandum submitted by Nick Weir (FL 09)

ISSUES FOR FLOOD ENQUIRY

I live in Stroud in Gloucestershire and was directly affected by the recent flooding.

I recommend that the inquiry is targeted largely towards the causes of the floods. It should make clear to what extent the floods were:

(a) the result of climate change

(b) the result of disruption to natural drainage and flood control systems by development of road building, housing and other developments.
The inquiry should also make recommendations as to what short, medium and long term changes to the above issues need to be made to prevent such flooding recurring.

*Nick Weir*

*August 2007*

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**Memorandum submitted by Stoke Orchard and Tredington Parish Council (FL 11)**

We are a Gloucestershire Severn Vale rural parish, with a population of approximately three hundred and fifty people, one hundred of which were affected by flooding. Because we are situated a few miles upstream from Tewkesbury, in the flood plain of three River Severn tributaries, our flash floods preceded the consolidated tragic severe Severn flooding in the town.

The unprecedented rainfall on July 20th and earlier in June 2007, had rendered us acutely vulnerable to flooding.

What has become very clear since however is that we were very poorly prepared.

Gloucestershire Highways is contracted to Gloucestershire County Council. Before the floods, it was running a £100 million highway maintenance budget deficit. Currently it now stands at £130 million. In our small rural parish alone, we had £0.25 million worth of outstanding drainage work waiting in abeyance when the flood waters overran the third of our underground drains in our parish that do function.

Additionally, the three tributaries of the River Severn draining for example Cheltenham Racecourse and its Cotswold escarpment through our parish, are only maintained to a minimum of their flood water capacity by the Environment Agency. One brand new highway bridge in our parish, obstructed flood water, and proved to only have a fraction of the flood water capacity required to release water, and prevent flooding damage to adjacent houses.

Lack of appropriate investment in cost saving drainage maintenance and drainage capacity via the two key authorities, we believe has contributed to the level of severity of the flood damage in our parish.

May we say that we hope that members will appreciate that the problem of a substantial lack of investment in drainage infrastructure both in our parish and in our county, has to be addressed as a matter of a sound, and now proven, investment for the future.

*Stoke Orchard and Tredington Parish Council*

*August 2007*

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**Memorandum submitted by Allen Keyte (FL 12)**

I know that there has always been a backlog of repairs and potential repairs to the drainage and road system in Gloucestershire. It means that there should be in place a properly prioritised programme for doing works—together with a contingency fund—and, of course funding.

Additionally in the latest crisis Gordon Brown has consistently said (and is it just words again?) that £800 million of funding will be made available to the most affected areas. Gloucestershire is accepted as being one of the main areas—but I understand no funding has been received. Perhaps this is our first area of attack. Come on Gordon, let’s have the promised money!

The funding of a large road/drainage problem is not easy—but it must be started upon. The problem is that much too much work is done on costing and planning schemes that never take place. In other words too much talk. We need to get schemes up and completed much faster. For example the cost of hatching off and painting which lines around Oxenton turning was between £6000–£8000. How can these sort of costings be justified? That is how we arrive at figures like £130 million.

Furthermore the taxpayers of this county, many retired, are simply unable to pay much more. The costs in Gloucestershire are 400% more than in an area of Majorca in which I am interested. Why?

A few things to think about, but rest assured that I am batting for the people of this area to get problems sorted.

*Allen Keyte*

*August 2007*
Memorandum submitted by Resthaven Nursing Home (FL 13)

I am the manager of a 32 bed nursing home and we were affected by the flooding due to having no tap water for 7 days, we were unable to use our laundry, residents were unable to have showers or baths and we did not receive a water bowser until 18 hours after the water ran out.

Obviously this led to risks of infection and increased work load on the home’s staff who needed to flush toilets with rainwater from waterbutts, boil all water for washing residents on the gas oven because we had no heating/hot water due to the boilers not working.

Working staff went to pick up drinking water from all over the county and took washing home themselves so that it had little impact on our residents.

Jayne Roberts
August 2007

Memorandum submitted by Julie Wickham (FL 14)

I work in Tetbury but live in Stroud, Gloucestershire.

We should look at hard standing and its effect on flooding and also building on floodplains where new developments seem to have an effect on older ones in terms of flooding.

I think we should look at why the South West is being over developed and under a sea of concrete when there are areas in other parts of the country that need development.

The amount of hard standing in an area is certainly an issue that needs looking at, as does building on floodplains. I have witnessed new developments that don’t flood having a knock on effect on older developments.

I also think it would be a good idea to investigate tax incentives for renovating existing houses. This would help to supply more homes without using green belt or building on floodplains.

Thank you for this opportunity.

Julie Wickham
Community Projects Officer, Tetbury Town Council
August 2007

Memorandum submitted by Jeremy Chamberlayne (FL 15)

Consultation on recent Severn Flooding

We can expect higher levels of flooding due to at least three factors.

— Increasing run-off from development—impermeable surfaces.
— More obstructions in the floodplain—including flood protection banks, placed too close to the main river channel.
— Rising sea levels.

I imagine that some protection from rising sea levels would be provided by the proposed Severn Barrage.

The main way to reduce the other two impacts is improved flood flow capacity. Starting from the estuary, say, at Longney, a wide flood relief channel should be cut, to about one metre above normal Summer river level and running to upstream of Elmore Back, (the former washland could remain protected). Then, on the West bank, the protection bank should be set back and the area between it and the main channel lowered. This could run northwards to Over Bridge (A40), providing alleviation in the area currently blocked by the Hempsted landfill site. (How did planners and DoE ever decide to consent this blockage in the floodplain, immediately downstream of a vulnerable city like Gloucester and all its electrical infrastructure in the floodplain?)

Then a relief channel should be cut from below Over Bridge, across Alney Island, under the road and rail viaducts, to the East channel. Northwards (upstream) from Upper Parting, where they exist, artificial banks should be set back on one side or the other, especially on the Sandhurst side, opposite Ashleworth Quay, which causes a serious bottleneck.

This treatment should continue at least as far as Tewkesbury—probably to Worcester.

Jeremy Chamberlayne
August 2007
Memorandum submitted by Roger Hendry (FL 16)

A few issues that need to be addressed regarding the recent floods:
Dredge the Avon/Severn/Thames and subsidiary rivers.
Do not build on flood plains as the water has got to go somewhere, build on existing derelict land instead. Reinstate larger culverts / drains. Have the storage of flood defence barriers including sand bags stored near to recognised flood risk areas. Review risk of flood barriers around Water and Power stations.
Advanced early warning system warning of flooding to be given priority on all TV channels / radio channels / newspaper coverage. All councils to tell residents what and where the designated relief shelters are. Make bowsers tamper proof to allow only 1–5 lts of water out at any one time to stop yobs from emptying them, also they need securing to stop yobs from urinating or putting chemicals into them. Make prisoners do the cleaning up instead of pandering to their whims.
Roger Hendry
August 2007

Memorandum submitted by Revd. Stephen Cope (FL 17)

I refer specifically to the flooding at Burstwick, East Riding, which followed the main Hull floods. I would imagine other places had similar situations. Much local anger centred round the likelihood that blocked field drains or inoperable sluices caused the backup which flooded the village and surrounding farmland. I appreciate that it might well not have been possible to answer questions at all immediately, but it would certainly have been useful for victims of the flood to have known as soon as possible precisely where and why the backup occurred, and whose the responsibility it was—even if only so that similar occurrences could be avoided in the future. Failure to admit responsibility is a repeated complaint with regard to government at all levels, and trust can surely best be restored by communicating all available information as soon as possible, by means e.g. of local radio.

Beyond that, I am sure it would come as no surprise to you to learn that I commend the work of the ARC-Addington Fund. I am sure their submission will be infinitely more useful than mine.

Revd. Stephen Cope
Bishop of Hull’s Adviser on Rural Affairs for the Archdeaconry of the East Riding, and Vice-Chair, Churches Rural Group
August 2007

Memorandum submitted by Colin Newlands (FL 18)

Flooding in West Oxfordshire.

I am sending this email as a result of a notice inviting comment on the recent flooding which is published today in our local paper.

We live in the small West Oxfordshire village of Alvescot—some 1.5 miles from Brize Norton which on 20 July received approx 159 mm of rain.

Understandably it is claimed the storm water systems were unable to cope with the exceptional circumstances of that day—except that in our case between us and Brize Norton there is a hill protecting the village from run-off by water lying over there.

In fact we suffered this time as we have suffered in July storms past—most recently in 2001 and 2006, because our drainage systems for storm and foul water are inadequate to cope with the development of new properties in this village and neighbouring villages to which the system is connected.

Over the years I have engaged in lengthy correspondence with West Oxfordshire District Council, Oxfordshire County Council and Thames Water to little ultimate effect, there being no mandatory compulsion for them to act in unison to alleviate this problem.

When I advise you that we are some seven or more miles from the Thames and the only nearby small brook runs the other side of the aforementioned hill you will appreciate residents anger that we should be subject to fairly regular summer flooding entirely due to storm water and the inadequate disposal thereof.

Contributory factors are the insufficient road cleaning services (another matter raised with the local council). Inevitably in a small farming village, field and harvest detritus finds it way onto the lane and ends up by clogging the drains. Getting the appropriate authority to initiate regular drain cleaning is another small headache. My understanding (perhaps incorrect) is that this should be done quarterly, but we are fortunate if we can prevail upon the authority to give an annual clean.
There is a Thames Water pumping station only some 50 yards from the end of the lane, which when it was installed approx 18 years ago, was adequate for its purpose, but the events of 2001 and 2006 rendered it little more than useless.

In the first of those years the village power supply was knocked out by an electrical storm, so the pumps ceased to function. It has since proved impossible to persuade Thames Water to install a standby generator, so we are at permanent risk should a similar strike re-occur. Last year while still functioning normally the pumps were unable to put the water through fast enough and sewage and storm water backed-up around the house—fortunately on that occasion not entering this or neighbouring property.

I appreciate that our local problems pale into insignificance with areas like the Severn towns and cities, but I venture to suggest they are probably replicated in many other rural areas. It does require a directive for the various authorities to work as one in solving this problem rather than standing back until another takes some small but minor alleviating action.

Colin Newlands
August 2007

Memorandum submitted by Chalford Parish Council (FL 19)

This is Chalford Parish Council near Stroud in Gloucestershire. Although we did not suffer flooding we did suffer a loss of water for over a week.

During that time we received extraordinary assistance from the District Council, the armed forces, Red Cross and within our Parish.

However, the lesson learned from this was that there was a lot of duplication in that the various organisations who assisted were “doing their own thing” to a certain extent which ended up with vulnerable people being visited by several people and causing a water overload. Although this Parish Council was the centre point for parishioners to call and for water to be distributed, none of the organisations stated contacted the Parish Council for directions, the best sites for bowser or local knowledge. The communication / requests came from the Parish Council and were met but no-one contacted the Parish Council.

We understand a Severn Trent trailer toured the parish for up to 2 hours trying to find a location for a bowser!!

We are grateful for the assistance but if there is a next time we feel that communication and organisation could be improved upon.

Christine Prince
Clerk, Chalford Parish Council
August 2007

Memorandum submitted by Susan Stoner (FL 20)

GLOUCESTERSHIRE FLOODING

I was not badly affected by the flooding as my home is relatively high up in the Cotswolds. However, the most challenging part of the floods was getting out of our staff car park here in Gloucester and then finding an accessible route out of town. There was little immediate police presence on the ground in controlling traffic flow, directing to safe routes or warning of routes being blocked. There were few signs to indicate road ahead blocked or which routes were safe. By sheer luck I found my way out of the city via the higher land near the Station and on to the 417/419 to Cirencester but this safe route was deserted while hundreds of vehicles poured onto the motorway only to get stuck for hours on end.

Some kind of rapid aerial assessment of safe routes was needed so as to get traffic out more quickly. If police helicopters were unable to take off, could military aircraft not be deployed to assess the situation and relay to police on the ground?

Also, a number of us were desperate to volunteer and help out but were unable to do so due to lack of training and lack of capacity of voluntary organisations to manage us. If such cataclysmic events are to be more frequent, we need some kind of initiative like the old civil defence programmes of yore!

Sue Stoner
August 2007
Memorandum submitted by Timothy Royle (FL 21)

HOUSING AND FLOODING DANGER

Further to your request for comments on the above, may I draw the Committee’s attention to the present planning proposals for locating a major expansion of housing in the Cheltenham / Gloucester area of the Severn Valley whilst restricting severely development of housing in the towns and villages of the Cotswolds.

We have consistency made representations to Ministers that such planning is disastrous and will expose such housing to regular flooding whilst preventing the communities in the Cotswolds to attract and hold the young people it badly needs to provide balanced social cohesion.

Timothy Royle
Former Chairman and Counsellor of Cotswold District Council
August 2007

Memorandum submitted by James Harris (FL 22)

ISSUES RAISED FOLLOWING THE FLOODS OF 20 JULY 2007 AT SOUTH CERNEY, GLOUCESTERSHIRE.

1. South Cerney, in the south of the county, despite having the heavy rains (5 inches or so) of the 20th July, was very fortunate to have only a couple of houses flooded. Three weeks on from these rains there are still some areas of land that remain underwater. This is surprising compared with other areas locally, where the water drained away within a couple of weeks.

2. With regard to one particular area that I am concerned with, this is wholly attributable to the lack of attention given to the maintenance of a watercourse by the farmer (from grid ref SU 055 974 to SU 057 976). The knock on effect has caused a number of people a lot of inconvenience (including flooding of out-houses at the Manor House that have never been flooded before).

3. Having spent 20 years as the Head Ranger in the area of the Upper Thames flood plain known as the Cotswold Water Park and I now serve on the South Cerney Parish Council (with a portfolio of Flood Warden). I have a great deal of local knowledge and I can assure you that this is just one case locally, among many others, that I am aware of.

4. I feel very strongly that farmers have a social responsibility to take better care of their water-courses in order that situations like this are avoided. Could we have reached the stage where there may a need for some type of pressure in the form of legislation to be considered?

James Harris
August 2007

Memorandum submitted by Christine Adamson (FL 23)

There has been some exceptional weather recently BUT a lot of the disaster could have been avoided if the organisations had only listened to the local people—who know their own areas. I was a Parish Councillor for 24 years and we have been on about flooding and drainage problems for years and years. When the development of Bishops Cleeve was first muted we said that there needed to be some drastic rethink of the drainage but nothing was done and we now have to bear the brunt of all the concrete jungle that has sprung up. The developer has now moved on so will not be able to fund any projects. Please listen otherwise consulting is a waste of everyone’s time.

Mill Lane Stoke Orchard has a known problem with tree roots in the culvert, but no-one will own the problem. It is us that again bear the damage. We were marooned three times recently—25 June, 19 July and 26 July all because no-one would clear the culvert properly.

Now it is time for some constructive joined up working together to deal with some major problems. We need to SEE something being done—not hear of further hot air meetings.

I learnt at the age of four years that a quart will not go into a pint pot. If the river is less than half its original depth where will the water go? Overflow of course. The flood defences further up the river just send the water down twice as quick. Start to clear the drains, ditches, brooks and streams then dredge the river are all very positive things to do and very cost effective.

Please do something visible very soon because there is more to come.

C Adamson (Mrs)
August 2007
Memorandum submitted by Jean and Gordon Basnett (FL 24)

This crisis could have been avoided if common sense had been employed. Spending money on futile flood defences at Cox’ Meadow in Cheltenham, Gloucestershire, instead of defending the plants that provide us with water and power.

A contributory factor to this flooding is the continual building on flood plains. Mythe water treatment plant at Tewkesbury was flooded even during construction a few years ago. Our drains and rivers are no longer cleaned and dredged as they should be.

There is no need to keep building in South and middle England when there are huge open spaces in Scotland and Wales, which could be made habitable with the correct infrastructure. Without any restraints on the population of England and continuous building this problem will be repeated. Lessons should be learnt.

Furthermore Severn Trent regardless of the weather were largely responsible for losing our water supply, and should compensate us. A paltry sum of £3.5 million, when they make profits of £300 million is derisory.

All these services which are in private and foreign hands, should be nationalised and belong to the people. Without shareholders to consider more money could be ploughed back into providing proper defences and better services.

Mr and Mrs G Basnett
August 2007

Memorandum submitted by David Royffe (FL 26)

I am a Cheltenham-based chartered engineer.

Due to the recent severe local floods June 2007 and July 2007 that included the Chelt flooding past the front of the Town Hall, I am very actively campaigning for our theoretical flood alleviation schemes to be made to work in practice.

My road—Oak Avenue Cheltenham has twice got very seriously flooded—deluging about ten houses and threatening my block of flats. There appears to be far too little drainage capacity for flash-floods off the Battledown Hill behind our estate and the Chelt river has much too large a flash-flood flow when heavy rain persists for some hours.

I am in active dialogue with Cheltenham MP and Cheltenham Borough Council with knowledge on how to very effectively deal with the problems—including how the barrage could be of major benefit in this regard.

It is clear to me that the flood alleviation scheme can be examined, and revised so as to improve our flood defences to a workable system.

I have surveyed and photographed the floods as they happened.

David Royffe
Chartered Engineer
August 2007

Memorandum submitted by Gill Pett (FL 27)

RECENT FLOODING LONGHOPE, GLOUCESTERSHIRE

I am a Parish Councillor for Longhope, which is a rural village, set in a valley in the Forest of Dean, Gloucestershire. We were badly affected by the recent floods. It is felt that the following contribute to the causes:

Poorly maintained hedgerows, culverts and lack of drain cleaning. Debris from the hillsides soon covers over the drains with leaves, sticks and gravel.
The brook which runs through the village is neglected and not kept clear. Seedlings turn into trees and obstruct the flow of water.

The bridges crossing the roads are too small to cope with the amount of water from the hillsides.
Some recently built houses have flooded, which leads us to think that there was not sufficient and thorough planning prior to the developments.

All these problems lead to water flooding the roads, lowest houses, and houses close to the brook in the village.
Many individual householders do not clear or sweep their own property frontage, or clear the brook running across their land as used to happen in times gone by. There seems to be a lack of acceptance of responsibility for one's own environment.

I hope this information is of help,

Gill Pett
August 2007

Memorandum submitted by Roger Case (FL 28)

I am the Chairman of the Meysey Hampton Parish Council in Gloucestershire. Although on the Eastern side of the County and not as badly affected as some we did experience very bad flooding to a Home Park on the edge of the Village—Greenacres.

As you are aware these are the homes of elderly and generally not so well off folk. The Greenacres site was completely flooded, one part to a depth of at least 5 feet. Three homes have been written-off and lots of personal possessions destroyed.

The problem seems to have been made worse due to the overgrown margins of the local stream meaning the water could not flow away very quickly. Rubbish swept down soon blocked a bridge which made the problem worse.

In earlier years the Water Board were a regular sight along the streams clearing the trees and rubbish back. This no longer happens. Why?

Roger Case
August 2007

Memorandum submitted by Holger Kessler (FL 29)

One of my greatest concerns in the public debate since the recent floods is the blame laid onto the Environment Agency for not doing their job properly. I feel a lot of the criticism is unfair and what is really needed is increased power and funding to bring together all strands of flood management and protection.

I used to work as a Geologist in Yorkshire where south of York land at 5 metres above sea level has been undermined by coal mining and is therefore sinking—the EA has to raise flood defences. At the same time Inland Drainage Board are installing more drains and pumps in the area, diverting more water into the Ouse, where when it floods the Agency is called to task. Developers seal the surface and create more run-off leading to peak flash floods and again, the Agency has no control or say about this.

I feel the role of the Agency should be expanded to include powers to stop development in flood risk areas, development that increases run-off and powers to regulate the Inland Drainage Boards.

Holger Kessler
August 2007

Memorandum submitted by Frampton-on-Severn Parish Council (FL 30)

Thank you for visiting Frampton-on-Severn to see and hear at first hand about the problems we have encountered over recent flooding in the parish, and the actions we are putting in place to minimise future problems.

As reported, some twelve properties have been affected by ground water and surface run-off in the parish, which may be summarised as:

**The Green**


Gardens flooded at The Old Coffee House and Nastfield Cottage.

The ponds have been at record levels with standing water on The Green.
Whittle’s Lane

Surface water entering The Old School House. The properties in the lane also suffered from a failure of the sewerage system.

Lake Lane

Surface water from the Playing Field flooding the roadway and adjacent gardens and very nearly flooding other properties.

Splatt Bridge

Cottage flooded.

Townfield Lake

At levels requiring an emergency response to avoid an overflow, which would have resulted in water entering properties in The Street. This was carried out by Parish Councillors and other volunteers together with the Frampton Court Estate.

Perryway and Whitminster Lane

Both closed to cars for short periods of time, as they were impassable due to surface water run off from adjacent fields.

Land to the south of the parish

This area contains The Marshes, and whilst this land provides an important water storage function the increased area flooded and the continuing rise in water some time after the rain had stopped is a cause for concern.

We have been helped through these difficulties with the assistance of:

Gloucestershire County Council Highways

Drains leading from Watery Lane are to be excavated and cleared of roots, so alleviating flooding on the lower Green and taking water away from Townfield Lake. This work will be carried out in conjunction with Frampton Court Estate.

Stroud District Council

Providing bags, filled with the assistance of Frampton Court Estate staff, which were distributed to households at risk of flooding in The Street and to provide a defensive wall adjacent to the Sailing Clubhouse on Townfield Lake. Stroud District Council also provided an excellent information service to residents.

As a community we are taking the following additional actions to minimise future problems:

1. We have formed a group to draw up a Community Emergency Plan and we expect to receive their recommendations before too long. We are particularly concerned that we go into the wet winter season with water-logged ground.

2. A meeting has been arranged with Severn Trent to discuss ways of over-coming the localised sewerage failures in Whittle’s Lane, which we believe can be resolved with some simple remedial actions.

3. To form a group with drainage knowledge to look at improved water management from the Clay Pits, the gravel workings, and the landfill run off, to the Frampton Lakes to the River Severn. As a first step Frampton Court Estate is producing a map of the current drainage system. This group will also look at the localised problems at the Lake Lane Playing Fields.

4. We intend to make it very clear to the Environment Agency that the release of water via Frampton Pill, which is their responsibility, is not working correctly. There are questions about modifications and a lack of maintenance that has possibly added to problems of flooding in the Parish.

From this you can see that the Parish Council is implementing actions to alleviate future problems. However, we are left with the unfinished business of needing the Gloucester Sharpness Canal to be maintained and managed as a flood defence and drainage canal for Gloucester. As discussed we will provide
you with a briefing paper, list of known issues, and a proposed agenda for a meeting with appropriate bodies. We would very much appreciate your continued help and participation to ensure we can achieve a satisfactory outcome to this problem.

Thank you again for your continued support.

David Speed  
Vice Chairman, Frampton-on-Severn Parish Council  
August 2007

Memorandum submitted by Carole Mortimer (FL 31)

RECENT FLOODING EVENTS

Please accept my thoughts on the recent flooding for the inquiry by Environment, Food and Rural Affairs Committee.

I believe there is a need for an Act that puts previous land drainage acts into reverse giving EA compulsory powers to block drains that empty water out of unproductive land not essential for productive farming. This Act should include the following:

1. Provision to block drains from moorland and also some of the improved land on the moorland fringe (that was moorland before, say, 1970).

2. Drains in some forestry woodlands whether in the lowlands or uplands—we have a huge wood that drains off the ridge above the Pang Valley in West Berkshire and it is full of deep drains and must have had some contribution to flooding of properties along the River Pang, eg Bucklebury (it was once a lovely semi-natural woodland but has been wrecked by commercial forestry).

3. Compulsory powers to the EA to secure management of floodplain land for flood defence purposes. This might involve restoring floodplain grassland and/or woodland, and installation of ditch networks that have water control structures that can be operated by named agencies as a preventative measure (e.g. to prevent floodwater entering a river, etc).

Furthermore the recent floods have highlighted another major issue. The Environment Agency and Farming subsidies have vastly increased the efficiency of land drainage and it is this factor more than all others that have been responsible for the dangerous flooding we have seen over recent years such as in Gloucestershire.

In a number of European countries such as the Netherlands, Belgium, Germany and Denmark land policy has been to retreat agricultural dykes from river banks creating more “natural” flood plains. These newly created flood plains act as a sponge to slow water flow and absorb water, helping buffer the effects of heavy rainfall.

These newly created wetlands need management to maintain their wetland characteristics and water absorbing capacity. This has been achieved through the use of conservation grazing.

It took many deaths by flooding for our European neighbours to learn from the mistakes we have all made in trying to turn our river systems into culverts. One such incident in which a flood overran a dyke next to a school, killing 12 children, was the event that saw the creation of the Blauwe Kalmer Nature Reserve. The reserve was an early pioneer of near natural conservation grazing using Cattle and Konik Ponies.

The Dutch and German Governments have found it far more cost effective to subsidise this conservation grazing than pay for intensive agriculture and maintaining flood defences on river banks. As you can imagine this took a lot of work in pushing the farming community down this road but in most cases amicable arrangements where made with land owners.

The upshot of this is the flooding issue could be solved very cost effectively by blocking upland drainage and creating flood plains along river systems. This would be a fantastic boost to wildlife and would create a large scale conservation grazing community to manage it.

Carole Mortimer (Mrs)  
August 2007
Memorandum submitted by Pauline Farman (FL 32)

Regarding the e-mail forwarded to members of Bagendon Parish Council, I would just like to comment that, fortunately, in this part of Gloucestershire we were not directly affected by the recent flooding due, in no small measure, to the effectiveness of the water meadows/flood plain which absorbed the flooded River Churn. It is a lesson which must be learned in other parts of the country that flood plains MUST be protected to reduce the risk of inundation, as it is clear that the weather we have experienced this year will not be a unique occurrence.

Pauline Farman
August 2007

Memorandum submitted by Fay Price (FL 33)

I would like to express my thanks to all involved in taking excellent care of so many of us in the Gloucestershire area with regards to water supplies and provisions. At no point did it cause too much detrimental effect to me personally, although I obviously understand how awful it must have been to have been affected by flooding in homes which had happened to several of my friends. What was in the authorities control was an excellent standard of care. It brought out the best in people, not purely the worst as the press would have us believe I think!

Fay Price
August 2007

Memorandum submitted by Whiteshill & Ruscombe Parish Council (FL 34)

I am writing on behalf of Whiteshill & Ruscombe Parish Council in Gloucestershire reference the Flooding Enquiry you are conducting.

As you know, the Mythe Treatment Plant was shutdown on the Sunday and Gloucester was the first to stop receiving tap water late Sunday afternoon. There was no warning given to residents in Stroud District that their water was also under threat of stopping. Whiteshill’s water stopped on Tuesday morning, and I telephoned Severn Trent to find out the situation, and was advised that the water shortage in Stroud District was a different problem, being a mains burst, and that water would be reconnected later on Tuesday. I found out later in the day that this was incorrect and that Whiteshill & Ruscombe would be affected the same as other areas of Gloucestershire.

Also on Tuesday, Severn Trent issued an updated bowser location list which included 4 locations in Whiteshill. No bowsers arrived in Whiteshill until the Friday, which meant that residents of Whiteshill & Ruscombe were without water for 4 days.

Our main issues with the flooding and subsequent water shortage can be summed up as follows:
— Why was Stroud area not told that their water was going to run out?
— Locations of water distribution were incorrect
— Delay in getting water bowsers—4 days for Whiteshill.
— Burst water main mis-information.

I think that more communication via the Councils (county and district) would have eased Severn Trent’s burden with water distribution and also made sure that water bowsers were located in areas of local need.

Julie Shirley
Clerk to Whiteshill & Ruscombe Parish Council
August 2007

Memorandum submitted by Quedgeley Parish Council (FL 35)

The Quedgeley Parish Council believes that the following issues should be addressed:
— Regular programmed cleansing of street gullies and surface water drainage systems does not appear to take place
— There appears to be no regular programmed maintenance of watercourses.
— Greater control of building on or in proximity to flood plains.
— New houses to have more “green” land.
— New commercial premises to recycle “grey” water.
— Dredging of main rivers and canals.
— Improved flood protection to water treatment works, sewage pumping stations and electricity sub-stations.

Quedgeley Parish Council
August 2007

Memorandum submitted by Chaceley Parish Council (FL 36)

Twenty homes in the heart of this small village on the western bank of the River Severn floodplain opposite Tewkesbury have been devastated by recent flooding.

It was the fourth flood that this village has suffered in six months.

However, 20 July 2007 brought exceptional conditions. Two houses that have never flooded, and would not have flooded from river water, were severely flooded from flash flooding from high ground.

INTERNAL DRAINAGE BOARDS

Exceptional quantities of “foreign water” pass through this village en route to the River Severn. The village main drains and ditches have suffered from neglect fostered by the self interests of those serving North Gloucestershire Internal Drainage Board which carried out no work in the village in 10 years. Happily, after a long campaign, the village now comes under the Lower Severn Internal Drainage Board which recognises the neglect that critical ditches have suffered and is committed to working through them. However, given the exceptional circumstances prevailing in this village the work is taking far too long and the Board is hamstrung by conditions laid down by English Nature which requires the protection of nesting birds with the consequence that a huge chunk of the summer is lost to drainage works. This must change.

In addition, they are not allowed to instruct contractors to immediately burn debris—it is frequently left beside the ditch to be washed into it by the next flood so that the ditch gets blocked again.

ENVIRONMENT AGENCY

Our residents recognise that this village cannot be protected from flooding when the river overtops. However, around 13 years ago the Environment Agency replaced the Chaceley Stock—the main water outlet to the river—with a new design. Where previously there were two doors so that the upper one opened as soon as the river level fell. Now there is only one and the greater pressure of river water against the pressure of inland water serves to retain water in the village long after everywhere else has forgotten flooding happened. The LSIDB agrees that this is the case. The Environment Agency should correct this situation.

It is intolerable that a body that is supposed to prevent flooding is sustaining it. Equally, the Environment Agency has not maintained the riverside outlet of the Stock for three years citing Health and Safety regulations. Since the flooding the barriers to this outlet are missing—this is a huge safety risk.

The current Floodline information provided by the Environment Agency is useless to homeowners who are about to flood. They need to know the predicted water level height above OD. Neither should people trying to protect their homes be forced to speak to call centres in Northern Ireland and elsewhere that ultimately have to refer the enquiry to the local office. These people need urgent, relevant information.

INFORMATION

Throughout the flood it was impossible to get reliable information of any sort (the village was cut off)—what time was water being cut off? How do we get water supplies? Which roads were closed? What time was high water? All the various bodies that had the information were snowed under. There should be a central control point disseminating this information (Borough Council through its website?) to parish clerks, neighbourhood watch co-ordinators, village agents and the like who can maintain contact with the community.

DEFRA

DEFRA has been actively promoting the enhancement of wetlands in the floodplain. The IDBs are against it, local communities are against it. It is time humans mattered.
PLANNING

Joined up Government. Homeowners are not allowed to import material into the floodplain to protect their homes and yet a major landfill site was allowed to be developed in Gloucester serving to flood the city and bottleneck water up river—why? Development continues in the floodplain, why? What happened to the River Severn Flood Defence strategy? Doubtless millions were spent on it but no one seems to know whether it ever reported.

LOCAL AUTHORITIES

Finally, local authorities should be more aware of their communities that flood. They are very quick to cancel services during floods but not to provide essential ones—road cleaning, and general maintenance works—post a flood. Rural communities pay rates too and they should be entitled to expect and to receive priority services post a disaster such as this.

In short:

— Areas at particular risk from flash or river flooding to be given priority by those responsible for drainage
— IDBs to improve ditches to reduce risk from flash flooding
— IDBs to be given powers to carry out their maintenance works the year round
— IDBs to be allowed to insist contractors burn or remove debris from site immediately
— IDBs to exercise their powers to insist riparian owners clear their ditches
— Environment Agency to ensure that its works do not enhance flooding!
— Environment Agency to be required to carry out its obligations on maintenance
— Environment Agency to have strong powers to prevent development in the floodplain
— Meaningful information from local sources to be provided by the Environment Agency
— A central emergency control disseminating information quickly and reliably would take pressure off people trying to deal with the situation.
— DEFRA to stop promoting schemes to improve wetlands in the flood plain—the IDB is opposed to these initiatives
— Local Authorities to be prevented from allowing development in the floodplain.
— Local Authorities to provide timely services post flooding

Chaceley Parish Council
August 2007

Memorandum submitted by Down Ampney Parish Council (FL 37)

I understand you require local knowledge on the recent flooding. I am the Chairman of the Parish Council of Down Ampney, near Cirencester in Gloucestershire. Our village suffered flooding to a degree that has not been known in living memory. Water flowed from one end of the main street to the other and stayed at quite a considerable depth for 36 hours. Ten houses in all suffered flood damage. The Ampney Brook to the west of the village burst its banks and flowed deeply over the adjoining fields and main village access road off the A419.

All the land around the village is owned by the CWS and we have spoken to them about keeping ditches dug and clear. Years gone by when Thames water was responsible for all areas including the Ampney Brook there was a local man employed on clearing and dredging the brook. I have lived in the village 19 years and have not witnessed any dredging. We know that the Brook has silted up considerably and we think the Environment Agency should ensure regular dredging which would have ensured the waters flowed more readily away from the village and into the nearby Thames therefore reducing the flooding in the village. Apparently the CWS have contacted the Environment Agency about this since the flooding.

I hope these facts help your investigations. We acknowledge the weather was exceptional, but we do not think general maintenance of ditches and rivers are being carried out as they used to be.

Julia Job
Chairman of Down Ampney Parish Council
August 2007
Memorandum submitted by Rosie Callinan (FL 38)

GLOUCESTERSHIRE FLOODING

In response to your request for information about the flooding I would like to highlight an area where the project I run was very useful. It also highlights an area that I guess there were several gaps in.

I run the Village Agent project which is funded by the DWP for 2 years. The aim of the project is to facilitate access to services for the over 50’s in the rurally isolated parts of the county and to ensure that services are working together.

Our Agents in the flooded areas were contacted by various organisations—social care, parish councils, charities, church groups etc as they have knowledge of the vulnerable and elderly people in their areas who needed help in obtaining water supplies, food etc.

As far as I am aware there is no “official” list kept and there probably never could be as all these people do not necessarily engage with social services or other statutory agencies. It would also be very difficult to keep a list of people up to date, so in many cases the Village Agent was the only person who had an overview of the parishes they work in and up to date knowledge of who was where.

I am attaching details about the project but as requested have kept this email brief. If necessary I can supply you with more information and case studies.

Rosie Callinan
August 2007

Annex A

WHAT IS A VILLAGE AGENT?

— Village Agents will bridge the gap between the local community and statutory and voluntary organisations able to offer help or support. They provide high quality information, promote access to a wide range of services, carry out a series of practical checks and identify unmet need within their community.
— Village Agents are recruited locally, and form strong links in the community in which they work and live.
— Village Agents have access to extensive relevant training and resources and get support from GRCC (Gloucestershire Rural Community Council) and the County Council’s Adult Helpdesk.
— Village Agents are paid a small “retainer” to work ten hours per week in the community. They will hold surgeries in the Village Hall or other suitable places, and carry out home visits where appropriate.
— Village Agents form part of a network of local contact points within Gloucestershire.
— The service will be provided primarily to older people in the 50+ age group, but other disadvantaged and isolated people will also be able to receive support.

Annex B

VILLAGE AGENTS—BACKGROUND INFORMATION

People living in rural areas, and Gloucestershire is no exception, are a classic example of a hard to reach group. Whilst frequently masked by a veneer of affluence, these communities are often isolated with high levels of social deprivation and poor transport links. They are usually very “self contained” and because of this, are reluctant to find help outside of their local community.

In a previous era, all villages had what are commonly referred to as the “5 P’s”:
— The Priest
— The Patron—Lord of the Manor
— The Postmaster/Mistress
— The Policeman—and invariably therefore the Policeman’s wife
— The Pedagogue—Village School Master/Mistress.

Today, many villages have few, if any, of these resident and, as such, that informal advice, information and support network has disappeared. The majority of parish councils employ part time clerks—their major skill resource—many of whom are only employed to give very limited time to this role. Many individual councillors have skills but little time, and some have time but perhaps do not always have the skills and experience. This lack of resource has been confirmed in the Rural Economic Strategy for Gloucestershire (published by Gloucestershire First in 2004).
The Village Agent concept was first identified as a recommendation from the Rurality research funded by the Department for Work and Pensions in 2002–03. This research gathered the views of older people living in some of the most rural areas of Gloucestershire and identified that an average of 83% of respondents would be happy approaching someone they knew and trusted within the community for help and advice.

The Village Agent will bridge the gap between the local community and those statutory and voluntary organisations able to offer help or support where required. Village Agents will act as a facilitator in the provision of high quality information, promote access to a wide range of services, carry out a series of practical checks and identify unmet need within their community. Through training and access to appropriate information resources, the Village Agents will develop their capacity to provide a service within their communities both in the short and longer-term. The role will incorporate information relating to social care, health services, pensions and benefits, housing, home and personal safety, adult education, leisure services, volunteering and advocacy services.

In order to be truly effective in taking a holistic approach to anyone in need within their community, the Village Agent will need appropriate access to relevant resources and support. In order to meet this need, they will form part of a network of local contact points within Gloucestershire, providing an essential role in taking information and support to some of the most rural areas in the county. They will be supported in their role through a range of “tools” such as the provision of a detailed training programme, publicity materials and high quality information resources, making appropriate use of advanced technology where practicable. The Village Agents will receive support both on a one-to-one basis and through the sharing of good practice within the network.

Village Agents are being recruited locally, trained and supported to provide face to face information and support which enables individuals to make informed choices about their future needs. The service will be provided primarily to older people, but other disadvantaged and isolated people will also be able to receive Village Agent support.

The 30 Village Agents are being recruited to carry out this role until June 2008 in order to identify the impact they can have both on individuals and on communities, and to test the hypothesis that rural communities prefer to access someone they know within their community for help and advice. They will be paid a small “retainer” to work ten hours per week in the community, providing access to information via laptops. This will be achieved through weekly surgeries in the Village Hall or other suitable places, and home visits where appropriate. It is intended to recruit and train all 30 by March 2007, using a phased approach. External evaluation will test the hypothesis, the benefits of the Village Agent approach for individuals and communities and the robustness of the methodology as a sustainable system.

Appropriate localities for Village Agents have been identified by a gap analysis and mapping exercise using Indices of Multiple Deprivation. The first 18 agents will be allocated to Cotswold and Stroud areas with the remaining 12 agents equally split between Tewkesbury and the Forest.

Older people themselves will be a crucial resource throughout the life of this project. The initial concept of the Village Agent has been identified from research carried out into the needs of older people and many of these same people will remain engaged in the project at all levels. A series of focus groups will be established at specific times to discuss and evaluate the effectiveness of the role and suggest changes or enhancements as appropriate.

The Village Agent pilot will be led by Gloucestershire County Council, working in partnership with the Gloucestershire Rural Community Council (GRCC) a countywide Charitable Company founded in 1923 and is funded by LinkAge Plus of the Department for Work and Pensions.

Rosie Callinan
Project Manager LinkAge Plus, Village Agents
August 2007

Memorandum submitted by Woodmancote Parish Council (FL 40)

We note that the House of Commons intends to hold an enquiry into flooding.

Whilst to some extent flooding has always been problematical, particularly in the River Severn environs, this has been exacerbated by the lack of good land management generally and particularly in those areas. Ditches and dykes are no longer kept clear of undergrowth, drains are not regularly cleansed and in addition there is far too much “hard landscaping” and intensive housing development all of which prevent the proper absorption of rain run-off.

This will continue and “global warming” will provide a convenient excuse, until proper care is taken to carefully assess every proposed development and the area for which it is intended. It is no longer good enough just to build hundreds of homes on every scrap of available land, whether it be brownfield, greenbelt,
white land in the town or the countryside. We have a duty to ensure that environmentalists, architects, town planners and landscape architects work together to improve our environment and ensure that our country is preserved for future generations.

M K Everett (Mrs)  
Chairman, Woodmancote Parish Council  
August 2007

Memorandum submitted by Mr M Baker (FL 41)

1. On 25th June 2007 my property was seriously threatened with flooding when a beck overflowed flooding the road.

The Authorities/organisations involved with controlling the beck are:

1. York Council who approved developments which drain into the beck.
2. Foss Internal Drainage Board (FIDB) who manage and maintain the beck
3. Yorkshire Water who maintain the pumps and pumping Station.

2. Queries made to York Council, FIDB and Yorkshire Water regarding whether the beck could cope with the run off water in heavy rain resulted in the following:

York Council has approved, over the years, a grand total of hundreds of house extensions, conservatories and single house developments in the catchment area of Westfield Beck.

They do not know the the safe capacity of the beck or the volume of “run off” water entering the beck. They advised the following “Along with the board we have long been concerned by the cumulative effect of these developments (and the paving over of gardens which is completely unregulated) but there is little that can be done by either authority.”

Yorkshire Water would not answer queries about the pumping capacity on account of their security policy.

3. Issues for investigation:

(A) In order to comply with government policy (Planning Regulations) councils are approving developments that will place other houses at high risk of flooding. Councils when approving planning applications should be required to give prevention of flooding to other properties priority over Planning and Building Regulations.

(C) Stop unregulated paving over of gardens.

(D) Only one Authority to be responsible for all drainage and that Authority to be subject to the Freedom of Information Act.

(E) Authorities responsible for keeping watercourses clear should be required to comply with standards that should be made public and can easily be understood by the public.

(F) More attention to be given to the effect of cumulative minor developments on increasing flood risk. eg Run Off water from 40 house extensions can be more than a major development of 10 houses.

M Baker  
August 2007

Memorandum submitted by Alison Lingham (FL 42)

As a resident of the Wye valley, adjacent to areas that flood regularly, I would like to comment about the current use of fields bordering rivers such as the Wye and Severn. Farmers are increasingly using this land for arable crops rather than grassland, which has considerable impact when the area floods. So much soil is being washed into these rivers, that they are becoming increasingly silted up, and consequently less able to carry away large amounts of flood water. We hear a lot about the consequences of building on flood plains, but surely this change in land usage from grazing land, where the soil is bound by grass, to arable, is having just as much effect. The Wye, for example, used to be navigable for barges carrying coal and ore from the Forest of Dean, but is now only navigable by canoes.

Alison Lingham  
August 2007
Memorandum submitted by Paul Rolph (FL 44)

In my experience it would be worthwhile to decide the difference between “maintenance and Conservation” particularly in respect of riverbeds and river banks. Clearing blocked trees and weeds around the stream in Upper Slaughter, instantly lowered the floods of the road.

Particularly in years gone by in Wiltshire my previous property in Lower Bemerton would not have flooded in the winter, had the river had been cleared of Debris and overgrown weeds.

Paul Rolph
August 2007

Memorandum submitted by Rebecca Nicholls (FL 46)

GLOUCESTERSHIRE FLOODS

I read with interest your article in Hardwicke Matters regarding organisations that were directly affected by the recent flooding. We provided voluntary services for Teckels Animal Shelter during the floods, please find attached a press release that I issued on their behalf to call for an animal crisis action plan to be put in place in the county.

It seemed that there was no one taking responsibility of animal welfare in the county. Teckels put in place a mutual aid agreement, to re-distribute supplies to other sanctuaries in need. Some of the donations were distributed to Skates Hill Kennel in Stroud, AAS Vets, Quedgeley and BJ Kennels in Staverton (whose animals had to be evacuated).

In future Teckels would like to work with the local authorities to create a forum to deal with animal crisis management and have an action plan in place—with a list of trained volunteers and animal professionals available in such emergencies. Not only would this reduce stress for animals and their owners, it could free-up the emergency services.

As a PR practitioner and animal lover, if such a plan was put in place, I have already volunteered to act as a media co-coordinator, as I did so during the floods.

Rebecca Nicholls
August 2007

PRESS RELEASE

CALL FOR ANIMAL CRISIS PLAN

An appeal to help Gloucestershire animal shelters cope with the recent flooding and disruption of water supplies has led to calls for better planning in the future.

Teckels Animal Shelter based in Whitminster, became full as it took in cats and dogs as emergency boarders during the recent flooding—on what is already its busiest period of the year. Joan Barrett the manager of Teckels Animal Shelter, says: “We have had kittens left by our gates anonymously, and only yesterday took in a three legged dog. With all the extra animals, we are struggling to cope with the overheads to keep the shelter running, veterinary fees often spiral to nearly £4,000 a month alone, the centre has to find £14,000 to remain open”.

Learning of the shelter’s plight, Rebecca Nicholls, who runs Eventageous PR in Gloucester, stepped in by organising an appeal through the media. She says: “Teckels needed help but was so engulfed in caring for animals around-the-clock that they didn’t have the time or resources to launch an appeal and get their message out to the media, so we stepped in.

Within hours we had a huge response. People gave water, (even when they didn’t have it themselves) animal food and bedding—which will be essential over the coming months.”

Matt Hammond who ran the Teckels emergency response said: “we have had an overwhelming reaction to the appeal, and would like to take this opportunity to the community at large for all of the donations that we have received, it is greatly appreciated. Although the floods may be subsiding, and many households are getting back to normality, here at Teckels we fear that the crisis has only just started. We are expecting to be full for many months to come as animal owners recover from the floods and restore their houses so that they are habitable again.
During the crisis last week, it seemed that there was no one taking responsibility of animal welfare in the county. We put in place a mutual aid agreement, to re-distribute supplies to other sanctuaries in need. Some of the donations were distributed to Skates Hill Kennel in Stroud, AAS Vets, Quedgeley and BJ Kennels in Staverton (whose animals had to be evacuated).

In future we would like to work with the local authorities to create a forum to deal with animal crisis management and have an action plan in place—with a list of trained volunteers and animal professionals available in such emergencies. Not only would this reduce stress for animals and their owners, it could free-up the emergency services.”

Specific Thanks goes to:

All the public donations of animal food and bedding.
To all the volunteers, we couldn’t survive without your loyalty.
British Red Cross
Alan Coward Transport for supplying a shipping container to keep all the supplies dry, and storage
To Equinox Interiors for assisting transporting supplies
Purina Animal Food
Cats Protection—Taunton & Wellington Branch
Tesco
Eventageous PR Ltd

NOTES TO EDITORS:

About Teckels:

Teckels Animal Sanctuaries was formed in November 2003 as a merger between two long established animal rescue charities. Swindon Animal Sanctuary Appeal had been running for over 17 years with the aim of building a sanctuary in the Swindon area. Around £120,000 was raised, but due to rising land prices it was getting no closer to its goal and was on the verge of being wound up.

Teckels Animal Welfare Centre had rescued over 8000 cats, dogs and small animals over its 20 year history. However the land on which they were based was put up for sale. Having insufficient funds to purchase it, this would have spelled the end of animal rescue there.

Therefore the timing and circumstances were just right for the two charities to help each other to achieve both their goals! The new Teckels Animal Sanctuaries charity presently runs a sanctuary and boarding kennels (whose profits go straight back into the charity) in Whitminster, Gloucestershire. In the Swindon area they rescue dogs via foster homes.

The rescue and boarding animals are all cared for by our dedicated and hard-working staff and volunteers who regularly clean out, feed, exercise and socialise with those in their care. The centre costs a lot to run (vet bills alone average £4,000 per month), which is why they need your help by sponsorship, donation, membership, or by using our dog and cat boarding facilities.

They raise funds themselves onsite by offering beginners dog agility training on Monday nights, pet grooming services, boarding from one day to long term and are able to microchip animals for just £10 each.

Unlike many shelters, Teckels do not discriminate against old or sick animals, just because they make take longer to re-home. They have a strict no put-down policy, and regularly (providing they have the space) uplift animals from other rescue centres that are destined to be put to sleep.

Teckels are actively involved in the community from carrying out school and college animal educational visits, taking on work experience pupils through to visiting people’s homes.

How Can You Help?

If only 1,000 people donated £10 a month, it would secure their future for another year, and the best thing is, you can see where the money is spent. Teckels will host an open day in September to thank all the people that have made donation to come and look around for themselves.

There are so many ways you can help, including recycling your old mobile phones and ink cartridges through to sponsoring a kennel, fostering an animal, having a collection box at your workplace or becoming a volunteer.

Rebecca Nicholls
August 2007
Memorandum submitted by Margaret Bishop (FL 47)

With particular reference to upper Thames valley and Gloucestershire, and what steps public authorities should take to alleviate flooding problems.

SUMMARY

This memorandum looks at factors causing flooding and what steps should be taken to alleviate it with emphasis on the containment and management of flood water in traditional flood plains and water meadows. The Cotswold Water Park contains many lakes suitable for this use and should be managed in future with flood alleviation as a major objective. Recognition of the importance of its role in flood containment, would benefit not just local towns and villages but the whole of the Thames valley. Flooding is a frequent regular occurrence in this area and includes rivers and lakes, rain water run-off and sewage flooding. Local Councils should be asked to carry out a full flooding survey and compile information for use by appropriate public bodies. Often the most cost-effective action would be to lower river banks in places to allow floodwater to be contained where it does little harm. The Environment Agency should be instructed to look for situations where this least costly method could be utilised, and to oppose any development proposals which would prevent it. Monsoon drains should be built to carry rain water away rapidly, and drains and ditches kept open. Housing or commercial development should not take place until the amount of waste water that the proposals will produce has been investigated and adequate provision made. Agriculture should be managed to prevent excessive rain water run-off, and subsidies could be paid for land to be used as water meadows. The public should be educated to understand that heavy rainfall and subsequent flooding may become frequent and regular occurrences, and to practice water containment and management as a matter of course.

1. General Causes

This is an area with a shallow ground-water table, held near the surface. Two main factors are involved in flooding.

1. Heavy rain falling.

2. How this rainfall is managed.

Because of climate change, excess rainwater is expected to increase and flooding to occur more frequently. The causes of heavy rainfall related to climate change are outside the scope of this memorandum. The issues of water management are very much matters for the Committee to consider. Heavier than usual rainfall produces flood water which has to go somewhere and will naturally flow into the lowest point available. Strategically important areas such as power plants, water plants, hospitals etc need protection by flood barriers and defences, but in principle, we must realise the futility of flood defences which relieve one place but divert the flow, passing the problem elsewhere, and increasing difficulties further downstream. We must take steps to contain floodwater at places where it does least harm, either in traditional flood plains and water meadows or, if no flood plain is available, then by creating designated areas where excess water can be safely stored. These storage areas could possibly also be a useful resource in times of drought.

2. Cotswold Water Park

Surrounding the upper Thames are large areas of gravel beds which have been extensively extracted in the past 50 years. This has created the Cotswold Water Park, a 40 sq. mile area with more lakes and water stretches than the Norfolk Broads. These are managed primarily for tourism development with the rationale that economic development from tourism will replace declining agriculture. Traditionally these gravel areas provided settlement beds and soakaway areas where excess floodwater could be accommodated, but water containment is no longer an objective. At present a consultation exercise is being carried out to determine the future management of the Cotswold Water Park, and a report has recently been produced. This report acknowledges that areas with shallow groundwater held near the surface are often subject to flooding when heavy rainfall occurs, and mentions the use of lakes as flood alleviation mechanisms, but there has been no consideration of this in the management proposals. The gravel beds have served a vital function as the flood plain for the area for thousands of years, and the current proposals for development are threatening this. In view of the increased rainfall expected as a consequence of climate change, it would seem desirable for as much floodwater as possible to be retained in the upper Thames valley and Cotswold Water Park to alleviate flooding in Oxford, Abingdon and towns further down the Thames. It is imperative that in future the Cotswold Water Park should be managed with much more recognition of the importance of its role in flood containment, not just for local towns and villages but for the whole of the Thames valley.
3. **Recent Flooding**

The Fairford/Lechlade area of the Eastern section of the water park was severely affected by the floods of late July 2007, but this is not an exceptional circumstance. Many houses in the district have suffered repeated episodes of flooding, often sewage flooding, and there have been 5 or 6 serious episodes since the year 2000. In 2006, the water authority, Thames Water Utilities, invested £3.3 million in a new pumping station at Moor Farm, Fairford, but though the sewage capacity was greatly increased, it cannot cope with excess rainwater and has not been sufficient to stop severe flooding occurring.

In this area there are 3 major contributing factors, flooding from rivers, rain water run-off and sewage flooding. The relevant authorities are the Environment Agency, Gloucestershire County Council and Cotswold District Council, but they will be overwhelmed with work as most of Gloucestershire has been affected by flooding to some degree. I suggest that local parish and Town Councils should be asked to carry out a full survey of where the flooding happened, where it came from, whether river, run-off or sewage etc. and compile information to pass on to these bodies and to Thames Water. This information could then be used to decide where river banks will need strengthening, where additional drainage is needed, and the emergency planners could work out where pumping by the Fire brigade would be most effective. During the July 2007 flooding, it was found that pumping carried out by the Fire Brigade relieved some areas but made conditions worse for others.

4. **River and lake flooding**

The Environment Agency is responsible for management of this type of flooding and should receive appropriate instruction, technically qualified personnel, and funding to ensure that this can be adequately carried out. It should be appreciated that often the most cost-effective action would be to lower river banks in places to allow floodwater to be contained where it does least harm. Flood water has to go somewhere and will naturally flow into the lowest point. If there is a lake, water meadow or flood plain available at the lowest point with room for millions of gallons of floodwater and no houses, no people, or domestic problems, it should be utilised as a first choice solution. The Environment Agency should be instructed to look for situations where this least costly method could be utilised, and to oppose any development proposals which would prevent it.

5. **Rain Water Run-off**

In countries where flash flooding from heavy rainfall frequently occurs, it is customary to build monsoon drains which rapidly carry it away. This system could easily be utilised in this area, where there are many lakes which could accept surplus rainwater, or in coastal areas where the drains could run off into the sea. Again this is a relatively low-cost measure and the Environment Agency should actively seek situations where it could be applied. If this is not possible, drains, ditches and culverts should be opened up and additional capacity provided to relieve black spots where water collects, and if possible to channel it away from roads and houses. There will need to be special provision to deflect excess rainwater from strategically important areas using both defensive floodwalls and drains or ditches to divert the flow.

6. **Sewage flooding**

Thames Water area has many old towns with a dual system, where rain water is not separated but allowed to run into the sewer system and be pumped away. This is only adequate for normal flows and where the system has ample capacity. In many cases, housing development and the increased use of showers, washing machines, dishwashers etc, means that there is little spare capacity and certainly not enough to contain large volumes of excess rain water, which comes up out of the drains in low-lying areas. In these cases, flooding in times of heavy rainfall is inevitable, and this is particularly distressing where the floodwater is combined with sewage. The solution is to build new systems where sewage and rainwater are kept completely apart, or to increase the pumping capacity to deal with many times the normal flow. Both these are expensive and would require millions of £s of investment, so are unlikely to happen in the short term, but pressure should be put on water authorities to use some of their excess profits to prevent sewage flooding which is not acceptable. In the meantime, any methods to divert rain water and prevent it entering the sewers should be employed such as monsoon drains, ditches and culverts as in 5.

7. **Housing development**

Post-war housing and commercial development has proceeded with very little attention to water management. This together with the increased personal and domestic use of water has produced a huge increase in waste water, often without the investment in water systems needed to contain it. Building development has taken place in low-lying areas, often utilising thick concrete slab foundations which keep the development dry but create impermeable areas whose run-off increases flood risk for others. Planning consent forms do enquire where waste water will go, but usually 3 words “into existing sewers” or “into soakaways” is regarded as sufficient. This must change. I suggest that in future, in the same way that
appropriate energy efficiency calculations must be produced as a condition of planning consent, water calculations should be called for. These would take into account the number of bathrooms, toilets, kitchen appliances etc. work out the probable waste water production and give details of how and where this would be accommodated. If additional provision needed to be made, this would have to be organised before development could proceed, and the cost of the necessary investment would be partly paid by the developer. The futile argument about the desirability of building on flood plains would be ended. In circumstances where this could go ahead with proper provision at reasonable cost then the development would proceed, if not then the development would not take place. I suggest also that just as building is not allowed in front of the building line, there should be limits on building at a height above the ground level of surrounding buildings. In many countries, houses in flood-prone areas are built with low level storage and garages, or wet basements with laundry room and wet activity areas, or on stilts. Ingenious design solutions could be found which would enable houses to be built without decreasing the water holding capacity at ground level which increases the probability of neighbouring houses being flooded.

8. Agriculture

Traditionally the period after harvest with short day-length when crops are not growing was used for hedging and ditching activities. These have declined in recent years and, to protect wild life, farmers have been discouraged or prevented from digging out ditches. Farmers should be encouraged to keep all ditches running freely, and be required to prevent excessive rain water run-off onto neighbouring property. At present, subsidies are paid for set-aside agricultural land, and no attention is paid to water management. Farmers could be encouraged by subsidies to harvest water and allow fields to be used as water meadows, an old agricultural practice which was considered in suitable areas to re-vitalise the land and produce earlier grass for stock feeding.

9. Public Information

The Environment Agency produces good information leaflets about what to do when flooding is expected, or after a flood, but these are not widely known. Press releases could disseminate this information more widely. The public should be encouraged to be sparing in their use of water in times of flood, just as in times of drought, since this minimises the waste water entering the system, and therefore the total amount which has to be accommodated. Motorists should be warned not to go past “road closed” signs, not to enter flood water unless they know the depth is manageable (abandoned cars block the road for larger vehicles), and to proceed very slowly so as to minimise the waves and splashing onto other vehicles and property.

We must learn to accept that heavy rainfall and subsequent flooding may be frequent and regular occurrences, and practice water containment and management as a matter of course. There will be need for some high technology, high cost solutions, but a great deal can be achieved by common sense and traditional methods.

M Bishop (Mrs)
August 2007

Memorandum submitted by Rev Robert Barlow (FL 48)

FLOODING—LESSONS LEARNT

I would suggest that experience of the floods in Worcestershire gives various learning points.

1. The Polluter Pays

This principle is accepted across the political parties. The reality of the floods is that the farmers are paying for clearing/decontaminating their land but the filthy that has been washed onto their land is not of their making. It is society’s rubbish and the clean up costs morally ought to be borne by society out of the public purse.

2. Public Generosity

The generosity of the general public to the ARC Addington fund and other Farming Help organisations shows there is a willingness to give to farmers who suffered through the floods. Government could/should recognise that and be similarly generous in match funding donations.
3. **The need for a robust and profitable agricultural industry**

With an average income per farmer last year of under £14,000, the floods have hit an industry that is already under pressure and is heavily reliant on Single Farm Payment. Rural Payments Agency ought to be fast tracking single farm payments for those counties that have suffered flooding.

4. **Post flood support**

AWM announced £2 million of support to those affected, but was it the support that was most appropriate? A £2,500 grant to buy in a consultant to tell you what to do is unlikely to be the most appropriate support for a landowner who is trying to clear rubbish out of ditches.

5. **Public Good**

Generally when farmland is flooded it serves to protect towns/villages down stream (though in this case the floods were so severe the towns flooded anyway). Land owners should be compensated on the basis of the costs avoided by the downstream towns.

*Rev Robert Barlow*

*August 2007*

**Memorandum submitted by Jaqui Taylor (FL 49)**

**Flooding 2007: Lessons to be learnt**

1. The flooding of summer 2007 was caused initially by extremely heavy rain and surface water drainage problems. There is no agency that has overall responsibility in mitigating or dealing with this type of flooding. It would make sense to identify a single agency to have a co-ordinating responsibility.

2. The consequences of the co-incidence of this flooding and the publication of the Government’s Green Paper about future development plans must be examined. It cannot be sustainable to even consider building on (or near) flood plains without properly addressing the water management issues which have been illustrated by this summer’s flooding. At present new development increases rainwater run-off compared to greenfield or even brownfield land and this affects both the immediate environment and also downstream locations.

3. This summer’s experience has redefined areas liable to flood. The present flood plain maps are not bomb-proof. The “one in a hundred year” rule used by EA to advise on flood risk limitations to development is not a scientific absolute. Local knowledge and experience need to be tapped more effectively as a basis for planning and possible results of climate change given credence in the process.

4. Water management requires a whole system view. Rainwater is a resource: becoming more scarce in the most pressurised parts of the country (the south and east). A national water strategy should be developed (the Netherlands offers a useful role model) for the following purposes (and probably others):

   - retain rainwater where it falls by for example, maximising permeable surfaces, run-off retention ponds, swales, rainwater collection and storage from buildings
   - slowing up water drainage and stopping it going to waste for example by sustainable drainage systems for all development including infrastructure such as roads.
   - consider potential ways of storing rainwater for subsequent use (e.g. aquifer re-charge) and/or slow release to the environment
   - devise building regulations that help to safeguard against effects of flooding and maximise economical use of water, rainwater harvesting for local use and realise any opportunities for renewable energy from water power
   - manage rivers and other watercourses so that flash flooding is reduced
   - locate development away from potential flood areas.

In addition to the negative impact of flooding of properties there are a number of positive environmental opportunities resulting from treating flood plains as an asset: water resource, biodiversity, landscape, agriculture, recreation and tourism advantages can be gained from a rounded thoughtful approach to the water environment.

Addressing the management of water in this wide-ranging way incorporating broad objectives would also serve the climate change agenda.
Such a strategy would need to be prepared and implemented through many agencies including Government/DEFRA, Environment Agency, planning authorities at all levels, local authorities, water companies and conservation and environmental bodies.

Jaqui Taylor
August 2007

Memorandum submitted by Carolyn Horsewood (FL 50)

I have three simple suggestions for control and upkeep of potential flood areas.

(1) Dredge rivers and major streams affecting critical flood areas.

(2) Keep minor criminals out of prison by giving them community service clearing/tidying small brooks and streams.

(3) Set up or encourage people to set up businesses for clearing up or tidying streams and brooks. This would take the burden away from local councils and release funds for other council projects.

C Horsewood (Mrs)
August 2007

Memorandum submitted by David Jones (FL 51)

REGARDING FLOODING IN ENGLAND AND WALES.

I am a retired Chartered Civil Engineer and was affected by the recent floods in Gloucester. I worked for Gloucestershire County Council Highways Department between 1964 and 1989 and as an independent consultant thereafter until last year. During my time at the County, I worked inter alia on Development of Tewkesbury and Gloucester when Planning Policies were generated allowing building to 10.4 O.D. Some arguments for a 14.5 O.D. were overruled. Whilst an articled pupil in West London I had experience in dealing with a number of drainage matters including flood relief work along The Thames as a result of the 1947 floods. I believe there are a number of issues causing severe flooding along the Lower Severn in July 2007:

1. Geography of The Severn Valley

Generally the River Severn flows in a south-westerly direction against the prevailing wind. Thus a typical Atlantic Storm blows up The Severn as flood waters travel down it. This is a completely different situation to river estuaries flowing eastwards to The North Sea such as the Humber where the south-westerly air stream flows more or less with the river current. There are also differences in geology all of which may lead to individual policies for each flood plain.

2. Building on the Flood Plain

This is dealt with adequately under existing terms of reference of The Environment Agency but advice to Local Planning Authorities on planning applications is not mandatory.

3. Building on areas above flood plains where rain water can be retained

This should not be confused with (2) above. Here the ground acts as a sponge allowing slow release of surface water reducing the possibility of sudden flooding. EA comments on planning applications do not appear to deal with this matter.

4. River and Watercourse Management

The bed of the River Severn above Gloucester is rising possibly due to the Victorian Weirs at Gloucester which allow mud to flow up stream on a flood tide but deposits mud on an ebb tide. After the July 2007 storm the water ran off from areas above the 50 m contour very quickly. My house is in this area and there were very few problems. The nearby Gloucester Trading Estate is being developed at the present time and provision has been made to contain water already in water courses such as the Wotton Brook in a balancing tank. Inspection showed that 2 days after the flood the balancing tank was empty.

I believe the following measures should be introduced:

1. The EA should have powers of direction for planning purposes.
2. The EA should develop policies on land for water retention above general flood levels.

3. Management of water courses and water flow control systems should be undertaken more vigorously.

D R Jones CEng MICE
August 2007

Memorandum submitted by Graham Shelton (FL 52)

As an Oxfordshire farmer severely affected by the flooding I believe that the following should be examined.

1. The flooding was unprecedented winter or summer; was the weather unprecedented or just wet for the time of year? Despite popular myth, my information is that it was only the 23rd wettest July in Oxford (Radcliffe Meteorological Station, University of Oxford).

2. Was the farmland unusually saturated before the flood (thereby reducing its “sponge” capacity)?

3. Why was this?

4. When were ditches, brooks and waterways last effectively cleared of vegetation and silt?

5. Were flood ditches and banks adequately maintained?

6. What were the costs to the farms and communities of these floods compared to the costs saved in not maintaining the waterways silt-free?

7. Is the land still unusually saturated?

8. How can it be effectively drained?

9. How will the Environment Agency prevent further flooding this winter and beyond?

10. Does the Environment Agency have any plan to drain the Thames Valley effectively or will it just hope that it doesn’t rain?

May I offer my answers to the questions I raised? I do this from personal observation in the Oxfordshire flood plain.

1. The weather was NOT unprecedented, although it was undoubtedly pretty wet.

2. The water levels were very high throughout the Spring and early Summer and the soil was saturated a little below the surface but workable around us.

3. No effective clearance of the waterways around us has been done by the EA for at least 5 years. We are not allowed to interfere with the key brooks that feed into the Thames, and the EA has allowed them to become seriously overgrown. They therefore have massively reduced flow rates, the more so because the vegetation collects silt which further impedes the flow. As a result, the drainage is impaired. It is no wonder, therefore, that the ground was saturated before the heavy rains. Its sponge capacity was already fully used and there was none spare to take the extra water. We clear our own ditches, and at the peak of the flood they ran backwards as they filled up from below.

4. There has been no effective dredging of the Thames around us for years and no effective clearing of key channels by the EA for a similar period.

5. Flood ditches and banks have not been maintained adequately.

6. Don’t know the overall costs. On our 500-acre livestock farm we estimate the cost at in excess of £10,000 already. I have provided to James Paice a detailed breakdown of these costs. This will ensure that we make a loss this year and will make the business unsustainable if it is a frequent occurrence.

7. The land is still saturated, as the water has still not drained out completely, killing grass, killing worms and leaving bare mudflats. This has never happened before, winter or summer. This is not because the soil in unusually compacted. It is because of the impaired drainage.

8. It is self-evidently the case that the drainage is inadequate to take the flows of water required. If the inflow to the bath is greater than the outflow then overflow is inevitable. We cannot alter the inflow and therefore flooding can only be avoided if we increase the outflow.

9. We can do this quickly and restore to pre-flooding levels by reversing the EA policy of not clearing and dredging. Longer-term, further drainage channels and banks may be needed. Achieving sufficient flow of water throughout the year is key. I understand that there is a drop of over 160 metres from the source of the Thames to the sea, this should allow sufficient flow to avoid most problems if the channels are kept clear.
10. We cannot change the weather and it is unreasonable to blame it for a management failing. We need to change our policy from a flooding policy to a drainage policy.

I look forward to hearing the full results and actions arising from your inquiry.

Graham Shelton
August 2007

Memorandum submitted by Fred and Jean Hollier (FL 53)

We consider the flooding to our houses occurred as a combination of the following factors:

1. Estimate of the total rainfall on the catchment area associated with the six houses.
2. Flooding from the suspected damaged manhole in an underground pipe carrying a natural water course.
3. Outstanding repairs to damaged stormwater drains promised by City Council.
4. Flooding from stormwater drains/balancing pond which have not been completed by a new development of 99 houses.
5. Inability of the combined sewer/stormwater system and local pumping station to function during heavy rain.

On 20 July six houses on the Bristol Road, Quedgeley were flooded. Our houses are in a natural dip between the A38 bypass and A4008 Bristol Road to the east and west and slightly higher ground to north and south. The pool formed in this dip was 20 inches deep at the deepest point, which resulted in 4–12 inches of water entering the houses. The total volume of water in the flood pool is estimated to be 650,000 litres. Our investigations have shown the following expected sources of the flood.

1. The total catchment area of the dip is approximately 300 ft x 100 ft and with 3 inches of rain falling during the day, this amounted to a flood of 450,000 litres. We consider it would be feasible for the Local Council to install an emergency drain which could divert this water from the dip and allow it to drain into the storm drain on the main A38 bypass.
2. We have a storm drain system across our rear lawn which leads to a manhole on the north side of our property associated with a large underground pipe carrying a natural water course. Unfortunately, during heavy rain, instead of this main pipe carrying away our storm water, the large pipe runs full and backs up to the manhole. The water gushes out from the manhole cover at a flow estimated at 10 litres per second which over the six hour period on the day amounted to 200,000 litres.

The underground pipe runs from the former RAF Maintenance Unit under the A38 bypass, under next door’s garden and under B4008 beyond which it becomes an open brook. This pipe has been in place since the 1930’s and was originally maintained annually by the RAF. However, over the last ten years houses have been built on the land and no maintenance has been done since, the Council say, the landowner is responsible. However, when council workers attended immediately after the flood they were unwilling to check the status of the manholes unless it was done by properly clad and trained operatives. The manhole from which the water gushes is at a junction of a 1 x 650 mm pipe with 2 x 450 mm pipes which carry the natural water course. We consider that such a major water course should be maintained and repaired by the local council since it is unreasonable for a householder to maintain such a large pipe.

3. We have correspondence from the local council, dating back to 2003, that they have surveyed the storm drain piping on the south side of our property and proposed a scheme which would sort out the flood problems experienced by a property 2 houses away. To date this scheme has not been instigated and we are pressing the council to include it in their current budget.

4. On the north side of our property there has been a development to build 99 houses, which is the responsibility of Charles Church Limited. The development included an area designated as a children’s playground which included a natural pool that was to be developed as a balancing pond. The planning application stated that work on sewage and storm drains should be completed before any houses were occupied. However, the City Council has advised that they have not received calculations for the storm drain scheme and have not been able to check or approve them. Hence, we have a situation where most of the houses have been built with a storm drainage system connected to the existing pool and many of the houses are now occupied.

The developers have completely ignored the Planning Regulations, the City Council have been negligent in not enforcing the Planning Regulations and the house buyers' solicitors have seemingly been misled when requesting a local search, since the storm drainage arrangements are not approved. In addition we have experienced a pool which during the flood, overflowed into our flood pool. The water is still lying over part
of the (designated) playground area. It has been there over two months and is now becoming a stinking mess, and still nothing has been done by the developers to establish a proper overflow from the balancing pond into the open ditch system.

5. One hour after the flood started to develop above ground it was noted that the water level in our sewage water pipes was already at ground level and it did not lower to its normal level until 32 hours later, whereas the flood pool had disappeared after 20 hours. This situation has been reported before to Severn Trent Water who advise that they will get someone to check whether the pumping station (approx 400 metres from our properties) has cut out or is operational. Although a large expansion pipe has been installed in the system to cope with peak flows it is obvious the system still cannot handle large flows of water. We have had meetings with Severn Trent Water and they have done a TV survey of the Sewage Pipe Line up to the Pumping Station. However, we still await any feedback on why the system does not work.

We consider that our flood occurred as a combination of the above five factors. Our concern is that the different bodies associated with each problem, will come up with reasons why their particular problem cannot be dealt with—and so when we experience the next heavy storm our houses will be flooded again. In addition we consider that underground pipelines greater than 300mm diameter, should be maintained by the Local Authority.

Fred and Jean Hollier
August 2007

Memorandum submitted by Ordnance Survey (FL 54)

1. EXECUTIVE SUMMARY

Ordnance Survey creates, maintains and distributes geospatial and cartographic data and products relating to Great Britain in the nation’s interest. As part of its public task, it also ensures that its data is capable of supporting the principles underlying the Digital National Framework (DNF) in underpinning the association and integration of third-party geospatial information.

Ordnance Survey has been proactively involved in the Atlantis initiative, which aims to achieve a far better understanding and managing of flood hazards. Ordnance Survey believes this programme provides an excellent example of collaboration between different government departments and agencies and of how datasets from different sources can be effectively integrated using the principles underlying the DNF.

The Atlantis initiative is described in more detail below but, if the Committee so desires, Ordnance Survey would be very happy to provide further information.

1.1 About Ordnance Survey

Ordnance Survey is the provider of definitive mapping data for England, Scotland and Wales. We benefit businesses, government organisations and consumers by supplying intelligent digital information and paper maps based on one of the world’s most detailed geographic reference frameworks.

Ordnance Survey has been a separate government department since the mid 19th century and an Executive Agency in its own right since 1991. Ordnance Survey has operated as a Trading Fund within the public sector since 1999. Our Director General and Chief Executive is official adviser to the United Kingdom Government on all aspects of survey, mapping and geographic information.

Ordnance Survey surveys and collects data on roads, buildings, postal and non-postal addresses, boundaries, water courses, height and many other aspects of the natural and man-made landscape of Great Britain. Although traditionally supplied to the user as paper maps, this data is now more usually supplied as digital information, which can be readily analysed, manipulated and linked to other information. The large-scale digital database of the surface of Great Britain is known as the National Geographic Database (NGD), from which the OS MasterMap product is produced. The NGD is kept up to date on a daily basis, with up to 5 000 changes being made to the database each day. It forms a valuable resource for both private and public-sector organisations in this country, and an independent report published in 1999 estimated that Ordnance Survey mapping underpinned £100 billion of economic activity.

1.2 The Atlantis initiative

1. The Atlantis programme has been established by a consortium of government organisations: British Geological Survey, Centre for Ecology and Hydrology, Environment Agency, Meteorological Office, Ordnance Survey and UK Hydrographic Office.

2. The objective of the initiative is to “Provide integrated geographic and environmental datasets to better support water management in flooding and water quality for the 21st Century”.

Memorandum submitted by Ordnance Survey (FL 54)
3. The primary purpose is to enhance the national capability to understand and manage flood hazards and other water-related environmental matters. Additionally, it is intended that the programme will facilitate major efficiencies and service improvements for the public- and private-sector users of the information.

4. A Detailed River Network (DRN) and a variable accuracy hydrologically consistent digital terrain model will comprise the core datasets. These will be high resolution, maintained and fully consistent with each other. Complementary datasets will include geology, river basin and flood flow information, climatological information, and coastal and hydrographic information.

5. These datasets will be interoperable with each other and with such OS MasterMap datasets as may be agreed between the programme members from time to time, meaning that units, coordinate systems, formats, referencing systems and positioning will be consistent and compatible.

6. The value of the new, very detailed datasets is in the ability to model and help manage water information from the national level to the local level; this has not been possible until now.

7. It will be possible to use the data in the cycle of planning and preparation of mitigation strategies, to help manage inevitable future emergencies, through to site restitution and claims settlement to the lessons-learnt stage, to be invested back into the planning and mitigation process.

Ordnance Survey
August 2007

Memorandum submitted by RB Shacklock (FL 55)

1. Long Compton lies in a valley surrounded by hills and with a stream fed by springs. On 20 July 2007, the village was inundated with 4.5 inches of rain in 24 hours and 30 properties (10% of village) were flooded internally. No advance warning (other than weather forecasts) was given and no help was offered afterwards. Indeed, the Environment Agency did not recognise the village as a flood area as it has no “named” river, only a stream. This stream feeds the Stour, Avon and Severn and we see it as an early warning for towns downstream (e.g. Shipston floods 6 hrs later, Stratford-on-Avon 24 hrs, Evesham 48 hrs, etc.).

2. The District Council was unaware and offered six questionnaires, increased when they were advised of the situation, but have not offered any further assistance.

3. Why is the Environment Agency not responsible for all flooding, and why is there no “early warning” network?

4. Are there to be visits to flooded localities to ascertain what flood prevention measures can be taken? And who will fund the measures?

5. As the insurance cost from the floods will be at record levels, why is there no financial inducement for them to contribute to flood prevention?

RB Shacklock
August 2007

Memorandum submitted by Dr Susan Juned (FL 56)

FLOODING IN THE TOWN OF ALCESTER, WARWICKSHIRE IN 2007

SUMMARY

This submission outlines the recent history of flooding in the town of Alcester, Warwickshire with some recommendations that might help to prevent or alleviate future floods and which may help residents should such an event recur.

RECENT FLOODING HISTORY:

1. Alcester is a historic town. Founded in Roman times it was established at the confluence of the Arrow and the Alne rivers. Historically it has flooded many times until flood defence banks were built around the town in the 50s or 60s.

2. I have lived in Alcester for just over 22 years. In that time the town has had two serious river flooding events in 1998 and 2007, but has also had numerous smaller, more localised floods caused by an antiquated and inadequate drainage system and, in some parts of the town, run off from poorly maintained land drains.
3. In 1998 the river breached a part of the flood defences where construction had taken place and where the level of the defences had been eroded. In addition to water from the river the situation was exacerbated by severe problems with the drainage within the town, by sewage from old-style combined storm water and sewage drains and an inadequate pumping station. Over 70 houses were affected.

4. In 2001, further flooding occurred caused by run off and inadequate drainage.

5. In 2003, the Environment Agency paid for maintenance work to the flood defences, which had, over the years, been eroded. In several places householders had dismantled parts of the defences to extend their gardens.

6. Warwickshire County Council and Severn Trent also carried out repair work to parts of the drainage system that were in particularly poor order—but there was no major rebuilding of the system. Combined storm water and sewage drains and the pumping station continued to exist without any promised upgrades.

7. Further localised flooding caused by drainage problems have continued to plague parts of the town since 2003.

8. In 2007 the town was again flooded. This time the river breached the defences on the opposite side of the town where a bridge is a weak spot and where there is some possibility that the defences were incomplete. Again the flooding was exacerbated by the drainage system in the town. In all 150 houses were affected in some way and over 110 were severely flooded.

9. For some householders it was the third time in nine years that they have had to cope with the trauma of flood damaged houses. For a number of households just outside the main town poorly maintained land drains have caused their houses to be inundated three times since January 2007.

10. Drainage problems hit all the roads into the town and rainwater flowing from fields alongside eventually made most virtually impassable to most vehicles. By 10.30 pm the centre of the town was isolated.

RECOMMENDATIONS FOR THE FUTURE

11. The drainage in Alcester is antiquated and, despite work carried out over recent years by Severn Trent and Warwickshire County Council, it is unable to cope with the kind of downpours that are becoming more frequent. As well as being inadequate in capacity, individual drains are often blocked and the cleansing regime is inadequate for the demands being put on the system. The pumping station on Stratford Road requires upgrading.

12. Most of drainage outlets in Alcester feed into the rivers. When river levels rise the outward flow is stopped and water begins to back up into the town.

13. The flood defences require regular checking and maintenance, as do the land drains in fields around the town.

14. The drainage system for the whole town needs a regular and more frequent cleaning programme. The whole drainage system needs more work—particularly to solve the outflow to the rivers—and the capacity of the whole infrastructure must be assessed to determine the capacity to cope with the heavier downpours that are predicted by various climate change scenarios.

15. There is a need for much more serious planning and action if we are to adapt to anticipated climate change and deal with the negative effects.

16. There are many players who have a role in such planning. The District Council, County Council, Severn Trent, Environment Agency, landowners and developers all play a part in averting and coping with flooding and all have a responsibility to work together to prevent or find solutions to flooding and adapt to climate change. There is currently no clear coordination body. Responsibility is split between so many bodies that decisions can be deferred and action not carried through. It is too easy to avoid action.

17. Alcester residents need to be assured that as much as possible is done by all public authorities to reduce the risks of any reoccurrence.

18. Whilst flooding may not be completely preventable much more can be done and consideration should be given to ensuring that:

   — The drainage and sewage infrastructure is comprehensively upgraded throughout the town
   — Any weaknesses in the flood defences are addressed
   — Measures are taken to reduce rainwater runoff and ensure that land drains are better maintained
   — Emergency procedures are up to date to meet any increased risk
   — Sustainable urban drainage systems are in place to prevent excessive runoff and alleviate flooding
   — Floodplains are properly utilised and able to divert water from the town
   — No further buildings are allowed in floodplains
   — Any new buildings elsewhere should be resilient enough to resist the effects of both flooding and drought
   — Residents are alerted to the fact that hard paving and surfacing increases the risk of flooding
— There is full coordination and cooperation between all who have a responsibility to prevent and find solutions to flooding and that there are the funds available to carry out essential work.

19. Better advice needs to be made available to residents to help them prevent, prepare for and recover from flooding. The Environment Agency carries some excellent literature covering advice on prevention, preparing for and recovering from flooding on the website www.environment-agency.gov.uk but many people do not have access to computers and many were unaware of the Floodline number, and the advice on practical action that can be taken in an emergency and practical action that can be taken after the event.

20. Town and Parish Councils have no specific land drainage powers but do have general powers to assist in their neighbourhood and can be of great assistance to the other authorities in providing a link to the community. The District and County Council need to ensure that they are able to do this by giving them support.

21. Parish and Town Councils can assist with a community communication system, a flood action coordinator, flood information centre and volunteer registration point within the town, along with a plan to manage the response to the flooding. They must have a clear line of communication to other authorities and be a part of a future plan of action.

22. Responsibilities for all tasks must to be clear.

*Dr Susan Juned*

*August 2007*

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**Memorandum submitted by Stroud District Green Party (FL 57)**

1. **EXECUTIVE SUMMARY**

Gloucestershire was one of the worst hit regions with the recent floods and all the indications are that such events will increase in the future. Our main recommendations are that we urgently need to adopt a mandatory and comprehensive national SUDs policy and significantly improve public awareness about the realities of climate change. We need to develop a comprehensive strategy towards water: this would include prioritising upstream flood defences, stricter rules about house building on flood plains, reducing impermeable surfaces and a re-looking at the role of agriculture.

We also need to look at how we can improve our crisis management, seriously tackle the causes on climate change with a robust programme of carbon reduction, restore water companies to public ownership, build community resilience, rethink our sewage systems, decentralise energy and consume less water.

2. **CLIMATE CHANGE: NEED FOR HONESTY**

2.1. Cause of floods. Let us be clear from the start the amounts of rainfall have been so extreme that any measure of preparation would have been bound to fail: dredging rivers, better sand bag organisation, inadequate contingency planning (bowsers and communication) and a host of other measures would have helped but it is clear we need to better acknowledge the climate-change-related nature of the floods. Recent joint research by several national climate research institutes, including the Hadley Centre of the UK Met Office, supports this view: it is not just the climate’s natural variability which has caused the increases in rainfall and temperatures, but there is a detectable human cause climate change, caused by our greenhouse gas emissions.

2.2. Need for clearer message re climate change. The public are not being given the facts about climate change or the urgency with which we need to tackle it. Numerous local examples like a County newspaper confusing ozone layer and climate change in their editorial last month, local Drainage Boards not having the implications of climate change as part of their policy and the local airport issuing a statement that climate change is a myth. Similarly nationally some papers rarely mention climate change (The Sun mentioned it about 6 times in 6 years) and even the Government’s Chief Scientist goes against international scientific agreement that the stabilisation target should be 430ppm CO₂. While he doesn’t deny the catastrophic effects of climate change or that the number of people at high risk from flooding will more than double to 3.5 million by 2080, he suggests 550ppm CO₂ is a realistic goal. As Tony Juniper (Executive Director of Friends of the Earth) said: “That might well be an arguably realistic perspective, building on one set of political and economic judgements, but that is not what the science says we should aim to achieve; nor is it the role of scientists to propose such compromises.”

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2 The Intergovernmental Panel on Climate Change (IPCC) confirms, in its February report: “The frequency of heavy precipitation events has increased over most land areas, consistent with warming and observed increases in atmospheric water vapour.” As the IPCC states, there is an identifiable global trend towards more intense precipitation—in all regions, and in all seasons. Even where the climate overall is becoming drier, as in Australia, when rain does arrive, it falls with undreamt-of ferocity. That means flash floods, even in places far away from rivers that may never have experienced flooding before. None of this on its own “proves” climate change, but it clearly fits the prevailing trend. There is more energy in the system, driving a more vigorous hydrological cycle.
3. Sustainable Urban Drainage Systems

3.1. What are SUDs? The SUDs philosophy is an integrated approach to managing water on site by
minimising run off, attenuating discharge rates, detaining water for passive treatment, improving water
quality and creating amenity space for people and wildlife. The overriding concept of SUDS is that drainage
design for development sites should mimic, wherever possible, the existing drainage characteristics of the
area and seek to minimise the effects of development on the hydrology of the site and the surrounding
environment: water will be dealt with as close to where it falls as possible. SUDs can be achieved by
utilising a series of porous hard surfaces, swales (broad open ditches), ponds and wetlands. These all ensure
that water seeps slowly away in to ground water (as would happen naturally pre-development) or is
discharged to the drainage system at a low controlled rate.

3.2. Advantages of SUDS. SUDs systems offer solutions that are often at a lower cost and lower
maintenance costs to traditional systems and are more sustainable than convention methods because they:
- reduce runoff flow rates which reduces the resulting pollution from run-off
- reduce flooding and subsequent damage to water courses and more
- protect or enhance water quality
- improve habitat for wildlife
- provide a public/functional space (good examples in Sheffield and Lewisham where SUDs have
been integrated into local parks) or for willow, biofuel or aquaculture
- reduce depletion of ground water flow which in turn impacts upon water resources

3.3. Ignorance and resistance. Take up in England and Wales is very poor indeed even with support from
Government through PPG25 and other policy documents, and from the Environment Agency. Forward
thinking councils like Gloucester City are attempting to develop ways to encourage more SUDs schemes.
However they and indeed most Councils, even where they have SUDs policies as part of their planning
process, are not seeing SUDS schemes delivered. Ignorance and resistance within the construction industry
means that drainage proposals that have been called SUDs schemes have not always delivered easily
maintained, visually attractive and functional solutions. Similarly even where Local Plans have called for
culverts to be opened up this has not occurred despite new developments. It is critical that greater guidance
and support is provided before a Detail Planning Submission is made.

3.4. Adoption problems. One key excuse that developers use to not submit a SUDS scheme is “adoption”.
However if structures are designed correctly in the first place then maintenance costs should not be
prohibitive and structures can be adopted as long as appropriate commuted sum payments are made. In
traditional systems pipes are adopted by Severn Trent, for which they are allowed to charge through the
water rate: typically 10–15% of a water bill will be for this service. If the pipe discharges into a balancing
pond then it is the local authority, who, with a commuted sum will take on the maintenance of this area in
a similar way to public open space. Currently Severn Trent are obliged to adopt pipes typically used in
traditional systems, but refuse to adopt many of the features associated with SUDs such as swales, filter
strips or French drains even though they convey water from one place to another. It is not clear why this is
the case, however, it has been suggested that the current system suits them well and there is no commercial
benefit to change it. Local authorities have also been reluctant to take them on board as they are unfamiliar
with them, and they have no long term revenue stream to pay for their maintenance even though SUDs
usually have lower maintenance costs than traditional systems.

4 The basic underlying concept of SUDs is referred to as the “management train” and this generally mimics, by a series of
drainage techniques what happens in the natural world. The management train has 4 components:
1. Prevention. This may mean reducing the area of hard standing or simply including water butts in roof down pipes.
2. Source Control. This is the control of runoff at or as near the source where it falls and could include permeable porous
paving for vehicular hard standing.
3. Site Control. This deals with the actual runoff and may include swales that transport water around the site and balancing
structures that allow water to stand to infiltrate into ground water or discharge slowly into a water course.
4. Regional control. This is beyond the confines of the individual site and would include an integrated approach involving
a number of developments.
3.5. Lack of urgency worrying. The Interim report on SUDs was published in July 2004 and there is not even an estimated date for the final report. Furthermore that Interim report did not go far enough in making use of the advantages of SUDs. Apparently a group led by the Environment Agency, including representatives of major stakeholders, is considering both the technical standards and legal issues required to underpin the future adoption of SUDs. Again this appears to lack any sense of urgency.

3.6. National guidance needed. We urgently need clearer guidance and a stronger lead from bodies like the Environment Agency. A move to adopt a mandatory and comprehensive national SUDs policy in all new developments like in Ireland and Scotland would be a significant step towards managing our water better, but in the meantime individual Councils can considerably improve their current provision of SUDs through LDFs and more.

4. OTHER KEY MEASURES TO REDUCE FLOODS

4.1. Prioritise upstream flood defences. It was reported last month that only 46% of flood defence systems in high-risk areas are adequate.

This clearly needs addressing. The importance of measures like dredging of some water channels and ensuring culverts do not become blocked has also been underestimated. However the key cause of our flooding (and regular droughts) is the inability of our land to properly store and infiltrate rainwater, together with the increased evaporation this causes. Further expenditure on downstream flood defences and increased drainage will be little help. Upstream storage and infiltration is a much cheaper and safer alternative (amongst a range of options), which will boost agricultural and local economies in a variety of ways.

4.2. Develop a proper water resources strategy. This is currently part of another consultation by the Environment Agency which starts with the welcomed acknowledgement that water companies should not be continuing to meet unconstrained demand. There are many aspects here that need consideration including many of the points already mentioned in this report. There is also a huge potential to better model the possibility for flooding within each catchment, but also to improve our analysis of potential flooding and provide proper protection for key sites like Mythe water treatment plant and Walham substation.

4.3. Stricter rules about house building on flood plains. New properties must be expressly designed to cope with flood risk and still allow the land to soak up the water so that the problem is not transferred elsewhere. There are a whole host of designs available from what are effective all green spaces including front gardens.

4.4. Reduce impermeable surfaces. National awareness campaign to reject concrete in favour of “porous” townscape which allow rain more easily to refill the aquifers and reduce run-off and flooding. Severn Trent Water report a 4% increase in their regions impermeable hard surfaces area each year. Councils need to be enabled to take action to manage and protect more effectively all green spaces including front gardens.

4.5. Important role of agriculture. Instead of civil engineers we need agriculture to be restored to its role of helping manage our water resources. This will require changes in farming practice in catchment areas prone to flooding such as reducing over stocking which compacts the soil and run-off, turning more arable areas into pasture land (which retains water better), expanding flood plains, planting more trees (woodlands are up to 60 times more effective at infiltration than bare arable land) and supporting organic farming which manages water better.

Water companies spend up to £313 million a year dealing with nitrates, pesticides and other contaminants (10% of the costs of supplying drinking water): chemicals and energy-intensive ultra-violet treatment make the water-industry the most energy-intensive utility (2.6% of UK carbon emissions). Instead we should tackle pollution at source, reduce chemical farming and use critical upland sites to allow water to soak away naturally. Defra should pay farmers to produce food in a way that works for water, wildlife and landscape.

5. CRISIS MANAGEMENT

Various measures like better preparation but also:

— stronger measures to stop people making unnecessary journeys, which contributes to congestion and stops the emergency services being able to reach affected areas: despite extreme weather warnings people still streamed onto “their” roads as if on autopilot

Carlo Laurenzi, Director of the London Wildlife Trust notes the increase in run-off from an impermeable surface such as concrete can be as much as three times greater than the run-off from porous surfaces. This impacts significantly on drains when flash floods occur. The Royal Horticultural Society notes that an average suburban garden on a typical rainy day will absorb 10 litres of rainwater a minute: this is about 10% of water that will fall in a storm. Although this may not seem a lot it plays a part in preventing thousands of litres contributing to localised flooding or causing rivers to burst. See the London Assembly’s report (September 2005), “Crazy Paving: The environmental importance of London’s front gardens.”
Ev 422  Environment, Food and Rural Affairs Committee: Evidence

— clearer warnings about the health risks of contaminated flood waters
— improved communication over issues like siting of bowsers

6. OTHER WIDER ISSUES

6.1. A robust carbon emissions reduction programme. This is critical to lessen the risk of freak weather events in the first place.

6.2. Build community resilience. The cheering news from the flooding is the way people have supported each other in the face of crisis. We are increasingly going to have to learn to rely on ourselves and each other more and more in the coming years. Building up resilient local economies and strengthening our communities is the most positive route we can take to protect ourselves from future crisis. Government can and must facilitate such moves 6.

6.3. Restore water companies to public ownership and ensure proper regulation. Ownership matters profoundly: rather than companies that seek to exploit loopholes in the regulatory regime, sell off “surplus” assets and fail to make improvements we want water companies back in public ownership and properly accountable to the electorate. In the first 9 years of privatisation pre-tax profits of the water companies rose by almost 150%. OFWAT, the sector’s regulatory body, found that operating expenditure as a proportion of bills had shrunk; the capital charges rose; but operating profits, which have more than doubled, account for virtually the entire increase in customers’ bills. The Environment Agency, Health Protection Agency, OFWAT and Defra all need to play a more significant role in improving and enforcing regulations.

6.4. Consume less water. The Germans consume a third less water than the English so it is possible to reduce consumption and still be comfortable. Measures needed include dual-flush loo’s, water butts, drip irrigation rather than sprinkler, grey-water harvesting and water metering to encourage conservation of water.

6.5. Decentralising energy. Power station cooling accounts for 39% of national water consumption: ironically drought orders could shut power stations like Didcot as flows of the Thames become too low.

Decentralised energy could include using existing technology to siphon methane off sewage plants to sell as energy and using the dry wastes as fertiliser.

6.6. Rethink sewage. Flood waters are highly contaminated with sewage and virtually every river in the country faces regular sewage contamination. Even in normal rainfall, sewers regularly surcharge into rivers and onto land (50 times a year in Thames area, typically 20 times a year in Gloucestershire). These surcharges, often through “consented outflows” (ie with consent from the Environment Agency), comprise of the biggest single source of pathogenic (disease causing) material. Over the years these discharges have in many cases worsened. We urgently need a rethink of the Victorian model of urban sewerage infrastructure. Embedded, decentralised wastewater treatment within the urban context using SUDS appears the only cost effective method of reducing these health risks, and could in many cases also reduce sewerage charges.

We need a whole host of measures to address this issue, including:

— Breaking up present unnatural sewage disposal infrastructure
— Investigation into the health risks of sewage in our water courses
— Determine appropriate public health (microbial) standards for watercourses and the discharges into them
— Cease local development (new sewer connections) until appropriate sewer (microbial) standards for watercourses and the discharges into them are achieved
— Transfer of private sewers into the hands of the water companies (a Defra consultation is currently looking at this)
— Promotion of cheaper and more sustainable solutions like reed beds

Stroud District Green Party
August 2007

6 There are many examples on how we rely too much on growing centralised provision and control. In the fuel blockade protests (September 2000) supermarkets confirmed that we came within a couple of days of the whole food industry coming to a halt. Similarly if Gloucester’s Walham substation had been flooded 250,000 would have lost power (and water as electricity is used to pump water). Local food and decentralised energy are clearly more robust in the face of crises.
Memorandum submitted by Joe Morris & Tim Hess (FL 60)

EXECUTIVE SUMMARY

Exceptional rainfall in June and July 2007 caused extensive flooding in parts of England and Wales. Although the focus of attention has been on the impacts on densely populated urban areas, there was an important rural dimension to these flood events. In this context, this submission makes three main points:

1. There is a danger that the rural dimensions of flooding are inadequately understood and represented in the responses to the recent flood events and in the formulation of future policy on sustainable flood risk management. Such extreme events have serious and potentially long term consequences for the livelihoods and welfare of people and communities in rural areas, especially, but not exclusively, those associated with farming.

2. The recent events show that rural land management could lessen the impact of extreme rainfall events where catchments are particularly “sensitive” and where there is scope to make land use changes. It is opportune to explore whether flood risks could be attenuated by the adoption of specific measures that could reduce runoff from, and retain storm water on, farm land—temporarily “disconnecting” its flow from the main river system.

3. Rural land can act a receptor for flood waters especially in flood plain areas, alleviating flooding in urban areas where the resultant damage would be much greater. The recent flood events clearly show that the purposeful storage of flood water in the rural parts of lowland floodplains has considerable scope for integrating multiple objectives of flood storage, farming and biodiversity.

SUBMISSION OF EVIDENCE: RURAL ASPECTS

1. Exceptional rainfall in June and July 2007 caused extensive flooding in parts of England and Wales, especially in South Yorkshire, Worcestershire, Gloucestershire and Oxfordshire. The prospect of wetter winters and increased intensity of rainfall events associated with climate change, suggests that such events could become more common, with major social, economic and environmental consequences.

2. Although the focus of attention has been on the impacts of flooding in densely populated urban areas, there was an important rural dimension to these flood events. Rural floodplains were subject to extensive and long duration flooding in the summer of 2007 at a time of year when farming and other land based industries are particularly vulnerable to flood risk.

3. In this context, this submission makes three main points:
   — the need to recognize the rural dimension of flood impacts
   — the potential role of rural land, including farm land, in the generation of floods
   — the potential role of rural land, including farm land, in the future management of flood risk at the catchment scale.

Rural dimensions of flooding

4. There is a danger that the rural dimensions of flooding are inadequately understood and represented in the responses to the recent flood events and in the formulation of future policy on sustainable flood risk management. In this respect, there is a clear need to ensure that the impacts of flooding on rural communities are understood and the characteristics of rural households, businesses and communities that make them particularly vulnerable to flooding are fully taken into account. This could help ensure that future flood risk policies are sufficiently “rural proofed”, avoiding approaches that otherwise might contain an urban bias.

5. Rural communities and economies are very diverse. Only a small proportion (<4%) of people living in rural areas are employed in agriculture or land-based activities. Many are employed as sole traders or in very small firms, with a smaller average workforce per enterprise than in urban areas.

6. The flooding of the summer of 2007 was unusual in terms of extent and timing. Most rural land management practices are resilient to winter flooding, but summer flooding causes much greater damage to crops, grazing land, livestock and tourism and recreational activities. These damages are rarely insured and therefore have significant financial impacts on those affected. Whilst summer events of this magnitude have been rare in the past, there is an expectation that they may be more common in the future.


8 Commission for Rural Communities. The state of the countryside, 2007.
7. Such extreme events have serious and potentially long term consequences for the livelihoods and welfare of people and communities in rural areas, especially, but not exclusively, those associated with farming. Rural areas could face increased incidence of flooding and a change in the nature of flood events in the future. While agriculture in floodplain areas is often well adapted to a degree of flooding, the exposure to flood risk could increase in the future because:

(i) protecting the relatively “sparse” rural space is deemed insufficiently cost-beneficial in economic terms relative to urban areas, and

(ii) rural areas are sacrificed for storage of flood waters in strategies that give priority to urban protection\[9,10].

(iii) Non-agricultural activities in rural floodplains may be less resistant or resilient to flood risk.

8. It is opportune to consider possible lessons for the England and Wales case of the approaches to “rural-proofing” of flood risk management in other parts of Europe. This could include the Dutch approach to Living with Water (Leven met Water) and Space for Rivers (Ruimte voor de Rivier)\[11,12], and the Danube\[13] initiatives that contain explicit provisions for flood storage in rural floodplains.

Role of rural land management in the generation of floods

9. The recent events confirm that rural land, most of it occupied by farming (about 73% of the total area of E&W) and forestry (9%), has an important role to play in the management of flood risk. Much of the flood waters were generated from extremely heavy and persistent rainfall in rural parts of the catchment (in this case relatively lowland areas rather than commonly wetter highland areas). Rural land operates as a “pathway” for rain water as it makes its way overland and through man-made and natural drainage systems to lowland river systems.

10. The recent events show how rural land management has potential to affect flood generation by influencing the extent to which (i) rainfall falling on rural land either infiltrates into the soil profile or runs off along the soils surface as overland flow and (ii) the speed at which overland flows reach watercourses and rivers with potential to cause flooding\[14]. Rural land management here is defined as a combination of cultivation methods or density of livestock numbers on grassland.

11. Generally, heavy and continuous rainfall tends to result in a high proportion of runoff rather than infiltration, with an increased likelihood of flooding. This is especially the case if soils are naturally impermeable (such as clays), have limited vegetation cover (such as bare soils), are in a degraded condition with low rates of infiltration (such as soils compacted by heavy machinery or livestock), or have limited capacity to store water because they are already saturated by previous rainfall or high groundwater.

12. Generally, during periods of heavy rainfall, unimpeded surface flows to water courses and eventually the main river system will tend to increase the likelihood of flooding. This is the case where large fields with uninterrupted slopes and limited boundary features such as hedgerows, facilitate the rapid movement of water into the main channels.

13. For the type of extreme and long duration precipitation events experienced in July 2007, it is likely that existing rural land management had a limited effect on these catchment scale flood events\[15,16]. That is, in such extreme circumstances, rural land use does not appear to significantly change the relationship between precipitation and river flows, and hence flooding. Thus, while intensive farming practices are known to exacerbate flooding at the local scale and their prevention can alleviate such problems (see Box 1), controls on land use may have a limited effect on the alleviation of flooding at the larger catchment scale, especially in extreme rainfall conditions.

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Box 1

Farming and Flood Generation

It is often assumed that the intensification of agricultural land use and management practices, evident in the switch over the last 30 years from grassland to arable farming and increased stocking rates of animals on grassland, has resulted in degraded and compacted soils, as well as reduced vegetation cover. This can result in increased volume and speed of runoff, resulting in a faster discharge of rainwater to, and higher peak flows in, rivers and channels (van der Ploeg et al., 1999; Samson, 1999; Bronstert, 2003; O’Connell et al., 2004; Evans, 1990, 2005; Holman et al., 2003). At the local scale, it is apparent that intensive farming practices, such as growing silage maize on hillslope, have exacerbated runoff from farm land resulting in “flashy, muddy, floods”, with serious damage to property, roads and infrastructure (Boardman, 2003). However, the extent to which farming practices can affect flooding at the larger catchment scale during major rainfall events is not clear (O’Connell, 2004, Morris and Wheater, 2006).

14. It is possible, however, that rural land management could lessen the impact of extreme rainfall events where catchments are particularly “sensitive” and where there is scope to make land use changes. For example, in some areas, actions could be taken to purposely slow down runoff or increase retention of water during storm events on farm (and forestry) land, thereby reducing the speed at which waters converge to cause flooding in main rivers. Furthermore, the purposeful storage of flood water in lowland floodplains can help to attenuate peak river flows.

15. It is opportune to explore whether, for the recent events, flood risks could be attenuated by the adoption of specific measures that could reduce runoff from and retain storm water on farm land, temporarily “disconnecting” its flow to the main river system17. Examples include conservation and contour tillage, retention of crop cover, in-field slope breaks, field margins and hedgerows, and ponds and on-farm retention reservoirs. Such measures could positively contribute to the control of flood generation from farm land. These are additional measures for which farmers could be rewarded.

Role of rural land, in the future management of flood risk at the catchment scale.

16. The recent flood events clearly demonstrate the scope for the purposeful storage of flood water in the rural parts of lowland floodplains18,19. Rural land can also act a receptor for flood waters especially in flood plain areas, alleviating flooding in urban areas where the resultant damage would be much greater. The recent events call for a catchment based approach to so-called “washland” storage options, using a range of engineering solutions, including those that return flood plains to their natural functions. There is considerable scope here, depending on priorities, for integrating multiple objectives of flood storage, farming and biodiversity. This is entirely compatible with the Environment Agency’s approach to Catchment Flood Management Plans and with Defra’s Making Space for Water. As referred to above, however, two aspects require further enquiry—(i) the extent to which multiple objectives are compatible for example where flooding of nutrient rich or sediment laden water may damage floodplain nature conservation sites, and (ii) the implications of increased storage in rural areas, including aspects of reward and compensation, for rural businesses and communities.

17. The recent flood events confirm that approaches to flood risk management in the rural space require an integrated response. There is much scope for bringing together and realigning the wide range of existing schemes and funding mechanisms that separately address issues such as flood management, control of water pollution from agriculture, water supply management, nature conservation, soil conservation, protection of key infrastructure, rural tourism and farm income support.

Ongoing research

18. Some of the flood related challenges facing the rural sector are the subject of ongoing research funded by Defra, the Environment Agency and the UK Research Councils. With respect to the latter, the Engineering and Physical Research Council is sponsoring the Flood Risk Management Research Consortium (FRMRC) that, amongst other things, is considering the role of rural land in flood risk management and how policy has potential to influence land management decisions and hence flood management outcomes20,21.. The joint UK Research Council sponsored Rural Economic and Land Use

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Programme RELU\textsuperscript{22} contains a project entitled Integrated Land and Water Management in Flood Plains Management. This project, set in the context of changing priorities in the countryside, is exploring opportunities for bringing together the multiple objectives of flood management, farming and biodiversity in flood plains in ways that will appeal to land managers and other stakeholder interests.

19. There is a strong case to extend the brief of ongoing research to determine the particular rural aspects of flooding, in the light of the obviously severe, yet so far undefined, impacts of extreme rainfall events on the rural space and its communities. This will help inform appropriate operational and strategic responses.

Joe Morris and Tim Hess
August 2007

Memorandum submitted by The Survey Association (FL 61)

1. INTRODUCTION TO THE SURVEY ASSOCIATION

1.1 The UK Land & Hydrographic Survey Association, more generally known as The Survey Association (TSA), was formed in 1979 to represent the views and look after the interests of private surveying companies in the United Kingdom.

1.2 TSA currently has 113 members who between them employ almost four thousand people. Unlike the Royal Institution for Chartered Surveyors (RICS) and the Institution for Civil Engineering Surveyors (ICES), TSA represents the company not the individual. TSA does however sit on a joint panel, the Survey Liaison Group, with RICS and ICES.

1.3 TSA is run by a full time Secretariat based in Newark and a Council of twelve people elected from the membership. Most of the members of Council are senior executives in the industry. In addition to the Council, the association structure comprises four committees; Public Relations, Membership, Technical and Finance. The Technical Committee is responsible for producing guidance notes on matters of importance for clients.

1.4 In May 2007, TSA held a reception at the House of Commons aimed at increasing awareness into the effects of cuts in public spending on flooding, and to alert MPs and Peers to the role of the modern day surveyor. Almost fifty parliamentarians and stakeholders attended the event.

1.5 TSA has been working with political audiences and stakeholders in 2007 to raise awareness of the role of survey in flood prevention. This includes ongoing liaison with DEFRA’s Flood Management Division and the Associate Parliamentary Group on Flood Prevention.

2. THE ROLE OF THE SURVEYOR IN FLOODING POLICY

2.1 Modern surveying makes a vital contribution to effective flood management, risk assessment and prevention. The role of the modern day surveyor has changed substantially as technology has developed, allowing surveys to be carried out which can establish the greatest level of detail about flood risk to an individual property or an area of land. This information is a vital part in flood defence planning, flood risk assessment for large scale infrastructure developments, and is the most effective way of properly establishing the flood risk of an individual property or geographical area compared to the broad-brush approach of the Environment Agency flood map.

2.2 There are generally two methods of acquiring survey data—from the air and from the ground. The accuracies of the methods however vary greatly, as does the cost. It is generally accepted that horizontal accuracy (position) is less important than vertical accuracy (height above ground) in flood mapping, as it is height above mean sea level that is most critical for hydraulic modelling.

2.3 TSA’s members offer a vast range of services from Aerial Survey and LiDAR (aircraft-mounted laser scanning) for mapping large areas of land, to the precise setting out of new construction sites and development areas. Aerial survey has been used by the Environment Agency until recently and is based on a calibrated camera installed in an aircraft from which stereoscopic imagery is produced. The data is then collected using photogrammetry—the science of taking measurements from photographs. LiDAR collects 3D data of the topography on a pre-determined grid as an aircraft flies over a site. This is the system commissioned by Norwich Union to survey the whole of the UK, although the system adopted provides data at the lower end of the accuracy scale (see figure 1).

2.4 Ground survey methodologies use a combination of reflectorless electronic distance measurement and Global Position Satellites. This system is ideal for precision surveys to fill-in or validate the data collected by other methods, and is the only method for collecting accurate data in critical flood areas. Figure 1 below lists the accuracies of different surveying methods.

\textsuperscript{22} Rural Economic and Land Use Programme: Integrated Land and Water Management in Flood Plains Management. http://www.silsoe.cranfield.ac.uk/iwe/expertise/relu.htm
Type | Accuracies
--- | ---
Lidar | +/- 500mm to +/- 5 metres
Aerial Survey (EA spec) | +/- 50mm
Ground survey (EDM) | +/- 10mm
Ground Survey (GPS) | +/- 25mm

Figure 1.

2.5 A number of TSA members have been employed by the Environment Agency in recent years to produce the survey data required for the preparation of accurate hydraulic mapping. The technology to be utilised in the preparation of survey data will be determined generally by the accuracies required. No one system provides a panacea for all. Powerful analysis and mapping utilities in GIS (Geographic Information Systems) can assist in the planning and prevention of flooding if the data being analysed is of sufficient accuracy.

3. THE EFFECT OF ENVIRONMENT AGENCY FINANCIAL CUTS

3.1 Financial cuts to the Environment Agency (EA) budget have had a devastating impact on many TSA members and their ability to undertake necessary surveying work following the recent flood crisis. One member’s income on flood mapping has dropped from £900,000 in one year to £200,000 in the next. This pattern has been repeated throughout the industry and has given many members a serious problem. Many surveys already commissioned were cancelled at short notice, while others were seriously delayed.

3.2 The problem is not just one of decreasing turnover; it also presents a serious resource difficulty. Most survey companies try to ensure that all members of staff are qualified to undertake at least two types of work. If for example a flooding survey project is cancelled, the staff will be moved onto another project and are then unavailable for anything else. The inertia caused by lack of work is difficult to reverse and the efforts then required to commence a project and get it up and running are immense. Consequently, cancellations ensure that an immediate restart if funding is available is almost impossible.

3.3 A number of TSA member companies have been commissioned to undertake emergency survey work at various sites following the recent flood crisis. However, due to the resource difficulty identified above, these companies have not always be available, which has caused delays in some of the restoration works following the floods.

4. RECOMMENDATIONS TO THE COMMITTEE—THE FUTURE CONTRIBUTION OF SURVEY TO FLOOD PREVENTION

4.1 TSA is able to give guidance to the relevant Government Departments, executive agencies and local authorities to assist in the specifying and collection of quality data to assist in the planning stage of flood defences.

4.2 Our recommendations to the Environment, Food and Rural Affairs Committee are:

- Sufficient funds must be provided to enable the EA to undertake the necessary survey work to improve flood defences;
- That the Government issues national guidance to ensure that the data collected for the purposes of flood risk assessment and defence planning by public bodies is fit for purpose and is determined by accuracy requirements, not cost;
- That the Government and relevant agencies, in cooperation with industry, draw up a programme of planned and sustainable works to alleviate the resource planning problems caused by unpredictable timeframes;
- That the Government and relevant agencies establish a forum for engaging with The Survey Association and other stakeholders to ensure effective industry consultation and dialogue on flood prevention policy.

The Survey Association

August 2007
Memorandum submitted by Robb Eden (FL 62)

COMMUNITY RADIO IN THE FLOODING

I understand that you are inviting comments from people directly affected by the recent flooding. I am writing to point out that Community Radio has a major part to play in informing the public at times of local crisis. Had I been able to obtain the information as it unfolded I believe that both my business and my car could have been saved from the flooding. Generally, the BBC and commercial radio provide limited coverage for the North Cotswold area. On July 20th there was very little information available therefore people were driving backwards and forwards trying to find ways to avoid the flooding.

As Community Radio has an important part to play, is it not time that Parliament looks at the whole issue, especially the penalising licence fees that Ofcom charge the volunteer workers who simply wish to provide a public service? Coupled with the exorbitant royalty fees charged for playing music it puts a lot of willing people off the idea of running what many believe is an invaluable service for the community.

Robb Eden
August 2007

Memorandum submitted by Tewkesbury Chamber of Commerce and Industry (FL 64)

EXECUTIVE SUMMARY

Tewkesbury Chamber of Commerce and Industry (TCCI) recognises the great recovery efforts made by many following the severe flooding after 20 July 2007. However this submission outlines areas where it feels the Committee should investigate in order to help lessen the impact of future floods.

In particular, TCCI believes that the following areas should be investigated:

— Command and control of the situation
— Communication Issues
— Loss of water
— Potential loss of power from the Walham sub-station
— Support for Tewkesbury businesses
— Emergency Service actions
— Access to Tewkesbury
— Environment Agency actions
— Insurance
— Recent construction
— Adequacy of current flood prevention measures

This submission outlines shortcomings in the above areas and welcomes the opportunity from the Committee to contribute to the Flood Inquiry.

INTRODUCTION

On Friday 20 July, Tewkesbury and the surrounding area experienced heavy and persistent rainfall amounting to 10.87 cm on that one day alone. The result of this unseasonal and extraordinary weather had immediate and long-lasting effects on the area. This submission outlines some suggestions from Tewkesbury Chamber of Commerce for the Committee in order to learn from the experience and prevent or reduce the effects if a similar event happens in the future.

Our submission predominantly focuses on the business community. Information forming part of this submission has been gathered from first hand evidence from local businesses and survey results (see Appendix 1 for survey questions).
1. CONTROL & COMMAND

1.1 Lack of apparent leadership of the situation

Residents and businesses of Tewkesbury Borough and Town look to their respective Councils for leadership. However our perception and observations are that the two authorities didn’t work as closely together on this common issue as they might. Inevitably this leads to oversights or duplication of effort.

1.2 Emergency systems

Whilst the public were aware of Cobra meetings and Gold Meetings at the Combined Emergency services HQ at Waterwells, communications further down the command chain at local levels was not apparent.

1.3 Disaster recovery

Were local authority and emergency services’ disaster recovery plans sufficient? Do they need to be overhauled to include flood and cover other potential disasters like riots, plane crashes, fire, terrorist actions on a large scale.

2. EMERGENCY ASSISTANCE

2.1 Lack of Resources

Insufficient presence was on the scene on the day of the floods (Friday). The area needed fire service, ambulance and police help from other areas as soon as the severity of the situation emerged—from 1 pm on Friday 20 July.

Priority should have been to keep the local infrastructure open for locals to get home. M5 was gridlocked, which stopped locals getting home—many spent the night at work, in cars and local pubs including GCHQ and Zurich Financial Services, as it was too dangerous to travel. Why wasn’t motorway traffic re-routed for people passing through the area? The environment agency warned about the severe weather, but this didn’t translate to Police warnings for people not to travel unless necessary and avoid the area.

2.2 Police barricades.

From 21 July until 25 July, Police prevented many business personnel from entering Tewkesbury, thereby securing their premises from looting, clearing damage and re-opening for business.

2.3 Fire & Rescue Services (FRS)

Rightly acclaimed for all they help they provided to the Town, the fire and rescue services were however inconsistent in their understanding and application of their own policy towards helping businesses. Some retailers were refused help pumping out their basements, unless they paid. Others rang 999 and were added to the list of people to help free of charge. Television interviews with local FRS representatives actively encouraged people to request their help following deaths at Tewkesbury Rugby Club.

3. ACCESS TO TEWKESBURY

3.1 Infrastructure review.

The Chamber questions whether the existing road infrastructure is robust enough to deal with flash flooding e.g. M5 between junctions 11b and 6 and roads into Tewkesbury e.g. A38, A48, B4080. No road access was possible for a few days after the flood, apart from to certain forms of transport e.g. boats or Red Cross lorry.

3.2 Policing of the town.

Police blocked traders from entering the Town on foot, to check and open their shops for people trapped in the Town, despite most being safe to do so. In future genuine traders should be allowed through the Police cordon. This increased their loss of trade and when traders have tried to claim on their insurance policies under obstruction clauses, their requests have been declined.
3.3 Shuttle buses

Transport in the form of lorries or tractors could have ferried key business workers in and out of the Town to start evaluating the situation; begin the clean-up operation and open their businesses as soon as possible.

3.5 Tewkesbury isolated

As access to the Town from the outside was so limited, it was in danger of being besieged from resources outside the Town.

4. Support for Tewkesbury Businesses

4.1 Flood relief

SWRDA and Gloucestershire First’s Flood Relief Scheme for businesses excludes money for loss of trade and does not necessarily help those who need most help. Chamber surveyed Tewkesbury businesses and 97% of 78 respondents advised that this was the biggest impact of the flood, compared with 42% reporting property damage; 38% reporting stock damage and 27% reporting equipment damage. £2500 is the maximum award per eligible business, which is too low. Regrettably the owner of the Pride of Avon boats, Dave Garfitt is selling his tourist boat trips along the River Avon, because his takings are 50% lower than normal. His business is unlikely to be the last to close. Telstar Cruisers who have lost months of orders and are still getting cancellations now for next month, but cannot show invoices for lost materials, and cannot insure for such lost sales and cannot put it against loss of earnings.

4.2 Bureaucracy of the Flood Relief Scheme

Traders have to submit balance sheets, accounts and other details. The Chamber understand the need to ensure flood relief goes to the most needy, but a fast-track interim scheme needs to be drawn up to speed up the process. When your business and livelihood is flooded, sitting down to prepare accounts is not always practical or possible. Do the flood victims of other countries have to fulfil the same flood relief criteria?

4.3 Permission delays for skips

Authorities compounded problems with bureaucracy e.g. some businesses were unable to re-open quickly, as they had to wait weeks for permission to place a skip outside their premises. One shop Options in Barton Street was delayed getting permits from Gloucestershire Highways, suggesting they did not have emergency measures to speed up the process in emergency situations.

5. Water

5.1 Mythe Water Treatment Works

Why was such a vital water treatment works so vulnerable?

5.2 Severn Trent’s response

Why was Severn Trent initially unprepared to react to the emergency situation? For example the Red Cross was one of the first to deliver water to local communities, along with local councilors, using their own transport e.g. Tugwells.

5.3 Lack of compensation

Severn Trent have decided to donate “compensation” money to be distributed by other parties. This is a “double whammy” for businesses such as hairdressers and catering businesses who rely on water to open for business.

5.4 No early warning

TCCI understand that Severn Trent were aware that the water table was unusually high in July, before the downfall. Could they have liaised with other bodies e.g. Met Office and Environment Agency to warn that heavy downpours could have affected the area adversely?
6. **Potential Loss of Power**

6.2 *Walham Sub-station*

   Why was the Walham sub-station in such a vulnerable position, without anyone to man the premises or apparent contingency arrangements to switch supply other stations?

7. **Improved Communications**

7.1 *Delays*

   As described in 2, local residents and businesses were initially unaware of the severity of the situation and national media seemed unaware of what was happening. The emergency services could have played a bigger part ensuring that warnings and messages got out—they have PR and communications departments that must have been able to access information from the central Gloucestershire Emergency Services Call Centre in Waterwells, without impacting on the relief effort.

7.2 *No pre-appointed place for people to seek help and advice*

   Local radio and other media was the only source of information for most, assuming they still had power. For those who didn’t have power, it was not obvious where people should go for help and advice. Why can’t local authorities communicate a central place which could be used in times of emergency to co-ordinate advice, relief and co-ordinate volunteer services?

7.3 *Misleading information*

   From the Sunday 22 July, media were warning of potential power and water losses. Incorrect telephone numbers for Severn Trent were read out and it was almost impossible to gather accurate information.

7.4 *Improved websites*

   Local authorities, emergency services and the Environment Agency must have the resources in place to ensure that their websites can be accessible with sufficient network capability and updated 24 hours/day, 7 days/week and 365 days a year. The flood in the Tewkesbury area happened on a Friday and over the weekend it was either impossible to connect to the Environment Agency website or, in the case of the Tewkesbury Borough/Town Councils, very little or no information (in the case of the Town Council) was posted until the following week.

8. **Environment Agency**

8.1 *Website and resources*

   Why was their website almost impossible to access over the weekend 21–22 July with up to date information? The Agency’s website hasn’t been a comprehensive source of information for a while e.g. floods pre and post Christmas 2006 failed to warn motorists of road closures in Upton-on-Severn—again this experience was a Sunday 10 December 2006 and Sunday 14 January 2007. The website was painfully slow and then failed to inform and warn motorists of the need to detour around the Town. Cover needs to be sufficient to cope with huge demand for information and this cover needs to be at all hours and days.

8.2 *River maintenance*

   Please explore whether the Carrant Brook and River Isbourne were sufficiently free from debris and silt to have lessened flooding in Tewkesbury and surrounding villages e.g. Mitton, Sedgberrow, Aston on Carrant, Beckford, Toddington.

8.3 *Insufficient authority*

   Tewkesbury Chamber and local businesses are not confident that the Environment Agency has sufficient authority to influence planning and carry out as much flood prevention as may be necessary. Would the creation of a specific flood agency have remedied this?

   Should the Environment Agency have more teeth, so they can force land owners to maintain the existing ditches and rivers in good order? Should they have a veto on building plans if in a designated area of flooding risk and also a directive to push for better water retention of properties like the use of gravel car parks rather than concrete, which send the rain water into the ditches instantly rather than in a controlled rate? Should more trees be planted, so for every house, five trees of native species tree are planted as near the property...
as possible (avoiding subsidence hazards) and for every 1/4 of a mile away this number doubles. So for example, if Persimmon Homes want to build a 50 house estate they have to plant 250 trees either on the plot or if a mile away 1000, and these trees are to be maintained by the builder for ten years.

10. **Insurance**

10.1 *Implications for the future.*

A survey carried out by Tewkesbury Chamber of Commerce & Industry found that 9 out of 55 Tewkesbury businesses replied that at the time of the floods 20 July, they either couldn’t get insurance or it was too expensive to arrange. Tewkesbury Chamber is concerned that future businesses will be unable to take out insurance against flood damage and loss of trade as it will be uneconomic to do so. This may result in businesses pulling out of the Town and only national chains would be able to afford the running costs—changing the nature of Tewkesbury as one of the loveliest market towns.

10.2 *Insurance claims*

Tewkesbury Chamber has received information that insurers are avoiding claims by businesses where they were obstructed by the Police from entering their businesses to clear-up and re-open. Insurers are arguing that obstruction means obstruction by say neighbouring premises collapsing and blocking access.

11. **Recent Construction**

11.1 *Cause and effect*

Did new and recent building developments in the Tewkesbury area contribute to the severity of the flooding?

11.2 *Drainage*

Was the drainage sufficient to cope with extra buildings recently built?

11.3 *Improved planting*

If flood meadows are planted with willow beds that are harvested, the willow could be used to power electricity generators powering the national grid. The willows will also slow the water flow/levels down and keep the soil stable below.

12. **Health & Safety**

12.1 *Public warnings*

Was the public given sufficient warnings about drinking water and the dangers of walking through flood water?

12.2 *Mosquitoes*

August and September have seen the area invaded by mosquitoes more commonly found in the Mediterranean area. Locals have frequently reported severe bites, many of which caused severe itching, inflammation, blistering and antibiotic treatment from GPs. Could communications or warnings have been improved?

13. **Adequacy of Current Flood Prevention Measures**

13.1 *Flood prevention*

Flood prevention measures like those in Bewdley and Upton need to be reviewed to see if instead of speeding the waters down past these towns, water can be slowed and controlled by weirs or land alongside that can be flooded instead.

Do current flood prevention measures cover river valleys and catchment areas, as well as flood plains? In the case of Tewkesbury initial floods occurred because of run-off from hills (particularly the North Cotswold escarpment) into Carrant Brook and Isbourne River, flooding some areas not normally classed as flood plains or potentially flood areas by the Environment Agency e.g. Kinsham village.
Flood Impact Survey of Tewkesbury Businesses

5. Please describe and estimate the loss or property damage if you are able below:

1. Flooded cellar—damage to archive records which will require to be dried out and information recovered—costs £3000 Trade disruption—staff unable to get to office on Monday. Only a few able to make it on Tuesday. Loss of chargeable time £7000.

2. Had to close for business on Saturday 21st and Monday 23rd. Reduced working hours on Tuesday 24th. Loss of commission income. 10% of normal activity

3. Stock £80,000 Plant £140,000 Loss of earnings £10,000

4. Cannot answer 4 at the moment as difficult to assess. One sale lost at a cost of approx £2k, we expect more to follow (approx £7k). As for effect on housing market for certain areas, it is impossible to measure the forward loss for the foreseeable future.

5. Only loss of trade, approx 40% of what we normally sell

6. Damage to stock, process equipment (control electronics), damage to leased property (relatively little), business interruption £250K–£500K

7. NO DAMAGE—LOSS OF TRADE

8. £12-15K

9. Trade Loss £2,000

10. We are losing trade as we are unable to get to our onsite customers and with Tewkesbury effectively cut off losing number of people shopping.

11. V. poor trade on Saturday, and no trade Monday or Tuesday and expected poor trade for remainder of week. Takings since Saturday already down thousands on same time last year.
12. Flooded cellars used for storage. Damage to carpeting and floors. Limited damage to electrical installation

13. Awaiting Insurers assessment. Our estimate is £40k plus loss of business at £1k per week depending on duration of drying and re-fitting of premises.

14. We have not had any property damage how ever we have lost about £50,000 in trade.

15. The knock on effect gets worse daily, condensation from cellar is real problem affecting walls and floor! assessing cost asap. removed most of stock as smell is horrid!! stock and extra display items lost in cellar, but still smiling as many poor people are worse off; determined to come back from this and reopen asap!! a big hug to all my past and future customers and thanks for the support from you guys at the chambers.

16. Heavy rain suspended ceiling tiles came down, as rain was coming through the roof. (But what about wages, I have to pay to staff loss of trade?)

17. Loss of Revenue due to flooding estimated at around £18,000 to £20,000

18. Insurance wont payout due to property not damaged. Estimated loss £1,500—£3,000

19. At least 1 full weeks trading whilst still needing to pay 6 employees and having insurance cover that will not cover the entire loss

20. Contents insured by myself—building insured by the landlord that I rent the shop from. Flood water entered shop through back as well as filling cellar up. Flooring soaked and plaster crumbling on walls with damp. Some stock lost in cellar as well as currently unused shopfittings. Stock in shop extremely damp and smelly—unsaleable. Some in back of shop soaked by flood water and disposed of. Carpeting taken up and not disposed of at request of insurance company. (Put on pavement.) Costs as yet not calculated. Could be months before I am open again according to the landlord.

21. We were affected by the water being cut off, not directly flooding . . . . but as a result of the flooding.

22. We would normal take on average £12000 worth of new business and we have not take any new business since the flooding.

23. cannot work from home. all children’s toys @ equipment lost @ + whole of ground floor ie workable area + garden + car. + cost of phone calls trying to help parents find alternate care. = loss of earnings. possible £1000s has affected parents of minded children, earnings also

24. All my moulding and machinery approx £5,000—£6,000

25. Business interruption estimated £2k per week plus hotel contracts


27. £4500 stock Sewerage in cellar with damaged stock just about finished. Pumping can’t get rid of rubbish. Lost £30,000 contract because customers house flooded.

28. £1,800 loss of trade approx

29. One week loss of work

30. Console Table Guilt £2850 Carpets £300 Restoration & Lost Stock £1000.00

31. Leaking Flat roof damage to tiles in the shop. Shop closed for 6 days loss of trade

32. £30,000

33. Loss of trade—@ £300 per diem—7 days estimated from 21/07/07 (to when we can reopen shop) currently cellars are flooded, pump hire £150—5 x Racking (5 tier) @ £450 + Vat, some stock @ £100, tools & paints £150 and Hire of dehumidity machine £120

34. Unable to trade due to floods and loss of water—loss of trade over the busiest period

35. Complete new floor, in barber shop dump all walls stock & equipment

36. Two Employees not able to attend work. for two days. Loss of water to works.

37. regarding above question we have insurance but have been told that as we were not actually flood damaged (we have been without telephones since the flood and phones are our life line) we are not covered for loss of business estimated loss immeasurable 4 phones normally ringing off the hook with orders to one mobile patched through we have kept open because I can’t send staff home on no pay but money is getting very short the directors haven’t taken any pay yet this month

38. £6,000

39. Total flooding of basement bar (to ceiling) Floor (wooden) of restaurant warped & split Carpets ruined—Loss of business until repaired—Stock (freezer) destroyed—some equipment waterlogged. Should be covered by insurance

40. Between £750,000 & £1 million (Confidential Information)

41. Building OK, just loss of trade through closure period when no access or no water supply for toilets.

42. 1 week of trade so about £3000
43. Van submerged by floodwater. Unable to get to unit Unable to work due to lack of water Amount approx £8–10,000

44. Devastation just about covers it including garden due to diesel contamination from another outlet

Tewkesbury Chamber of Commerce and Industry

August 2007

Memorandum submitted by Tewkesbury Town Council (FL 65)

FLOODS OF JULY 2007: TEWKESBURY TOWN COUNCIL
REPORT CONCERNING IMPLICATIONS FOR THE INFRASTRUCTURE, 10 SEPTEMBER 2007

A. PREFACE

a. The Working Group has met upon 4 occasions between: 14 August and 5 September. This report was unanimously accepted by the meeting of Tewkesbury Town Council on 10 September 2007.

b. It was chaired by Cllr. Vernon Smith and comprised 5 Town Councillors (1 of whom is a County Councillor), assisted with specialist evidence from 1 County Councillor, 1 Borough Councillor and 3 members of the public.

B. COUNCIL EXECUTIVE SUMMARY

For geographical reasons, Tewkesbury has always been and will always be susceptible to flooding. Since 1990 witnesses have experienced an increasing frequency and severity of flooding and the reasons for this must be understood and mitigated. The people of Tewkesbury are very vulnerable to decisions made elsewhere with scant regard for the consequences “down stream”.

1. Imperative: that one local agency should have complete control/scrutiny over all agencies be they governmental (e.g. E.A.) or private (Severn Trent Water):
   a. flood prevention measures: to enforce spending where required.
   b. defining the flood plain: it is clear that the current E.A. definition is too limited.
   c. over-ruling plans to build on the defined flood plain and to ensure that developers provide and maintain adequate drainage systems from the development to the outfall, however, distant that may seem.

2. Demand a Local Public Enquiry into the causes of the 2007 Floods and ascertain why the submission by Tewkesbury Town Council Tewkesbury, Development within the Flood Plain, written and research by Georgina Smith in October 2002 was not implemented. Re-visited since July 2007, it is arguable that had the evidence been heeded then the disaster of July 2007 might have been diminished.

3. Halt all developments and plans which are currently taking place on or near the flood plain until it is decided that a flood disaster will not be the consequence.

4. Living with flooding.

It is argued that there are three different types of flood, which affect Tewkesbury

1. Flash floods:
   A. the hard flood—run off from concrete
   B. the soft flood—run off from agricultural land

However as the hard flood travelled such distances from the Cotswold scarp villages like the now huge Bishops Cleeve, the hard and soft floods were coinciding in Tewkesbury. Flash floods in Tewkesbury then exacerbate the problem.

2. Avon Flood—2–3 days later.

3. Severn Flood—2 to 3 days after the Avon flood, depending on where in the catchment area the rain had fallen. This is then exacerbated, especially on 22 July 2007 by a high tide on the Severn.

Once all 3 floods coincide then tributaries like the Swilgate, Tirle and Carrant Brook back up causing even more flooding and damage.

The aim of many of our proposals would be to enhance the passing of the flash floods before the impact of the River flood.
C. PHASED RECOMMENDATIONS RE INFRASTRUCTURE:

The Group analysed the problems and recommended solutions under three perspectives: Short Term (issues of maintenance which have been neglected), Medium (issues which require extra-ordinary funding but are urgent) and Long Term (issues which require extra-ordinary funding but which will be of long term benefit to the Town).

a. Short Term (issues of maintenance which have been neglected; these need to be completed by the season of winter floods 2007–8.)


   a. Estimated that
      - Gully sucker required 30 days x 10 hours x £80ph
      - Jet Flush 50 days x 10hrs x £150ph

c. Ashchurch Road: should 1 ft (0.3m) diameter pipes be replaced by 1 metre culvert?
d. Wynyards Close.
e. GCC have conceded that there are no maps of drainage systems so these must be drawn up by Parishes, with the assistance of Residents Groups.
f. It is claimed that Morrison’s is protected by 2 culverts and a ditch from the Tirle which links up with the Carrant Brook; however the former Safeway had been built upon Wash lands called the Water Meadows which always used to flood without harm.
g. Alleys: where does responsibility lie for poor quality paving; lack of drainage from newer properties and blocked drains?

ii. Ditches:

   a. systematic plan for clearing debris and banks; there has been no increase in the capacity of the Tirlebrook or the Fidd and that the planning led to the joining of large culverts to smaller ones; the theory being that the flash floods would pass quickly; photographs provided of the bed of the Swilgate passing through Rudgeway Farm in 2006 which showed how silted up is that river in that location.
   b. responsibility of residents of Tirlebank to clear half of Tirlebrook on each property to be clarified and enforced.
   c. Balancing ponds—are they adequate? Are they working? Who owns them? Who maintains them? It was felt that they were now silted up and, in any case, rendered less valuable because at level of water table.

iii. Flood Plains:

   a. recommended that Town Council Advice contained in 2002 Flood Enquiry submissions be implemented.

   b. The culvert under the A38 which gives the Swilgate access to the Lower Avon was—and still is—inadequate for the amount of water that it must pass in times of flood; since 2002 more houses have been occupied in Wheatpieces along with 400 homes in Bishops Cleeve. It must be stressed that the Swilgate hosts water from the rivers Tirle and Fidd as well as smaller brooks and drains the scarp of the Cotswolds from Dixton Hill to Cleeve Hill.

   c. The filling in of the Flood Plains:
      1. Severn Trent should re-impose clearance order concerning materials dumped on the field behind Pike House, so-called Massey’s Field.
      2. Chapel Fields in Walton Cardi

   d. The possible damming effect of new Roads: are the culverts sufficiently large and are they cleared?
      1. The Eastern Bypass
      2. The M5

   iv. Cycleway on former railway track which provides a dry route during floods. Cllr. Dawson (GCC) reported that it is in the funding priority for 2008–9 but that, because of its importance, he hopes that its priority will increase.

   v. Closing the Cotteswold Road Gap in the Railway embankment which caused such misery in Station Lane and Cotswold Gardens.

b. Medium Term (issues which require extra-ordinary funding but are urgent.)

i. Coventry Close, Priors Park needs urgent building of a defence eg a bund.

ii. Mill Avon requires

   a. Abbey Mill pond to be dredged from 3ft to nearer former 32’.
b. Owners of Abbey Mill be required to clear water wheel bays to allow passage of water.
c. King John Bridge archways need dredging and keeping clear of debris.
d. Finger moorings to be replaced by floating mooring with a winding point being kept clear to encourage tourist narrow boats to turn right and moor in Tewkesbury.
e. Re-establish LANT control of Town Slipway by restoring chain on slipway with key issued only to LANT licence holders.
f. Action taken to reduce speed which is wearing away the banks.

iii. Prior’s Park Emergency Dry Route:
   a. the area already was a serious shortage of parking spaces for residents verges where possible to be replaced by grass creep parking bays which could be cleared in emergency for use by police etc.
iv. New estate development; planning requirements need to be amended so that:
   a. developers must ensure that they pay for improvements to existing communal drainage so that new homes can be drained effectively without overloading the system; perhaps this is the only moral use for Section 106 payments? Developers should be required to set up a Trust Fund, the interest from which would be used for drainage maintenance in the future, whether or not the developer concerned ceases to trade.
   b. all new homes to be built with grey water provision.
v. raised decked causeways with Armcop piping to be built at crucial blockage points
   a. Bredon Road between c Handyman centre and corner of Oldbury Road (Carrant Brook). What about the need to rebuild the Carrant Brook bridge on Bredon Rd using railings instead of a solid parapet to prevent damming of flood water which increases flooding of buildings?
   b. Ashchurch Rd: Wilding Close to Oldfield Road (Tirlebrook)
   c. Church Street—but problem of Abbey Terrace might mean only recourse is to widen stream through Gloucester Road bridge on the Swilgate
vi. link road between Morrison’s Ghost Road and Station Road with bollards to restrict traffic except in emergency as only dry route into town. (Some councillors would like this . . . road extended along Station Road to give access only to the Town Centre Car Park in Spring Gardens. Cllr Dawson advised that “it had already been looked at by GCC and rejected on safety grounds on at least 2 occasions in the past.”

vii. Canal bypass
   Cllr Pavey provided a rationale for a flood canal to link the Swilgate just west of its confluence with Deans Brook and the Coomb Hill Canal. The distance was estimated at 2.5 km and way leave would be purchased to construct a vallum for flood water which would be grassed for pastoral use in normal times. This would necessitate a really appropriately large culvert under the A38.
   The benefit would be that much of the water which funnels into the Swilgate via Tewkesbury suburbs would enter the Severn giving some relief to Deerhurst.
   The disadvantage would be the threat to the wild life reserve on the Coomb Hill Canal which suffered to badly in these floods of 2007.
   However, all members of the committee thought the idea merited earnest consideration.

viii. Dredging/clearing of debris from Rivers Severn and Avon: in commercial days 12 ft was the depth and in pleasure days 6ft. Is this maintained?

c. Long Term (issues which require extra-ordinary funding but which will be of long term benefit to the Town)
i. M5 Junction 10 to be opened up to both carriageways and directions.
ii. Relief Roads
   a. Northern Relief Road
      i. The Chair explained from professional and personal experience that the embankment which carried the former railway acted as a dam which probably protected a lot of the Northern Oldbury from being flooded.
      ii. the flooding in Station Lane and Cotteswold Road was probably caused by flood water penetrating the gap which used to be bridged by the railway: the gap needs flood defences.
      iii. therefore, if present ideas were carried through and the embankment was gradually lowered to meet a roundabout in the Bredon Road, then even more properties in the Oldbury would have been flooded.
      iv. Conclusion: from a perspective of flood prevention then the proposed GCC Northern Bypass along with former railway would exacerbate flooding in the northern Oldbury area.
   b. Alternative Bypass Plans submitted by Peter Finnigan via the Chair
i. Phase 1: This would coincide with raising the level of the Bredon Roads over Carrant Brook by decking; Bredon Road would be raised on a solid embankment from the decked section to the White Bear.

ii. Phase 2: The former railway embankment would be preserved as a noise and flood barrier (with a bund filling in the crucial gap at the end of Cotswold Road. The Relief Road would then be built on a new embankment to the north of the existing one in the Carrant Flood Plain which would gradually be lowered to meet the raised Bredon Road.

iii. Phase 3: would then be the purchase of land from the Tewkesbury Marina to bridge the Avon and follow the enlarged railway embankment to a roundabout at the junction of the A38 and the Ledbury Road.

iv. The committee concluded that this imaginative plan might be so expensive and exacerbate the flooding y using the Carrant Brook floodplain.

c. Alternative relief roads for the traffic (which would also be dry in times of flooding):

i. a road linking Shannon Way and the Bredon Road, north of the new allotments. This would give an alternative way of accessing the M5 without travelling through the town centre.

Tewkesbury Town Council

August 2007

Memorandum submitted by the British Ecological Society (FL 66)

INTRODUCTION

1. The British Ecological Society is the learned society for ecology in the UK. Founded in 1913 its mission is to promote the science of ecology worldwide. This response was produced with input from Professor Alan Hildrew, the BES’s Climate Change Advisory Group and its Public and Policy Committee.

2. The BES response focuses on the potential for land-use management to help mitigate flooding. The BES supports an integrated approach to flood risk, in which land-use practices maximize a range of ecosystem services, such as flood control.

THE ROLE OF ECOLOGY IN MITIGATING FLOODING

3. Flooding is the episodic flow of rivers over their channel banks and is a natural occurrence and a key aspect of landscape ecology. While there are many important beneficial ecological effects of flooding, for instance on fish and other wildlife, the ecology of river catchments could be managed to minimise the costs of flooding. Natural ecosystem processes in catchments can ameliorate the intensity of run-off generated by any particular rainfall event, and thus reduce the extent of flooding downstream, where it causes most nuisance and economic damage.

4. The careful management of land-use in river catchments can help to mitigate, at reasonable economic costs, the increased occurrence and severity of rainfall that is expected to result from climate change. The uplands receive much of the rainfall and generate much of the run-off to flood-prone rivers—such as the Severn and Wye. The restoration of upland land-use to native deciduous woodland, would help to:

   — increase the interception of rainfall by vegetation;
   — increase water infiltration into the soil and groundwater;
   — increase transpiration to the atmosphere;
   — reduce peak flow due to surface runoff.

5. The economic cost of managing land-use in this way would be modest in the uplands. In addition, this would have additional benefits for conservation objectives and increased carbon storage. Increasing natural flood mitigation measures in the uplands will still require both natural and conventional flood mitigation measures in the lowlands, since once upland ecosystems are saturated their ability to reduce flooding events is limited.

6. Giving streams and headwaters more space next to their channels would encourage the development of lateral vegetation and wetlands and increase the retention of flood flows in the upper reaches of rivers. Water would be released more slowly to downstream areas, where most economic damage from flooding occurs. River flow would also help to be sustained during dry periods. Again, there would be some economic cost due to restrictions on agriculture near streams, which would need to be set against reductions in flooding downstream and in benefits to water supply and conservation.

7. The intensification of farming practices has tended to reduce the infiltration capacity of soil and decrease water storage in agricultural areas. This can cause higher peak flows in watercourses. Soil with a good natural structure can, depending on soil type, can retain large amounts of water. Certain arable land
management practices can lead to soil compaction, puddling, capping and plough pans, all of which reduce infiltration and increase surface runoff. Cultivation techniques including soil management, surface crop cover and headwater management can all be used to increase water storage capacity. The Soil Framework Directive and the Water Framework Directive provide the opportunity to improve the structural health of our soils and could contribute to reducing flood risk.

8. The best way to manage water flow through catchments will be to base risk estimates on they dynamics of land use and hydrology in the catchment. Of course lowland flooding results on some occasions from combination of events in more than one catchment.

9. Other land management practices which could be used to mitigate flooding include, restoring upland bogs, putting meanders back in rivers and creating new “washlands.” Sustainable urban drainage systems would also help by enabling rainfall to infiltrate the ground rather than run-off to urban drains. Such ecological responses would obviously not ameliorate the risk of flooding, but are part of the solution for reducing flooding. Projects to reduce flood events should look at both the effectiveness of the conventional flood management and the opportunities provided by emerging techniques of restoring natural functionality in the landscape. There is evidence that such approaches deliver effective flood management together with social and economic benefits.

10. The majority of the experimental information on the effects of forests on runoff in the UK has focused on uplands. Only a few studies have been carried out on lowland broad-leaved woodland. More research on how to best to manage ecosystems to reduce flood events is needed.

IMPACTS OF FLOODING ON ECOLOGICAL FACTORS

11. Biological, physical and chemical water quality are impacted by flooding events. Flooding also has localized direct impacts on many species. For example, the nests of many waterbirds are known to have been swept away during this years floods and ground nesting species in areas that flooded are also likely to have failed in their nesting attempts this year. However, assuming the frequency of flooding remains low this is unlikely to have any long term impact on species abundance and distribution.

12. Summer flooding is not a typical feature of flood-plain systems in the UK and the long-term impacts of more frequent summer flooding are almost unknown and more research is needed in this area. Species living in wet meadows and washes are typically adapted to winter flooding. In one recent paper detailing the impacts of summer flooding on the Ouse Washes the authors conclude that declines in a population of Black-tailed Godwit are related to the rate of flooding. The generality of such findings are often unknown.

The British Ecological Society
August 2007

Memorandum submitted by Clanfield Parish Council (FL 67)

1.1 MANAGEMENT SUMMARY

Clanfield was flooded on Friday 20th July 2007, the floods lasted for approximately 6 days, the flood was caused by the run off water of the area, and the inability of the local brooks to accommodate that water, and we were not flooded by the Thames River.

This document covers what is believed to be the causes of the flood, the effect of the flood, the issues that the flood raised, ie, road closures, sand bags, river/brook clearance, local development impact, responsibilities and the responses from the relevant authorities.

The Parish Council are quite confident in saying that the cause of the flood was the inability of the local brooks to accommodate the amount of water that fell in the relatively short period, this was compounded by the lack of maintenance by the Environment Agency over years, and their persistent response of off loading their responsibilities to land owners.

1.2 CAUSE OF THE FLOOD OF CLANFIELD

The cause as mentioned above was the land run off caused by the 5.5 inches of rain that fell over about 12 hours in and around the area of Clanfield, and the inability of the local brooks handling that flow.

Clanfield is within 3 miles of Brize Norton RAF airfield, and Carterton town, both of which have seen significant development over the past few years. This development has increased significantly the amount of rain run off, and although facilities have been built in to hold water, no actions have been taken to ensure the brooks and stream with in the area are kept clear and are adequate to remove the water without flooding.
Clanfield repeatedly over the past few years have referred planning matters to the Environment Agency, who have accepted the plans being submitted, but made no effort outside the developments to ensure flood water can be cleared.

We have two specific brooks in the area The Clanfield Brook and the Blackbourton brook, the former is cleared once a year by the EA, however is was choked with weeds on 20 July 2007, the latter was cleared regularly by the EA up until four years ago.

1.3 THE EFFECT

The PC performed a survey on the whole village to identify who and what was flooded, when and by how much, we distributed 350 forms, to date we have received 155 returns, form which the initial analysis reveals that 60 properties were flooded, of which 55 included the habital area of the property. These properties were flooded between 0.5 inch up to 12 inches, the effect on the occupants being one of devastation, and not being able to get back to a “normal” life for six months.

1.4 ISSUES RAISED

1.4.1 Road Closures

The road in Clanfield became impassable to normal cars within an hour of the banks of the brooks being breached, however following many requests to close the entrances to the village to all traffic fell on deaf years, and the village suffered repeatedly of 4x4 vehicles travelling through the village causing a bow wave which forced water into road side properties.

1.4.2 Sand Bags

When it became apparent that the village was under threat of flooding, 4pm on Friday 20th July, requests to the West Oxfordshire District Council fell on deaf ears, and very few bags arrive before Sunday evening. WODC’s recent response is that it is not their policy to supply Sand bags, so whose is it?

1.4.3 River/Brook clearance

As mentioned above the effect of the flooding was made worse by the lack of Regular maintenance to the brooks in the vicinity of the village, these include the Clanfield brook, the Black Bourton brook, and the Charney brook.

We need to ensure that in the future these waterways are maintained to a suitable width and depth and kept clear at all times. A single agency needs to be responsible for this and funded accordingly.

1.4.4 Local development

Over the past few years we have seen significant development both at Caterton, in the form of 1000 houses being built, and at RAF Brize Norton, where recently a new hanger has been constructed, and the installation of 18 Hercules concrete standings are about to be laid, this amounts to concreting the equivalent of 14 football pitches.

This sort of development must be supported with suitable flood drainage, not just on the sites but in the surrounding area impacted in between the site and the Thames River.

1.4.5 Responsibilities

The responsibility of the maintenance of rivers and brooks should fall to one agency, no matter if the water flows across private or public land, this agency should have the authority to go on to private land and clear blocked or poorly maintained ditches/brooks and rivers. They must not use conservation, or lack of funds as excuses, the repair bill for Clanfield alone amounts to approximately £2 million.

Clanfield Parish Council
August 2007
Memorandum submitted by the Country Land & Business Association (CLA) (FL 68)

EXECUTIVE SUMMARY

The CLA is the leading national organisation which represents and supports businesses in rural communities, covering all aspects of land use and management. Our comments are based on those received from our members and their collective experience of the recent floods.

Rural communities have suffered significant losses and difficulties in the recent floods. Farming has been particularly hard hit. Crops were destroyed or damaged by flood water and the excess rainfall experienced, which will have a knock-on effect on availability, quality and prices of a number of foodstuffs. Livestock farmers were given little warning or advice before/during the floods and encountered severe problems trying to move and house large numbers of animals at short notice. Grazing and fodder crops were destroyed leading to longer-term difficulties for these farmers. Many of the financial losses resulting from the flooding will not be met through insurance, as premium costs are prohibitive, and will have to be borne by the businesses themselves.

Accepting that the rainfall was abnormal, the primary causes for the severity of flooding in rural areas, and the length of time the flood waters took to recede, was lack of maintenance of river channels and flood defences, coupled with the difficulties arising as a result of excess building on flood plains. Weed growth and overhanging vegetation has been allowed to choke many watercourses, severely reducing flows, leading to overtopping of river banks and defences. One of the causes of this lack of weed cutting is the Environment Agency’s concentration on environmental/wildlife priorities rather than flood protection. One suggestion is that the Environment Agency concentrates on its water management and flood defence roles and achieve a more sensible balance with its environmental champion role.

Flood defences and pumping equipment have not had the level of repair and improvement needed in the past decade, and were not therefore fit for purpose. Lack of personnel and resources, such as temporary flood barriers, were obvious in the days leading up to the flooding. Rural populations have suffered particularly due to lack limited resources and priority being given to urban areas. It is abundantly clear that the level of spending on flood protection is woefully inadequate and will need to be substantially improved if losses from future flood episodes are to be minimised.

Future flood management needs to be based on a planned, catchment-based approach, limiting further development in flood plains. Landowners have a role to play in the creation of washlands sited to accept excess water and protect local and downstream populations. However, they will need to be properly recompensed for this benefit to wider society. We believe Internal Drainage Boards have the ability to play a greater role in flood management, taking back responsibility for Critical Ordinary Water Courses.

CLA COMMENTS

Background

The CLA is the leading national organisation which represents and supports businesses in rural communities, covering all aspects of land use and management. We represent the breadth of the rural economy and 38,000 members in England and Wales between them own around 5 million hectares of rural land. Our members run more than 250 different types of businesses in rural areas including agriculture, forestry, fisheries, renewable energy, food, tourism, recreation and other rural businesses. Availability of fresh water, flood and coastal defences are important concerns for them, and are, in turn, influenced by their land management activities. Our comments are based on those received from our members and their collective experience of the recent floods.

Problems Encountered

1. Flood damage to property and buildings. Homes, business premises and farm buildings were all subject to flooding with resultant damage and losses. Of particular concern to farmers was damage to materials such as seeds, livestock feedstuffs, fodder crops (hay) and farm produce—many of which are difficult to replace due to the localised production of certain crops and the seasonal nature of their production.

2. Damage to crops and longer term effects. Flood water that covered growing crops, including grassland, for more than 48 hours generally resulted in the total destruction of that crop, rendering it worthless. It is worth noting that in circumstances where saline water covers crops the time before total damage is incurred is significantly less (usually about 1.5–2 hours). The result of crop losses is economic loss, but unlike most domestic and business losses, crop losses are more difficult to replace due to the seasonal nature of farming.

Loss of potatoes, peas, oilseed rape, etc will undoubtedly impact on food availability and prices. Even areas that were not flooded have suffered from reduced yields and lower quality crops as a result of the unusually high summer rainfall so there are likely to be general shortages of many UK grown foods.
One vining pea farmer in Lincolnshire estimated his loss from the pea crop alone of £410,000—resulting from 42 acres of crop completely destroyed by flooding from the local river, 360 acres partially flooded and the remainder damaged by heavy rain leaving the crop unfit for vining. Two neighbouring members in Lincolnshire lost 70 acres and 55 acres respectively of a borage, completely destroyed by river flooding. They have estimated a net loss of £230/acre amounting to £28,750 between them. Potato growers have also suffered significant losses of crops from flooded crops. Where the floods receded more quickly the result was much reduced quality produce.

Loss of hay/silage crops can only be replaced by buying in materials from other areas, with the resultant countrywide shortages and higher prices further affecting businesses already devastated by flooding.

Grazing land is particularly difficult to replace especially where significant areas of grassland were affected. It is both costly and practically difficult to move herds any distance from the farmstead. Insurance is not available to cover these losses.

The flood waters not only damaged the economically important crops but many environmental stewardship strips, field corners and natural meadowland. In several places, land that had been deliberately converted to flood alleviation grazing meadows under an ESA scheme—but is usually only waterlogged over winter—was badly affected leading to concerns about environmental stewardship payments and the impact on flora and fauna.

Rotting crops, especially grass that had been cut for hay or silage started to ferment and polluted the flood waters and resulted in several local complaints that farmers had emptied their effluent pits into the floods. In winter floods the water is colder and there are no fleshy crops, thus this problem does not normally occur.

3. Particular problems for livestock farmers. In addition to the obvious difficulties of finding higher ground/available empty buildings, moving substantial numbers of livestock and finding replacement feeds/fodder crops in a very short time scale, there were a number of welfare and bureaucratic issues following the floods. In several instances, cattle had to be moved from flooded land onto grassland allocated for second-cut silage, thus the second-cut silage crops were lost. In addition some farmers had to start feeding first-cut silage to young stock because of lost grazing. Several members have reported having to reduce stock numbers due to lack of winter feed stocks.

Having to move livestock away from the main farm results in higher costs and less opportunity to keep watch over them—contrary to the advice given in the Animal Welfare Regulations. One farmer on the banks of the River Severn had to find accommodation for 1000 sheep and 500 cattle in less than 24 hours—and is now left with the difficulty of finding grazing and fodder for them as all his crops were destroyed. Neighbouring farmers do not have the necessary “spare” grazing land.

Many livestock farmers cited lack of help and advice in dealing with animal movement records and other bureaucratic requirements. The recent restrictions on animal movements due to FMD will have further compounded problems for many farmers suffering lack of grazing and fodder.

4. Lack of flood warnings and advice. Many CLA members commented that whilst flood warnings were generally adequate, little help and advice was available for businesses/farmers. Because of the problems noted above, particular priority needs to be given to issuing warnings to livestock farmers. We understand that in past this was the case but that was not the experience in the recent floods.

5. Disruption to water supplies following the floods and resulting problems. Following disruption to fresh water supplies, housed livestock and dairy herds, in particular, had great difficulties, resulting in distress to animals. Whilst emergency supplies for domestic use were being provided, little was forthcoming for farmers. There was no point of contact to obtain help or advice on this or other matters.

6. Insurance. In common with domestic premises in flood plains, farm insurance is either very costly or not available. It is prohibitively expensive to get insurance cover for damage to growing crops, grass, fodder, etc so these losses will have to be borne by the farming business. Livestock farmers, already under pressure financially, will suffer severe hardship in bearing these losses and these floods may result in them going out of business. It is hoped that giving the affected localities Disaster Area status will allow EU funds to be made available to those businesses that have suffered catastrophic losses.

Underlying reasons for the problems

7. Lack of maintenance of flood defences and river channels. In rural areas the main reason cited for the severity of recent floods was lack of maintenance of flood defences and lack of clearing rivers and watercourses of vegetation. Many defences overtopped where they had been allowed to fall into a state of disrepair, and once the water got through, further damage to the defence resulted. The lack of basic repairs and maintenance to defences has resulted from inadequate funds and resources, coupled with excess emphasis on habitat protection. Farmers and the rural population feel strongly that defence of their land and properties is being neglected in favour of larger urban areas as funds are inadequate. The poor state of some of the pumping stations and the bureaucratic delays in getting authorization to pump were also cited as contributing to the severity of flooding.
Some members commented on the policy of maintaining high water levels in certain watercourses—for example the Ankeholme—to allow recreational navigation. This, of course, reduced the ability of the water course to cope with extra rainfall.

8. Building in flood plains. The failure of planners and developers to heed the Environment Agency’s advice about building homes and associated roads/hard surfaces in flood plains is generally regarded as one of the main reasons for the severity of the flood problems encountered. It puts at risk those properties in the flood plain as well as those further downstream which suffer because the ground is covered in hard impermeable surfaces which have a very much reduced capacity to absorb water.

9. Flood defence vs habitat protection. Numerous members suggested that many watercourses were not being kept clear of vegetation to the same extent as in previous decades—and most believed this was because the Environment Agency is jointly responsible for flood and environment protection, leading to conflicts of interests within the one organization. Whilst East Anglia did not suffer severe flooding on the scale experienced in Gloucestershire, there have been numerous cases where grazing meadows have been flooded and have failed to drain away quickly (resulting in lost grazing)—all as a result of rivers being infested with weeds. The local Agency personnel have stated that they were unable to undertake adequate weed cutting early in the season because of having to protect nesting birds and other wildlife.

10. Lack of resources and manpower. In the days leading up to the floods, and subsequently, the lack of adequate personnel within the Environment Agency was manifestly obvious. Operational teams have been greatly reduced in recent years and they were clearly unable to cope with the emergencies. In this situation the resources were, understandably directed at larger areas of population, leaving isolated rural communities and farmers more vulnerable.

One example occurred north of Welshpool where the Environment Agency had just started renewing a flood embankment using its own workforce. They had removed 500 mm from the top of the old defence and had started building the new embankment on a new line set back from the river. A flood warning was issued on Thursday 19th July, with a further two flood warnings the next day at which time there were no Agency in-house work force available as they were all south of Worcester. On the Friday evening the Field Team Manager had to obtain some (inexperienced) private digger drivers to try to rebuild 1,480 metres of partially demolished flood defence. On Saturday morning it failed and the embankment overtopped. The area defended is 1,500 acres with 29 dwellings, including 7 dairy farms, resulting in much unnecessary damage. Firstly, the Environment Agency should have heeded its own flood warnings and started the repair 24 hours earlier when the first flood warning was issued. Secondly, the in-house Operations Delivery Team of 16 (originally 22) are responsible for not only work in Upper Severn Wales but also for erecting flood barriers in Shrewsbury, Ironbridge, Bewdley and Worcester. They were away doing this as well as assisting in the Tewkesbury area with the defence of electricity substations. They were stretched beyond what was humanly possible.

The reliance on temporary barriers for flood protection clearly relies on adequate barriers being in the appropriate place and adequate manpower to erect them. In some places there appears to be lack of clarity between local Councils and the Environment Agency about responsibilities for storage and erection of these barriers and post-flooding clear up. As an example, the Environment Agency decided that temporary flood barriers were the solution in places such as Shrewsbury, Ironbridge, Bewdley, Worcester and Upton on Severn. It decided it would retain the responsibility for the erection and storage of the equipment rather than delegate this to the local councils. The policy of retaining control of the barriers caught it out at Worcester and Upton on Severn. The barriers are kept at Kidderminster, upstream of Worcester and again it did not respond to its own Thursday Flood Warning. The men started moving the equipment on Friday and got caught in the local flooding on the M5 and local roads. They never got to Worcester or Upton.

11. Failure to consider whole catchment. Flood management has historically been looked at on a fairly local basis, especially with regard to individual development proposals. It clearly needs to be considered on a much wider scale. Whilst some of the recent problems undoubtedly arose due to local “flashy” watercourses and inadequate drainage systems, many problems arose due to water rushing downstream—there being inadequate upstream areas to absorb the excess water.

12. Piped ditches and culverts. Many of the recent problems in urban areas resulted from inadequate drainage capacity. Within rural areas the increased use of piped roadside ditches and culverts—to save Highway’s maintenance costs—was cited as adding to local problems coping with the excess rainfall. Piping reduces the area of land that can receive the floodwater and directs it to the nearest stream, and so the road and nearby properties flood.

13. Debris and rubbish. Many members noted that a number of bridges, culverts and rivers with overhanging trees were blocked as a result of debris and rubbish being carried in the flood water and building
up around obstructions—both in rural and urban locations. One member noted a local factory, located in a floodplain that had pallets and wagon bodies stacked up in the yard. The flood took all this material and piled it against the nearby railway bridge, blocking it and creating a massive localised flood.

**Suggestions for future improvements to flood management**

14. Better maintenance of flood defences and water courses. Without doubt the reduction in basic maintenance and repairs to flood defences and reduced clearing of watercourses contributed significantly to the degree and extent of flooding. This needs to be addressed as the first priority.

15. Greater spending on flood and coastal defences. The lack of maintenance of flood defences is largely a result of under-funding flood (and coastal defence) spending—something highlighted in the Foresight Report in 2004. At present levels the total flood spending equates to three days spend on the Health Service. In view of the enormous economic and human cost of the recent floods, this would seem wholly inadequate.

16. Less building in flood plains. Clearly development in flood plains is a significant factor in both exacerbating flooding and putting more homes/business premises at risk of flooding. Development needs to be curtailed in flood plains and that which is permitted needs to include better provision for the absorption of water (permeable surfaces, etc) and compensatory flood provisions. In addition any building in flood plains (including farm buildings) may need to consider incorporating flood resilience measures and better provision for drainage—eg SUDS.

One suggestion is to levy a developers’ charge or bond to be used towards flood defence funding/creation of compensatory flood plains.

17. Environment Agency to concentrate on flood role. The EA should concentrate on delivering water management and flood protection, reducing the emphasis on its environmental champion role. The conflicting roles of the EA in delivering both flood and environmental protection has resulted in reduced clearing water courses and has a similar adverse effect on the provision of coastal defences.

Whilst generally providing adequate flood warnings in domestic situations, better provision for livestock farmers and general post-flooding advice is needed. The bureaucratic nature of the EA makes it extremely difficult to find a local contact who can help in any given situation.

18. Make better use of the Internal Drainage Boards. There is a good case for strengthening the IDB responsibilities as their record of water level management, and keeping drainage channels clear, is highly regarded. It would be worth re-assessing whether IDBs should be given back responsibility for maintaining Critical Ordinary Watercourses. The efficiency of IDBs seems to have prevented serious domestic flooding and their recent record in low-lying areas would seem to be a lot better than in those areas “protected” by the EA. IDBs have good local knowledge which is valuable in prioritizing the necessary maintenance and improvements to flood defences. Giving the IDBs greater flood protection responsibilities, rather than burdening them with the extra “public accountability” work would make a valuable contribution to flood protection.

19. Catchment based approach to flood management and use of natural washland. The recent emphasis on catchment based flood management plans is a good one and needs to be extended to development proposals. During the late 1980’s/1990’s EA embarked on a series of maintenance works increasing height of the banks alongside the River Severn, only to realise this was causing even more flooding downstream. A holistic catchment approach may have foreseen these problems.

Landowners have a significant role to play in providing natural flood plains/washlands where water can be held rather than it rushing downstream and causing flooding to towns and villages. However, in order for this to happen there needs to be suitable recompense for the affected landowners whereby the government purchases the land for this purpose or compensates for any loss of income as a result of this land being used for the public benefit—as occurred in some places, eg the Lincolnshire Washlands Scheme. Historically, environmental stewardship has been proposed for this purpose, and whilst being a suitable mechanism there is insufficient in the budget to be widely used. However, proper provision for livestock evacuation needs to be incorporated in any agreement as much of this washland would be grazed during the summer months, the expectation being that only winter flooding would occur.

20. Clarity of roles and emergency planning. In the light of, for example, the difficulties encountered when erecting temporary flood barriers and delivering fresh water after the floods, there needs to be greater clarity of roles between the EA, local councils and the emergency forces.

Better planning with regard to protecting and restoring basic infrastructure such as electricity and water is needed.

Specific points of contact are needed where, for example, livestock farmers can obtain help and advice.

21. Greater controls on rubbish near water courses. Whilst retaining trees in the floodplain may have some benefits in reducing flows, it is clear that fallen trees and other debris were washed downstream to become lodged in the next bridge, causing localised flooding or damage to the bridge. River banks and the adjacent floodplain should not be used to store any materials and fallen trees should be removed from the river and the adjacent fields.
22. Insurance cover/financial support for hardship cases. The recent floods have again highlighted the very real difficulties that homeowners have with regard to getting adequate insurance cover if the home is situated in a flood risk area. Insurance is even more costly and difficult to obtain for many businesses and farmers. Greater government help is needed, either in the form of supported insurance or hardship funding to help with economic losses due to flooding.

CLA
August 2007

Memorandum submitted by Oxford City Council (FL 70)

My suggestions for the topics the enquiry might want to consider are as follows:

1. Is there enough flood level monitoring on the Thames and how well is information on river levels translated in the flood warnings downstream?
2. Is there enough advice given to households at high risk of flooding with regard to:
   i. simple flood defence measures that can be taken on domestic properties;
   ii. should grants be provided to households to encourage “self help”?

Peter Sloman
Chief Executive, Oxford City Council
August 2007

Memorandum submitted by Stephen Watkins (FL 71)

I am a farmer farming 2500 acres in the flood plains of the river Severn and Avon, of which 1000 acres was flooded in July. The crops lost were mainly high value spring sown crops Potato, Spring onion, Peas, Carrots, Sweet Corn, also damage to water meadows and general infrastructure, buildings etc. The initial loss was expected to be circa £250,000 but now the water has gone this has gone up to over £355,000. All of this loss is an uninsurable loss.

I would like the committee to consider the following points.

1. Assistance with clearing up flood rubbish, why should I have the cost of clearing up other peoples rubbish then having to pay commercial rates to land fill it.
2. A formula for financial support for those uninsurable losses eg direct cash, soft loan (zero% or very low rate underwritten by Government) to help business trade out of these losses. Lots of farmers are tenants me included so have little collateral to borrow against.
3. Cleaning and proper maintenance of all water ways, dredging, flood bank maintenance etc.
4. With 11 miles of river frontage should I take the flood defences away—which would cause flash flooding. Leave as is and accept the losses when the bank is breached and receive government support when we have summer flooding (March to October) as this is when I lose my crops. Build the bank higher as my own insurance and cause greater flooding down stream, the possible outcome of that this time could have been that the power station at Gloucester would have been flooded, power to GCHQ would be lost, does GCHQ have sufficient back up power to protect the country? So I think the government needs to sit down with interested parties to come up with a long term solution sooner rather than later before we all build our banks up.
5. Why did a crew from Italy have to come to Tewksbury with rescue hovercraft when the Army depot at Ashchurch (1 mile away) has plenty in storage.
6. Why did the local agricultural engineer have to phone me to get some pipe fittings, to allow more than one tanker at a time to fill water at the Strensham water works. Where is the forward planning?
7. To look at the use of the Army or an on call civil body to assist the emergency services in this sort of situation, again look at all the machinery at the army depot, or call on the farmers with their mobile irrigation pumps. I had eight available.
8. To look for solutions “outside the box”.

I should like the opportunity to give oral evidence to the committee as I feel that the practical knowledge and experience could be of assistance to the discussions.

I look forward to your response.

Stephen Watkins
August 2007
Memorandum submitted by Farm Crisis Network (FCN) in Yorkshire (FL 74)

EXECUTIVE SUMMARY

We are chiefly concerned with the East Riding of Yorkshire, the flood plain of the River Hull in an area stretching from Driffield to the City of Hull.

In the majority of the farmers visited the cause of the flooding was the dykes, which run parallel and adjacent to the river, “backing up” because the water is normally pumped up and into the River Hull by a whole series of pumping stations. Evidence suggests that the pumps were not on to prevent flooding in the City of Hull and the Kingswood Estate in particular. The Kingswood Estate was built in the last 3–4 years on an area that was known to flood.

On various farms it was approximately 16 days before the water started to drain away which suggests that the pumps were not operating.

Whilst we accept the need to protect large urban conurbations such decisions need to be transparent and there is a compelling case for compensation to those whose land is more seriously affected as a consequence of flood management strategy.

During this episode FCN have handled 26 cases due to the flooding in East Yorkshire of which 11 are in the area described above and we are aware that there are many others in this area who have been affected but who have not applied to FCN or ARC-Addington for help and assistance. To put our figures into context the local authority in the area puts the scale of the loss to farmers in the region of £14 million. Other partners working in the area such as The Royal Agricultural Benevolent Institution (RABI) will also have attended cases in this area. Paradoxically those whose businesses sustained the greatest financial loss may not have contacted either FCN or RABI since the amounts of financial help on offer were far too small to make much difference.

We are also aware that many farmers have been affected by this years weather although they are not in areas that were known for flooding.

DETAILED BREAKDOWN

1. In the cases visited there were broadly 2 effects of the flooding. The first was visible flooding where large areas of land were covered with water and in other cases, water “backed up” the drainage pipes and the water moved upwards destroying the root structure of the crops. Crops affected by direct flooding can survive longer than crops affected by this indirect flooding due to oxygen being captured in the former case, and forced out in the latter. One of the key factors in the level of damage to crop and soil was the length of time that land was under water, the longer this went on, the higher the crop loss. In the instances where water did back up the drainage pipes the resulting back flow may have caused these pipes to become silted up in which case they will require extensive jetting and repair

This table gives a brief outline of the cases from this particular area showing the amount of land affected by flooding.

<table>
<thead>
<tr>
<th>Acres</th>
<th>What type of farm</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>168 Beef and Sheep</td>
<td>90% flooded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>500 sheep moved</td>
</tr>
<tr>
<td>Case 2</td>
<td>260 Suckler Cows Beef/Arable</td>
<td>60 acres lost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All cattle having to be housed</td>
</tr>
<tr>
<td>Case 3</td>
<td>300 Beef/Arable</td>
<td>Lost 80 acres of wheat</td>
</tr>
<tr>
<td>Case 4</td>
<td>30 Dairy</td>
<td>Field flooded for 3 weeks</td>
</tr>
<tr>
<td>Case 5</td>
<td>560 Pigs/Arable</td>
<td>Loss of 30 acres of borage</td>
</tr>
<tr>
<td>Case 6</td>
<td>200 30 acres of barley 170 acres Woodland diversification</td>
<td>60–70 acres affected</td>
</tr>
<tr>
<td>Case 7</td>
<td>200 Grass Land Suckler Cows</td>
<td>Lost 50–60 acres—under water for 4 weeks</td>
</tr>
<tr>
<td>Case 8</td>
<td>60 Hay and straw and contract pigs</td>
<td>Lost growing crops and crops “in store”</td>
</tr>
<tr>
<td>Case 9</td>
<td>80 Hay and straw and contract pigs</td>
<td>All lost</td>
</tr>
<tr>
<td>Case 10</td>
<td>300 Pigs/Arable</td>
<td>Lost 60 acres</td>
</tr>
<tr>
<td>Case 11</td>
<td>200 Grazing</td>
<td>Loss of grazing and costs of concentrate</td>
</tr>
</tbody>
</table>

2. The losses due to this flooding take various forms:
   A Total loss of cash crop eg wheat, barley, potatoes
B Loss of forage crop and animal bedding
C The cost of buying in replacement forage crops eg silage
D Provision of concentrates (cereals) for livestock housed due to the flooding of fields
E Cost of alternative grazing including transport
F Lack of employment opportunities for contractors
G Reseeding and establishment of replacement grass crops including liming.
H Possible soil contamination with heavy metals and the cleanup
I Cost of removing spoilt crops

The above financial implications take no account of the associated stress and local socio-economic factors.

3. Although historically the major drains have been well maintained by the environmental agency, in recent times there appears to have been a shift in emphasis to environmental protection, which may have resulted in a reduction in water movement capacity. The River Hull, which is a major outlet for water has been neglected as evidenced by the presence of sunken boats and barges. This can be seen at various places eg Bethels Bridge near Hempholme. One of the compilers of this submission Mr M Doyle has seen this first hand.

4. Longer term effects on farm businesses
The farms concerned could in some cases suffer longer term implications including:
A Potential impact on value of land that is known to be a part of a flood management strategy
B The impact on costs of production of shortage of and increased cost of feed and bedding
C Impact of fixed price contracts with supermarkets
D The impact on insurance premiums for buildings and livestock

Farm Crisis Network (FCN) in Yorkshire

August 2007

Memorandum submitted by Eastington Parish Council (FL 75)

1. Considering that the majority of houses in Eastington are on high ground and away from the rivers, it was quite surprising that so many flooded during the heavy rain of July 20th. We know that two houses close to the River Frome flooded, and believe that at least a further thirteen succumbed due to overflowing sewers or blocked ditches. Several properties were saved only by exceptionally hard work and many others had flooded outbuildings, garages and gardens. It is believed that almost all of the flooding could have been prevented by appropriate maintenance of drains, ditches and the main sewerage system. It is also likely that the remaining flooding could have been prevented by appropriate flood defences (sand bags etc.). The Parish Council welcome the advice and access to such defensive measure as offered by the County Council or any other agency.

2. Since no single authority has an overview of the flooding problems in Eastington, the Parish Council, together with local volunteers, is undertaking a survey. This should give a more accurate view of what happened during the heavy rain. It is planned to use this information to persuade the relevant parties to attend to any necessary improvements, and to develop a plan to significantly reduce the risk of Village houses flooding in future.

3. It has proved very difficult to get an accurate picture of the extent of flooding and it is believed that the stigma associated with flooding is the main reason. Impact on insurance premiums and the negative impact when selling a house seem to be the reasons for not volunteering information. There is concern that the problem may have been significantly worse than initially reported and it is hoped that our survey may clarify the situation.

4. While it seems there were no severe hardship cases in Eastington, most of those affected are still waiting for insurance companies to agree commencement of remedial actions. Significant stress and frustration is being reported verbally to us by parishioners. (This is in contrast to some un-insured households in worse affected areas of the County, which have received money from local funds in order to begin repairs.)

5. Eastington has had a problem with an inadequate sewerage system for several decades. The sewage has to be pumped up hill to the main Stroud treatment works. It has proved extremely difficult for the Parish Council to get appropriate action from Severn Trent, or to even define the problem. We are still a long way from remedial action. Breakdown of sewage pumps, power-cuts and heavy rain have lead to many other occasions when properties have been flooded with sewage-contaminated water. The resources of our Parish Council are inadequate to continually pursue Severn Trent to take appropriate action. (We have a part-time clerk and volunteer councillors to cover all the escalating Parish issues.) A great deal of Parish Council time is spent pursuing various authorities for either not delivering on promises, or for poor standard of work. Some assistance in these processes would be greatly appreciated.
6. Several planning applications have been granted thus allowing significant increases in sewage to our already overloaded system. One of these was for large volumes of wastewater to be pumped into our system from a landfill site in a neighbouring parish. We are told that there are no planning reasons to delay planning permissions until our sewer system is upgraded. It would help to have planning reasons for encouraging remedial actions to drainage and sewerage systems.

7. It seems that permission is not required for removal of hedgerows. We have examples where removal of hedges, and particularly the raised mound upon which these grew, has allowed surface water to run off land directly into a neighbouring property. Some restriction on removal of hedgerows would be welcomed.

8. The top surface of roads in our Parish has risen over the years following successive laying of tarmac. Kerbstones of 40 years ago, in some locations, are now level with road surfaces. Many houses are now significantly lower than the road surface and there are no kerbs to stop storm water running into properties. Wider use of the much publicized on-site recycling of worn out road surfaces, would help reduce quarrying for fresh stone and keep road surfaces at original levels. Where this is not appropriate, it would be good to have additional road profiling or kerbing, to protect properties from excess surface water.

9. Modern methods of hedge cutting result in an abundance of macerated hedge being sprayed over roads and ditches. No one ever cleans this up and it is left to accumulate in drainage ditches. Legislation to enforce landowners to collect hedge and grass cuttings, would significantly reduce this problem.

10. There are but a few properties where ditches are regularly dug and maintained but most have been abandoned for several decades. Water frequently runs over the road surfaces. A few ditches that have been dug out in the past 5 years have become choked with vegetation. Some form of incentive is believed necessary to encourage maintenance of ditches and grips.

11. The increase in wider and wider farm vehicles and increased ownership of 4x4 vehicles has lead to damage to the few maintained ditches, especially in single-track lanes. Such vehicles are often seen squeezing past each other in narrow lanes instead of waiting at a passing point. Hours of work spent cleaning ditches are undone in seconds by such vehicles driving over verges. While there are some measures to control speed of vehicles, it would help to have some measures to protect verges in narrow lanes, and to address the hazards encountered by pedestrians due to inconsiderate driving of wide vehicles.

Eastington Parish Council
Stonehouse
August 2007

Memorandum submitted by Alison Cobb (FL 76)

A DISASTER TO COME: NOTES ON FLOODING IN BINSEY AND WEST OXFORD IN 2000, 2003, 2007

SUMMARY

This submission examines the experience of recent flood events in West Oxford, centred on Port Meadow, the village of Binsey and adjacent river channels.

It places the blame on the Environment Agency for failure to maintain river channels, failure to maintain the embankment of the main River Thames, and failure to broadcast accurate and timely information during the floods. Simple remedies are recommended.

INTRODUCTION: BINSEY AND WEST OXFORD

1. This submission is centred on the Thames floodplain, on the western edge of the city of Oxford. It describes some of the experiences of the village of Binsey, a small isolated rural hamlet in the centre of this floodplain (but within Oxford City), during the floods of December 2000, January 2003 and July 2007.

2. Only residents of Binsey can know what happens during severe floods because Binsey is cut off by one mile of flood water in all directions. Neither Environment Agency nor Oxford City officials can, or do, get to the village at these times.

3. Binsey, “Ben’s Eyot” or island, lies between the river Thames to the East, and its old course the Seacourt Stream to the West, which branches off the Thames above Oxford, and rejoins it below the city. As it goes through Oxford, the Thames fragments into a number of smaller channels (Seacourt Stream, Castle Mill Stream, Bullstake Stream, Hinksey Stream). These are not tributaries: they leave the main channel and rejoin it a few miles downstream. They are an integral part of the Thames.
PORT MEADOW

4. There is a large lake, or area of flood water storage, called Port Meadow, about one mile N-S, and half a mile E-W, which when full stands about one metre above low lying parts of Oxford. Port Meadow is immediately to the east of the village of Binsey.

5. The natural reservoir of Port Meadow is enhanced by an embankment on the West side of the Thames, one metre high, thirty metres wide. In the recent floods, this has been overtopped. This overtopping worsened with each of the last three floods, and in at least ten places along Port Meadow the bank is eroded. In the last flood, water came over the bank for a length of 150 metres in one place.

6. The overtopping happens suddenly. An enormous volume of water cascades into the low lying floodplain around Binsey, and follows the lie of the land South into Botley and Osney, flooding several hundred houses this time. This is one reason why Oxford floods.

SUBSIDIARY CHANNELS

7. A series of 10 maps from 1792 to 1944 show a connecting stream between the Thames at the North end of Port Meadow (which is the last part to fill with flood water) to the Seacourt Stream. In early maps, it is simply named “Swift Ditch”. In eight later maps, the point where it leaves Port Meadow is labelled “Overflow”. Its course is often indicated with flow arrows. The map currently provided to flood wardens by the Environment Agency also distinguishes it, and no other nearby stream, with flow arrows.

8. Swift Ditch and the Seacourt Stream are now blocked with growing vegetation and fallen trees. The Seacourt Stream was visited by kayak during the height of the floods: the craft did not move, since the stream was not flowing, even though water was flowing strongly across the adjacent meadows. There were fallen willows every fifty metres or so at that point. Neither the old “overflow” of Swift Ditch, nor the natural drainage of the Seacourt Stream, is able to work properly.

THE ROLE OF THE ENVIRONMENT AGENCY

9. After each flood the residents of Binsey tell the Environment Agency what happened; which they cannot otherwise know because they cannot get into Binsey during the floods. After each event we have walked the embankment with representatives of the Agency. Each time they say this is bad, something needs to be done. But nothing is done.

10. The Environment Agency is shown, on its own maps, to have a “power” over the Seacourt Stream. It does not exercise this power. We have recently (8th September 2007) canoed its central reach between Wytham village and Duke Street, West Oxford, and twenty-two fallen willows, ashes and hawthorn trees lie across it, blocking it.

11. If Swift Ditch is not part of the Environment Agency’s responsibility, surely it should be? In living memory it was always maintained and kept flowing by the Thames Conservancy. An overflow for Port Meadow would be a help in alleviating serious floods.

12. People with long memories claim that the flood regime for the last three floods has been different. Flood water used to flow West, towards the Seacourt Stream. In these last floods, as never before, the Thames overtopped its embankment. As the embankment erodes, this becomes more dangerous. We believe we may have a New Orleans situation here. There, the levees broke: the city flooded. Afterwards it was discovered that the authorities had known about the weakening levees, but had done nothing to safeguard them. We have shown and told the Environment Agency three times, after each flood, about the new overtopping and eroding of the Thames embankment. And they have done nothing. A larger area of Oxford floods each time. Next time it may be disaster big-time.

13. The Environment Agency is making no new flood wardens. It hopes instead to involve “the community” in flood warnings. The experience of one flood warden is that the tinny voice on the telephone announcing a severe flood event is no substitute for being telephoned or e-mailed by a known person telling you. As the flood waters are rising dangerously, “the community” will all be busy taking valuable stuff upstairs, ripping up the carpets, and so on. Only a volunteer flood warden, who knows it is his or her duty, gets on the telephone at that time and warns people, before dealing with their own disaster.

14. There has been great indignation in Oxford at the inaccuracy of the Environment Agency’s warnings. At one point they said the peak flood would come at eleven o’clock that morning, sorry, four o’clock that afternoon, sorry, seven o’clock that evening, sorry, during the night, and they announced the next day that the level was going down. A stick stuck in a lawn in Binsey measured in inches (because inches are easier to read with binoculars than centimetres, though conversion is easy), showed in that afternoon when levels were supposed to be dropping, in fact the water level was rising one centimetre every hour and a half. This looked like a peak coming, and we told the Environment Agency, who said they would pass it on. When we heard no announcement, we e-mailed Radio Oxford (who deserve high praise for their up-to-date handling of news of the latest floods) and asked them to put out a warning, which they did. We were then telephoned by the Environment Agency, asking what we were doing spreading alarm and despondency? We were right, an hour later the highest flood level of all hit Botley and Osney.
RECOMMENDATIONS

15. We suggest that the money and the means be given to the Environment Agency, and that they be spurred into action, to deal with the weakening embankment along the West side of Port Meadow, and renew and maintain the ability of Swift Ditch and the Seacourt Stream to take the overflow.

16. We suggest that more voluntary flood wardens be appointed. Two other villages North of Oxford, Wytham and Wolvercote, with no flood wardens, had no warning and suffered severe flooding, and 39 sheep drowned in Wytham. We suggest that flood wardens, instead of being issued with unnecessary yellow jackets, be given a measured stick to push in somewhere where they can easily read it. The absolute depth of the water is not so important as the rate at which it is rising, and anyone watching a measured stick can tell that. Had Wytham and Wolvercote had flood wardens with measured sticks, the rate of rise of waters in these two villages, which are above Binsey, would have given much earlier, and much more accurate warnings than those of the Environment Agency. The Environment Agency takes its data from the locks, the worst place in which to measure flood depths, and has proved to be dangerously inaccurate.

Alison Cobb
Flood Warden for Binsey; Press Officer, Binsey Residents Association
August 2007

Memorandum submitted by Roland M Smith (FL 77)
Comment on the June 2007 Floods at Burstwick in the East Riding of Yorkshire

1. ACTIONS IN EVENT OF DRAIN LEVEL APPROACHING CRITICAL LEVELS

Environment Agency Responsibility

1a. The Environment Agency do not appear to issue “alarms” for fluvial floods risks, this is clearly a dangerous situation and may cause loss of life.

1b. The Environment Agency have instrumentation that shows when a river or drain is close to over topping its banks. Burstwick drain began overtopping its bank at around 1430 on Monday 25th June 2007 no alarm was raised, it was at 0230 hours on the 26th June 2007 that residents of Burstwick first became aware that they were in danger of flooding and by 0300 hours people in Trinity Close Burstwick had to begin leaving their home. No alarms were ever issued by the Environment agency. The Environment Agency should have alarms for fluvial events set at preset water levels and / or Rate of Change of Level that should activate a emergency response procedure this should allow action to be taken to prevent the flooding occurring:

1c. When the alarms is activated warn residents of low lying areas that are in the “floodplain” and that water has high possibility of coming over the top of the River / Drain etc and that they are in serious danger of flooding

1d. Emergency response Team to mobilise pumps to the drain outlets so that when the outlets are tide locked that the drains can continue to be emptied.

2. MAINTENANCE OF DRAINS AND DRAIN OUTFALLS (CLOGHS)

Environment Agency Responsibility

Burstwick Drain, Keyingham Drain and Skeckling Drain

2a. Burstwick Drain effectiveness is dramatically decreased by lack of maintenance. The outfall at Hedon Haven is effectively operating at only half capacity due to 1.4 metres of silt that has built up over the years. This silt is effectively a wall that the flow has to get over as the outlet is only 2.6 metres high, a wall of silt 1.4 meters high restricting its flow would have a dramatic impact on the flow rate. Even at the date of this letter no work has even begun to dredge this silt. The Environment Agency should be asked to produce its maintenance plan that shows it annual programme and at what is the criteria for the maintenance to be brought forward should the silt level begin effecting the water flow.

2b. Burstwick Drain dredging has not been carried out effectively for many years, Surveys are costly and need to be done but actually doing the dredging is cheaper than a survey. A good operator can tell what needs to be brought out by the “feel” of the bucket and it best carried out when the level of the drain is low. To get the drain low the silt much first be removed from the outlet.

2c. Pumps have been proposed for the outfall of the Burstwick Drain for the last 15 years so that at high tide and heavy rain the drain can continue to function. The Environment Agency’s budget should be increased to allow this long awaited event.
2d. Bridges that have been built over the drain that in some cases have a sill that restricts the flow of water. Why did the Environment Agency of other government dept allow this to happen?

2e. There is an old assembly that used to hold the original set of clough doors due north of the new Hedon Haven clough doors, this assembly severely restricts the flow of water due to its narrow opening and its high sill level. This assembly should be removed urgently.

2f. Comments 2a) 2b) and 2c) 2d) can be equally applied to the Stoney Creek outlet that serves the Keyingham and Skeckling Drain.

3. Planning Permission: ERYC Responsibility

Planning permission was given for the development of Elmtree Farm Estate with recommendations instead of conditions.

3a. Planning permission at Churchill Rise, Trinity Close, Skeckling Close etc was granted with the recommendation that the land was built up 1.8 metres. Had this recommendation been accepted and carried out by the developer not one single house on this estate would have been flooded during the heavy rains in June 2007. Why was this a recommendation and not a condition? Local drainage board recommended that planning permission was not granted. ERYC to investigate and put rules in place that ensures this cannot occur again.

3b. The housing estate Churchill Rise, Trinity Close, Skeckling Close etc was built on ditches and drains. These drains were culverted by the developer as he saw fit but were not part of the planning permission are not documented and no plans appear to be in existence. Several of these drains are now blocked but as there are no plans of where they run maintenance is difficult. It is suspected that they run under houses and private gardens. The owners of the land are not aware that these drains are on their property neither are they in the title deeds. The strange part is that the owners of the land are the riparian owners and have a duty to maintain these water courses. ERYC Planning Dept should investigate how they allowed this to happen and to produce a viable plan for future maintenance.

Ronald M Smith
August 2007

Memorandum submitted by the RSPCA (FL 79)

Executive Summary

— The RSPCA committed a great deal of time and resources to the recent flooding.
— On the whole the response was co-ordinated well at a local level.
— Lessons can be learned with regard to animal welfare so that the public and local authorities can be better prepared in the future to protect their animals.

Introduction

1. The RSPCA welcomes the opportunity to respond to the Environment Food and Rural Affairs Select Committee (EFRA) inquiry into the recent floods in Yorkshire and the West Country.

2. As we discuss below, the RSPCA was involved in the response to both incidents of flooding. Very many of our staff were involved, and we rescued and provided fresh water and other assistance to a large number of animals. We also rescued some affected people.

3. From our experience, the Society believes that the organisation of the response to the floods at the local level was appropriate and effective. However, we make a number of recommendations below to further improve the response to future incidents, particularly in respect of animal welfare matters.

RSPCA Response to the Flooding

4. At the time of the floods, the main media focus was on Gloucestershire, due to the well-documented failure of a local water treatment plant, and the resulting shortage of clean water. This posed an additional challenge to those affected by the flooding, and to those responding to it. However the Society did respond in other areas of the country where flooding occurred, helping to assist people and animals in difficulties.

5. RSPCA staff worked hard, and showed a great deal of dedication, during the floods. For example, many individuals working at our cruelty line centre based near Doncaster still came into work to support the RSPCA inspectorate response, even though their own homes were flooded or likely to be flooded later that day.
6. The RSPCA committed a considerable proportion of its resources to the response to the floods throughout England. At the peak of the most severe floods up to one third of our front-line staff were involved (this consisted of 17 fully operational and equipped teams). This did impact on the day-to-day operations of the organisation, but we were able to help 5,450 animals and also rescued 62 people in the affected areas.

7. The RSPCA has a national team of inspectors trained to a high standard in fast-water rescue techniques. This means that our inspectors’ skills are recognised and widely respected by the emergency services and other rescue organisations. Indeed in some instances inspectors transported paramedics to patients in need and electrical engineers to power stations so that emergency repairs could be carried out.

8. One of the biggest problems for people and animals following the initial flooding in Gloucestershire was access to clean drinking water. The RSPCA helped co-ordinate the provision of clean drinking water to areas where it was most needed, especially to farmers, stables, and livestock owners. A good example of this was when inspectors sought clean drinking water for cattle farmer Steve Theyer (near Cheltenham) who had turned his 100-acre farm into a sanctuary for 15 dogs, 32 cats, 28 rabbits, 10 ferrets, 14 chickens and a tortoise.

9. In total, the Society was able to provide fresh water to 26,618 animals directly affected by the water treatment plant failure in Gloucester. The Society brokered the water from other water companies.

10. In Gloucestershire the Chief Constable of Gloucestershire police set up a command centre (“Gold Command”) at the police headquarters. Representatives of the other emergency services, together with the RSPCA as well as the Red Cross, Seven Trent Water, the Environment Agency, the Army, the RAF, NHS, Air Sea Rescue, local authority emergency planning teams and Animal Health were able to have a presence at this important command and control centre. Communication and co-ordination of the response was particularly effective in Gloucestershire as a result.

LESSONS TO BE LEARNED

11. Floods occur throughout the world and a lot can be learned from the different policies and practices of other countries. Possibly the most useful and constructive approach with regards to animal welfare has been developed in America following Hurricane Katrina in 2005.

12. It was very quickly realised by the American authorities that the evacuation process of people can be slowed down, and public order can even be undermined, if provisions are not made for pets and livestock. This experience led to the passing of federal law, the Pets Evacuation and Transportation Standards Act 2006 (PETS Act 2006), to provide for animals during an emergency situation.

13. Since then the two organisations the RSPCA works most closely with in the USA—the American Humane Association (AHA) and the Humane Association of the United States (HSUS)—have developed detailed response procedures and advice notes for the general public.

14. Taking the American example, we recommend that contingency plans for floods and other similar events should cover the following issues with regard to animal welfare:

   — Initial assessment of animal-related needs—for example different responses will be needed for small scale and large scale incidents. It is important time is taken initially and the most appropriate people are consulted with to ensure an effective response is made.
   — Emergency search and rescue of animals (including humane trapping)—the RSPCA has a great deal of expertise in such emergency search and rescue activities.
   — Establishment and management of temporary emergency animal shelters—again the RSPCA is able to do this, but it would also useful for local authorities to know what types of facilities are in their area that could be converted to temporary shelters at short notice should they need them, eg greyhound stadiums, etc.
   — Evacuation support—the RSPCA’s frontline staff are trained in fast-water rescue techniques and these skills can be used for both humans and animals. Thus while people will always be the priority with regards to evacuations there is a cross-over of skills that different agencies can use to pool resources.
   — Veterinary evaluation of animals—having veterinary support is essential to any response and local authorities should make an assessment of vets they may call up to be based at emergency shelters or to assist RSPCA inspectors during difficult rescues or where animals are injured.

15. Although the response to this Summer’s floods has cost the RSPCA at least £300,000, we strongly believe that we have a vital role to play in ensuring the welfare of animals (and people) in these circumstances. On this basis we are taking forward a number of actions in order to be better prepared to help local communities in the event of such a crisis in the future. These include:

   — Drafting advice cards for livestock, equine and pet owners on how to ensure the welfare of their animals can be best protected.
   — Encouraging local authorities and the national government to ensure that animal welfare is a written into contingency plans (covering both minor and major incidents).
— Ensuring RSPCA front-line staff receive regular “refresher” training on different rescue techniques and sufficient equipment is kept in stock and is easily accessible.
— Liaising with other agencies involved in emergency work to see how we can work in a more co-ordinated way particularly when minor incidences and small-scale evacuations occur.

RSPCA
August 2007

Memorandum submitted by the National Trust (FL 81)

1. SUMMARY

1.1. The National Trust was significantly affected by the recent flooding in England and Wales, and we welcome the opportunity to submit evidence to this inquiry.

1.2. Flooding is predicted to become more frequent as a result of climate change and there is a need to adapt to this heightened risk.

1.3. The Trust advocates a risk based approach to the planning of the nation’s infrastructure, and urges the Government to be much more proactive in relocating major infrastructure and housing developments out of high flood risk areas in order to protect people’s lives and livelihoods. This is in addition to avoiding problems with the location of new development.

1.4. We also advocate investment in more effective, long-term cost efficient and sustainable solutions to flood risk management, based on restoring the natural function of catchments. Every parcel of land in a catchment, including that within major built developments, can make a contribution to reducing the probability and consequence of flooding, with the uplands and floodplains playing vital roles in water capture and storage.

1.5. There is also a cultural challenge for society to relearn how it must live with water. We suggest the Government should take a more proactive approach to the communication of flood risk, not only to raise general awareness, but to facilitate practical adaptation through promoting actions that people can take in everyday life.

2. INTRODUCTION

2.1. The National Trust is one of Europe’s leading conservation charities, with over 3.5 million members and 49,000 volunteers. We are the UK’s largest non-Governmental landowner, managing over 245,000 ha of countryside and greenspace. We own over 1,100 km of coastline in England, Wales and Northern Ireland and manage over 10% of SSSIs in the UK. Over 100 million visits are made to our countryside and coastal sites every year and we also welcome 500,000 educational visits to our properties.

2.2. The Trust’s experience of flood risk management is based on the following:
— the Trust’s core statutory purpose of conserving and promoting access to the nation’s natural and cultural heritage in perpetuity—we are a steward of special and fragile places for ever, with decisions taken for long term public benefit;
— the Trust is a major business, from tourism to catering, with an annual turnover of £295 million—we have significant economic assets actually or potentially at risk, but also benefits to be derived from a more integrated approach;
— the Trust is a major voice in public debate at national, regional and local levels, indirectly through the media and directly through interpretation and events at our sites—through our communication we have the potential to reach millions of people and promote greater understanding of the risks we all face; and
— the Trust is an authority on land and resource management and use—we have decades of expertise in understanding and managing risks and undertaking our conservation work through the careful “management of change”.

2.3. The Trust is working towards improved sustainable land and water management across its whole estate, through working in partnership with individuals eg farm tenants, neighbouring landowners (such as water companies and conservation NGOs), and national partner organisations (such as Natural England and the Environment Agency). Our approach to water resource management, based on working with the grain of natural processes as far as possible, is outlined in our water policy (see Appendix One).
2.4. In 2006 we undertook a Water Resources Risk Assessment (WRRA), which will be used to help “water-proof” all management decisions, and help enable adaptation to climate change. It will guide strategic and operational decisions and investment, both to reduce the risks to the Trust and to make the most of the positive opportunities. For example, we will not expand visitor facilities in an area of high flash flood risk. Some relevant headlines from the WRRA include:

- 43% of England and Wales drains through NT owned land
  - we are very exposed to whatever happens “upstream” of our properties, so must be vigilant and active in influencing land use and water use in our catchments. We also have a responsibility to ensure that our activities do not impact negatively on interests downstream.

- 5% of NT land and 1,893 NT buildings are within the flood zone 3
  - wherever we have such flood risk areas, we must know what is at risk and how it will respond to the flood when it comes, so that we can mitigate and adapt buildings (where practical) ahead of the flood event.

- 120 properties are in very high Flash Flood Risk areas
  - flash floods can happen very quickly and their impact on settlements, infrastructure and people (such as in campsites and caravan parks) can be devastating, as we experienced at Boscastle.

2.5. We welcomed the risk-based approach to flood risk management set out in the Government’s “Making Space for Water” strategy, and suggest this should be implemented more widely.

3. **The Impacts of Recent Flooding in England and Wales on the National Trust**

3.1. The National Trust was significantly affected by the floods in June and July 2007. Over 100 buildings were damaged to varying degrees, and an initial estimate from our Loss Adjusters suggested the potential cost of the flood damage for June and July incidents is approximately £1.3 million\(^2\). Table One gives an overview of some of the flooding impacts on properties.

**Table One**

<table>
<thead>
<tr>
<th>Dates of flooding</th>
<th>Property affected</th>
<th>Summary of impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–23.07.07</td>
<td>Buscot &amp; Coleshill, Wiltshire</td>
<td>Over 60 properties in the local National Trust villages at Buscot &amp; Coleshill flooded, with impacts ranging from 4 inches to over 4 feet of inundation. Some damage to old walls, gates, paths, drains also.</td>
</tr>
<tr>
<td>20–23.07.07</td>
<td>The Vyne, Hampshire</td>
<td>The Vyne saw some extraordinary rainfalls and as a result the basement—including boiler room—flooded.</td>
</tr>
<tr>
<td>20–23.07.07</td>
<td>Osterley House, London</td>
<td>Osterley House was hit by lightning, disabling fire and security systems.</td>
</tr>
<tr>
<td>20–23.07.07</td>
<td>Ham House, London</td>
<td>Water ingress to the basement</td>
</tr>
<tr>
<td>20–23.07.07</td>
<td>Morden Hall Park, London</td>
<td>Some backed up sewage and drainage caused unpleasant damage to some tenanted properties.</td>
</tr>
<tr>
<td>20.07.07</td>
<td>Knole, Kent</td>
<td>The heavy rain on the 20th July caused a lot of water entering the Ballroom, necessitating the removal of a picture and a large ceramic jar. All windows had some leakage. The gutters can’t cope with such a large amount of water. Damage was minimal.</td>
</tr>
<tr>
<td>20–22.07.07</td>
<td>Snowshill Manor, Gloucestershire</td>
<td>Closed due to lack of water supply following flood damage to water treatment works. Access path washed out.</td>
</tr>
<tr>
<td>23.07.07</td>
<td>Coughton Court, Warwickshire</td>
<td>Closed—due to flooding damage.</td>
</tr>
<tr>
<td>25.07.07</td>
<td>Charlecote Park, Warwickshire</td>
<td>Closed—due to flooding damage.</td>
</tr>
<tr>
<td>20–22.07.07</td>
<td>Hidcote, Gloucestershire</td>
<td>4 or 5 cottages flooded, garden paths washed out garden closed for repair.</td>
</tr>
</tbody>
</table>

Note: £1.3 million is only an estimate and it will be many months before the claims are settled.
### Dates of flooding | Property affected | Summary of impacts
--- | --- | ---
20–22.07.07 | Chedworth Roman Villa, Gloucestershire | Flooding of buildings and general level of water flow through property—no damage but property closed for health and safety reasons.
20–22.07.07 | Avebury, Wiltshire | Offices flooded, no electric, property closed.

3.2. A number of our properties in northern England were also affected. For example, at Fountains Abbey World Heritage Site, Ripon (there was direct damage from floodwater of historic fabric which may also include undercutting of heritage river defences). Estimated costs for Fountains Abbey are approximately £55,000, of which approximately £21,000 relates to buildings and structures damage and reinstatement and the balance relates to loss of commercial fixtures and fittings plus loss of revenue (that revenue ultimately being used to pay for conservation work and interpretation). A figure of approximately £200,000 has been suggested for longer term works that may be needed to reduce the risk from flooding.

4. Lessons learnt from recent flooding

4.1. This summer’s flooding has brought home the need for society to adapt to climate change, as well as the importance of acting now to reduce greenhouse gas emissions to limit more severe impacts in the future. As the Stern Review emphasised, there are limits to adaptation and without strong and early mitigation, the physical limits to—and costs of—adaptation will grow rapidly.

4.2. The Government has an essential leadership and co-ordination role to play in securing effective adaptation to climate change. The Trust is calling for:

- Long term planning and climate proofing of decision making and public spending to minimise risk and accommodate change;
- A new integrated spatial approach to the planning and management of natural resources at local, regional and national levels;
- Innovation in financial mechanisms that enable households, businesses and wider society to manage risks and share costs equitably;
- Raising public awareness and understanding of climate change impacts and risks through improved communication and engagement.

4.3. Flooding is projected to become more frequent as a result of climate change: both flash-flooding and river basin flooding caused by more intense rainfall will increasingly affect more people and property. We have to adapt to this heightened risk by changing our use of land in the headwaters of catchments and in some floodplains, so as to maximise retention and slow release of heavy rainfall. We believe there is scope to adjust Government incentives to support suitable uses (see 4.5 below).

4.4. The Trust advocates a risk-based approach to the planning of our infrastructure, and urges the Government to be much more proactive in relocating major infrastructure and housing developments out of high flood risk areas in order to protect people’s lives and livelihoods. Local authorities should specifically be required to plan for this in their Local Development Frameworks. There is also a need to adapt existing buildings in known flood risk areas to suffer less damage, and be more easily cleaned or repaired when flooded.

4.5. We are also advocating investment in more effective, long-term cost efficient and sustainable solutions to flood risk management, based on restoring the natural function of catchments. The floods in England in June and July would have happened no matter how benign the catchment land-use. The rainfall intensities we experienced simply overwhelmed saturated land and watercourses and found every possible route to pass downstream. However, every parcel of land in a catchment, including that within major built developments, can make a contribution to reducing the probability and consequence of flooding, with the uplands and floodplains playing vital roles in water capture and storage. By rewarding farmers and land managers for practices that are conducive to water retention and slow release we can help secure a more sustainable future, reducing flood risk with additional benefits for wildlife, landscape, cultural heritage and public access.

5. Issues the Committee should examine during its inquiry

Where is “Making Space for Water”?

5.1. The Trust strongly supported the Government’s stated intent to make space for water by managing flood risk strategically, within the context of the catchment or shoreline as a whole, and sustainably, through respecting natural processes (Making Space for Water, Defra 2004). This is the philosophy and approach the Trust is increasingly employing in the management of its own land, buildings and coast.
5.2. Unfortunately, a huge gap remains between the stated aims and objectives of the strategy and delivery on the ground. The “portfolio of responses” discussed in the strategy remains an aspiration, leaving public investment locked into provision of hard defences even if more cost-effective alternatives exist. At the same time, communities and businesses that do not qualify for defences can be offered flood warning but will become increasingly vulnerable in the face of climate change.

Why haven’t Sustainable Urban Drainage Systems been widely adopted?

5.3. There is a significant opportunity to reduce flash flood risk in urban areas through the development of Sustainable Urban Drainage Systems (SUDS). SUDS are surface water drainage methods that take account of quantity, quality and amenity issues.

5.4. Despite a commitment to SUDS within “Making Space for Water”, they have yet to be widely adopted. The reason for this is unclear—the technology is available and affordable. The Trust has installed a SUDS at our Stamford Brook housing development on the Dunham Massey Estate in Altrincham, Greater Manchester. A series of open trough-like depressions (swales) run through the development, allowing infiltration into the permeable geology. In extreme events water is also be channelled into a series of retention basins, as well as the restored Sinderland Brook river corridor. This has delivered observable improvements to water resources, as well as biodiversity benefits.

Involving the public in flood and coastal erosion risk management

5.5. To facilitate public support for a sustainable approach to flood risk management we believe the public (and stakeholders) should be aware of the risks that relate to them and to be aware of their rights and responsibilities.

5.6. There is also a cultural challenge for society to relearn how it needs to live with water. The Trust has evidence that communities a century ago had adapted well to living with flood events eg through making carpets and occupied by people with no “memory” of flooding.

5.7. The Trust finds that, amongst many of the communities it has a stake in, there is a significant lack of public awareness and understanding of the complexity of flood risk, the scale of the risks they face, or the implications of climate change at home. This makes local participation in decision-making difficult. Attempts at more inclusive decision-making are undermined by inadequate process, capacity and skills for involving local communities, particularly within national agencies. This can lead to unreasonable and unfulfilled public expectations about the different flood solutions possible, sometimes bringing into disrepute the process and decisions made and undermining public confidence. The Government, statutory agencies and other authorities may know the extent of risk yet appear unwilling to contact at-risk communities directly beyond saying flood risk information is available on the Environment Agency website.

5.8. We believe a step change improvement is needed in the way the Government proactively communicates the risks from flooding to the public, not only to raise general awareness, but to facilitate practical adaptation through promoting actions that people can take in everyday life. Relying solely on people finding their way to EA Flood Risk Maps is insufficiently proactive. We recognise our own role in raising public awareness, and that we can also be more open and confident in communicating externally and engaging with communities. We would welcome more of a partnership approach to achieving this.

5.9. Restoration of the flood damage at Boscastle (where the Trust is the predominant landowner, including the harbour walls) indicates the problems caused by a hasty response and lack of discussion about options and needs with the local community. The result is that some of the more immediate works initiated by the Environment Agency have restored the previous defences rather than necessarily provided solutions fit for future requirements. However, long-term options are being explored with regard to the management both of the harbour and of the land in the Boscastle catchment.

Relocation out of flood risk areas

5.10. As a society we need to draw up and implement plans for relocation of permanent uses in the highest risk areas. We feel new mechanisms are needed in insurance, assurance, compensation and long term management in order to facilitate this. A coherent Government approach to managing the socio-economic impact on those communities and enterprises that will no longer be protected from flooding is essential. Relying on conventional products and timescales will be wholly inadequate.

5.11. In our experience, a relocation package, including compensation, will be needed to move those buildings or assets, their occupants or contents away from areas where risk cannot be sustainably managed. Over the next 20 to 50 years there will be many more homes and businesses unable to secure private insurance and mortgages. If we do not provide transitional support, we risk creating pockets of deprivation and potentially ghetto communities. This is because those who can afford to manage risk either by moving away or privately investing to protect themselves in the short term will do so, whereas poorer households are less able to adapt, leaving them highly vulnerable to loss of assets and in the worst cases to loss of life.
5.12. We call upon the Government to develop a relocation strategy as an essential part of the nation’s response to climate change, drawing on wider national and international experience.

National Trust
September 2007

APPENDIX ONE

THE NATIONAL TRUST WATER POLICY

The following policy sets out the National Trust’s aspirations for the management and use of water resources by itself and by others. The Trust seeks to implement this policy alongside its other commitments and is keen to share its experience with others.

THE TRUST’S APPROACH

— The Trust will take a comprehensive, long-term and strategic approach to the protection of water resources and all water-dependent aspects of the natural and cultural environment.
— The Trust will manage its own affairs to minimise the demand for water and production of waste water and to minimise the negative impacts of its activities on the water environment.
— The Trust will develop a decision-making process for site and business management based on the principles and practices of Catchment Management and River Basin Planning, to integrate water resource conservation into all its activities and to maximise the benefits of working in partnership.
— The Trust will promote the protection and enhancement of water resources based on its own experience of water management and conservation of water-dependent features.

OUR MANAGEMENT PRINCIPLES

1. Working with natural processes

The Trust will work to enable the natural functioning of water-dependent geomorphological and biological features and encourage landscapes and ecosystems to be dynamic and responsive to natural processes and sustain the hydrological cycle. This includes water underground, at the surface and in the atmosphere.

2. Sustainable use of water

The Trust will safeguard the quality and quantity of water resources in its use for any purpose.

3. Catchment management

The Trust will operate at a landscape scale and beyond its ownership boundaries to influence what happens in the catchment of its properties and address the impacts of its own activities on the catchment.

4. Healthy water for healthy people and sustainable economy

The Trust will improve provision of high quality potable water, the treatment to the best practicable standard of its used waters, and the protection of its coastal and inland waters for recreation and health.

5. Heritage water

Valued cultural features and water dependent habitats threatened by change will be conserved and enhanced as far as practicable within the scope of the hydrological cycle and enabled to adapt to climate change. Where assets cannot be protected indefinitely, the Trust will ensure such features are properly recorded before they are lost and/or will consider relocation or re-creation elsewhere.

6. Access to water

The Trust will actively promote public access to water, subject to conservation and safety considerations, in order to provide public enjoyment and recreational opportunities and to develop understanding of the role of water in our environment and livelihoods.
7. **Promoting respect for water**

The Trust will promote appreciation of the value of water in its community, learning, influencing and campaigning work.

8. **Water-proofed land use planning decisions**

The Trust will only support development (its own and by others) which has taken proper account of water resources and their environmental, cultural and landscape connections.

9. **Working with others**

The Trust will work in partnership and/or consultation with other managers, organisations and communities to share experience, resources and knowledge and to negotiate the future use and management of water resources in order to deliver benefits which we would not be able to achieve or sustain on our own.

10. **Water conservation through acquisition**

The Trust will consider the implications of this policy when acquiring land and buildings or other legal rights, including the potential of acquisition for the primary purpose of improving management and protection of water resources.

*July 2006*

**Memorandum submitted by Ashchurch Parish Council (FL 82)**

**EXECUTIVE SUMMARY**

In response to the Committee’s invitation for written memoranda from interested parties on the issues raised by recent flooding in England and Wales and what steps public authorities should take to address them Ashchurch Parish Council would wish to make representation as follows:

1. **The Protection of utilities needs to be investigated:**
   a. Severn Trent Water Authority need to make contingency plans to ensure the safeguarding of the water supply and its distribution.
   b. Steps need to be in place to ensure the protection of Emergency services, hospitals, nursing homes, areas servicing vulnerable people, hospitals, schools etc.

2. **Clear distinction needs to be made between flash and river flooding:**
   a. **Flash Flooding:**
      i. Enhancing the standard for drainage.
      ii. Expanding storm drain systems and alleviating overloaded sewerage systems should be investigated.
      iii. Environment Agency Best Practice on sustainable urban drainage systems (SUDS) must be enforced on new developments
      iv. Land must be retained for soakaways to reduce flash flooding (washland)
      v. It is essential that methods are developed to keep sewerage out of homes and businesses.
   b. **River Flooding:**
      i. With the speed at which water is able to disperse being essential in controlling the depth of flood waters, a contingency measure is needed to improve downstream flow, perhaps consideration should be given to opening the Sharpness Canal
      ii. Examination of obstructions placed in the path during recent years ie riverbed silting and the new Castlemeads Causeway.
      iii. To the best of the Parish Council’s knowledge there is no active water flow model in the South of Avon catchments and the River Severn North of Gloucester. These could be physical or computer generated.

3. The floods illustrated the weakness in contingency planning for identifying vulnerable people.
1. INTRODUCTION AND BACKGROUND

Ashchurch Parish is located to the East of Tewkesbury in Gloucestershire. The Parish is a mixed community of rural villages and larger residential and business developments with 6,000 residents and 2,600 homes. No houses or businesses lie within the areas defined in the Environment Agency 1947 flood margin although to the West and North of the Parish farmland does lie within the flood plain. Two streams run through the Parish—Carrant Brook and Tirlebrook, these streams flood adjacent farmland after heavy rainfall or when the Tewkesbury flood plain is full. The only instance of buildings being flooded in the Parish prior to 2007 was recorded in April 1998 when a small number of houses adjacent to a culvert were flooded following heavy rainfall. Some local roads including the A46 and B4079 have flooded briefly due to flash flooding.

In July 2007 the severity of the rainfall caused a very significant number of houses to be flooded—around 200 from the latest estimates. All bar 5 or so of these homes have not been flooded previously or even been considered to be under threat. To the best of the Parish Council’s knowledge no more than 3 or 4 businesses suffered flood damage. Travel in the Parish came to a halt with all roads in and out of the area being impassable, including the M5 motorway which was flooded to a depth of 1 to 2 feet across all 3 lanes where it passes through the Parish. Once the flash flooding subsided the Parish was unaffected by the unprecedented level of flooding in the Severn and Avon river basins.

Water supplies in the Parish were turned off on the morning of Monday 27 July and not restored until Tuesday 5 August. Bottled water was not available in the Parish until late on Tuesday 28 July and bowser were not delivered until the afternoon of Thursday 30 July.

2. INFRASTRUCTURE PROTECTION

As the Committee will be well aware the pumping station at The Mythe, Tewkesbury was flooded when the Rivers Severn and Avon rose above 1947 flood levels. Similarly, the power grid switching station in Gloucester would have been inundated without the superhuman efforts of the emergency and armed forces.

The fact that 2 critical infrastructure components serving up to 500,000 people proved to be single points of failure and that the population of Gloucestershire was just an inch or so of flood water away from mass evacuation means that:

a. It is both urgent and essential that the appropriate agencies bring in the necessary protection for these critical services.

b. Disaster recovery plans are made and implemented.

c. While these are in progress, and it is recognised that they may take a considerable time to implement, emergency plans must be made following public consultation and then publicised so that the local population are informed.

d. As part of the contingency planning process steps need to be in place to ensure the protection of Emergency services including hospitals, nursing homes, areas servicing vulnerable people, hospitals, schools etc.

3. RECOGNITION OF DIFFERENCES BETWEEN FLASH AND RIVER FLOODING

The flooding resulting from the extreme weather conditions in July had two components—local flash flooding and river valley flooding. A clear distinction needs to be made between these events when planning remedial measures.

a. Flash Flooding—this can only be alleviated by having sufficient washland and permeable surfaces for water to drain naturally supplemented by a drainage system capable of clearing surface water rapidly:

i. Enhancing the standard for drainage Environment Agency standards must be revised to recognise the possibility that the volume of water the drainage system must handle is significantly greater than current best practice recommends.

ii. Expanding storm drain systems and alleviating overloaded sewerage systems should be investigated Investment must be made in updating and expanding the storm drain and sewerage systems including installing storm drains where the sewerage system currently carries both effluent and drainage water.

iii. Environment Agency Best Practice on sustainable urban drainage systems (SUDS) must be enforced on new developments. The Parish Council has had a policy for at least five years that all new developments should meet Environment Agency Best Practice on sustainable urban
drainage (SUDS) but unfortunately the Planning Authority has not had the power to enforce this on developers and land owners (even the Environment Agency themselves when they carried out an extension to the office’s car park).

iv. Land must retained for soakaways to reduce flash flooding (washland). Recognition must be given in the planning system for the vital role washland plays in drainage and water management.

v. It is essential that methods are developed to keep sewerage out of homes and businesses. The health risks and the level of damage to homes and businesses is exacerbated by the fact that sewerage escapes into the general flood waters. This is completely unacceptable in a modern society.

b. River Flooding—while the flooding in the main Tewkesbury flood plain does not have a direct impact on our Parish other than causing our waterways backing up we would still wish to make the following general observations:

i. With the speed at which water is able to disperse being essential in controlling the depth of flood waters, a contingency measure is needed to improve downstream flow, perhaps consideration should be given to opening the Sharpness Canal.

ii. Examination of obstructions placed in the path during recent years ie riverbed silting and the new Castlemeads Causeway.

iii. To the best of the Parish Council’s knowledge there is no active water flow model in the South of Avon catchments and the River Severn North of Gloucester. These could be physical or computer generated.

4. IDENTIFYING THE VULNERABLE

The floods illustrated the weakness in contingency planning for identifying vulnerable people. In response to the state of emergency in the Parish, members were happy to form an informal emergency committee to co-ordinate water distribution, volunteer activity etc but it became immediately obvious that we could not prioritise support for local people in relation to need or to identify the especially vulnerable. This problem must be fed into the emergency planning system so that the responsible authorities (e.g. Social Services) can use local volunteers and community groups to help them reach those who need help most.

Ashchurch Parish Council
September 2007

Memorandum submitted by Wildwood Trust (FL 83)

EXECUTIVE SUMMARY

Land drainage and agricultural flood defences are chiefly responsible for flash flooding events witnessed in the UK in recent years. Government policy in tackling excessive agricultural drainage and the re-creation of wetlands on the banks of our rivers could protect communities from flooding. This policy change would have many advantages:

— Reduce flooding.
— Reduce Government spending by many hundreds of millions over the next 100 years.
— Support a huge increase in biodiversity meeting a number of Government biodiversity targets and International Treaties.
— Mitigate the effects of climate change if rainfall amounts increase.
— Mitigate global climate change by a massive increase in our “Carbon Sink”, wetlands are our most important carbon sink and sequestrate far more carbon in their peaty soils than woodlands or any other form of habitat.
— Increase flow of water into ground water systems, reducing the need for capital investment in reservoirs and water treatment facilities in certain areas of the country, most notably the South East of England, which will help prevent water shortages and hose pipe bans.

This has already been realised by many of our European neighbours and policies to block upland drainage and retreat agricultural dykes have now been successfully put in place to protect built up areas from flooding, saving many lives and hundreds of millions of euros in the process.
1. **Wetlands, Drainage and Flooding**

1.1. Wildwood Trust wishes to highlight the successful methods of cost effective flood mitigation practised by our European neighbours and urge the Government to save the taxpayer hundreds of millions of pounds and address a root cause of the flooding incidences seen in recent years.

1.2. Wildwood Trust’s position is based on the premise that land use change, especially agricultural land use, is responsible for the flooding events witnessed recently in June and at Boscastle in 2004.

1.3. Due to the complex nature of the problem, little media attention has focused on the fact that our land is now better drained than in the past. When we experience heavy rains the water rushes off our land into drainage ditches and straight into river systems. In the past wetlands and limited drainage buffered the effects of heavy rainfall. In a vicious circle our flood defences then try to stop this water flooding villages, towns and farmland which just makes the flooding worse further downstream as we try to contain more and more water in our river systems.

1.4. It took many deaths by flooding for our European neighbours to learn from the mistakes we have all made in trying to turn our river systems into artificial drainage channels. One such incident in which a flood overran a dyke next to a school, killing 12 children, was the event that saw the creation of the Dutch Blauwe Kamer Nature Reserve. Wildwood Trust’s partnership with the Blauwe Kamer Nature Reserve has made us aware of the inadequacies of our flood defence policies.

2. **Artificial Drainage**

2.1. The drainage of land, especially upland areas to improve grazing quality or for forestry planting, has been blamed for increasing the danger of flash floods of some upland river basins. This is because the drains remove water from the land more rapidly, resulting in all the water from a rain storm running off the land in a short period of time. The devastating effects of the Boscastle flood are due to this and not changes in rainfall patterns.

3. ** Destruction of Wetlands**

3.1. The destruction of wetlands by agricultural dykes, small flood defences along most of the rivers in the UK, has lost a huge water buffer which protected cities and towns from flooding. Wetlands regulate floods, sustain flows during dry periods and recharge groundwater. The role of wetlands in relation to water flow can be likened to that of a sponge in that they are able to absorb significant volumes of water. That water is then released slowly, reducing peak flow levels in water courses fed by the wetland. This slow release of water tends to reduce the likelihood of flooding lower down the river catchments. Equally, where there has been no rain the wetland continues to release its stored water, maintaining flow levels in streams and rivers. The wetland “sponge” drains into groundwater in the same way as it does into surface waters.

3.2. Wildwood Trust urges Government policy to restrict the level at which water is allowed to be drained from the land and to abolish Internal Drainage Boards and give authority to the Environment Agency to regulate drainage with the policy of flood prevention.

3.3. Agricultural subsidies through the Higher Level Stewardship scheme, administered by Natural England, could be used to fund the retreat of agricultural dykes along riverbanks allowing the creation of flood plains to help buffer the effects of flooding.

3.4. In a number of European countries such as the Netherlands, Belgium, Germany and Denmark land policy has been to retreat agricultural dykes from river banks creating more “natural” flood plains. These newly created flood plains act as a sponge to slow water flow and absorb water, helping buffer the effects of heavy rainfall.

3.5. This policy will require statutory instruments and powers to be given to the Environment Agency.

4. The benefits of such a policy will be to:

4.1. Reduce flooding.

4.2. Reduce Government spending by many hundreds of millions over the next 100 years.

4.3. Support a huge increase in biodiversity meeting a number of Government Biodiversity Targets and International Treaties.

4.4. Mitigate the effects of Climate change if rainfall amounts increase.

4.5. Mitigate Global Climate change by a massive increase in our “Carbon Sink”, wetlands are our most important carbon sink and sequestrate far more carbon in their peaty soils than woodlands or any other form of habitat.
4.6. Increase flow of water into ground water systems, reducing the need for capital investment in reservoirs and water treatment facilities in certain areas of the country, most notably the South East of England, which will help prevent water shortages and hose pipe bans.

Peter Smith
Chief Executive, Wildwood Trust
August 2007

Memorandum submitted by Professor Donald Knight (FL 85)

Comments on the recent floods (Summer, 2007)

1. INTRODUCTION

We have been here before—Thames (1947), Lynmouth (1952), Severn (1990), Leamington (1988), UK wide (2000), Boscastle (2004), Carlisle (2005) and today (2007). And that ignores all the coastal flooding events in the UK and numerous events overseas. So it’s not new. I offer here a few comments on issues that you will not often hear about via the media, but which are drawn from my personal experience of working on certain aspects floods for many years. I will avoid detailed technical issues, which of course I can explain, but references are provided for those interested in such matters.

I would remind you that however distressing the consequences of flooding are here in the UK, our problems are mild compared with those in other countries (e.g. Bangladesh, China, USA, Mozambique, etc.). Of all the natural catastrophes that can occur (earthquakes, storm, flood, etc.), floods are still the biggest killer in the world, especially so in Asia. However, even in the developed world, and notably in Europe, we have seen devastating floods in the last decade, some in part due to climate change. The articles on “Floods—are we prepared” (Knight et al., 2006) and “Examples of recent floods in Europe” (Knight & Samuels, 2007) illustrate this. The journal in which these two papers appear (see references) indicates how much more prepared the Japanese are in their forward thinking about policy and practice for all types of disaster, in funding R&D institutes and in public awareness campaigns.

So as far as the UK is concerned I suggest you look back at the ICE presidential commission report “Learning to live with rivers” (November, 2001), which reviewed the technical aspects of flood risk management in England and Wales, following the widespread flooding in Autumn 2000, the wettest Autumn period in the UK for 270 years. The report was later published as a book, under the title of “Flood risk management” (Fleming, 2001). More recently, I had the opportunity to bring together many European experts and researchers to run an Advanced Study Courses for the European Commission of flooding issues. The series of lectures were later published as a 607 page book in 2006, under the title “River basin modelling for flood risk mitigation” (Knight & Shamseldin, 2006). So, as I say, it’s not new, and is familiar territory for river engineers like myself and other professional colleagues. If you read our conclusions in the ICE 2001 report you will find many aspects that are as relevant today as they were then, and indeed, many recommendations that have still not been addressed. Having said that, the recent rainfall in June and July this year has been exceptionally severe.

2. GOVERNMENT

I do not wish to be unduly critical, but as an academic it is my job to offer advice and comment, especially on technical issues within my province. I leave it to the politicians to act or not—it is their prerogative. So I begin with two comments on the role of government and the part played by the Department for Environment, Food and Rural Affairs (defra), as that government department controls the Environment Agency (EA), sets policy and is therefore important.

(i) It is inexcusable that a few years ago defra abolished the post of Chief Engineer. We have a very able chief scientist to the government, Sir David King, who led the Foresight programme (2003) on flooding. But however good that programme was, it was looking at long-term issues and hence not particularly focused on the “here and now” practical issues. I suggest we must have engineers in charge of technical issues related to engineering. The last chief engineer at Defra, Reg Purnell, was an outstanding leader whose expertise and political acumen we miss. We see how inter-related many flood issues are—affecting infrastructure, water supply, power generation and transport. Floods are pre-eminently about the built environment, which Civil Engineers have all the necessary expertise to deal with. Engineers use the best science available, but add to that their own experience of what has been done in the past and the art of the possible. Within Government, it is astonishing that we have chief scientists for food safety, veterinary practice, pharmacy, science, etc. but not one for “engineering”. Perhaps this is why successive UK governments have been so timid and lacklustre about major engineering projects—high speed rail links, nuclear energy, tidal barrage on Severn estuary, etc., to name but a few.
(ii) The lack of adequate funding to do the job properly in a changing environment is another clear failure of government. Having been an advisor on fluvial processes to defra for 6 years (1999–2005), one always expects to see some proposals ignored, advice not taken and written reports collect dust, but to have the majority suffer that fate is frustrating. At the final plenary meeting of all the Theme Advisory Group (TAG) members in July 2005, there was considerable disquiet at the lack of investment in both R&D on flood risk management and at the projected expenditure levels on the constructions and maintenance of capital flood defences. A figure of at least £1 billion was suggested for the latter. Although expenditure on capital works has increased from around £300 million to £500 million over a decade, and Hilary Benn has this week announced a further increase to maybe around £700 million, it is still not enough. These large sums need to be set in the context of the £2.5 billion cost to insurers in these last two months alone, and the value of national infrastructure assets at risk from flooding in the UK, estimated to be of the order of £300 billion. It was deplorable that in 2006 defra actually reduced expenditure by £15 million on the vital modelling work done by engineering framework consultants on flood risk planning, in order to meet a shortfall of cash arising from the needs of the farming community, due to defra’s own poor administration and lack of foresight. The lack of funding, both for the maintenance of capital works, R&D and strategic consultancy work must be laid at the government, not the EA, but this is not to say that the EA has no shortcomings.

3. THE ENVIRONMENT AGENCY (EA)

(i) I suggest the EA has some serious strategic weaknesses in its management and policy. Despite perpetual re-organization, the EA is a top-heavy organization with a poor science base, especially to do with the hydrodynamics of rivers and floodplain processes.

(ii) Furthermore, it made a major error in the late 1990s by out-sourcing all its hydrodynamic modelling expertise to consulting engineers, referred to as the “framework consultants”. Although it is sensible to have a team of experts outside the agency, tied in for the long-term rather than for ad-hoc consultancies for particular schemes, never-the-less it is inappropriate for the EA to have no effective internal expertise left at all. In 2001 we debated about whether the management of flooding within the UK should be taken away from the EA and given instead to the Met Office, mainly on the grounds that the latter has a better science base and also on the grounds that this might bring meteorological, hydrological and hydrodynamic modelling together, which in some cases is desirable. We decided not to recommend this, but it is noticeable that the EA is hardly visible at scientific meetings or via publications in learned society journals. It is hardly ever present at international conferences presenting the results of hydrodynamic model results, which are at the heart of flood risk mapping and management. It has disbanded all its modelling teams and lost most, if not all, of its expertise in this strategic area.

(iii) This brings me to a third comment about the EA. It is water level that is of crucial significance in flooding, albeit driven by discharge via precipitation. The prediction of the stage-discharge relationship is not necessarily as straightforward as most people expect (see references). Some theoretical aspects related to estimating the H v Q relationships for overbank flows and extreme flood events are complex. Consequently much of the data collected by the EA for high flows at gauging stations that are outflanked or inadequately designed is surprisingly high. Consequently, the Flood Estimation Handbook (FEH), and later revised derivatives, contains spurious data on which return periods are estimated. In addition, most mathematical models require good quality data (not just HvQ) for calibration purposes. Nearly every single project I have ever been involved with for the framework consultants over many years indicated some sort of errors in gauging station data. Unless the EA uses models intimately, it never understands fully the poor quality of much of their own data, the poor spatial and temporal coverage, and the inadequacy of it for really developing mathematical models to a higher level. Too many flood risk maps, derived from such models, are inadequately calibrated and are of poor quality. For the last two Summers, supervising MSc students working separately for Halcrow and Peter Brett Associates (pba) problems with data became glaringly obvious yet again.

The FEH was sponsored by one particular Research Council (NERC), without any reference to other Research Councils, such as EPSRC, and regrettably it is therefore completely biased towards hydrology and omits any consideration of hydraulics or hydrodynamics. These did at least get a brief mention in the original Flood Studies Report in the 1970s, a forerunner of the FEH. This bias in the FEH has had the effect that in flood analysis, there is an undue focus on only one half of the problem, discharge and not water level. It is now time that the EA/defra put all its hydrometric water level data onto a single CD, so that for any UK river in any catchment the water level data is systematically given to Ordnance datum along a river course. Explanatory notes should be given for every gauging station, together with complete hydraulic equations, allowing sensible extrapolation to be undertaken where necessary. Historic flood data could also be added, as well as flood outlines for particular frequencies of precipitation or run-off. This would mirror perhaps how catchment descriptors are available for all UK catchments within FEH. The idea of a Flood Plain Handbook (FPH), as a companion to the FEH, is one close to my heart. Further work is also desirable on the UK Roughness Advisor (RA) within the Conveyance Estimation System (CES), as it is crucial for accurate hydrodynamic modelling. Indeed I have proposed these things several times, and again more recently, as highlighted next.
(iv) Fourthly, the EA is under statutory control to develop and operate a hydrometric scheme for rivers in England and Wales. This largely consists of rainfall and river flow (or water level) gauges at various points in a catchment. Long term records are kept and used for frequency analysis, producing key statistics, flow duration curves, etc. Although the EA does some excellent work in this respect, it is starved of funds, does not treat its hydrometric division with the status it deserves, and has divorced many of its monitoring teams from the end-users, thus denying them the opportunity of seeing how their data are crucial in flood risk management. For example, if the EA possessed more capability in modelling, the inadequacies of simply regressing equations through data, without any real understanding of the physical processes that produce that data would become apparent. Weir formulae are seemingly disregarded, inbank and overbank rating curves are often established with no hydraulic vision, so cannot be safely extrapolated, etc. Imaginative ways of measuring new kinds of data are also not encouraged enough. A fundamental reform of our hydrometric scheme and the use to which data are put is long overdue. More imaginative ideas on measuring water surface slope, resistance coefficients, surface velocities, video cameras at many more stations might help. I have recently put such a proposal up to the EA, but have had no response. Is this because “management” is devoid of technically perceptive enough engineers to see the significance and adequate funding for this type of work? I wrote the section in the ICE report (2001) on “the intelligent client”, ie the EA, which should be re-read, as well as helping to get the EA “skills shortage” working group (2004-06) off the ground. I am also currently involved in a 3 year EPSRC sponsored research project titled, “New approaches to estimating flood flows via surface videography and 2D & 3D modelling”, run jointly between Birmingham and Loughborough Universities, the Centre for Ecology & Hydrology at Wallingford and a Japanese University.

(v) Fifthly climate change. Defra and the EA have suggested the adoption of a precautionary rule that adds 20% to river flood flows to account for climate change up to 2115. Two recent studies by MSc students at the University of Birmingham (Bearne, 2006 and Green 2007) have shown that the basis of this rule is intellectually flawed and in practice is an underestimate, especially for urban or impermeable catchments. See Table B2, page 16, of PPS25. Comparisons were made on three UK catchments, sponsored by two leading framework consultants (Halcrow and pba) who were sceptical of the EA’s advice and wanted to see for themselves how it applied in practice. One has to ask why it is that the question of the validity of this rule is first raised by two students writing their MSc dissertations. Why is the science group in the EA not engaged in such work? Again it points to lack of strategic thinking, modelling capability and awareness.

(vi) Building on floodplains. In reports like “Making space for water”, in planning guidance notes (PG25) and in planning policy statements (PPS25), consideration is given to development on floodplains. Water needs to be either stored of conveyed down a river course and in times of flood it soon becomes apparent how buildings and infrastructure on floodplains limit the flow and heighten water levels. Compound channels are a useful way of maintaining ecological status and also providing extra discharge capacity when needed in times of flood. These types of channel are popular in Japan, and have been researched in the UK (eg Flood Channel Facility work at HRWallingford. See www.flowdata.bham.ac.uk). Never allowing any construction on some existing floodplains is not tenable (eg London), but serious consideration needs to be given to controlling developers better, as well as government house building programmes (eg Thames gateway). Various examples exist in the UK of how the EA’s advice has been overridden by central government with regard to allowing unsuitable development of buildings. If strict power regarding planning approval is to be devolved to the EA with regard to flooding, then their modelling expertise will have to be taken to the highest level in order to produce flood risk maps that are demonstrably accurate and will not be disputed by other hydrodynamic experts in a court of law. This reinforces the points previously made about improving river and floodplain modelling within the EA.

(vii) My last comment on the EA is one that possibly illustrates the lack of hydraulics knowledge. In my last letter to Reg Purnell (27/07/05), I set out 5 issues that I thought were important concerning the new R&D arrangements. Regarding one issue I said “As you are aware, I am still somewhat concerned about the capability of some of the senior management within the Environment Agency in this respect, particularly when dealing with technical fluid flow issues. You have to look no further than the Jubilee channel as a monument to the “skills shortage” within the EA. A new £90 million channel takes only 2/3 of its design flow—how basic can you get? Especially when the EA has a new “Conveyance Estimation System”, developed through a £0.5 million R&D managed programme, and then “launched” in June 2004. But it gets even worse, as, in another criticism of the EA, I have to say that the CES software is still not available to anybody within the Agency or by consultants who want it, due to EA “procedures”.

And in a postscript, I have to add that it is still not available today, even in July 2007! This just reinforces my view that dealing with the EA is a bureaucratic nightmare. You just have to talk to any consultant and they will say the same thing. Baroness Young and Sir John Harman are both culpable in this respect and need to seriously consider their functional capabilities. The group may wish to see the whole of my letter of 27/07/05, and Reg Purnell’s response, since they both deal with the important issue of R&D within defra and the ERA. I was co-author of the 2005 report “A vision concerning the hydraulics knowledge base required in river engineering and associated research needs” (Knight & Ramsbottom, 2005), for the Defra/Environment Agency Flood and Coastal Defence R&D programme.
4. Private and Public Utilities

It is now widely recognized that flooding is not just pluvial or fluvial, but may be caused by poor drainage and infrastructure in inappropriate places. Thus the private sector needs to be involved, as do local government. Consideration needs to be urgently given to policy and planning regulations regarding the various parties (water and sewerage companies, like Severn-Trent), as well as the difficult technical issues related to combined surface and sub-surface modelling of water flows. Many planners and developers seem to have lost sight of certain simple principles regarding water. Some aspects of drainage are not rocket science, even though complex modelling via Infoworks and other software packages is. On this issue, the UK is in danger of not supporting software development enough at centres like HRWallingford, or in consultants and universities, where much work is done, but not at a commercial level. The private sector alone cannot support continual development of software for river engineering as it is not cost-effective in their terms. An example of this is the well respected ISIS software, now used extensively throughout the UK for flood risk mapping by the framework consultants for the EA. It was mainly developed in the private sector on a very limited budget, eked out of profits from commercial consultancies, and with little support from central government or the EA. We could be a world leader in such software, but our position is weakening, with other countries developing their own systems. The excellent work done by UK engineers, especially at HRWallingford, is shown by their leadership of the largest European collaborative R&D project known as Floodsite (website below). Our research establishments, and particularly our university laboratories, need more funding from central government, otherwise the UK will lose out further in terms of world markets and influence in this important area.

5. Home Owners

The EA is not an emergency service, and the fire service and police are not paid to solve flooding problems. Home owners must not expect the government to do everything. Home owners need to take responsibility themselves, consult flood risk maps and when exchanging property ensure that solicitors understand the significance of these maps. They should consider basic drainage concepts in relation to their property, as well as PPS25, as insurance companies certainly will. The tacit “gentleman’s agreement” between the UK government and the insurance companies is just about at breaking point. The UK is the only country in Europe where flood insurance is still possible to obtain. The insurance companies only agree to insure properties in the UK on the assumption that the central government puts in sufficient resources to protect against flooding. Hence the importance of the £500 million highlighted in Section 2(ii) and defra’s need to increase this to where the TAG groups think it should be. Developers building on floodplains need strict control, without trivializing planning as is the danger in some of the requirements in PPS25. Projects involving the Thames Gateway scheme and the future of the Thames barrier involve some complex and politically difficult issues.

6. The Media

The media love floods, but regrettably for most of the wrong reasons. They like dramatic pictures, disaster video footage but give little analysis. The UK has some excellent research scientists and engineers, and has done some sterling work. Sadly, the scientists get more coverage than the engineers. This is one reason why a Chief Engineer should be at the heart of government to give authoritative leadership on major engineering issues. The media rarely comment on the EU Water Framework Directive, (2000) and the more recent EU Flooding Directive (2007), both of which will impinge on legal and policy issues for many years to come. Instead the media seem to like climate change issues more, which happily does at least relate to floods. As a result, the public has improved its understanding of climate issues, even if governments have been more cautious in their actions. The media needs to understand the concept of a return period in a non-stationary time series and the concept of adaptive flood risk management. In the same way, defra and the EA need to work to higher levels of flood defence, possibly taking 1 in 200 return periods and beyond as the norm, as well as contemplating and designing for those situations when flood defences are overwhelmed.

In Summary

1. Government—no Chief Engineer; lack of funding for R&D, capital works, maintenance & operational activity regarding flood schemes; policies on floodplain development are re-active rather than pro-active with respect to floods; research needed on the 20% rule in PPS25; needs to develop adaptive flood risk management policies and consider worst case scenarios; avoid the “complacency” cycle.

2. Environment Agency—lack of strategic management at technical level; poor science base with regard to river hydrodynamics; should not necessarily stop out-sourcing of modelling, but should develop internal modelling capability as well; should improve hydrometry and application of new technology, including remote sensing; consider worst case scenarios; should develop a Flood Plain Handbook (FPH) on water level data for the UK, somewhat akin to the Flood Estimation Handbook (FEH) and CDrom; develop the Roughness Advisor with suitable water surface slope data.
3. Private & public utilities—better co-ordination of flood risk management policies with Defra and EA is needed; financial penalties and inducements are needed.

4. Home owners—consult flood risk maps; use flood proofing if necessary, it is their responsibility; think about the unthinkable and how floods might affect their property.

5. The media—not very reliable and always focusing on the dramatic, visual material; media needs to be more informative and highlight the complex engineering issues involved; engineers maybe need to learn to be more media savvy.

6. Final comments—“learning to live with rivers”—are we? Perhaps we are not learning fast enough and making sufficient “space for water”? There are many websites related to flooding issues (try a few key words in Google) and the Floodsite and Peseta websites listed in Knight & Samuels (2007) are worth perusing. Three websites that I have been particularly concerned with in recent years are: www.flowdata.bham.ac.uk, www.river-conveyance.net and www.europa.eu.int/comm/environment/water/flood_risk/index.htm.

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Donald Knight
Professor of Water Engineering, The University of Birmingham
September 2007

Supplementary memorandum submitted by Professor Donald Knight (FL 85a)

Letter from Professor Donald W Knight to Reg Purnell, Chief Engineer, Flood Management Division, Department for Environment, Food and Rural Affairs, 27 July 2007

INDEPENDENT REVIEW OF DEFRA/EA RESEARCH

It was good to talk last week. I wanted to await the discussions on Monday last, before writing to you concerning the above, and also specifically concerning the Theme Advisory Group (TAG) on Fluvial, Estuarine and Coastal Processes (FCEP), whose demise the Report recommends. I have enjoyed serving on that Group for the last six years and also engaging in offering advice to you earlier, notably through the “Learning to live with rivers” ICE independent Commission & Report. I want to make just five points.

1. I welcome your proposals concerning a high-level board and key managers. The statement in 1.5 (page 3) that “the overall direction of the programme is weak” is a reasonable assessment in my experience, and your proposals concerning a high-level board should correct this. This appeared to be supported by most people on Monday, although there remains some fuzziness in the chain of command/consultation and management. However, it necessitates sufficiently technically competent personnel to be found to fill these positions. As you are aware, I am still somewhat concerned about the capability of some of the senior management within the Environment Agency in this respect, particularly when dealing with technical fluid flow issues. You have to look no further than the Jubilee channel as a monument to the “skills shortage” within the EA. A new £90 million channel takes only 2/3 of its design flow—how basic can you get? Especially when the EA has a new “Conveyance Estimation System”, developed through a £0.5 million R&D managed programme, and then “launched” in June 2004. But it gets even worse, as, in another criticism of the EA, I have to say that the CES software is still not available to anybody within the Agency or by consultants who want it, due to EA “procedures”? They had two years advance warning of this and it is now three years since that project started. I could say more but I will no doubt bore you. Mervyn drove this very well, but there appear to very few champions like him within the EA. Thus staffing and skills issues within the EA are vital.

2. With respect to the “lack of focus”, you may need to ask why the R&D programme (and TAGS) lacked “focus” in the past. Part of the reason is I believe because the previous R&D report (1999) was itself such a step-change that it probably got the division of subject material wrong, and hence the focus has been blurred. The joint Defra/EA approach was very sound and commendable, but it had six TAGs and three of them—Broad Scale Modelling (BSM), Engineering (ENG) and Fluvial, Estuarine and Coastal Processes (FCEP) should in my view have been incorporated into a single group as the basic core “engineering” or “technical” side of river engineering. Albeit a large group, it is important to keep these topics together. Experience of working in these three TAGs has demonstrated this. Part of the problem therefore has been the lack of appreciation concerning how “fluid flow” aspects (or call this old-fashioned hydraulics and hydrology “engineering” aspects if you like) drive the whole. My third point follows on from this.
3. I fear that the present report (June version) makes the same mistake again, particularly if you analyse the breakdown of topics in the Project Area Groups in Table 3.2. My concern is the way in which the topics are dealt with. This Table really makes little sense, and I was a surprised to see the muddle and confusion in their scientific thinking. For example, “core” modelling topics are seeming to be benchmarked in a haphazard manner. Why are all those topics on “data”, “uncertainty” and “models” placed under the “Risk and social dimensions” Theme? What has “benchmarking of 2-D models” got to do with this—surely this should be in an “Engineering” Theme? And why just 2-D models, what about the various types of 2-D and numerous 3-D models? I have just completed, together with another university, some research for the EPSRC on this very topic. My worry list could continue . . . Why are “data” and “sensitivity” placed in the “Flood incident” Theme? Why is “improved hydrometric practices” place solely in the same flood incident theme? Hydrometry is the often neglected topic, but germane to all. If ever there was a need to “measure more”, “think more” and “model less”, it is now. Clearly modelling is going to play a vital role in nearly all flood risk management, but there is a real need to understand the basic processes. Most river processes are very complex, and increasingly models are being used to deal with these problems. Hence there is crying need to understand the underlying basic processes better and hence to use the “tool” better. The user experience is vital. Running “models” is not just a question of button pushing. Two decades ago, the non-thinking automation of structural analysis led to a marked decline in the understanding of structural behaviour, and as a result the IStrucE had to re-educate their “tool” users. The same is happening in our profession, as young modellers get ever divorced from the reality of water in motion.

And so to be positive, I think it is important that you do not attach “data” to “risk” as in your modified draft project area grouping, as proposed on Monday. There is certainly a role for “risk” as a separate theme, maybe as a cross-cutting theme. I believe this was confirmed by the reaction of people on Monday in the discussions about “subject division”. So please keep “data” with “processes” in an “engineering” theme. I was glad to see that the defra response was indeed to set up a more comprehensive “engineering” theme. I would add “data” to it. I concur with your view to increase the themes to five, on the proviso that due recognition (including resources) be given the larger engineering theme. I know that group is potentially unwieldy, with coasts, estuaries, rivers, data, processes and modelling as its core, but they fit together.

4. While I welcome any attempt to link some R&D work more closely with the Research Councils (recommendation 2.7, page 46), I totally disagree with the conclusions reached in section 1.5, No 3 (page 4), Section 2.3.2 (page 12), Section 2.6.1 (weaknesses, No 2, page 16), Themes (page 27) and conclusions 2.3.2 (page 46). It is wishful thinking that the EPSRC or NERC will undertake all such basic process work. From my long experience on EPSRC Panels and also having been an SERC co-ordinator, I know that much river work is unattractive to reviewers and there are other fluid flow processes that are often perceived to be more “attractive” and hence brought to the fore. In the last year I have seen at least three flood related bids regarding as “outstanding” (the highest grade within EPSRC) be turned down for various reasons, not always the most rational. It is therefore essential that defra and EA maintain their own core process element where it is required. Also, having been party to setting up the FRMRC, I have to say that it is still ignoring many of the basic research topics outlined in our Flood Network report of 2001.

5. I will not make much comment about the demise of the FCEP TAG, except to say that the reasons given in 3.2.2 (page 11) are unjustified and flawed. The logic on page 12 smacks of intellectual laziness (“difficult to evaluate”, page 11) and ignorance “no clear customers”, page 12). I reject both of these statements. With regard to the first what about improvements to FEH, High Flow data, Extension of rating curves and the CES work? With respect to the second the 34 page “Vision concerning the hydraulics knowledge base required in river engineering and associated research needs” sets out very clearly the issues and elaborates at least 10 “User needs”. Did the authors of the report look at this? It is on your website. Further, as argued above, processes form a vital part of engineering, and many topics will never be researched by the Research Councils in the way required for Flood Risk Management.

Finally, as you know, I will retire in a few years time, but I remain passionately concerned and committed to maintaining the science of fluid mechanics, as applied to rivers. We have an excellent MSc course at Birmingham and many PhD students (I have seven at the moment) all working in the area of interest to you. I am therefore ready to assist in whatever way I can, and trust that these comments will not just be taken as criticisms, but positive pointers. There is much that is good about UK Flood Risk Expertise, Hydrodynamic modelling, etc, and your R&D programme has many excellent aspects. I wish you well with your task.

Donald W Knight
Professor of Water Engineering

July 2007
Memorandum submitted by Butler Sherborn (FL 86)

A REPORT ON FLOODING IN UPPER THAMES CATCHMENT AREA IN JULY 2007

1. BACKGROUND

1.1 Butler Sherborn is a firm of Chartered Surveyors and Estate Agents with offices in Burford, Cirencester, Slow-on-the-Wold and Tetbury. The firm has a number of clients and contacts in the Catchment Area.

1.2 At the beginning of September we received an e-mail circular from Country Land & Business Association (CLA) alerting members to the existence of your Committee and the proposed programme for submitting statements. We wrote to a number of people who we felt may have been affected and have received half a dozen responses.

1.3 This firm feels that it is appropriate to collate the points raised by its clients and contacts on the grounds that if their business is affected so is ours. Also as agents we need to be aware of actions and policies which affect the management, value and use of land and property.

2. THE EVENT

2.1 On Friday 20 July 2007 about 100 to 125 mm of rain fell in the Cotswolds and adjoining area. Farmland and houses became flooded.

2.2 Reports from affected respondents are attached as appendices.

3. ISSUES ARISING

3.1 Who manages the River Thames and its tributaries?

3.2 Who issues flood warnings, to whom and how?

3.3 Why did the water rise so fast and so high on Saturday 21 July 2007?

3.4 Why was there no warning of the Saturday surge?

3.5 Who is responsible for clearing ditches and watercourses?

3.6 Has substantial development in Swindon led to increased run-off into the catchment areas?

3.7 Why was the flood water held back for so long?

3.8 Is there a policy to hold back flood water in the catchment area to prevent flooding of urban settlements downstream?

If so:

(a) Which agency made the policy and when?

(b) When will occupiers of this flood plain be notified that they are in an area that is likely to be flooded as a matter of course?

(c) When and how will these occupiers be informed that a flooding event is likely to occur?

(d) What provision is made by the policy maker/agency to compensate the occupier for:

(i) loss of crop/livestock/business

(ii) limitations on insurance cover and/or increased premiums

(iii) any reductions in retail or capital value

4. CONCLUSION

4.1 It appears from the responses and our local knowledge that many property owners took sufficient action on 20th July to protect their property. However many were caught out by the rising water levels entering their property on 21 or 22 July. These rising levels were apparently caused by the normal flow being held up at Lechlade Lock.

4.2 There is a general understanding that flooding of urban settlements downstream must be prevented. However there is an urgent requirement to:

(a) Publicise the policy which we suspect exists.

(b) Publicise the execution of the policy to those likely to be affected by an event.

(c) Address the compensation issues set out in para 3.8(d) above.

Butler Sherborn

September 2007
Appendices:

1. E-mail from M. Scott 10th September 2007. Resident
2. E-mail from JG Peel 12th September 2007. Farmer
3. Notes of conversations
4. Ordnance Survey extract

Memorandum submitted by Edward Stephens (FL 87)

BROADWELL BROOK—LACK OF MAINTENANCE

EXECUTIVE SUMMARY

My wheel tries to discharge the tail race at an invert 700mm below the bed level of the Broadwell Brook, downstream of my watermill. This silted up and blocked water course causes my property to flood.

1. I have contacted my District Council and County Council who have informed me by letter that the maintenance of the Broadwell Brook is the responsibility of the Environment Agency.

2. I am concerned that although the Environment Agency is responsible for flood defence, and thus responsible for the Broadwell Brook (designated Main River) adjacent to my home, the Environment Agency has continuously failed to ensure that this watercourse is properly maintained despite being aware of the need.

3. The EA having themselves failed to ensure that the Broadwell Brook is properly maintained, I believe their decision to withhold consent for myself to maintain Broadwell Brook is unreasonable.

4. I am concerned that the ongoing failure to maintain this watercourse will result in an ever-worsening situation, with both the probability and consequences of flooding increasing over time.

SUBMISSION

1. I am the owner of, and have lived at Little Clanfield water mill since 1976.

   I am concerned that the Environment Agency is failing to ensure that the Broadwell Brook is properly maintained.

2. Over the last 30 years I have witnessed an increasingly rapid decline in the capacity of the Broadwell Brook downstream of my watermill. The Broadwell Brook is not owned by me. This reduction in capacity is caused by aggradation ie material deposition, over time, with consequential bed rise, uncontrolled tree growth and various unauthorized constructions. I believe this combination contributed to the recent flooding of my home and also Clanfield village.

3. In my opinion, the Broadwell Brook has been in urgent need of maintenance for many years. Now, in times of normal and high flows, the water backs up due to the reduced capacity of the watercourse. My Mill was flooded recently, and there is evidence that the reduced capacity of the Broadwell Brook exacerbated the July 2007 flood event.

4. Furthermore in times of low flow, what little water there is just disappears into the rising bed of the watercourse, resulting in complaints about lack of water from my downstream neighbours.

5. The Broadwell Brook is designated “main river” in recognition of its importance for both flood defense and land drainage purposes. The EA is legally responsible for the condition of this watercourse and has been aware of the problems for many years.

6. I believe it is their job to ensure that this watercourse is properly maintained, but they have done nothing. The EA has not taken action themselves nor against the riparian owners and I believe that the failure to take any action has aggravated flooding in Clanfield Village.

7. Farm land downstream of Clanfield village avoided flooding because the Broadwell Brook and Clanfield village brook was restricted. I am concerned that the ongoing failure to maintain this watercourse will result in an ever-worsening situation.

8. In the absence of action by the EA, I sought permission to re-grade the Broadwell Brook ie re-instating appropriate bed gradient by means of material removal. Re-grading downstream would be beneficial to the environment but the EA has withheld consent, a decision I believe to be incorrect (EA ref SP205E/8/1/MRD/9).
9. Furthermore the EA is now prosecuting me again, for the third time, for failing to set my sluices in accordance with their directions. They appear convinced that adjustments of my sluices is the correct solution to the problem of insufficient water downstream. I look forward to the opportunity to put my evidence at the five day Court hearing scheduled for November.

10. I am concerned that the EA is generally failing in its responsibility to ensure that our watercourses and drainage ditches are properly maintained for flood purposes, in contrast to the National Rivers Authority and their predecessors) and fail to recognise the need to properly maintain the watercourses for flood defence purposes.

11. Therefore in conclusion although responsible for the Broadwell Brook the EA have failed to ensure or enforce appropriate bank and bed maintenance over many years, resulting in a watercourse unable to serve its purpose.

12. Having repeatedly failed to recognize that the problem of shortage of water downstream in times of low flow could be resolved by watercourse maintenance rather than sluice adjustment, I am unhappy that the EA are prosecuting me yet again for failing to set my sluices in accordance with their directions.

13. Having themselves failed to ensure that the Broadwell Brook is properly maintained, I believe their decision to withhold consent for myself to maintain Broadwell Brook is unreasonable.

E Stephens
September 2007

Memorandum submitted by Hesco Bastion (FL 88)

INTRODUCTION AND SUMMARY

1. Hesco Bastion welcomes the opportunity to submit evidence to the Select Committee as part of its inquiry into flooding.

2. The submission covers four areas:
   - Background to Hesco Bastion
   - Our role and involvement in the emergency response to the July floods
   - Effective emergency response planning for the future
   - Planning for the longer term security of the country’s critical infrastructure

ABOUT HESCO BASTION

3. Hesco Bastion Ltd (HBL) is a Leeds-based company, founded and owned by Jimi Heselden OBE. The company, which has been in operation since 1990, has three manufacturing sites in Yorkshire. It employs approximately 250 people in the UK and also has a small factory in Louisiana, USA. It has been involved in civil, peacekeeping, military, humanitarian and engineering projects for over a decade.

4. HBL manufactures a patented product known as the Hesco Concertainer™ unit, developed to provide the optimum solution for a wide range of protective and structural requirements. The system was originally used in civil engineering and to combat coastal erosion but since then it has also been deployed in countries such as Iraq and Afghanistan to build blast mitigation walls; to upgrade levees in the aftermath of Hurricane Katrina; in the construction of humanitarian shelters and most recently to protect vital utilities in Gloucestershire from further flood damage.

5. The Concertainer system consists of linked welded mesh cells lined with geo-textile. The units, which are flat-packed and transported to site on pallets, can be pulled out very easily in a matter of minutes to form a robust barrier in nine different sizes up to 7” high. The units are then machine-filled with aggregate to form a robust defence wall. Once the initial layer is built the wall can then be increased in height by the addition of further layers. This provides the ability to tailor the wall dimensions to what is required.

6. The principal effect of this innovation is the speed at which it can be installed. A typical wall of Concertainer units, equivalent to 1500 sandbags, can be erected and installed by two people using a standard front end loader in 20 minutes. A similar wall made with sandbags would take ten people around seven hours to build.

7. In an emergency situation, when there is a threat of flooding, it is essential to move swiftly to protect the key infrastructures that provide the community with critical support functions such as power, drinking water and health services.
8. Hesco Bastion Ltd was approached to provide immediate defence by the emergency planners and utility companies to protect:

- Walham Switching and Power Station, Gloucester
- Mythe Water Treatment Plant, Tewkesbury
- Castle Meads Sub Station, Gloucester

Walham Switching and Power Station, Gloucester

9. The National Grid facility, which provides up to half a million people with power, was flooded on Sunday 22nd July. A temporary installation was erected immediately but when a second flood warning was issued, Hesco Bastion was called in to assist the Royal Air Force and the Army with the installation of the Concertainer Unit. News footage showed flood waters just inches away from devastating the sub-station presenting a very real threat for National Grid.

10. The barrier—which was approximately 800 metres in length—was securely positioned in just 19 hours, averting a potential national disaster and ensuring that power remained on for local residents.

11. Traditional defence walls made of sandbags could have taken around one week to complete.

Mythe Water Treatment Plant

12. The treatment plant, owned by Severn Trent Water, was flooded on Saturday 21st July.

13. The facility had been off-line for one week with the result that 300,000 local residents had lost their normal supply of clean water. Although the clean-up was progressing, the plant had a limited distribution of non-potable water and a second flood warning was issued. It was at this point that Hesco Bastion was contacted and asked to provide emergency flood protection.

14. The units were ordered at 18:00 on Friday 27th July and arrived on site at 21:30 on the same evening. Working with the Army and local companies, over a kilometre of flood defence barriers over a metre high were erected around the perimeter in just 27 hours. Traditional defence walls made of sandbags would have taken about two weeks longer to complete.

Castle Meads Sub Station, Gloucester

16. Owned by Central Networks (part of E.ON UK), the sub station supplies electricity to 48,000 homes.

17. It was flooded on Sunday 22nd July and temporary flood barriers were erected. Once the water levels had subsided, Hesco Bastion was called in to conduct a site survey. Although this facility was not under immediate threat of re-flooding, Hesco Bastion provided approximately 300 metres of Concertainer units to provide a longer term flood defence system against future flooding.

18. The key benefits of Hesco Concertainer units compared to the use of sandbags are:

- the provision of superior protection against flooding. The protective walls around the plant are far more robust than traditional sandbag walls—fewer joints mean less opportunity for the water to seep through and the linked structure provides an extremely stable barrier against the possibility of future flooding.
- a much lower skill set is required for effective assembly of the units compared to the fairly high skill set required to build effective sandbag walls
- the relative speed at which the barriers can be erected in an emergency
- the ability to make structures which have been put in place for the longer term, more aesthetically pleasing by the use of foliage and planting to blend it into the environment
- the additional benefit of anti-terrorist protection

19. Taking into consideration the intensive labour required to erect sandbag defence walls, the cost of Concertainer units are comparable.

Effective Emergency Response Planning

20. Fortunately, the secondary flooding did not materialise in either Gloucester or in Tewksbury.

21. However, the experience does demonstrate that in emergency situations and within a relatively short space of time, it is possible to put in place robust flood defences on a large scale to protect critical infrastructure. In Mythe for example, with less than 24 hours of planning and 24 hours of construction, a wall just over one metre high and just under 1 km long was erected.

22. Based on our recent experience in the UK and from other experiences around the world, we have identified the following as the significant factors which determine the effectiveness of an emergency response:
— a detailed emergency plan in place which has been communicated, rehearsed, regularly reviewed and revised
— the existence of a clear decision making process
— a coherent project management team with clear lines of responsibility and the authority and ability to procure material in a timely manner
— a supply chain in place
— a technically competent and motivated team on site who understand the effect of success or failure
— detailed, timely and accurate information on the likely timing and level of the flood being communicated to the team on site
— availability and allocation of resources (people, priority access to the site and equipment)

23. Our experience is that while almost all critical infrastructure facilities have emergency procedures in place for a fire or a terrorist incident, it seems that no such procedures exist for flooding. Similarly, while critical facilities are generally acutely aware of the risk posed to them by fire or terrorism, it is rare for a risk assessment to have been made on flooding. Although the recent floods and the associated media coverage have raised levels of awareness of this, there is still much work to be done in educating and informing people, businesses and organisations on the risks and threats of flooding and the prevention options that are available.

Planning for the longer term security of the country’s critical infrastructure

24. Working with the utility companies, emergency planners and the Armed Forces, and as long as the necessary capacity and resources are available, Hesco Bastion can help to provide an effective emergency response. However, there is obviously a limit as to how many facilities can be supplied and protected under an emergency scenario.

25. A much more desirable position is one where the country’s critical infrastructure is not solely dependent on an effective emergency response, but rather reasonable steps have been taken in advance to protect key sites from flooding.

26. Such an outcome might be achieved for example by the following approach:
— identify critical infrastructure at risk of flooding
— issue flood risk information and warning directly to all relevant critical infrastructure sites and utility companies
— companies and organisations obliged to commission a survey of their facilities and make an assessment of the risk
— companies and organisation obliged to react and take necessary steps in a timely manner if a risk is found.

27. Depending on the nature of the risk, the necessary steps might include stockpiling barriers and materials, putting project teams on standby or even erecting defence barriers.

28. For some facilities where there is a more regular or more serious threat of flooding, more permanent defence protection should be considered. Many such critical infrastructure sites also carry a risk of terrorist attack and the Concertainer units double up to provide anti-terrorist protection.

Summary

29. Hesco Bastion’s area of expertise lies in the design, production and supply of the Concertainer units. The company is not an emergency response planning agency nor is it a project management company. However we have had first hand experience around the world in this field and our intention and hope is that this submission will contribute in some way to improving the UK’s response to the growing threat it faces from flooding.

Hesco Bastion

September 2007
Memorandum submitted by United Utilities (FL 89)

EXECUTIVE SUMMARY

1. United Utilities welcomes the Committee’s Inquiry into flood management and recognises the need for a joined up and long term strategy to protect the UK from future flooding incidents. United Utilities welcomes the opportunity to illustrate to the committee the lessons the company has learned from recent experiences in Cumbria in relation to flooding as well as providing more general observations about flood prevention, alleviation and mitigation.

2. Climate change is expected to lead to an increase in extreme weather events in the UK with drought and flooding becoming more common. In response, Government, regulators and infrastructure providers have now sensibly begun to consider long term weather patterns when planning infrastructure investment and development.

3. While the North West was not affected by this summer’s heavy rainfall, the storms and flooding that occurred in Cumbria in 2005 provided United Utilities with considerable experience of dealing with such issues. The significant disruption caused to water, wastewater and electricity services prompted United Utilities to undertake a number of studies designed to enable the prioritising of investment across all the company’s infrastructure networks.

4. United Utilities recognise that significant investment is needed in order to fully prepare for, prevent and mitigate flooding. The company acknowledges that in order to properly plan ahead, a more coordinated approach by the Environment Agency, the Government and the utility sector is needed to ensure that all the appropriate information is being shared and put into practice.

5. United Utilities are carrying out further study and assessment in order to determine the level of risk, prioritise investment enabling the company to minimise disruption by putting in place adequate measures to defend infrastructure. The economic regulators must also acknowledge their role in the creation of a future flood defence strategy and enable adequate funding for utility providers in future regulatory price reviews.

INTRODUCTION

6. United Utilities welcomes the Committee’s inquiry into flood management and recognises the need for a joined up and long term strategy to protect the UK from future flooding incidents. As the UK’s largest water company and multi-utility provider, United Utilities is acutely aware of the problems caused by the flooding of utility infrastructure and is committed to working closely with the Government, regulators and other industry stakeholders to avoid damage to infrastructure and disruption to customers wherever this is possible.

7. United Utilities welcomes the opportunity to illustrate to the Committee lessons learned from our recent experiences in relation to flooding, as well as more general observations about flood prevention, alleviation and mitigation.

ABOUT UNITED UTILITIES

8. United Utilities owns and operates the regulated water, wastewater and electricity distribution networks in North West England, providing services to approximately 7 million people. United Utilities recently announced proposals to sell its electricity assets. Once the sale of these assets has been completed, responsibility for the protection of those assets will transfer to the new owner.

9. Last year, United Utilities invested almost £600 million in its regulated businesses in the North West, with investment exceeding profits for the sixteenth consecutive year.

THE IMPACT OF CLIMATE CHANGE ON UTILITY INFRASTRUCTURE

10. Climate change is widely expected to lead to an increase in extreme weather events in the UK with drought and flooding becoming more common. While no individual cases of extreme weather can be incontrovertibly linked to climate change, it is clearly sensible for the Government, regulators and infrastructure providers to consider long term weather patterns when planning infrastructure investment and development.

11. United Utilities is committed to reducing the overall environmental impact of its business and its customers and is at the forefront of managing the reduction of carbon emissions in the utility sector. In March 2007 United Utilities was the first water company to set out an action plan to reduce CO2 emissions.

12. United Utilities’ plans for investment across the company’s infrastructure therefore have the twin aims of reducing emissions from the company’s operations while also preparing to adapt to the impacts of climate change, including changing weather patterns, wherever this is possible and economically viable.
13. It should be noted that because these businesses are regulated, any plans for investment in the company's infrastructure assets, including investment in flood defences, needs to be approved through the appropriate regulatory processes.

PROTECTING OUR CUSTOMERS AND FACILITIES FROM FLOODING IN THE FUTURE

14. United Utilities is acutely aware of the problems that flooding can cause to utility infrastructure. While the North West was not affected by this summer's heavy rainfall, United Utilities has considerable experience of these issues following storms and flooding in Cumbria in 2005. These storms caused significant disruption to water, wastewater and electricity services and prompted United Utilities to undertake a number of studies designed to prioritise investment in flood defences. With regard to this summer's floods, United Utilities supplied logistical and personnel support to Severn Trent to assist its emergency response.

15. The studies and investigations carried out after the 2005 Cumbria floods have been used to inform the ongoing investment programmes across all the company's infrastructure networks to prepare for and defend against flooding. This continues to be an investment priority for the company.

Protecting infrastructure through flood defences

16. United Utilities has long adopted the approach of “building in” resilience to shallow flooding in certain assets. This has minimised the cost to the customer and to the company. Clearly, as weather patterns change, climate change will increase the engineering costs necessary to avoid flooding of assets.

17. Where flood defences are not part of the construction of an asset, or when there is a short-term risk of flooding, temporary flood defences are sometimes used. However, these temporary flood defences are likely to be inappropriate in many situations because of the difficulties of transporting them to a site and the availability of personnel to erect them during a crisis. Additionally, because temporary defences tend to be lightweight, theft can be a problem if they are left unsupervised. Supervision of temporary flood defences by United Utilities is not an option given the demands on resources in a crisis and the obvious potential risk to personnel in a flood situation.

18. These problems were evident in the events of July and August this year, when temporary flood defences failed to arrive in time and there was interference with them and theft. Utility companies cannot expect to rely on the emergency services at times like this, as saving lives will always take priority.

19. It is clear that more permanent methods of protection will offer better value for money. However, planning for such permanent methods requires more comprehensive predictions of the impacts of climate change and weather patterns and regularly updated flooding data from the Government and its agencies.

REDUCING THE IMPACT ON WASTEWATER INFRASTRUCTURE

20. United Utilities operates a number of different types of wastewater facilities, including wastewater treatment works, which discharge treated sewage and storm water flows to rivers, as well as combined sewer overflows, which divert excess storm flows from sewerage systems to adjacent watercourses in times of excessive rainfall. United Utilities network treats 2,200 million litres of wastewater every day via a network of around 39,000 kilometres of sewers.

Assessing the Risks to Wastewater Facilities

21. Extreme weather can have a detrimental effect on wastewater facilities, increasing the risk of pollution incidents in waterways and sewer flooding of homes. As part of the previously mentioned studies by United Utilities on the impact of floods, the company assessed the vulnerability of wastewater facilities against the effects of flooding and determined that a significant number of facilities are sited within the Environment Agency’s defined indicative floodplain maps.

22. If facilities are directly submerged from flood waters this can lead to loss of sewage treatment capacity, pollution of the flood water and damage to the facilities, leading to an increase in the time taken to return service to normal once flood waters subside.

23. Additionally, even when the storms are not extreme enough for the facilities themselves to become flooded, increasing river levels can result in combined sewer overflows being unable to discharge excess storm flows to watercourses, which in turn leads to flooding within and from the local sewerage system.

Measures required for protection

24. Provisional assessments of the cost of providing a blanket high level of flood defences for wastewater facilities are considerable. If United Utilities was to invest in full flood defence protection for all waste water facilities at risk of a “1:100 years” flood event, the cost would be in the region of £800 million. To protect all facilities at risk of a “1:1000 years” flood event, the cost would be in excess of £1.1 billion.
25. United Utilities is carrying out a criticality assessment of each of its facilities to determine the impact on service due to the failure of each facility as a result of both raised river levels and direct flooding. Once the criticality of each facility has been identified and the costs to protect the facilities from flooding have been determined, United Utilities will carry out a cost/benefit analysis to establish the most appropriate solution in each case.

26. For example, following the flooding in Cumbria, which demonstrated the risks to wastewater assets from river flooding, United Utilities is currently investing approximately £20 million to upgrade the sewerage system and ensure that the performance of the local wastewater treatment works and combined sewerage overflows are suitably protected from flooding and raised river levels. This work is being developed in conjunction with the Environment Agency’s ongoing flood defence project and will be completed by 2010.

United Utilities’ Strategy in the Future

27. United Utilities believes that while some of the necessary flood protection can be implemented by the water companies, the regulator, Ofwat, should ensure that adequate funding for flood defence work at high risk assets is properly considered in the periodic price review for 2010 onwards.

28. United Utilities has appointed a consultant to assist the company in developing solutions and produce robust cost estimates to allow a programme of work for flood protection to be submitted to Ofwat in the forthcoming regulatory price review. United Utilities has identified in the region of £200 million of investment, which will address ten high-risk areas at a cost of £20 million per area. This may be phased over more than one regulatory period.

29. Flood protection of United Utilities’ facilities or Environment Agency driven flood defence work in isolation will not address the entire flood risk. Integrated schemes addressing all flood risks across the various asset owners need to be developed and implemented. The company would like to streamline the responsibilities and ownership of these asset types ideally with the Environment Agency still having responsibility for fluvial flood protection but by moving towards water companies being given responsibility for development of overall improvement plans for non fluvial drainage systems in urban areas and potentially transferring responsibility and ownership of additional assets types to water company ownership, such as highway drainage systems and sustainable drainage systems (SUDS).

30. This approach would be a significant step forward in effectively allowing integrated urban drainage schemes to be developed, funded and implemented.

Protection of Water Infrastructure

31. United Utilities owns and operates the water network in the North West of England supplying 2,000 million litres of water every day via a network of around 40,000 kilometres of water mains, 1,444 kilometres of aqueduct and over 100 water treatment works. United Utilities has a number of different types of water facilities in the North West, including impounding reservoirs water treatment works, pumping stations and service reservoirs.

The Vulnerability of Water Facilities

32. The storms in Cumbria in 2005 caused significant disruption to water, wastewater and electricity services. Following the studies mentioned previously, which were undertaken by United Utilities to investigate the risks of disruption from flooding of infrastructure assets, the company undertook a further study into the particular vulnerability of water facilities. This study concluded that the most significant risk to water assets would be due to excessive rainfall, potentially leading to fluvial and/or tidal flooding. United Utilities carried out spatial analysis to identify which of its water facilities fall within the Environment Agency’s predicted floodplains in order to inform policy and investment.

Mitigating the risk

33. The analysis carried out by United Utilities led to the creation and “approval in principle” of various policies. These policies, which are still subject to qualification of costs and the impact on risks, propose that all new or critical existing facilities at risk from flooding are to be designed to withstand a 1:1000 year flood event while all existing non-critical facilities at risk of flooding are to be designed to withstand a 1:100 year flood event. ‘Critical’ has been defined as a facility that if it failed, it would have an impact on over 25,000 customers. This has been determined using the SEMD guidelines (Standard for Security Arrangements at Operational Sites), which has been approved by the Council of Water UK and endorsed by DEFRA.

34. United Utilities is currently carrying out a study to assess the current levels of flood protection at each of the facilities deemed to be at risk from flooding. This work will determine the most appropriate flood defence and associated investment required to mitigate the risk caused by 1:100 and 1:1000 year flood events. The study, which is being carried out by a professional support services company, is due to be completed.
later in 2007. Impounding reservoirs were not included in this study as a separate programme of work is in place to identify whether the impounding reservoirs can withstand a Probable Maximum Flood (PMF) event, and if not, to determine the investment required to protect the dams.

35. Throughout the course of the study, United Utilities has worked closely with the Environment Agency to establish whether there are existing Environment Agency flood defences in place to protect these facilities from flooding. Furthermore, this work has sought to authenticate the quality of the Environment Agency’s predicted floodplain data at each facility in order to determine the levels of risk.

Implementing the Necessary Protections

36. United Utilities is also carrying out a criticality assessment of each of its facilities to determine the impact on service due to the failure of each facility as a result of flooding. Once the criticality of each facility has been identified and the costs to protect the facilities from flooding have been determined, United Utilities will carry out a cost/benefit analysis to establish whether the policy is suitable and, if not, will amend it as appropriate. While some of the necessary flood protection can be implemented by the water companies, United Utilities will be making the case for adequate funding for flood defence work in the next Ofwat price review.

37. In the meantime, United Utilities is currently investing £2.1 million to protect Huntington intake pumping station, which is situated next to the River Dee, near Chester. The pumping station feeds Huntington water treatment works, which is one of United Utilities’ most strategic works supplying water to a large number of industrial users and 1.7 million domestic customers. The pumping station has been close to flooding on a number of occasions and thus following a cost/benefit analysis, as mentioned above, a decision was made to protect the pumping station from the future risk of flooding.

Flood Defences for Electricity Infrastructure

38. With regard to electricity infrastructure, United Utilities operates and maintains electricity substations in North West England, delivering electricity annually to approximately 2.2 million residential, commercial and industrial customers.

Impact of Flooding on Electricity

39. Many electricity assets, such as major substations, are sited near riverbanks and watercourses due to the historical need for cooling water for predecessor power stations (i.e., power stations that existed on the site but have since been replaced by substations connected to the national grid). As a result, over the years there have been a number of incidents of flooding of electricity assets, especially where they are either located on floodplains or where there is a risk of flash floods. In the past, the industry was able to rely on publicly funded flood defences to protect infrastructure. However, the increase in the number of incidents due to more variable weather patterns there is a greater need for the industry to do more to protect assets from flooding in order to limit disruption to customers, ensure continuity of supply in non-affected areas and minimise insurance costs related to the assets.

40. As mentioned above, the first step in United Utilities’ strategy to manage the risk of flooding was to carry out studies to identify and understand the depth and likely frequency of potential flooding of electricity assets.

41. In order to protect electricity assets United Utilities and other electricity network operators must determine at what depth a flood will adversely affect the electricity plant’s ability to continue to provide supply. The nature of substations means that the higher the operating voltage, the shallower the flood likely to have a detrimental impact and the greater the loss of supply in terms of numbers of customers affected and the geographical spread of the loss. Currently, some substation sites are able to flood to some degree providing that the control room and indoor switch houses are protected. However, if this indoor equipment is inundated, it will result in loss of supplies and electrical danger to operators.

The Response of United Utilities

42. To demonstrate compliance with the relevant electricity statutory regulations (based on guidance given by the then DTI in 2006) United Utilities policy includes for flood protection of 132,000V substations for 1:1000 year flood risk as these sites feed between 250,000 and 10,000 customers. 33,000V substations are now required to have flood protection for a 1:100 flood risk as they feed between 15,000 and 1,000 customers. Low voltage substations were not specifically mentioned in the DTI guidance and these tend to supply only a small number of customers meaning that any disruption should be localised. However, United Utilities’ risk assessment process will identify and protect low voltage substations that merited special consideration, such as where there is something unusual or unique about the customers being supplied.
43. United Utilities has already adopted the principal requirements of the National Planning Guidance PSS25 in terms of new substations operating at 33,000V and above and attempts as far as possible not to site these in areas of flooding risk. Such substations typically serve approximately 10,000 customers. In contrast, 11,000V substations need to be sited close to the developments they serve (typically 300 customers); therefore when local authorities approve such developments on flood plains utility companies need to respond accordingly.

44. As part of the measures for longer term flood defences, United Utilities is ensuring that the external walls of its buildings are properly rendered, bunded (i.e. coffer dam) areas are installed around the doors and above-ground access ways, while sealing all the underground access ducts. United Utilities is working with specialist consultants to determine the further specifications required for defending key assets and to ensure that all measures are carried out correctly.

45. United Utilities has recently invested approximately £0.5 million in actively addressing known high risk sites, specifically Lancaster 132kV substation, Carlisle 132kV substation and Willowholme primary substation (also in Carlisle). United Utilities has also made specific investments where other new build work has been constructed, taking account of the perceived flood risk at the time of installation and retro-fitting flood protection to existing assets proven to be at risk. There are plans to invest at least a further £1m in the current regulatory review period up to March 2010.

46. In order to put in place long term and adequately designed flood defences, it is vital that the electricity industry works with the Government and the Environment Agency in order to ensure the provision of flood depth data predictions. Better coordination is required between companies, the Environment Agency and other appropriate bodies in order to plan flood defences and relationships would benefit from being formalised as part of the overall strategy.

47. While United Utilities recognises its responsibility to tackle this problem, the regulator must also be willing to play its part and allow for extra and effective funding for flood defences in regulatory settlements as companies look to put in place permanent measures.

48. Regulators and the Government must recognise that utility companies should not be reliant on the emergency services, or indeed the military, to assist in the event of extreme weather and need to have appropriate funding to be able to respond appropriately and independently.

49. For the next regulatory period United Utilities is proposing to seek funding to address the flood risk at all the grid, bulk and primary substations but target investment at the highest risk distribution substations that supply strategic infrastructure or emergency services on condition that the strategic infrastructure is itself flood protected. This would address 20% of the distribution stations at a cost of £5.2 million and gives a proposed total programme of £8.9 million in the period 2010-2015. This approach will be reviewed in light of industry work that the Department for Business, Enterprise & Regulatory Reform has just commenced.

CONCLUSIONS

50. If, as predicted, weather patterns continue to change, scenarios such as the flooding in Cumbria in 2005 and the extreme weather of the recent months will become more frequent and water, wastewater and electricity assets will continue to be at risk of severe damage.

51. There is a consensus that significant investment is needed in order to fully prepare for, prevent and mitigate flooding. While United Utilities recognises that temporary protection can alleviate some of the immediate problems caused by extreme weather, due to the generally unreliable nature of such measures, it is necessary to put in place longer term plans in order to mitigate against such risks.

52. Further study and assessment is required of individual facilities in order to determine the level of risk and the vulnerability of particular assets, and all utility companies must recognise that in order to minimise disruption and ensure continuity of supply to non-affected areas, they have a responsibility to put in place measures to adequately defend infrastructure. As such, each company must be prepared to carry out its own cost-benefit analysis in order to properly define the potential costs.

53. In response, the economic regulators, Ofwat and Ofgem, alongside the Government and the Environment Agency, must acknowledge their role in creating a future flood defence strategy and provide adequate funding to support the work of the utility providers.

54. Finally, in order to properly plan ahead, a more formalised joined up approach by the Environment Agency, the Government and the utility sector must be created in order to ensure that all the appropriate information is being shared and put into practice.

United Utilities

September 2007
Memorandum submitted by The Chartered Institution of Water and Environmental Management (FL 90)

The Chartered Institution of Water and Environmental Management (CIWEM) is the leading professional and qualifying body for those who are responsible for the stewardship of environmental assets. The Institution provides independent comment, within a multi-disciplinary framework, on the wide range of issues related to water and environmental management and sustainable development.

CIWEM welcomes the opportunity to provide comment in response to the Committee’s review of the flooding in England during June and July 2007.

We hope that the attached comments are of value to you. Should you wish us to expand on or clarify any of the points raised please do not hesitate to contact us. We would be pleased to provide oral evidence to the Committee, as there are many issues which we have highlighted which would benefit from further, in-depth examination.

Nick Reeves  
Executive Director

INTRODUCTION

1. CIWEM welcomes the opportunity to make a submission to the Environment Food and Rural Affairs Committee Review of the flooding that affected various locations in England and Wales during June and July 2007. We believe that whilst the rainfall events were severe and subsequent damage extreme, in some cases this was partly due to failures related to infrastructure in the floodplain. Such flooding is likely to occur more often in the future as a result of climate change.

2. It is our belief that, following previous reviews into floods, lessons have been noted rather than actually learned or acted upon. This is unacceptable, and must change. The lessons from this review must be translated into an action plan with each specific action given a date for completion and an accountable person or organisation. The actions must be realistic. This plan must be monitored and reviewed at the highest level.

3. CIWEM membership is drawn from all sectors of the flood risk management profession (operators, designers, contractors and regulators). CIWEM’s Rivers and Coastal Group has nearly 1000 members who are drawn from the key organisations involved in flood risk and environmental management. The Group is able to provide evidence on what we believe are the key issues.

4. There are clearly many lessons to be learned and implemented and some lessons will have a particular local relevance. From a national perspective CIWEM believe that there are three key factors which warrant specific attention due to their universal impact on all locations. The key issues are:
   — Governance and institutional arrangements
   — Infrastructure and development planning
   — Funding

GOVERNANCE AND INSTITUTIONAL ARRANGEMENTS

5. Since the Easter Floods of 1998, there has been a decade of floods, inquiries, reviews, emergency planning exercises, and Lessons Learnt reports. These have been helpful, and there has been substantial improvement in the management of flood risk during this time which is welcome. However, we consider that Government should be more ambitious and establish more robust management arrangements for flood risk. These should:
   — Remove dis-incentives to delivery or participation
   — Ensure that all partners work together within a common framework, in an open, transparent and robust way
   — Improve reporting mechanisms on problem identification and delivery.

6. The Foresight Future Flooding report (2004) identified the likely increases in risk over the next 30–100 years, and highlighted the particular challenges faced by towns and cities from intense storms. The recent floods have shown this so devastatingly in places such as Hull, Sheffield and Tewkesbury.

7. The Governance and institutional arrangements through which flood risk is managed is complex. This is undisputed. The main organisations reducing the risk of flooding (from whatever source), using permissive powers are:
   — Environment Agency —main rivers and the sea
   — Local Authorities as:
     (a) Planning Authority
     (b) Flood Management operating authority for ordinary watercourses
     (c) Highway Authority
     (d) Emergency Planning Authority
Ev 480  
Environment, Food and Rural Affairs Committee: Evidence

— Internal Drainage Boards
— Water Companies as Sewerage Undertakers.
— Developers
— Asset owners
— Riparian Owners

Note: Water Companies are private companies, but they provide a public service.

8. There is no clear line of sight from the setting of Government policy to its implementation, and the
delivery of Flood Risk Management outcomes in a holistic way. As an example, for a city to establish
the flood risks in an area, and future management plans, it would be necessary to assemble information from
each of the organisations listed above.

9. CIWEM believes Government should put responsibility and accountability for ensuring planning of
Flood Risk Management with a single, fully resourced and empowered Public Organisation. The primary
purpose of this remit would be to ensure that all the delivery agents are working together on the planning
and delivery of their respective activities, for a common timeframe.

10. Greater alignment of strategic plans should deliver benefits locally through more detailed delivery
plans. Clearly planning should be carried out on a consistent basis, using flood risk as the “common
currency”. This organisation should have the power to set the basis and criteria used for planning, and would
need to be equipped with the necessary powers, tools, and resources.

11. The opportunity to do this is before us with the stated Government intention to give the Environment
Agency a Strategic Overview for Inland Flooding (all types). Recent years have shown that the effectiveness
of “voluntary” approaches is not good enough for an issue as potentially crucial as Flood Risk
Management. The challenge is too great, and there are too many competing pressures, to expect “tweaking”
of the current system to deliver the certainty and clarity which the Nation deserves. Government should be
bold and ambitious in developing the Strategic Overview, and requiring its effective implementation. (Two
examples to support this approach are provided in Appendix 1.)

12. CIWEM believes Local Authorities should “grasp” the flood risk issues within their area, and develop
a long-term leadership role. Local Authorities should embed Flood Risk Management in all their activities,
and satisfy themselves that appropriate management plans are in place.

13. This role includes contingency planning, and flood aftercare and recovery phases. Local Authorities,
as democratically elected organisations are uniquely placed to fulfil this role and ensure sustainable
development within their areas. Extra resource will be needed, but benefits will come locally from ensuring
that all the delivery agents take a long term, strategic approach to Flood Risk Management, and resilience
will be increased. CIWEM understands that there is currently no single target on a Local Authority which
requires them to do anything on Flood Risk Management.

INFRASTRUCTURE AND DEVELOPMENT PLANNING

14. CIWEM recognises the significant advance that has been made in establishing sustainable planning
policies, the aims of which are to ensure that flood risk is taken into account at all stages in the planning
process. Government policies for flood risk and water management including Making Space for Water and
Planning Policy Statement 25: Development and Flood Risk direct new development away from areas at
highest risk and where development is necessary in flood prone areas ensure that it is safe from all but
extreme floods.

15. Whilst a strategic risk based approach to future development can protect all new development from
frequent floods, CIWEM believes there is a danger that millions of people in existing communities will
become increasingly subjected to a life that is punctuated by flooding on a scale similar to that witnessed
across England during June and July 2007. An area of particular concern highlighted by the 2007 flooding
related to the resilience of existing critical infrastructure such as electricity transformers, pumping stations,
potable water and waste water treatment stations to flooding. With this in mind, CIWEM is organizing a
series of conferences in 2008 focusing on Critical Infrastructure and Flooding (March 2008) and Emergency
Planning and Extreme Flooding (November 2008). In addition, CIWEM has an annual conference on
Integrated Urban Drainage Management (May 2008) at which key issues from the recent extreme flooding
will be highlighted. All outputs from past conferences on flooding and drainage issues are freely available
on the CIWEM website www.ciwem.org

16. CIWEM believes owners, operators and regulators of critical infrastructure must design and operate
their distribution networks to ensure continuity of supply for a range of flood events, in accordance with
the precautionary principle.

17. Infrastructure plays a crucial function during emergency situations and throughout recovery. It is
imperative that this issue is treated with the urgency it deserves. Infrastructure owners and operators must
be accountable for ensuring that new works provide resilience against extreme flood events, and are designed
used a risk based approach.
18. CIWEM is unable to see how the Civil Contingencies Act 2004 has enhanced the nation’s ability to assess, plan, advise and act on the flooding of critical infrastructure such that our preparedness for increasingly severe flood events is improved.

FUNDING

19. The recent floods provide evidence that without sustainable investment decisions, future generations will be subject to frequent exposure to lengthy periods of homelessness as a result of disruption following flood events. There will be an increasing financial impact upon the national economy. The cost of sustainable solutions is something that we, as a nation, must start paying for now. The established systems for investment decisions already place great importance on the “best value for money” approach. Processes and mechanisms to achieve “value engineered” solutions are firmly embedded within investment decision making.

20. The Minister’s announcement in July 2007 to increase the flood risk management capital allocation over a period of time is welcomed. However, this initial expenditure must be accompanied by a commitment to long term strategic public expenditure to maintain, manage and renew the existing assets.

21. CIWEM believes that there is a danger that existing communities will be increasingly subject to severe flooding. Capital investment needs to keep pace with climate change so that existing communities can have a sustainable future. It will be important to ensure that a proportion of the financial benefits from new development is captured and contributes towards improving the resilience of existing communities. We believe that this leads to two specific issues that we would wish to highlight, continuity of funding streams and sources of funding.

22. The timetable to produce a flood alleviation scheme typically lasts several years. If schemes cannot be constructed having been consulted upon, designed and having gained regulatory approval they are “shelved”. The concept is applied so that the scheme can be “re-opened” as soon as funding is available. This concept is flawed in that both public expectations, regulatory requirements and technical standards may have changed during the intervening period and hence significant amounts of detailed re-design are needed at further cost. A lack of continuity of funding leads to significant changes in workload across the profession and this exacerbates the difficulties in efficiently managing project work that are caused by the current skills shortage within the industry. It also leads to increased costs to deliver flood reduction measures.

23. The sources of funding for flood prevention schemes should be reviewed. The current public funding rules allow for almost no consideration of scheme components that do not directly contribute to flood alleviation. A more holistic approach should be adopted so that it becomes easier to incorporate into scheme justification and funding contributions from sources that are seeking to, for example, provide social and environmental enhancement.

24. We believe that improvements to the piped drainage network should be addressed by OFWAT. This should feature in the 25 year Strategic Direction Statements which water companies are currently preparing, and forthcoming Price Reviews (eg PR2009, PR2014). This should ensure that targets for local water companies are set that will lead to improvements to the drainage system and this source of funding be incorporated into the economic appraisal of schemes. Improvements should be planned in a strategic way, and consider the functioning of drainage systems across the catchment area. These issues are a key focus for forthcoming CIWEM conferences with OFWAT in November 2007, at our “Land Use and Water” conference in November 2007, and at the Integrated Urban Drainage Management conference (May 2008).

25. This same process should also be used to ensure that water companies assess and reduce the flood risk of their critical infrastructure.

26. CIWEM believes that with regard to funding arrangements public authorities should:

   — Maintain 5–10 year capital investment programmes and lobby to secure funding from Central Government to deliver those plans. Public bodies should openly report progress on delivery of those plans.

   — Identify additional sources of funding, other than Central Government, to deliver the capital investment programme where it can be demonstrated that further benefits will arise from flood alleviation schemes (ie social and environmental enhancements linked to EU funding streams).

   — Require OFWAT to secure commitments from water companies to reduce the incidence of sewer flooding to properties, in a strategic way. Breaches of the commitment should result in full financial compensation to the affected property owners and/or financial penalties paid to the relevant public authority. The penalties would contribute towards the costs of the recovery phase of a flood event.

   — Secure additional funding through “planning gain” receipts (Section 106 Agreements) to support flood risk management activities.

27. These are additional requirements over current practice, and failure to implement the actions will lead to repeated incidents of extensive flood events across England.
28. This submission is made with specific reference to England. The issues however are common throughout the UK.

29. We believe that the steps outlined above will help to better prepare the Country for future floods. Continuation with the status quo will lead to more of the same. That is an option we cannot afford.

30. CIWEM would be pleased to provide oral evidence to the Committee, as there are many issues which we have highlighted briefly which would benefit from in-depth examination.

Appendix 1

EXAMPLES HIGHLIGHTING FRUSTRATIONS WITH MULTI-AGENCY FLOOD RISK MANAGEMENT WORKING

1. Sustainable drainage systems (SuDS). These are recognised as an effective way to provide drainage. They provide water quantity, water quality, and environmental benefits. However, their uptake has been frustrated by an inability to agree who should adopt and maintain them ie the issue is institutional, and not technical.

2. Designing for exceedance in urban drainage. It is inevitable that as result of extreme rainfall, the capacities of sewers, covered watercourses and other drainage systems will be exceeded from time to time. A guide on how to manage these “exceedance” flows was produced in 2006, by a cross-industry group. However the implementation of the guide has been patchy as there is no requirement to follow the guide, and it is only effective if all delivery agents follow it together. The approaches are dependent on the use of highways as intermittent flood routes. Highways engineers have proved difficult to engage.

These examples have both been under consideration for many years. They illustrate how issues are institutional and not technical. Had these approaches been implemented more aggressively, there would have been less damage during the recent floods.

The Chartered Institution of Water and Environmental Management

September 2007

Memorandum submitted by Blueprint for Water (FL 91)

1. INTRODUCTION

1.1 In 2006, a coalition of organisations concerned with the health of our water environment came together to set out ten steps needed by the Government and its agencies in order to restore the health of our waters by 2015—the “Blueprint for Water”25.

1.2 The vision of the Blueprint for Water is to secure water supplies, enhance biodiversity, maximise social and economic benefit and improve resilience to climate change by protecting and restoring the ecosystem function of catchments, wetlands and water bodies; managing demand to meet environmental limits; and making those who damage the water environment bear the costs.

1.3 Wildlife and Countryside Link (Link) currently provides the secretariat for the Blueprint for Water campaign. Link brings together 40 voluntary organisations concerned with the conservation and protection of wildlife and the countryside. Our members practice and advocate environmentally sensitive land management, and encourage respect for and enjoyment of natural landscapes and features, the historic environment and biodiversity. Taken together, our members have the support of over 8 million people in the UK.

1.4 We call on Government to take bold action to tackle flooding and welcome the opportunity to submit our concerns and suggestions to this inquiry.

1.5 This document is supported by the following organisations:

—— Anglers’ Conservation Association
—— Association of Rivers Trusts
—— Buglife—Invertebrate Conservation Trust
—— Herpetological Conservation Trust
—— The National Trust
—— Pond Conservation: The Water Habitats Trust
—— Royal Society for the Protection of Birds (RSPB)
—— Salmon & Trout Association
—— Waterwise

25 See www.blueprintforwater.org.uk for more details.
2. **Summary of Key Steps to Sustainable Water by 2015 of Relevance to this Inquiry**

2.1 *Retain water on floodplains and wetlands*

- By 2007, local planning authorities should no longer be able to automatically approve major development in floodplains.
- By 2010 Defra and DCLG must stop supporting uneconomic drainage and defence of agricultural land.
- By 2012, the Environment Agency should begin a national programme of large-scale floodplain restoration to enhance biodiversity and reduce flood risk.

2.2 *Support water friendly farming*

- By 2007, Defra should commit to funding a sustained national programme of support, training and advice for farmers, building on the Catchment Sensitive Farming Programme.
- By 2008, Defra and the Treasury must fully fund the Environmental Stewardship Scheme to reward farmers for improving water and soil quality at a catchment scale without compromising existing biodiversity.

2.3 *Clean up drainage from roads and buildings*

- By 2007, DCLG must reform planning guidance and building regulations to make Sustainable Urban Drainage Systems (SUDS) the standard method of disposing of surface water.
- By 2009, DCLG and Defra must decide who is legally responsible for the construction and maintenance of SUDS.

3. **Rationale**

3.1 This summer’s flooding has brought the dynamic relationship between the environment and man into sharp focus. In those areas that bore the brunt of weather the impacts on people, property and local economy has been devastating. Wildlife has also suffered as the last fragments of wetland habitat have disappeared under deep water, leaving breeding birds and mammals nowhere to escape to.

3.2 As recent events have shown, flood defences cannot provide an absolute fix for flooding or flood risk. Although hard engineering will continue to play a role in protecting communities, there is also a need to look at how we manage our rivers and their catchments from source to sea. In rural areas this could mean managing soils so they can absorb and store water, reducing the efficiency of arterial drainage so water is held on the land, reversing the impacts of soil compaction, creating on-farm ponds and wetlands that store water, and restoring the natural form and structure of rivers and floodplains so that they hold water back and reduce the “flashiness” of flood events.

3.3 Even though such measures may never prevent flooding during extreme events, they can reduce risk by slowing the generation and movement of flood peaks. Even one or two hours can be vital in buying time for flood forecasters to issue warnings and for communities to respond. Rather than simply focusing upon hard engineering dictated by economic imperatives, Government should divert more funding into land management measures that benefit communities throughout a catchment, including those that would traditionally struggle to qualify for flood defence infrastructure under the priority score system. Only then will Government be able to meet other commitments to improve water quality, wildlife and amenity under its sustainable development agenda.

3.4 This summer’s flooding has also highlighted the importance of urban planning and building design in mitigating risk. There is a need to redouble efforts to limit development on areas of high flood risk, design urban landscapes to store floodwater rather than surcharge sewers and make buildings more resilient to floods so households and businesses can recover more quickly.

3.5 In fairness, Defra has acknowledged many of these issues in Making Space for Water26, their flood risk management strategy. However, a huge gap remains between the stated aims and objectives of the strategy and delivery on the ground. The “portfolio of responses” discussed in the strategy remains an

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aspiration, leaving public investment locked into provision of hard defences even if more cost-effective alternatives exist. At the same time, communities and businesses that do not qualify for defences can be offered flood warning but will become increasingly vulnerable in the face of climate change.

Blueprint for Water
Wildlife and Countryside Link
September 2007

Memorandum submitted by The British Insurance Brokers’ Association (FL 92)

1. EXECUTIVE SUMMARY

1.1 The British Insurance Broker’s Association (BIBA) is delighted to respond to the Environment, Food and Rural Affairs Select Committee inquiry into flooding.

1.2 BIBA is the UK’s leading general insurance intermediary organisation. We represent the interests of insurance brokers, intermediaries and their customers and have partner members from the leading companies in the insurance industry.

1.3 Our members have been actively involved in helping householders and businesses to submit and pursue insurance claims in the aftermath of the summer 2007 flooding across various parts of the country.

1.4 We welcome this inquiry as an opportunity to review the collective experiences and effectiveness of many of those involved and to make any recommendations for changes in the future.

2. THE 2007 FLOODS

2.1 After the June floods in Yorkshire and Humberside, followed by those in Gloucestershire and surrounding areas in July, the insurance industry has processed around 50,000 individual claims. These claims cover both domestic and business properties.

2.2 It is difficult to be precise but we believe that the average value of each flood claim amounts to £40,000 for domestic claims and £60,000 for business claims.

2.3 It is part of our role as brokers to help insured victims process and pursue their claims. We estimate that it takes between 3 and 15 months for a straightforward claim to be processed and paid out. Interim payments are often available for immediate, emergency expenses and alternative accommodation. Many of these payments are usually made within days.

2.4 The recent floods were extraordinary and have been a major test for the insurance industry, just as they have been for local authorities, the emergency services and other organisations.

2.5 Given the scale of the flooding, we believe that brokers have responded well both in the speed of their response and resources to cope with a claims overload situation.

3. LEARNING FROM THESE EXPERIENCES

3.1 For many, a major concern for the future will be the continuing affordability and availability of insurance—particularly in the areas worst affected by the floods—but also nationwide. It is our firm view that on this occasion, there is no need for insurers to substantively raise premiums.

3.2 We are keen to ensure that flood insurance continues to be readily available even if repeated catastrophe flooding occurs. It is important that the price of insurance does not act as a deterrent to ensuring adequate cover.

3.3 However, regular flooding and storms of this kind would require insurers to invest in additional resources which would have an inevitable cost burden upon the consumer. Clearly, the best way to keep premiums down is to keep claims to a minimum—and that is dependent on good flood defences and other preventative action.

3.4 We see a number of ways that the Government and private sector can work together to protect properties from flooding in the future.

Appropriate insurance cover

3.5 The UK is one of the few member states in Europe where consumers are able to purchase insurance policies to cover them in the event of flooding.

3.6 Despite flood cover being available, we estimate that at present 25% of homeowners and occupiers either have no contents insurance at all or are significantly under-insured. In certain areas, this figure could be as high as 40%.
3.7 With the appropriate cover in place, homeowners and businesses will not be left stranded and dependent on aid from their local authority or the Government to recover from a major flooding incident.

3.8 We would call on the Government to raise awareness of the benefits of insurance, and urge all home owners and businesses to ensure that they have the appropriate cover in place to protect themselves against flooding and storms.

**Funding for Defences**

3.9 It should be a priority for the Government to increase spending on flood defences at an early date, to safeguard homes and businesses.

3.10 Regular repetition of incidents such as the recent flooding will make the pressure for higher premiums more difficult to withstand. The need for better flood defences is now—2011 is too far away—so such commitment should be implemented as a matter of urgency. We would urge the Government to ensure adequate levels of spending to support the increased need for flood and sea defences to a level that is generally recognised as adequate to meet the changing needs of our climate.

3.11 We also support the view of other professionals who have called for higher levels of maintenance and improvement of storm water drainage systems so that drains and gullies can more easily be kept clear and to allow surface water during heavy rainfall to be channelled away rather than accumulate, leading to flash flooding.

3.12 Similarly, we urge local authorities to ensure adequate natural ground drainage in densely populated areas by not building on all open spaces.

3.13 A significant number of the claims BIBA members have handled resulted from inadequate drainage.

**Building on Flood Plains**

3.14 There is a similar vulnerability to existing housing developments on flood plains. Looking to the long term, we suggest that further consideration should be given to planning applications for new housing developments on flood plains, using flood risk modelling techniques.

3.15 There are also options about the way we build our houses, for example, to raise living areas above ground to offer further protection from inundation. We believe that these must be fully explored.

**Meeting Immediate Needs**

3.16 When large numbers of homeowners and occupiers are affected in a single area, there are particular issues in relation to finding suitable alternative accommodation both short-term and longer term.

3.17 High levels of demands on contractors and tradespeople to undertake repairs and reinstatement of their properties and replacement of home contents also impact on costs for insurance payments and can extend the period of time it will take to fix a residence or business.

3.18 We have seen costs escalate in areas where alternative accommodation was required.

**Business Resilience**

3.19 Business resilience planning is a core element of the advice that brokers can offer. It is important for businesses to understand the need to take out insurance cover not only for the physical damage incurred but also to cover them for the period when they are unable to trade from their premises.

3.20 A recent BIBA survey showed that nearly half of small businesses had no plans in place to deal with the effects of flooding. We have been campaigning to raise awareness, particularly amongst SMEs, of the need for adequate business resilience planning.

3.21 We believe there is a role for the Government and local authorities to play in helping to raise awareness of the importance of business resilience planning.

4. **Conclusion**

4.1 In conclusion we believe there are several steps which can be taken immediately to protect our homes and businesses in the event of future flooding.

4.2 The Government must recognise the urgent need for flood and sea defences to be improved to a level considered adequate to meet the changing needs of our climate. This requires increased spending to prevent not only catastrophic damage to property, but also the adverse impact on the economy as a whole, jobs, and even lives.

4.3 Further to this, we are keen to work with Government and local authorities to help raise awareness of the need for homeowners and businesses in vulnerable areas to be better prepared.
4.4 We hope this document outlines our experience and that of our members in supporting communities in the wake of the recent floods, and provides some information on the steps which must be taken to ensure the insurance industry can continue to provide affordable flood cover in the future.

4.5 We would be very happy to meet with the Committee, or facilitate meetings with any of our members, to provide further information on the areas set out above.

The British Insurance Brokers’ Association

September 2007

Memorandum submitted by the Wildlife Trusts (FL 93)

EXECUTIVE SUMMARY

Current climate change predictions suggest that increased storminess and intensive rainfall patterns will become more frequent throughout the British Isles. Furthermore, as a result of land use change, water moves through catchments faster than ever before and has significantly less natural storage space. Consequently, flooding has become more extensive, as water seeks new pathways overland and through urban areas.

Hard defences should be maintained and used where they are needed, which is most likely to be in urban areas. However, flood defences are more likely to fail in the event of extreme flood events and do not address urban drainage problems, so we should be looking at complementary natural solutions in the wider catchment to take the pressure off flood defences in the event of extreme rainfall events. These should comprise:

- Restoration of river systems—Reconnecting floodplains to their rivers means that land available for water storage is significantly increased and habitats are reconnected as part of the natural riverine system.
- Reduce urban runoff—Using Sustainable Urban Drainage Systems (SUDS) reduces the proportion of impermeable surfaces and increases capacity to retain water. Water is allowed to percolate into the natural system, reducing the pressure on urban drainage systems.
- Restore good land management practices—Wetland creation can be incorporated into existing land management and still retain a viable farming base if properly designed and implemented. Where water is stored offline, peak river flows are weakened and delayed, reducing the pressure on flood defences.

The Wildlife Trusts urge Government to do the following:

- Promote the policy lines in Making Space for Water, which encourage floodplain storage and addressing urban flooding problems
- Make a proportionate response to the flooding in terms of the use of hard flood defences. Current cost-benefit analysis tends to favour hard engineering solutions, even though policies promote the use of washlands. This is often because of extra land take costs. Funding should be made available for complementary catchment management schemes and land purchase
- Provide a strong steer away from further intensification of drainage of agricultural land and straightening/embankment of rivers. It is a misconception that this approach reduces flooding, and is often a cause of flooding
- Invest in further piloting of catchment management schemes in partnership with landowners to reduce flood risk to deliver land management schemes which bring multiple benefits to the local economy and improve biodiversity
- Expand agri-environment schemes to consider:
  - “flood storage” as an option under ELS/HLS through the creation of multi-functional washlands
  - promote grassland in upper catchment areas to reduce run-off from arable land
- Resolve the issue of responsibility for maintenance of SUDS
- Ensure that River Basin Management Plans take full account of climate change
- Encourage water companies to adopt catchment management schemes to reduce the need for intensive treatment works through the Periodic Review
RESPONSE FROM THE WILDLIFE TRUSTS

1. The Wildlife Trusts welcome the opportunity to provide evidence to this Efra Select Committee Inquiry.

2. There are 47 local Wildlife Trusts across the whole of the UK, the Isle of Man and Alderney. We are working for an environment rich in wildlife for everyone. With 720,000 members, we are the largest UK voluntary organisation dedicated to conserving the full range of the UK’s habitats and species whether they be in the countryside, in cities or at sea. We manage 2,200 nature reserves covering more than 83,000 hectares; we stand up for wildlife; we inspire people about the natural world and we foster sustainable living.

3. The Wildlife Trusts are involved in water policy issues at national, regional and local levels, and are key players in wetland habitat management, restoration and enhancement on the ground. We are represented on the Defra WFD stakeholder group and the Defra Flood Risk Management Stakeholder group, represent the environmental NGO sector on a number of River Basin District Liaison Panels and Regional Flood Defence Committees.

4. The Wildlife Trusts are heavily engaged in the planning system at national, regional and local levels. We have been instrumental in helping to shape national planning policy and its impact on wildlife, whilst at local level we scrutinise and monitor more than 90,000 planning applications each year, improving the environmental outcome of more than 1,200. We are active in the energy and climate change debate focussing on: landscape scale conservation that enables wildlife to adapt to the impact of climate change; policies to reduce outputs of greenhouse gases; encouraging behaviour change and demonstrating sustainable business.

5. The Wildlife Trusts believe that land use planning and flood management policies all have the potential to contribute significantly to habitat restoration and enhancement, providing a mechanism for adaptation to climate change and landscape scale conservation, contributing to ecosystem services.

6. We would be pleased to provide further information in relation to this submission.

SUMMARY OF EVIDENCE OF IMPACTS

7. The recent flooding has caused significant social and economic problems, which will last well beyond the floodwaters dissipating. The Wildlife Trusts are actively involved in communities throughout the UK and are acutely aware of the impact the flooding events have had and will continue to have on residents and businesses in the long term in those areas affected during June and July. A number of our own offices were flooded, and many nature reserves owned or managed by The Wildlife Trusts were also severely inundated and were temporarily closed.

8. Our evidence of impact will relate to wildlife and our own nature reserves, but our evidence for changing the approach to flood management demonstrates a method which works with natural solutions, rather than against them, addressing the causes of flooding rather than the impact, subsequently bringing benefits to people, the economy and wildlife by reducing flood risk, and providing more robust habitats for wildlife.

Ground-nesting birds

9. Coombe Hill Nature Reserve in the Severn Vale, Gloucestershire is an area of wetland that normally floods in the winter months, but this summer flooding has been terrible for ground nesting birds such as lapwing, skylark and redshank, which were rearing young. As a result of flooding, all young not at the flying stage will have perished. This will cause a serious set back in population growth, which is just beginning to establish itself following recent habitat restoration work.

Invertebrates

10. Many invertebrates were badly hit by the recent flooding. Smaller numbers of invertebrates also has a knock on effect for the many species that rely on them as a food source. This problem has already arisen for bats. In July mother bats are normally busy feeding on a host of insects, in order to be able to produce enough milk for their one bat “pup”. The wet weather has reduced the number of invertebrates and prevented the bats from being able to hunt, forcing many mothers to abandon their babies or face starvation themselves.

11. Many insects will be scarcer next year, as a knock-on effect from this summer. But most have the capacity to breed rapidly, and will make up the losses in a single year, if the weather is better for them.
Rare animals and species

12. Rare animals whose populations are already depleted, which have retreated to a scatter of small sites, are particularly vulnerable. The flooding was catastrophic for small mammals like voles and mice. This will have a serious knock on effect for predators like the barn owl which rely on them for food.

13. The water vole, once abundant throughout Britain, has disappeared from many areas because of habitat loss and the depredations of American Mink. If isolated pockets of water voles drowned in the floods, there may be no others within water vole travelling distance to recolonise. In 2002 localised extreme flooding in Derbyshire resulted in 80% of habitat loss. Counts have indicated that these areas still haven’t recovered.

14. The rare Swallowtail Butterfly, in the Norfolk Broads, may have been hit by flooding while it was a caterpillar, so may be very scarce even in its strongholds next year.

Flood storage nature reserves

15. Potteric Carr is one of a number of nature reserves designed as a water storage area. Potteric Carr alleviated flooding for South Doncaster, for approximately 10,000 homes. During the recent flooding, the wetland site retained a significant volume of floodwater and was closed to the public until mid-August. In addition, the wetland plants filter the water coming in, so when it leaves the site the water quality is much improved.

The Wildlife Trusts aspiration

16. The Wildlife Trusts aspire to an environment where natural processes are recognised as providing ecosystem services, where the same solutions to flooding benefit wildlife, people and the economy. Flooding in the right places can be beneficial for wildlife. Adopting the right solutions to flood management will bring improvements to water quality and water quantity, leading to a significantly improved water environment.

A more Sustainable Approach to Managing the Water Environment

17. Although the recent flooding is, in part, due to extreme rainfall, climate change predictions suggest this type of event will become more frequent. Floods are a natural occurrence and the environment (including people and wildlife) does have the ability to recover. However, as a result of land use change, water moves through catchments faster than ever before and has significantly less natural storage space. Flood defences have separated rivers from floodplains. Consequently, the natural system is imbalanced and flooding has become more extensive, as rivers are unable to cope with increasing amounts of water, which seeks new pathways overland and through urban areas.

18. Water which enters populated areas must be discharged as quickly as possible to reduce the risk to people and property. Hard defences should be maintained and used where they are needed, which is most likely to be in urban areas. However, flood defences are more likely to fail in the event of extreme flood events, so we should be looking at alternative solutions in the wider catchment to take the pressure off flood defences.

19. A combination of approaches to flooding will lead to solutions which bring multiple benefits. Changing our approach to rural land use can help to hold water away from urban areas, reducing the speed at which it reaches downstream areas. Flooding surrounding land and retaining water upstream allows water to be slowly released into the catchment once water levels have receded.

20. Sustainable approaches can also be taken in the urban environment, through the use of Sustainable Urban Drainage Systems (SUDS) and flood resilient measures. Development should be sited away from floodplains to reduce the risk of flooding to homes and businesses.

Restoration of river systems

21. Rivers have been disconnected from their historic floodplains by the construction of flood defences and the physical modification of river channels. This has had knock-on effects to species which have floodplain habitat. Reconnecting rivers with their floodplains and designation of supplementary flood storage areas will reduce the impact of flooding further downstream and bring secondary benefits to biodiversity.

22. Wetland areas hold water in the catchment, until the river has returned to its pre-flood level, when the water is then released back into the river. The outcome is that land available for water storage is significantly increased and habitats are reconnected as part of the natural riverine system.
STAFFORDSHIRE WASHLANDS

23. The Staffordshire Washlands Project started in 2003 to promote healthy and biologically diverse rivers and their associated floodplain habitats, in a landscape managed for the sustainable use of water, with natural fluvial processes encouraged to create new geomorphological features. Through working at the catchment level, the creation of multi-functional washlands (ie for biodiversity and flood storage) will also take the pressure off flood defences on the River Trent. Modelling work to date has shown that while issues relating to urban development and drainage are important, in this catchment run-off from rural tributaries is a major factor in the cause of flooding, particularly during sustained rainfall events.

Reduce urban runoff

25. Increased development and the “right to connect” results in drainage networks being unable to cope with significant volumes of rainfall. The increase in impermeable surfaces in urban areas also exacerbates the problem of urban flooding. In London alone, gardens equal to an area of 22 Hyde Parks have already disappeared.

26. Incorporating SUDS into all new developments will reduce the pressure on urban drainage systems. A more sustainable urban drainage network reduces the proportion of impermeable surfaces, has increasing capacity to retain water, reducing the likelihood of flooding in homes and businesses.

27. Garden plants and soil systems work like a giant sponge, soaking up rainwater and allowing it to evaporate slowly and steadily. In conjunction with the development of “Green Infrastructure” the amount of impermeable surfaces in urban areas will reduce. Wildlife benefits through the creation of “stepping stones” and corridors to migrate through urban areas.

THE POTENTIAL FOR SUDS IN HULL

28. Hull is in a unique position in that 95% of the population lives on the floodplain. In populated floodplain areas the risk to people and property from fluvial and tidal flooding is much greater. However, the interim report on the June 2007 floods in Hull reported that the flooding was caused by poor drainage of surface water and evidence so far does not suggest that fluvial flooding was a problem.

29. Had SUDS been incorporated into new development on the floodplain, this would have reduced the pressure on the urban drainage system. This would also reduce the need for the proposed costly upgrades of the urban drainage system. Ensuring that all new development includes SUDS will reduce the future risk of flooding from surface water runoff by attenuating flows and can also bring added value to a community through amenity space and biodiversity value.

Restore good land management practices

30. Extensive drainage of upland areas, overgrazing and burning has led to an increase in peat erosion and subsequently, a reduction in the ability of the uplands to hold water. Wildlife will benefit from restoration hydrological conditions in the uplands, which will also improve the ability to store water and improve water quality. Run-off from the chalk hills in the Lincolnshire Wolds which resulted in severe flooding in Louth and Horncastle is attributable to intensive arable land use, which reduces the ability of soil to absorb water. Reducing arable intensification will allow water to recharge aquifers, reducing the risk of flooding from surface run-off.

31. Lowland areas have been extensively drained in order to maximise agricultural production which has had a devastating impact on wildlife. During normal flood events, water moves rapidly through the system, increasing the rate at which it reaches rivers and streams and consequently the speed at which it reaches downstream areas. During extreme flood events it is not always rivers bursting their banks which causes farmland to flood. Drainage ditches are often unable to empty, due to elevated river levels which leads to flooded farmland. Wetland creation can be incorporated into existing land management whilst at the same time retaining a viable farming base, if properly designed and implemented. There are areas of land along river valleys that could easily be returned to wetland to provide flood storage areas with the added bonus of increased biodiversity.

32. Where water is stored offline, peak river flows are weakened and delayed, reducing the pressure on flood defences.

RIVER HULL HEADWATERS

33. The River Hull Headwaters project has been running since 2000, initially to create new areas of habitat suitable for water vole, water shrew, European otter and harvest mice. The land use changes that have been implemented to achieve the project aims have gone on to raise awareness of the way in which land can be managed to reduce the impact of flooding. On a farm-by-farm basis, wetland features have been introduced into the landscape, including pond creation and off-line river features. Other steps have been taken to improve water quality, including fencing of rivers to prevent stock entering the watercourse. The
funding has been used to provide infrastructure for guided walks. This benefits the farming economy and provides a visitor experience, as well as improving biodiversity in the area and contributing to a landscape which is managed in a more sustainable way.

The Wildlife Trusts

September 2007

Memorandum submitted by the Commission for Rural Communities (FL 94)

The Commission for Rural Communities

1. The Commission for Rural Communities was established in April 2005 and became an independent body on 1 October 2006, following the enactment of the Natural Environment and Rural Communities (NERC) Act.

2. The Commission provides independent advice to Government and others and works to ensure that policies reflect the real needs of people living and working in rural England, with a particular focus on tackling disadvantage.

3. We have three key functions:
   - Advocate: the voice for rural people, businesses and communities.
   - Adviser: giving objective advice to Government and others.
   - Watchdog: monitoring and reporting on the delivery of policies.

4. The Commission is responsible for hearing and capturing the concerns and priorities of rural people and their representatives and communicating these concerns publicly and to Government.

Background to our evidence

5. Stuart Burgess, the Chairman of the Commission for Rural Communities and the Government’s Rural Advocate, visited Gloucestershire, Worcestershire and Yorkshire in June and July this year. He heard first hand from rural communities and businesses directly affected and spoke with the organisations who are now working with them to help deal with the consequences of the flooding.

Impact of the flooding on rural communities

6. The Association of British Insurers has estimated the cost of the floods at £2.5 billion, and they are already handling over 50,000 claims from homes and businesses. A total of 857 schools were affected whilst many businesses and homes suffered significant damage.

7. Even now the full impact of the flooding is not known. Yet if there was one, overriding, message heard during our visits it was that the effect of the floods on rural communities—on individuals, businesses, farmers, market towns, and on the rural voluntary and community sector—will continue over many months, and that this extends far beyond the physical damage to homes and property.

Impact on the rural economy

8. The flooding caused an immediate and substantive shock to many in the rural economy. We heard of village shops and rural businesses being closed, tourists being turned away at what should have been the height of the season, village halls flooded, summer events cancelled, transport links and business operations who were severely disrupted and contractors who were laid off. In Yorkshire we heard that one contractor had lost £80,000 income in lost work within the first month of the flooding.

9. This has led to financial losses—some uninsurable and some uninsured—for a wide range of actors across all sectors of the rural economy and many connected operators in the national economy: from retailers to suppliers, hauliers to service providers. This has created pressing short term problems—such as cash flow difficulties in meeting staff costs and tax demands—coupled with a loss of income, disruption to supply chains and increased costs. These difficulties will undoubtedly be carried on into the medium and longer term as businesses try to deal with the shock caused to their balance sheets and business plans.

10. A specific concern of smaller businesses relates to the knock-on impact of insurance companies’ replacement policies. Insurance companies tend to bypass local suppliers, using nationally agreed lists of suppliers, rather than allowing people to source locally produced goods, or goods from local shops. This will have a long-term effect on the profitability and viability of local businesses and the knock-on impact through the supply chain may well extend over the next five years, given the lifespan for replacing household goods.
11. One other concern is the less quantifiable impact caused by external perceptions of flood disruption and business availability. For example, there is widespread concern that the tourism industry will be hit hard, not just this year in affected areas, but also next year as people plan holidays elsewhere.

Effects on farming and farmers

12. The scale of financial loss in the farming community is huge, and cannot be compensated for either through traditional business insurance (growing crops cannot be insured) or offset by charitable donations.

13. The facts that the floods occurred in summer—an unusual event—led to large amounts of growing crops and winter feed crops being destroyed. Some crops were under water for over four weeks and waterlogged for longer. Many fields were too waterlogged for machinery to access and many farmers were forced to use ground usually reserved for winter grazing.

14. Many farmers are facing severe financial hardship and/or bankruptcy. Some will simply not be able to sustain either the level of losses and increased costs they have incurred or the increased costs they will have to incur in the months ahead. Smaller farms, and those who have had a significant proportion of their land flooded appear particularly vulnerable. Equally, we also heard examples of larger farms, who will experience an extremely difficult year with losses running into tens of thousands of pounds, but who are confident that they will be able to survive.

15. We heard fears about the serious knock on implications for farmers, whether flooded or not, who will face increased costs of production, for example increased drying costs, coupled with poorer quality and/or lower yields. Livestock farmers, in particular are likely to face inflated feed prices, on top of already higher prices due to recent cereal price increases.

16. There was concern expressed that with winter feed crops destroyed across large areas, winter could see potential animal welfare issues arising. Some farmers were considering selling their suckler herds, as they would not now have their own winter feed supplies, did not see it would be economical to buy in, and/or did not see where they would be able to source feed. Shortages in straw, hay and silage are predicted.

17. Our visit also heard a real sense of anger from the farming community who raised questions about the management of water courses and water control, both before and after the floods. Farmers reported being unable to pump water off their fields, due to unnecessarily high water levels in Environment Agency drains. They also reported poor maintenance of these drains had caused water to flood back out onto farming land (which farmers were then unable to pump off).

18. Along the River Derwent, water had been deliberately held back to help protect Selby and Hull. Whilst farmers recognised this was necessary, they disputed whether the length of time the water had been held back, and therefore the period the fields were kept underwater—some four weeks, was proportionate.

19. Questions were also raised about the relative importance afforded to environmental conservation in the management of water courses before the flooding and in policies during the flooding response. For example, whether limited or no dredging for environmental reasons had reduced the capacity of ditches and dykes for water management. Equally farmers were concerned at their perceived inflexibility of cross compliance measures, where restrictions prevented hay meadows being cut before the floods. We understand that the local drainage board in Yorkshire is considering an independent technical review that will help identify lessons for mitigating the impact of future flooding.

Displacement of communities/housing and accommodation issues

20. The physical rebuilding and repair of buildings and infrastructure will and does inevitably take time. People have been displaced from their communities, potentially for twenty-four or more months while rebuilding and repair work to make their homes viable is undertaken. For example, only now are families able to return to their repaired homes in the village of Sutton under Whitestonecliffe, Hambleton, in Yorkshire after localised flooding in June 2005. The scale of this flooding is likely to cause even longer delays.

21. The problems of displacement will be exacerbated in sparse, rural areas by the lack of available, alternative accommodation. Families are finding themselves located away from their villages, away from friends and support networks, often in urban areas such as Hull. It will be important to ensure that people are able to stay in touch with their community, schools and social networks throughout the post-flood period.

Impact on rural services

22. There are questions over the capacity of local authorities, particularly smaller rural authorities, to stand the capital costs of repair and rebuild of council property on the scale that will be required. Local authority estates tend not to be insured, with authorities preferring to offset one-off costs against annual insurance premiums.
23. We heard of increased strain on local medical services. GPs are already reporting increases in the number of visits from farmers, suffering respiratory problems associated with the standing water, and stress related illnesses. Amongst farmers and the wider community there has been an increased demand for counselling to help deal with the stress associated with the floods.

Supporting ongoing community networks

24. Various organisations including, but by no means limited to, the Farming Help Partnership, Rural Community Councils and the churches, are playing an important role offering practical advice and emotional support. Some groups are also offering financial assistance, based on generous public donations, and are seeking sources of match-funding to make this money go further. The ability of such groups to reach out to vulnerable people in remote rural areas is, and will be, an important lifeline.

25. At the same time the income of many local voluntary and community groups has been impacted by the floods, many of whom have had to stand losses from cancelled local events and shows, as well as missing an opportunity for vital fundraising.

Summary Reflections

The need for a long-term response

26. Responses to emergencies tend to suffer from rapidly declining rates of public and political attention. Yet our visits highlighted that the crunch period for many rural actors affected will be over the medium term horizon of six to eighteen months. This is often at precisely the time when initial Government responses and public attention are diminishing. It is important that this is built into planning responses now and that the impact of the floods on communities is not forgotten, after the media spotlight has moved on.

The need to recognise the realities of the rural economy

27. The Government’s response needs to reflect the breadth of the rural economy and the wide number of affected economic actors. This includes many small businesses that are less able to represent their concerns at the national level or through representative bodies for business.

28. Interventions targeting rural businesses should think innovatively about helping to overcome short and medium term disruptions that traditional insurance policies are not well designed to cope with, for example cash flow problems. In previous crises this has involved tailored policy interventions such as temporary VAT or tax holidays or interest free loans to a range of rural actors.

29. Emergency interventions also need to be careful to avoid several “blind spots” for affected groups in the rural and national economy.

30. These include urban-based businesses trading in a rural area (for example providers of marquees for agricultural shows were badly hit during the foot and mouth crisis) or national businesses with important hubs in the affected areas, which may have been hit by transport disruption or a general perception from customers that they are no longer “open for business”. Diversified farm businesses also present an administrative challenge in helping address the impact on non-farming business costs (for example farm buildings used as office space or in tourism).

The need for awareness of social justice issues

31. Those hit hardest by the floods have often been the weakest actors, who both lack sufficient assets to absorb the costs of the shock and an effective voice to claim Government assistance—for example tenant farmers, small businesses, older people and those in more isolated areas. It is important that response plans actively considers these less visible needs.

The need to look forward in future planning

32. Flooding will inevitably occur in future, with the possibility, perhaps the likelihood, that its frequency may increase. It is therefore important that we look to encourage a public debate on water course management—to put it crudely, on decisions about which areas will be sacrificed to save which other areas. This would produce greater transparency and knowledge of these decisions, in order that the implications of such decisions can be better assessed, and mitigating actions put in place, to limit and compensate for the impact of future severe flooding incidents.
WHAT THE COMMISSION FOR RURAL COMMUNITIES WILL BE DOING

33. We are in discussion with the Environment Agency about commissioning some research work to quantify the impact of recent floods on farmers, on the wider rural economy and on rural communities as a whole.

34. The Chairman of the Commission for Rural Communities will be returning to flood affected areas in the Autumn to hear how communities are coping three months after the floods and whether their concerns are being addressed.

35. We will be reporting to the Prime Minister on the impact of recent shocks upon the rural economy and ways in which the rural economy can be strengthened.

Questions for the Committee to take into consideration

36. Are weaker actors voices heard and responded to in immediate and post emergency planning?

37. What balance of costs and benefits should be used during future flood management and how should the impact on rural businesses be factored into future planning?

38. What measures can the Government and other actors implement that help rural businesses over come the short-term impact of flooding?

39. To what extent did the flooding response prioritise some sectors over others?

40. What are the medium term needs of rural businesses and farmers and are these being adequately addressed in post flood planning?

41. How can community links and social networks, particularly from remote rural communities, be preserved during the displacement associated with housing repair and rebuilding?

42. Are local voluntary agencies that are responding to the crisis coping, and what additional support would they value?

Commission for Rural Communities
September 2007

Memorandum submitted by Pickering Flood Defence Group (FL 97)

At the top of the agenda on the lessons learned page I invite the committee to place the example of the historic market town of Pickering, North Yorkshire—and many more in the same sinking boat—which have literally been hung out to dry as a result of a failure to invest in defences despite the need being demonstrated with deplorable frequency.

1. Summer’s flooding in Pickering was predicted and preventable. The town has flooded six times since in the last eight years, the latest was the worst yet and caused upwards of £2 million worth of damage to homes and businesses. A viable scheme of defences was drawn up by the Environment agency five years ago at a cost of £750,000, since then plenty of bricks have been dropped—not one has been laid.

2. In common with other schemes in North Yorkshire, most recently Ripon, but also Thirsk and Northallerton, funding has been withdrawn by the Government for the scheme to defend Pickering. It was the only one of seven “fast tracked” projects not to have been built following serious and sustained flooding. Malton and Norton, eight miles down the road were protected and this time were both saved. Pickering was hit by its worst deluge in living memory.

3. We urge the committee to examine the yawning gap between rhetoric and reality on the funding of defences. The offer is £200 million more investment by 2010. This amounts to a sticking plaster over an open wound. The agency estimates it would need double its current funding for the next decade just to bring existing defences up to a satisfactory standard, let alone build enough new ones.

4. The repeated claims made by the Secretary of State for the Environment, Hilary Benn, no doubt on a very tight brief, that capital spending on flood defences has not been cut, must be thoroughly examined. Schemes already commissioned were not cut, others—including Pickering and Ripon—have been unceremoniously axed.

5. Spending on defences has increased, we are told, but this depends on where the line is drawn to make the comparison. The level of spending was in fact ramped up to a more adequate level only to be cut back, resulting in the rug being pulled from a series of schemes across North Yorkshire and the country as a whole. Another case of being economical with the truth, or at very least selective.

6. Taking Pickering as an example, the question needs to be asked how £750,000 of public money can be spent on drawing up a viable scheme of defences, only for the plans to be left to gather dust for five years with no expectation of proceeding at present because of the points system which has raised the bar higher, in line with spending cuts.
7. The points system is used as a smokescreen to veil the blatant failure of the Government to invest adequately in protecting homes and businesses from the ravages of flooding. The system is arbitrary, fails to take account of the specific needs of communities in more rural areas, and should be consigned to the same skips as those housing the belongings of flood victims in Pickering.

8. The evidence is that that the Government—and the Environment Agency—stuck their hands behinds their backs, crossed their fingers, and hoped to avoid a repeat of the major floods of 2000, and those 18 months previously. The gamble spectacularly failed and victims in Pickering and other North Yorkshire towns are paying the price.

9. It only a matter of time before further floods hit the town. We know the cause, we know the solution. The scheme on the table offers a quick win for the Government and the Environment Agency in contrast to areas where a massive amount of work still needs to be done on designing the infrastructure needed to prevent a repeat of this summer’s torrent of destruction.

10. We would be pleased to see the committee analyse is how it is that the Government constantly talks about climate change only to removes funding from the engineering solutions needed to protect communities against its devastating effects. That has been the experience of victims in Pickering and a string of other towns in North Yorkshire.

11. Catchment Flood Management Plans offer the hope of long term improvements in land management which may help keep pace with worsening bouts of extreme weather by reducing the speed of run off from farmland and areas such as the North Yorkshire Moors. It is essential that this strategy is pursued hand in hand with the provision of adequate defence. It is not in any way a substitute for defences that need to be built now.

12. We need the £6.7 million defences planned for Pickering to be provided without further delay or excuse. It is blatant neglect to stand by while homes and businesses are allowed to be hit time and again. We need to be saved from the fiction pedalled about “resilience.” When a wall of water comes your way, only one thing will stop it—that is properly engineered defences.

Help us.

Pickering Flood Defence Group

September 2007

Memorandum submitted by Melvyn Cole (FL 98)

FLOODING IN WEST OXFORDSHIRE ON 20 JULY 2007

The village of Clanfield was badly flooded on 20 July 2007. A survey of all properties in the village, of approximately 350 properties showed 58 homes flooded with a further 20 outbuildings and gardens flooded.

The main causes of the flooding were:

— brooks flowing through and around the village overflowing
— rainwater run off fields flowing directly into properties over blocked drains.

Given the severity of the weather some flooding would be expected in the village however the scale of this flooding was far more severe than should have been.

The immediate issues raised are as follows:

— traffic (four wheel drives and similar vehicles) continued to drive through the village even when the road was closed. One vehicle was stoned when refusing to slow down. The wash created by such vehicles caused serious damage to several properties along side the road. Agencies must close roads earlier.
— there was a lack of response from all agencies on the Friday afternoon, specifically Oxfordshire Highways and Thames Valley Police regarding road closures. Agencies must be coordinated including across county boundaries.
— flood warnings were issued 24 hours after the floods to some residents who were signed up to the Environment Agency’s “early” warning system. The telemetry system installed in the village two years ago seems to have failed miserably. The Environment Agency must sort out its procedures and/or competencies.

The longer term issues which need to be addressed are well understood and have been on going for a number of years and must now be taken forward as a matter of urgency.

These are:

— ditches and brooks must be properly cleaned. If landowners are responsible they should be charged for cleaning undertaken if they are unwilling or unable to do it themselves.
— the Environment Agency must not be allowed to prevent cleaning of essential ditches on the grounds of wild life preservation as was the case with one of the two key brooks contributing to the Clanfield flooding

— the run of surface water from Brize Norton has caused problems in the past, and with the current flooding and will do so in the future particularly with the expansion of the base increasing the hard standing area significantly. The reassurances provided particularly with the lack of commitment to cleaning the brooks down to the Thames are not at all convincing. This area of the expansion must be reviewed before the next problem arises.

Melvyn Cole
September 2007

Memorandum submitted by Pickering & District Civic Society (FL 99)

EXECUTIVE SUMMARY

I. Situation and geography of Pickering, North Yorkshire.
II. History of flooding
III. Existing flood protection scheme
IV. Lack of action despite repeated flooding
V. Major flood in June 2007
VI. Civic Society agenda for flood alleviation
VII. Concerns, suggestions and observations.

1. Pickering is a small town in North Yorkshire bisected by Pickering Beck, normally a small river. The Beck rises in the NY moors and although picking up water from only a number of small tributaries, can swell rapidly given sufficient rain or melt water from the substantial moorland catchment area. Flooding generally both rises and recedes relatively quickly.

2. Most of the flooding in Pickering is not directly from the huge volume flowing down the beck, rather it is that which cannot escape, backing up due to the constricted nature of the watercourse through the town, with a number of pinch points and low bridges.

3. Between 1999–2002, Pickering suffered several serious floods, the last being the highest ever recorded at that time. Around 50 properties and businesses were affected. Other local towns, primarily on the River Derwent also suffered major flooding.

4. Consequently, several flood alleviation schemes were hastily drawn up and implemented. All were inaccurately costed and went substantially over budget. The Pickering scheme was rejected locally as being badly engineered and unsightly in a conservation area.

5. The re-engineering process cost £750,000, with the building costs put at £6.7 million (a figure which spiralling building costs will have now increased significantly). It was rejected by the Environment Agency (EA) on a cost-benefit basis, as the funding source had been decimated by the other local schemes. ie Pickering missed the boat. Building flood defences in Pickering is very different to the Derwent schemes. The river channel flows through the town centre, is often narrow and of much smaller capacity, has a secondary channel and a railway line. Properties, many of which are listed buildings, are closely packed around the riverside and there are numerous bridges. It is therefore a much more difficult terrain to defend when the river flash floods with tremendous volumes of water.

6. Following the major flood of 2002, many meetings were held and much hot air expended. Other than dredging out one weir, nothing concrete happened. Pickering Flood Defence Group (PFDG was formed, primarily pressing for the re-engineered scheme to be built.

7. 25 June 2007 once again brought major flooding, with water levels about 18ins–2ft above the previous highest recorded levels. Many more properties were flooded than before and the town completely cut in two, with access impossible between the two sides. The water rose very quickly from about 21.00, peaking about 02.00, meaning many businesses and householders were left unprotected or unable to act quickly enough, particularly those never affected before. There were a number of logistical problems with the relief effort of official bodies, but these have been addressed by Pickering town council. The water was receding significantly by morning and flooding had all but cleared by the same evening, 26 June.

8. Inevitably, the usual meetings, forums, writings and petitions have been rife, with very strong calls for the flood scheme to be delivered. EA have reiterated its low priority, particularly in view of extensive floods elsewhere nationally. With justification, residents feel abandoned to their fate once again, with little promise of any action. Being a lightly populated rural area, will any resources ever be made available under the current policy of cost-benefit, irrespective of need, or frequency of flooding? Several months ago, local
authority, Ryedale DC, pledged the sum of £1 million towards flood defences for Pickering. Is it unreasonable to expect at least match funding by NYCC and government agencies? There has been absolutely no sign of any thus far.

9. The Pickering & District Civic Society (PDCS) take a more pragmatic approach than the PFDG and propose a 3 point agenda:

a. To slow the water down to the North before it reaches the town.

b. To waterproof vulnerable properties within the town.

c. To drain the water away more quickly to the South of the town.

10. With reference to 9a, the society is not convinced that sufficient serious thought has been given to one or more simple low earthworks or dams in the valley above the town. These would have a limited bore outlet pipe and spill-over in order to temporarily restrict and even out the flow of large volumes of water during flood conditions. Under normal conditions, they would be empty and fairly inconspicuous. We also feel there should be dialogue with the Forestry Commission about the effects of both tree planting and harvesting as a means of delaying or evening out water flow.

11. With reference to 9b, the society is concerned that the existing flood plans only address the problem of protecting the town by constricting an already narrow channel between flood walls. We strongly suspect the volume of the June 07 flood would have over-topped the walls and also that the water may have backed up and flowed around the start of the walls, with the potential to flood previously unaffected properties. Only the EA are in a position to confirm or deny this. At the very least, consideration should be given to alleviating some of the pinch points and modifying low bridge arches.

12. Why are drains and gulleys cleared so infrequently, meaning they are often incapable of coping with excessive surface water drainage? Routine maintenance seems to have become anathema to the big agencies and councils (easy targets for spending cuts?), while large capital projects give far more kudos.

13. It should go without saying, but the importance of protecting and preserving flood meadows in the valley bottoms and limiting areas of concrete and tarmac that speed up the run off of water cannot be overstated.

14. It should be mandatory that purchasers or tenants of properties be made fully aware of any previous flooding and have redress in law for compensation should this not be done. Property values would consequently adjust to reflect this risk of potential cost and disruption.

15. Owners of properties susceptible to regular flooding and builders of properties likely to be susceptible should have strong inducements or a compulsion to make them flood resilient ie reducing potential damage with high level electrical wiring, split level plastering, solid floors etc. Any remedial work carried out under insurance cover should include this caveat. While it must be accepted that insurance is a business, with premiums related in many ways to gambling odds, there needs to be some protection for people who have not been flooded, despite being in flood areas as defined by the EA. One would also hope that reasonably priced premiums would be available to those willing to exclude flood risks, or perhaps with restricted flood damage risks for those that install reasonable flood resilience & resistance measures. There has been a worrying precedent in recent years of insurance companies all offering similar “one size fits all” policies, which could price many properties out of the market for any form of household insurance (including all risks other than flooding).

16. With reference to 9c, there is much anger locally and nationally at the EA/DEFRA policy of not maintaining waterways effectively and restricting farmers to clearing drainage ditches one in five years. There is a balance to be struck between nature conservation and the economic well-being of communities, where the pendulum appears, yet again, to be at one extreme. Water cannot flow properly along silted and weed choked channels. Additionally, fallen trees and low branches with the potential to cause log-jams during floods are rarely cleared. We accept that some of this responsibility lies with riparian owners, who must be educated to take their responsibilities seriously. People generally also need educating to not treat rivers as surrogate rubbish dumps to carry their waste “somewhere else”. It rarely travels far and can build into effective dams during flood conditions.

Pickering & District Civic Society

September 2007
Memorandum submitted by the Institution of Civil Engineers (ICE) (FL 101)

INSTITUTION OF CIVIL ENGINEERS

1. The Institution of Civil Engineers (ICE) is a UK-based international organisation with over 75,000 members ranging from professional civil engineers to students. It is an educational and qualifying body and has charitable status under UK law. Founded in 1818, the ICE has become recognised worldwide for its excellence as a centre of learning, as a qualifying body and as a public voice for the profession.

PREVIOUS REPORTS

2. After the autumn 2000 floods, ICE was asked by government to hold a Presidential Commission into flood risk management. Many of the recommendations of the subsequent report27 and its successor28 are still valid. The findings of the government’s own 2004 Foresight29 report and the supporting technical volume30, to which many ICE members contributed, are also relevant.

FLOODING 2007—THE CAUSES

3. The recent floods were noteworthy in that they took place in June/July/August a period normally associated with localised intense summer storms. On this occasion, a study of the rainfall records suggest that the flooding followed a period of persistent and extremely wet weather, more typical of winter months. Around, Sheffield and Hull this resulted in normally permeable soils becoming virtually impermeable, with the obvious consequences for volumes of surface water. ICE recommends that the Committee considers the issues around surface water management and not focus purely on rivers bursting their banks. By way of example ICE believes that 75% of the Gloucestershire’s flooding was inland—relating to drains and streams—and not main rivers.

DESIGN STANDARDS

4. There is a concern that there is a poor understanding of the meaning of the terminology used to describe the level of protection provided by flood defences. Defences designed with a 1% probability of being breached in any one year are described as operating to a 1:100 year return period. The higher this period is set, the higher the level of defence. This introduction of time periods is aimed at making probability more readily understandable but can also be misleading to the layperson. Taking a 1% probability over 70 years, it can be shown that a 1:100 year flood has a 50% probability of occurring during that period and a 15% probability of occurring twice.

5. ICE supports a review of the suitability of design standards for all flood defences. Property and infrastructure in areas with fluvial (river) defences designed for a 1:100 year incident were a affected by the recent floods. Also, in many areas with relatively high levels of fluvial defences, flooding occurred due to the limitations of urban drainage systems, currently designed to a maximum 1:30 year standard. This was certainly the case in Hull where areas were inundated due to failure of land drainage and public sewer pumping stations. Finally Planning Policy Statement 25 requires that promoters of new development in areas at risk of coastal/tidal flooding ensure they are defended to a 1:200 year standard. However existing property in such areas is not, as a matter of course, defended to this level through the public purse indeed many defences offer standards as low as 1:10 years or worse.

6. It is also the case that the actual risk of flooding in any one area may be far greater than often anticipated because the hazards arise from a variety of sources including rivers, land drainage systems, sewer systems and coastal flooding. This creates a cumulative risk, which can also be triggered by a variety of different meteorological conditions. To combat this threat ICE recommends that the Committee examines how the institutional and legal barriers to an integrated approach to urban drainage and flooding can be overcome. Furthermore whilst brownfield development is to be welcomed for its regeneration benefits, it does to add a burden to existing Victorian drainage systems unless they are strengthened.

7. There is evidence that the public is increasingly risk averse and it is valid for society’s changing view of acceptable risk to affect Flood Risk Management policy and by extension design criteria. Yet the impact of public opinion on policy is not obvious. Any danger to life will clearly result in a very low level of acceptable risk. However if risks are to inundation of farmland, managed retreat may be an option.

8. Finally, in the case of genuinely extreme events, overtopping of flood defences and drainage systems will occur. This fact needs to be accepted and more done to ensure that valuable infrastructure in areas at risk is resilient or relocated.

27 Institution of Civil Engineers (2001), Learning to Live with Rivers, London: ICE
28 Institution of Civil Engineers (2004), Engineering Skills for Flood Risk Management, London: ICE
Forewarning

9. The Environment Agency has recently invested in a National Flood forecasting system which provides a common framework within which to operate a real time flood forecasting model. This is a welcome development, but ICE is concerned that flood forecasting capability varies considerably between EA regions. Investment in flood forecasting models needs to be accelerated to ensure the UK benefits from advances in forecasting. In particular as hydrodynamic river flow modelling develops, it should be possible to make a much more robust link between metrological forecasts and consequential river flows. This will allow agencies to more accurately predict size, location and timings of flooding of the nature that affected Sheffield.

10. ICE believes that the EA issued flood warnings in line with correct procedures but the Committee should note:
- Warnings currently only identify if a “zone threshold” is likely to be reached and do not provide inflation on flood level and timing to owners of individual properties
- The Agency is responsible for giving flood warnings resulting from main rivers and the sea/tide. As noted above, much of the recent flooding was a result of flash flooding related to extreme rainfall. The Met Office with its access to rainfall radar technology may be best placed to offer localised warnings of flooding from these other sources. The inadequacies of the warnings in June/July suggest that the EA and the Met Office should work more closely in this area.

Vulnerability of Critical Infrastructure

11. The floods demonstrated the vulnerability of critical infrastructure including water treatment works, national grid key points and in Gloucestershire major roads including the M5, M50 and A40. ICE recommends considering two linked issues:
- Improving factual knowledge of what is at risk. We understand that Severn Trent did not believe that its water treatment works at Tewkesbury was in an area of flood risk. Whilst the EA’s website does reveal the facility is situated in a 1% flood risk zone, more work is clearly needed to ensure that owners of facilities are aware of risks. Local Authorities have a duty under the Civil Contingencies Act to develop community risk registers. The Committee should examine the progress with the production of these registers and how effective they are in identifying infrastructure at risk and communicating this to owners.
- Much critical infrastructure is now privately managed and decisions around siting and appropriate levels of defences are based primarily on commercial and regulatory considerations. Regulation could be imposed to require either improved contingency planning or any actual guarantee of provision (analogous to the duty on water companies to demonstrate drought capability). We believe that there is a strong argument that the public interest would be served by such a move but recognise that there would be a financial cost, which providers are likely to pass on to consumers.

Advice to the Public

12. Our perception is that senior officials and politicians were successfully mobilised to provide high level information to the media. However authorities were not as successful in providing details and data at a property by property basis or even at a community scale. To an extent this is likely to be a recurring problem, particularly in areas such as Tewkesbury where the flooding incident involved two catchments simultaneously (the Severn and the Avon) and rainfall related flash flooding, increase the difficulty of predicting the combined event. A lesson may be that flooding from numerous sources from different timed events is extremely difficult to prevent by centralised measures in high risk zones. In these circumstances it may be wise to place all properties in the area on the EA’s Automated Voice Flood Notification System to enable owners take personal mitigation measures. However ICE recognise that this is only likely to be effective in areas of high risk, as residents in areas with 1 in 100 year risk, vulnerable to an extreme event, are unlikely to act on a generalised warning regarding an entire flood plain.

Temporary defences

13. Temporary defences, both bespoke demountable defences for specific locations and general temporary defences (eg sandbags) are likely to be part of a long term sustainable solution to flood risk management. Whilst temporary measures provide flexibility and reduce visual intrusion, they are reliant on human intervention and thus only as effective as the system they operate within. Planning exercises are required to improve the smoothness of the mobilisation and deployment of these resources. The public that is protected by such defences also needs to be given a very clear understanding of their advantages and disadvantages. Decision makers should also be aware that, quite naturally, as memories of flooding fades, so does the public perception of disadvantages of temporary defences.
FLOOD RISK MITIGATION—MANAGING PROBABILITY AND CONSEQUENCES

14. The “priority scoring” model used by the Environment Agency since 2002 to allocate funds for flood and coastal has in practice led to schemes that are economically justifiable in cost/benefit terms not receiving funding. It should also be noted that because the system is largely driven by assessment of economic impact, it favours defences in more affluent areas and/or areas with large populations.

15. Overall the Environment Agency is currently spending circa £600 million per annum on flood defences. The Association of British Insurers believes this should increase to around £1 billion. The government’s Foresight study into future flooding estimates that changing weather and development patterns suggest that the UK could need spend between £22 billion and £75 billion in the period up to 2080 on new engineered flood defences. The public acceptability of this level of spending, and also the carbon footprint of the necessary built assets, may be a constraint. If so, government and the EA must engage in a proper public dialogue, particularly with communities who will not be defended to the extent that they may well expect.

16. A further aspect of the “priority scoring” methodology, is that by allowing annual shifts in priorities and budgets it exacerbates a “stop-start” approach to developing flood risk infrastructure. This has hampered recent efforts to develop long term plans for the development and retention of skilled engineering staff, the shortage of which was a key finding of ICE’s Learning to Live with Rivers report.

17. The Committee should note that the comments above refer to coastal and main river schemes. The June/July events suggest that significant investment may also be required to upgrade drainage to address risks associated with flash flooding.

18. In the context of the likely need for additional spending, it is alarming that the National Audit Office found that in 2005–06, 29% of the Agency’s capital budget for river and coastal defence was spent on programme management and planning31. This is above the level one would expect in the utilities sector and suggests that the Agency’s business processes would benefit from streamlining.

SUSTAINABLE URBAN DRAINAGE SYSTEMS (SUDS) AND MANAGING RUN OFF

19. SUDs which as far as possible mimic the natural drainage of a site and deal with runoff close to where rain falls are essential for all new development. We are concerned that Planning Policy Statement 25 (PPS 25) is not prescriptive enough in this respect.

20. However we recognise that SUDs cannot provide a complete answer. The recent floods suggest that in the case of genuinely extreme events the bulk of the flood water is conveyed on the surface and SUDs will have only limited impact. In these circumstances, the most effective way of avoiding indiscriminate flooding of property is for urban development to be designed to accommodate the passage of flood water safely on the surface. Also as water flows downhill, low lying land should only be designated for low level development and certainly not housing. Buildings can also be designed to be more resilient to flooding.

PROScribing DEVELOPMENT IN FLOOD PLAINS

21. It is not realistic to proscribe all development in flood plains. Central to PPS 25 is the process of matching type of development to degree of flood risk. The PPS’s “sequential test” instructs planning authorities to show there are no reasonably available sites with a lower risk of flooding appropriate to that type of development or land use. Where a lower risk site can not be found, proposed development is required to pass an “exception test” demanding that the development makes a positive contribution to sustainable communities and to reducing or managing flood risk.

22. These conditions need to be properly enforced. In this context we are concerned that the Law Society reports that in 2005, 21 major planning applications were granted against Environment Agency advice on flood risk.32

BALANCE BETWEEN INSURANCE, PUBLIC INVESTMENT AND PRIVATE PROVISION

23. At present the UK benefits from “shared” flood risk insurance which is available to most property owners. This situation, combined with a relatively high level of public investment in flood risk management, currently provides a high level of security compared with much of the world. The long term viability of this situation relies on agreement between the insurance industry and the government on where the balance should lie between these two factors. At present the ABI has made it clear that it will provide collective insurance for events less frequent than 1.75 years and in practice public investment determines who is above

or below that threshold. New development and climate change are increasing flood risk but is seems unlikely that the insurance industry will be willing to absorb ever increasing levels of risk. This means that either public investment in flood risk management will need to be increased or more of the cost passed directly to owners of property directly at risk. In principle given that the benefits of flood defence accrue very widely, it would be reasonable to expect the public purse to meet the costs of defences that are sustainable and cost effective.

**Flood Defence—Success and Failures**

24. A full account of the success and failures of defences will doubtless be provided by the EA, however some examples are given below. One point that should be noted is that the condition of flood defence assets does not appear to have been a major issue, as most flooding took place where there was no defence at all or where defences were overtopped.

25. A notable success was the use of demountable defences at several sites including Bewdley. The corollary to this is the problems at Upton-on-Severn where demountables were stored 25 km away as they served a number of villages and were not able to be delivered in time because of traffic problems caused by the flooding. The defences were however deployed elsewhere however, so were put to effective use.

26. Sheffield was impacted severely. The rescue mission for its local reservoir which started to fail demonstrates good and bad practice. Recent inspections appear not to have identified the potential for failure. However the immediate response from both professional advisors and the emergency services (closure of the M1 and identifying areas of evacuation) avoided the potential for disaster. In the event the reservoir maintained its overall integrity and the required strengthening works are being implemented in the short and longer term.

27. We also note that the River Tame defence in Birmingham were overtopped, suggesting there is a case for reviewing and increasing the protection provided to England’s second city.

**Administrative Arrangements and Responsibilities**

28. The poor overall condition and lack of maintenance of many watercourses was a factor in the recent events.

29. The responsibility for critical ordinary water courses lies with the Environment Agency. This is a recent change following previous flood report recommendations. The EA is not however adequately resourced so whilst they have adopted the responsibility they have asked Internal Drainage Boards and Local Authorities to act on their behalf to continue to manage this type of watercourse. Problematically these bodies are also short of funds.

30. The owners of non main rivers, streams and watercourses do have responsibilities but often do not manage their assets well due to lack of knowledge and funds.

31. ICE does not believe it is realistic to attempt to place more responsibilities on riparian owners, not least because the benefits from actions and/or defences created accrue to a much wider section of society.

32. We would ask the Committee to examine the case for shifting the criteria for ownership away from physical location/size to one based on risk. Under such a system, all high risk river systems would be publicly owned and managed. In addition the Environment Agency does have enforcement powers over existing riparian owners. The Committee may want to consider if the EA has the funding, skills and other resources to effectively exercise these powers.

**Clean-up Costs**

33. The Bellwin formula appears to have been too low to cover the clean up costs required for Gloucestershire, Hull, Sheffield and Humberside. The government was forced to supplement the cash derived from the formula with additional injections of cash.

**Wider Issues**

34. There is a danger that current activity will focus almost exclusively on flooding related to rivers and extreme rainfall. This masks the wider question of the adequacy of the UK’s defences against all forms of flooding, including coastal and tidal flood events.

35. If taken together, the overall risk of flooding from potential and combined sources of flood water is probably understated. As noted in the body of our response, when combinations of flood events occur simultaneously or build on each other the difficulty of predicting and defending against their impact is heightened. Models of the impact of climate change suggest that such multi cause events are likely to become more frequent. Climate change is also likely to place significant, specific strain on Flood and Coastal Erosion Risk Management services.
36. In the long term “traditional” flood defences, and the investment that goes with them, will need to be complemented by an increased focus on urban design, building standards and managed retreat. However the public must be engaged with and understand the implications of this debate.

ICE
September 2007

Memorandum submitted by Leeds City Council (FL 103)

EXECUTIVE SUMMARY

Flood risk management in the UK is currently regulated by a series of different statutes and a large body of Common Law. Roles are split between several bodies—including the Environment Agency, water companies, local authorities, highway authorities and riparian owners. As a consequence coordination of effort is problematic and there are many areas of flood risk management for which no-one has an effective responsibility. These include flooding from overland flow, hazards from reservoirs falling outside the regulatory regime of the Reservoirs Act 1975, preparation of off-site emergency plans for reservoirs, and the adoption of sustainable drainage installations.

Design standards for the hydraulic capacity of sewers and watercourses appear to be completely different and require re-appraisal: flood risk victims do not think that flooding from sewers is acceptable at a higher frequency than that from watercourses.

The June 2007 flooding in Leeds disabled, or put at severe risk, critical infrastructure such as the railway station and a major electricity sub-station. This has happened on several occasions in the last five years. Thus, the detrimental effect of the flooding extended unnecessarily far beyond the occupants of the buildings that were inundated. The resilience of critical national infrastructure to flood events needs to be investigated.

Improved collaboration between relevant organisations (local authorities, the environment agency, and water companies)—reinforced by statutory obligations—is needed in drawing up flood risk management plans, preparation of Strategic Flood Risk Assessments, investigating flood incidents, sharing information about flood incident locations, and the sharing of drainage infrastructure records.

Some clarification of the roles of key organisations during a flood incident is needed.

OUTLINE SUGGESTIONS FOR INQUIRIES INTO JUNE 2007 FLOODING

Recommendation

Need for a new, single national statutory framework (and appropriate statutory guidance) which clearly defines the roles and responsibilities of all key players in the management of the drainage infrastructure and flood risk and which requires their participation in joint solutions.

Statement of Problem and Detailed Comment

1.1 The current statutory framework is fragmentary, composed of a disparate set of laws which lack clarity of responsibility, have significant gaps or are difficult to enforce. The responsibilities of riparian owners emanate from common law and can be difficult to enforce. Amongst the key statutes are the:

- Land Drainage Act 1991
- Water Industry Act 1991
- Public Health Act 1936
- Reservoirs Act 1975
- Water Act 2003
- Water Resources Act 1991

EA SUPERVISORY ROLE

2.1 The Water Resources Act, 1991 (s.105) says that the EA “shall . . . exercise a general supervision over all matters relating to flood defence”. The EA needs to strengthen its role in this area. Currently, it seems to be concentrating only on “main river” flood risk. Only rarely does the EA engage water companies in discussing flooding problems on a strategic level. The EA has done little to act as a catalyst for discussion and collaboration between the relatively isolated drainage engineers working for local authorities (this being especially necessary since sewerage agencies were abolished).
**Dam and Reservoir Safety**

**Inadequacy of Water Act Framework**

3.1 The contingency planning requirements included in the Water Act were inadequately framed in spite of advice provided to DEFRA officials by LGA advisers and other emergency planning representatives who were asked to provide an input into the provisions. In particular, whilst there is a statutory requirement for there to be an on-site plan developed by the undertaker and links developed with emergency responders, there is no requirement for there to be an off-site plan in line with well-established models in place for industrial accidents under the COMAH regulations. There is no compulsion for such work to be undertaken other than through its being picked-up via the Civil Contingencies Act risk assessment process. However, in a number of specific areas, this would constitute an enormous burden within existing resources and, if done correctly, would prevent any other emergency planning work being undertaken. In addition to this, no lead agency has been identified for who should undertake this work nor any recharge mechanism for compensating public agencies for mitigating risks related to structures owned by private entities.

3.2 In relation to structures falling under the Reservoirs Act threshold of 25,000 cu. m, only 40% of these relate to water company-owned reservoirs. A large number of the majority remaining are owned by charities or other organisations, many of which are not financially resourced to undertake on-site planning nor to undertake the responsibility of co-ordinating an on-site response.

**Appropriateness of Current Reservoirs Act Threshold**

3.3 A significant number of reservoirs exist, which are below the capacity (25,000 cu.m) required for registration as a large raised reservoir under the 1975 Act, but which are nevertheless believed by the EA and local authorities to constitute a potential flood risk to communities. Many of these are disused mill ponds in the Pennine area (Lancashire, Yorkshire and Derbyshire) which are no longer maintained for their original function and are in a poor condition. Some are on hillsides overlooking populated areas and, because of the lack of maintenance and superintendence, are arguably a greater hazard than many larger reservoirs. Consideration should be given to including these within an enforcement regime, or at the very least issuing safety guidelines to their undertakers.

**Scope of Coverage of Reservoirs Act**

3.4 A number of reservoirs are designed with the intention of storing considerably less than 25,000 cu.m., but are quite clearly capable of storing a vast amount more. There seems to be confusion amongst panel engineers about the definition of the relevant capacity. Some even say that a normally empty balancing reservoir should be considered as having zero capacity for the purposes of the Act. This quite clearly ignores the whole point of the Act, which is to ensure that potential hazards are properly supervised. The Enforcement Authority (the EA) should review the interpretation of the Act.

3.5 There are also a number of quarry lagoons which constitute de facto reservoirs, but which are regulated by the HSE under a less rigorous regime contained within the Mines and Quarries Act. Once these are decommissioned, we understand these are unregulated or insufficiently regulated. At least some water companies also have large non-water storage reservoirs for sludge etc which have capacities over the Reservoirs Act threshold, but which are also not regulated and may give rise to major risks. The nature of this risk would suggest that these bodies of water should be subject to the same rigour as actual reservoirs.

**Run-off from Open Land (“Land Drainage Flows”)**

4.1 Many properties in Leeds were flooded in June 2007 by water running off fields and open space. No one, however, currently has any responsibility or duty to resolve flooding that arises from surface water run-off from fields or open space.

4.2 The Water Industry Act, 1991 (s.94) says: “It shall be the duty of every sewerage undertaker [ie water company] . . . to provide, improve and extend such a system of public sewers (whether inside its area or elsewhere) and so to cleanse and maintain those sewers as to ensure that that area is and continues to be effectually drained” . . . and yet the water companies refuse to see it as their responsibility when houses are knee-deep in water that has run off fields and highways! The reason they give is that the legislation only empowers them to provide sewers and “sewers” are elsewhere defined as drains serving “premises” (not open land). In many parts of Leeds—in common with other urban areas—there are no natural watercourses. Consequently, if the overland flows cannot soak away (due to clayey soil) and cannot go into the sewers, there is no solution that anyone has a duty to implement. Section 94, which originally was a duty on local authorities in the Public Health Act, 1936, has thus been rendered meaningless.

4.3 The Councils and the EA have permissive powers to carry out flood alleviation works on “ordinary watercourses” and “main rivers” respectively, but no duty. It is vital that the “duty to effectually drain” the area should be made enforceable—even if it is lifted out of the Water Industry Act and given to the EA. Otherwise, there is no point in calling for greater cooperation between the various agencies to resolve flooding problems.
CONNECTIVITY OF OTHER DRAINAGE INFRASTRUCTURE

5.1 The Water Resources Act s.106 requires a water companies to accept flows from domestic properties to its drainage network once planning permission has been granted, but it does have the ability to refuse the connection of highways drains to this on “reasonable grounds”, leaving this water with nowhere to drain.

DESIGN STANDARDS AND POLICY

6.1 The water companies and developers building prospectively adoptable sewers commonly design sewers to accommodate flows arising from the worst case 1 in 30 year rainfall without flooding. This is in accordance with the current edition of the Sewers for Adoption guidance manual issued by Water UK. The water companies during June 2007 seemed to quickly seize on this figure to disclaim responsibility for addressing sewer capacity issues when people were affected by what seemed like an extraordinary rainfall. In doing so, they were often making technically erroneous assumptions, since what is perhaps a record one day rainfall is not necessarily more severe than the 1 in 30 year sewer design flow, which should be based on a much shorter rainfall duration.

6.2 When flood alleviation schemes are being designed by flood defence operating authorities (eg the EA and local authorities) to control flooding from watercourses, a much higher standard is used—e.g. a 1 in 100 year flood, or worse, including an uplift for climate change. This discrepancy between the standards used for sewers and watercourses does not seem reasonable.

6.3 The rainfall in June 2007 has also brought into question the reliability of nationally accepted methods for calculating return periods. In central Leeds, in the 21 days up to 2 July 2007, 250mm of rain fell. This is one third of the average annual total and, according to the national Flood Estimate Handbook, is only likely to occur, on average, once every 1000 years (ie 0.1% AEP). Few people who have experienced the exceptional rainfall of the last few years, however, would stake much on this being true! It is perhaps time that there was a review of these methods of calculation. If return periods are over-estimated this not only makes the public cynical, but also reduces the estimates of future flood damage that are used in scheme appraisal (cost-benefit ratios, etc).

6.4 Government should also undertake research and provide guidance in a number of other drainage-related areas:

— What is the impact of permitted development that increases hard standings and paved areas? Should such development be subject to formal planning approvals and should permeable solutions be mandatory?
— Do “beanie blocks” make a positive or negative contribution to highway drainage?
— What criteria should be used for determining the cleaning frequency of various forms of highway drainage? Should there be recommended standards for main routes, urban vs rural etc?
— What prevention strategies can be adopted for limiting the entry of waste such as cooking fats into the sewer systems?

CRITICAL NATIONAL INFRASTRUCTURE

7.1 We were disappointed that in spite of the 2000 floods and the preparations for Y2K nationally that the issue of the CNI has not been bottomed. Government needs to urgently ensure that electricity substations and fresh water pumping stations and their ilk are adequately protected. In addition, there should be nationally agreed resources to deal with business continuity issues arising from failures in these areas, in terms of back-up power supplies, national water contracts for bowsers and bottled supplies, very high-volume pumps etc.

STRATEGIC FLOOD RISK ASSESSMENTS

8.1 We are led to believe that the SFRAs—key planks in driving our approaches to development and flood risk—now being produced for local authorities by consultants in compliance with PPS25 are of divergent qualities and of limited utility. DEFRA and EA should ensure that robust standards are in place for these and that rigorous quality control should be in place. Steps should be taken to ensure that all parties with statutory role in drainage provision buy in to the SFRA process by supplying flood risk information in relation to their own drainage assets.

SUDS

9.1 Whilst sustainable urban drainage solutions are being encouraged for new developments, there is a sense in which we might be storing up further flood risk problems with these. The causes for this are that once developers build these they do not wish to maintain these and water companies do not want to adopt these. Local authorities are then looked to in order to intervene and pick-up the responsibility, even though
these costs would have been avoided if conventional gully and piped drainage had been installed. It is recommended that government takes a fresh look at the effectiveness of, and responsibility for, SUDS and how these should be better regulated or taken account of.

**Conflicts between Different Central Government Departmental Priorities and Statutory Guidance**

10.1 Central government needs to reconcile the imperatives of different departmental agendas to ensure these do not conflict. It is already clear that there are huge tensions between growing pressures from DCLG to build ever-greater numbers of housing in urban areas many of which may be brownfield sites located in flood risk areas and the pressure from DEFRA and the EA to restrict growth in flood plains under planning guidance (PPS25). This tension is particularly acute given the lack of adequate investment in flood defence schemes.

10.2 We also understand that the EA in considering flood defence measures is legally only allowed to assess the economic benefits on the basis of buildings already in place and not developments forming part of the spatial planning in the Local Development Plan. This is clearly short-sighted and limits the utility of its methodology.

**Local District Drainage Strategies, Funding and Co-ordination Forums**

11.1 To support a revised national framework, there should be a statutory duty for all key stakeholder organisations to cooperate in the development of a local authority district-based five to ten year “Drainage and Flood Risk Strategic Plan” highlighting priorities around the existing infrastructure and how this should evolve. In order to ensure the success of this, it would be helpful if local authority district based forums comprised of representatives of the council, EA and water company are set-up on a statutory basis at a senior management level (to drive the strategy) and at a technical-operational level (to address known problems, investigate incidents, and review plans for major developments on a multi-agency basis). Both of these have been set-up in Leeds with the aim of driving a more co-ordinated approach in which local priorities can be better aligned or at least not conflict.

11.2 It is essential that these strategies are directly linked to an investment plan to fund this. Bodies like OFWAT should also be required to factor these into discussions around water company spending plans. Having such a strategy in place should also prevent drainage from remaining the “Cinderella service” that it currently is, underfunded and largely ignored.

11.3 Central government should also consider whether there are sufficient young people being brought into the profession to ensure that technical expertise and detailed local knowledge is not lost.

**Statutory Duty to Maintain Records of the Drainage Infrastructure**

12.1 The effective maintenance and upkeep of the drainage infrastructure requires responsible bodies to maintain adequate records in order to highlight where this is, what size it is, what risks it faces, what cleaning and maintenance frequencies are required, and the interdependencies and links to other parts of the infrastructure. Assessments can then be made about how they should be maintained, by whom and what capital investments are required.

12.2 Several years ago, Leeds CC was in the position where it maintained substantial records of culverted watercourses (although it has no statutory duty to collect or maintain these), but had few records of private sewers or highway drains like many authorities. In our view, this contributed to a less than adequate maintenance regime: “out of sight, out of mind”. Following previous major floods, the Council took the view that we needed a comprehensive baseline for our maintenance, investment and risk assessment work and began to survey all aspects of the Council-owned infrastructure. As a result of this, we have identified 48,000 of our 130,000 highway gullies using GPS for upload into a database and GIS and have established that over 5,000 of these require more intensive maintenance as “wetspots”. We also established that, in spite of the current standard eight monthly cleaning regime, some 7% of gullies are blocked requiring reactive action.

12.3 In our view, the proposed transfer of private sewers to water companies will result in most of them being recorded in the near future. We would also suggest that all watercourses and ponds of a significant size in a district should be identified by the local authority and information maintained on the ownership of these for enforcement purposes. Solicitors should also be required to draw attention to these “assets” as part of the conveyancing process so that owners understand the nature of the burden they are taking on.

**Statutory Duty to Share Information on Infrastructure and Cooperate in Investigations**

13.1 In flooding incidents, the flood waters may arise from multiple sources—sewers, highway drains, watercourses, overland run-off, etc—and it is essential that the different bodies with responsibilities for the relevant assets collaborate in the investigation of the causes to resolve problems successfully, but also to avoid “buck passing” allegations. However, investigations require comprehensive records and obtaining whatever information there is can be problematic.
13.2 To assist in investigating flooding or appraising the flood risk from new developments, the Council has been provided with access to Yorkshire Water sewer records but only on a stand-alone YWSPC. However, for our purposes it would be far more useful to be provided with a copy of these in GIS format in order to superimpose them on our own drainage data. This would enable us to more easily understand the route of surface water run-off and to trace this, but is not currently permitted. An example of the complex route taken by run-off might be: Highway run-off enters a highway gully; this discharges via a connecting pipe into a highway drain; this in turn connects into a surface water sewer; this then connects into a culverted watercourse; this discharges into an open channel watercourse more than a kilometre away from the original gully. As can be imagined, it is very difficult to investigate drainage problems holistically when the various records of each undertaker or owner can only be seen in isolation. Consideration ought to be given to amending the law so that anyone who has a statutory duty to keep drainage records also has a duty to share such records with partner organisations in a compatible GIS format.

13.3 In another regard, when investigating recent flooding from culverted watercourses the Council has found that certain utilities have laid service pipes and cables through the middle of culverts that are in riparian ownership (whose owners probably didn’t even know of the existence of the culvert).

Recommendation

Need for central government leadership and funding for the development of policies and tools to support the response to flooding incidents by Cat 1 and 2 agencies.

14.1 There is a great deal of good practice available in terms of approaches to responding to flood incidents, but there should be more national leadership, coordination and financial support to ensure that this is or can be adopted throughout the country.

PROVISION OF A SINGLE, PROPERLY-RESOURCED NATIONAL FLOODLINE NUMBER FOR MAJOR FLOOD EMERGENCIES

15.1 We have established from our long and frequent experience of serious flooding that the victims of flooding experience great frustration in establishing the source of their flooding to identify who to call and then trying to get through to a relevant organisation able or prepared to help. The following are just some of the numbers they try: local authority general helpline; specific Council departments, such as drainage, highways, etc; the water company; the EA; the Fire Service; or even the Police. Given the difficulty of establishing the cause even for technical staff, it comes as no surprise that the public often get referred on elsewhere in a serial “buck passing” exercise. Serious consideration should be given to piloting a single flood helpline for all forms of flooding which removes the barriers and provides clarity for the public who only want to get help.

SIGN-UP TO EA FLOOD WARNING SYSTEMS

16.1 In spite of excellent work over the years by the EA to promote its warning systems and repeated flooding in many areas, many householders fail to sign-up to its flood warning systems. One of the consequences of this is that the scale of damage caused can be higher due to a failure to take appropriate precautions in time. Data protection law has been used as a fig leaf for this failure, but the public authorities are still obliged to support residents who fail to help themselves.

16.2 The CCS should explore the possibility of all affected householders in flood warning areas being automatically opted into the EA’s systems with the provisions for them to “opt out” should they wish. This would save the EA a great deal of time and effort wasted in promotion, make the schemes more viable and reduce the level of damage incurred allowing a speedier recovery.

SINGLE NATIONAL FLOODING LEAFLET AND ONE-STOP FLOOD RECOVERY WEBSITE

17.1 Currently there are a large number of leaflets in circulation to provide information to householders and businesses who have been flooded which cover a range of issues. These include: general who does what (LAs); insurance (ABI); rogue builders (Trading Standards); crisis loans (DWP); public health and clean-up (CIEH); as well as other leaflets provided by the EA or water companies. As it stands, we have a large number of organisations reinventing the wheel, preparing leaflets of differing quality and then bombarding residents with a variety of data, when the information needed varies little across the country.

17.2 We would recommend that the CCS leads a short exercise with DEFRA to identify best practice and lead the preparation of a best practice template encompassing all key messages which can be adopted in all local areas and which enables local contact numbers to be inserted.

17.3 This initiative could be coupled with a national one-stop shop website of helpful information.
NATIONAL CONCEPT OF OPERATIONS

18.1 In some areas, some agencies have yet to accept that they have a key role in responding to flooding emergencies. Following the failure of West Yorkshire Police to play a meaningful role in previous floods, Leeds CC led the development of a CONOPS document stating the roles of each agency more clearly. Even though this has been exercised successfully, in the recent floods WYP organised its tactical co-ordination on a county rather than district basis, even though 4 of the five districts were struggling with co-ordination in their own patches and the County HQ could not be reached.

18.2 At the same time, Yorkshire Water appears to have focused exclusively on responding to the challenges to its own infrastructure rather than participating in a response characterised by partnership. The EA local areas were overwhelmed and were unable to provide the fullest support to LAs on those “main rivers” which were formerly critical ordinary watercourses, which in Leeds posed the major area of problems.

18.3 National representative bodies (LGA, ACPO, CFOA, Water UK) should be brought together with the EA by CCS and DEFRA to agree a national protocol on roles and responsibilities in flood incident response to avoid confusion. The CCS should urgently consider the status of water companies in responding to flooding as their Category 2 status has provided a pretext for a lesser role.

CLARITY AROUND WHO SHOULD PUMP-OUT DOMESTIC PROPERTIES

19.1 When flood waters are receding, one of the key goals of residents is to ensure that remaining water is pumped away as quickly as possible to enable the process of drying and restoration to begin. Some insurance companies provide pumping out as a standard service, whilst others refuse. Leeds would like to contribute in this area, albeit on a prioritised basis. Our Fire Service are prepared to offer this, but only if a £100 fee is paid. What service should the public expect and should this merely be down to local determination or the generosity of particular insurance companies?

PLUVIAL FLOODING RESPONSIBILITIES AND FLOOD WARNING TECHNOLOGIES

20.1 The recent off-river flooding served to highlight the lack of clear responsibility for providing warnings and co-ordination of pluvial flooding-related incidents. This is something that requires meaningful discussion between key agencies at the national level.

20.2 On a more practical level and given existing limitations, one of the biggest problems faced during the response to flooding in June 2007 was ensuring that the Council’s limited resources were being used preemptively in the right areas. Given our lack of accurate data, it would have been extremely useful for the Council to have had access to real-time spatial rainfall data in the shape of the Met Office’s rainfall radar data (Nimrod). We are aware that the Environment Agency has access to this in its “HiRad” system, but local authorities generally do not have access and the cost of this is quite prohibitive. Given that this data is being collected by a quasi-governmental organisation, consideration should be given to making it available to the whole of the flood defence community (including local authority emergency planners and drainage engineers) free of charge.

NATIONAL PROTOCOL FOR INFORMATION-SHARING ON FLOODED LOCATIONS

21.1 An effective response in support of the community’s needs is wholly dependent on having good intelligence on locations flooded and to what extent at the earliest possible moment, regardless of the source. In the recent floods, this proved tortuous at times, because no single agency maintains a single repository of this or is necessarily concerned about flooding from sources for which it has no responsibility. In the absence of a single helpline, rainfall radar in the local authority and a single or linked GIS database for logging all properties, the response can be ad hoc or await identification of affected properties some days or weeks later in large urban districts where residents have self-evacuated. Access provided by Cunningham Lindsey (25% of the market) to the address details of claims for flood damage in Leeds yielded a significant increase in data around affected properties and enabled the authority to visit newly-identified affected areas to offer support.

21.2 However, there are several ways in which this situation might be rectified:

- Research to be undertaken by the EA with key partners (LAs, CFOA, Water UK) to explore how a secure web-based flood incident logging application might be developed in order for agencies to pool information on flood locations and type of flooding to ensure that affected residents get the response needed;
- CCS/DEFRA to explore a protocol with the Chartered Institute of Loss Adjusters to provide a process of early access to address and post code details of affected properties to enhance the quality and speed of multi-agency recovery operations in areas suffering flooding in multiple areas.

Prepared by:
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Memorandum submitted by the Coleford Area Market and Coastal Towns Initiative Partnership (FL 105)

This submission is on behalf of the above named organisation which is involved in development of a community led regeneration strategy for the Parish of Coleford, West Gloucestershire and its surrounding area.

Flooding Issues During June and July 2007 and their Effect on the Coleford Area

Executive Summary

The flooding that happened during June and July 2007 is not without precedent in the Coleford area, but the speed and ferocity was not experienced to such a degree in such a short period of time.

The problems faced in Coleford area are not unusual, being:

(a) Failure of government to accede to the needs for finance local authorities to enable local authorities to maintain and improve surface water drainage systems to cope with additional development within the area.

(b) Failure to identify responsibility for existing drainage ditches and culverts constructed in the Victorian era, leaving this liability to an unsuspecting public as being riparian owners. (Land Drainage Act 1991)

(c) Failure to allow sewage authorities to raise additional funding to deal with known problems of ingress of surface water into the foul drainage system and to plan for the future to ensure this does not continue in the future.

All of these problems have resulted in an infrastructure that, at best, did not satisfy the needs of the community before extensive development that has taken place over the past 50 years.

Local authorities have worked together well in providing emergency care but previous attention to the above issues would have meant that the emergencies could have been averted.

Coleford, West Gloucestershire: Flooding Problems 2007

1. Topography: The area of land covered by this report is a large basin with shallow top-soil on a clay bed leading to a narrow winding valley. Previous heavy rain led to the upper soil levels being saturated and the lack of ability for further penetration to lower levels. Levels from the rim of the basin begin at over 700 feet above sea level to a level at the point of entry into the River Wye of more than 200 feet above sea level. None of the area can therefore be classed as a flood plain in the normally accepted sense.

Approximately 1 inch of rain falling in the area produces in the region of 45 million gallons of water draining through a narrow valley, the head of which is near the town itself. On 25th June alone 59 properties in the small town were reported as being affected, that quantity having fallen in a few hours.

2. Existing land drainage: The drainage system comprises Victorian culverts running for a distance over more that 1.5 miles. They are fed by the confluence of small streams each entering higher in the valley. The culverts join together in the town centre and the main run varies in size as it passes through the area, due to the many repairs carried out over a long period of time by various land owners, often without consideration of the effects on other properties. Surface water run-off from most properties and developments finds its way into this system resulting in a huge build-up of hydraulic pressure and collapse of parts of the culverted system. In addition springs are evident as the land slopes downwards running through farmland and small hamlets adding to the flow where the culvert becomes a torrent in open stream sections. The least of the worries are that bating could assist in some areas whilst wholesale repairs and renewal may have to be the ultimate solution in others.

3. Sewer systems: Some properties discharge surface water into the sewers resulting in surcharge of that system and consequent spillage onto the streets of the town and some local farmland. Urgent inspection of which properties affect the situation is needed but property owners are reticent to allow dye testing and this will be a lengthy process.

4. Road drainage: The majority of existing road drains are of the “chute” variety that allow all debris to enter the system resulting in the blockage of drains. Where “sump” type gullies have been installed there is a large build up of debris and silt that is normally only cleaned out once a year except when emergencies arise. This is due to the lack of revenue available for such work.
5. Action taken: A Public Meeting was held on Saturday 21 July, following which a Forum has been set up through the Partnership and comprises representatives of the Statutory Authorities, Parish, Town and District Councillors and Partnership volunteers. The Forum has discussed the existing problems and all bodies are of the opinion that a large sum of money is required to enable proper surveys to be undertaken resulting in a well formed plan for provision of proper drainage that will cope with existing problems and prepare for the future threats of further climate change. Financial help is therefore urgently needed to avoid any further repetition of the problems so frequently experienced in this rural area.

Coleford Area Market and Coastal Towns Initiative Partnership

September 2007

Memorandum submitted by Sue Everett (FL 107)

I have only just found out about this inquiry, so have put together a quick email and also a few slides, using Powerpoint.33

1. The local authority (West Berkshire Council) assisted by Thatcham Town Council are currently compiling an overview of the flooding in West Berkshire on 20 July, so hopefully you will have received more detailed information from them.

2. I am a resident of Thatcham but was lucky not to have been flooded. However, over 1000 residential properties were flooded. The local authority is still trying to get a final figure. It may reach 1200+.

3. The nature of the flooding was associated
   — astoundingly high rainfall over a short period of time
   — surface water unable to “fit” into culverts and drains through the built up area

4. A significant number of properties were flooded because before housing estates were built in the 1960s and 1970s, ditches and streams that took water from the valley slope down to the River Kennet, were diverted into culverts. These culverts now lie under roads and gardens, although residents have no information about the precise line of some of them and whether or not they run under their gardens. Certainly it would appear that parts of the culverts run under residential properties. See Slide 3 showing properties on Swansdown Walk that illustrate this.

5. Some of the housing estates were built “on appeal”. Environmental Assessment unheard of, as was ecological design. With hindsight, linear parks should have been left to cater for flood events, allowing sufficient space for streams to fill up into grassland between houses.

6. The amount of surface water is exacerbated by gardens being concreted over, and the lack of porous hard surfaces. Also, I suspect that gutter maintenance is too infrequently undertaken. However, these were not the cause of the flooding.

7. Infilling—replacing two or three houses with denser developments and building in gardens—is increasing the density of concrete and potentially worsening the surface water situation.

8. On 20 July sewer overflows occurred nearly everywhere in the town where there was flooding, including in the vicinity of the new sewer main installed by Thames Water south of Lower Way.

9. A new housing estate of nearly 900 units (Kennet Heath) is currently being built in the lowest part of the town. Many houses only recently occupied here were very badly flooded as water from the rest of the town ended up here. Originally the plan was for 550 houses, this number has now been increased by one third owing to the pressure for housebuilding. This area is known as being prone to flooding. It used to be occupied by the MOD (supplies). Houses here should have been built with garages and non-residential space in the lower floors. Can plans for the houses yet to be built here be changed?

10. The flooding must be having a significant impact on the housing market and will do so into the future. There is no vacant rented accommodation available.

11. There is plenty of evidence that drains and ditches serving the town had not been sufficiently maintained. On the 20 July this fact may not have prevented flooding in most cases. However, this is an assumption.

12. There have been other flood events in the town, eg in the 1970s. I am told by older residents in the area, that the most serious flooding was after the 1947–48 winter—at this time there were no housing estates in the town. There was also a near-flood event on 31 December 2006 when one of the streams running out of a major culvert in the south of the town overflowed its banks. There was also a sewer overflow (Longcroft Road) following this event. If the rain that day had been more prolonged, a similar event to 20 July may have occurred.

33 Not printed.
13. Regardless of the cause of flooding, and anticipated changing weather patterns associated with climate change, events likely to result in significant flooding of residential properties in the town are likely to occur at least 1 in 60 years, possibly 1 in 30. The developments constructed since 1960 have not taken this periodicity into account, nor the likely quantity of water that may arise following extreme events such as in 2007 and possibly 1947–48.

14. Many properties flooded on 20 July 2007 will flood again, if a similarly extreme event occurs. Only by knocking houses down along the path of major culverts and creating linear parks, will future flooding be prevented.

15. Surface water could be reduced by encouraging residents to retrofit porous surfaces to hardstandings. Grant aid would be required. If there was substantial activity on this, potentially minor flood events might be averted but extreme events as occurred on 20 July would inevitably flood residential properties again.

16. Thatcham has grown at an extraordinary rate, from a population of around 5,000 in 1950 to an estimated 25,000 today. There are huge pressures for housebuilding in West Berkshire. All of the developments to date can be construed as being environmentally unsustainable on grounds of carbon footprint and sustainable drainage, ie neither have been taken into account.

17. The largest development in the town was built in the 1990s (Dunstan Park). This was built over predominantly pasture land that gently sloped along the foot of the valley. This area was riddled with springs, all of which are now in pipes. Water from this area will have substantially exacerbated flooding in the south of the town—balancing ponds and culverts were insufficient to take the quantity on 20 July. See Slide 3—Stoney Lane—much of this water will have come from the Dunstan Park development just upslope. There are pressures to build more houses just to the east, but the drainage systems lying to the south would clearly be unable to cope if this was to happen.

18. No one—residents—local authorities—voluntary groups—was prepared, in any way, for the flooding that occurred on 20 July.

I am noting below some further specific items worthy of consideration for the proposed EFRA enquiry.

1. FLOOD VICTIMS: HEALTH

   A fair number of flood victims I have spoken to in Thatcham fell ill after clearing their houses out. As far as I know no one is producing any figures on this, but the GP surgeries should be requested to do so.

   Advice was not available prior to the floods, and residents were probably to a significant extent unaware of the risks to their health, which includes gastro-type infections as well as Weil’s disease, as a result of dealing with contaminated water.

   In addition, an obvious action at time of flood would be for all residents to know NOT to use or flush the loo, as this will inevitably increase contamination of flood water. No advice on this has ever been available as far as I know.

2. RETROFITTING BETTER DRAINAGE SYSTEMS

   Most of the flooding in Thatcham was associated with flash flooding—water following the course of old streams which now have housing estates built on them and which have, in part been diverted, into culverts which do not completely follow the old courses. You can clearly see where the land lies lower (the houses are also lower) where the old streams used to run.

   These houses will flood again. Should they be knocked down? That may be the only way to stop future flooding.

   The drainage infrastructure in many flooded areas was proved inadequate. Who will pay for it to be upgraded, where this may be possible? Who is going to identify what needs to be done where?

3. IMPACT ON HOUSING MARKET

   What is the future for houses affected by flooding? Who will want to buy them? To what level will their value have depreciated? 1500+ houses flooded in Thatcham out of around 8000 residential properties has already had a significant impact on the housing market and removed all available rented properties from the market.

4. HOUSING IN FLOOD ZONES STILL BEING BUILT—SHOULD DEVELOPMENT BE STOPPED?

   There is a large housing estate of 880 homes in the process of being built in Thatcham (Kennet Heath). A substantial number of properties on this development, situated at the lowest part of the town, were flooded. Should there be a moratorium on completion of this development until a full and proper assessment of flood risk is undertaken?
5. **ROLE OF ECOLOGICAL MANAGEMENT OF LAND IN MANAGING FLOODING**

The Environmental Agency should be provided with statutory powers to acquire and manage land for flood management purposes, or to impose management of land which at present may contribute to flooding. This includes blocking upland drains, and drains in forestry land. For example, a large woodland near Thatcham (under an FC management agreement with the landowner) has a substantial network of drains in it, water from which will have contributed to raising the levels in the River Pang, which overtopped and flooded many properties downstream, e.g. in Bucklebury Village.

The Higher Level Environmental Stewardship Scheme is insufficient to address the need to develop large-scale ecological management of land areas for flood management. It is a voluntary scheme (landowners have to apply) and in any case its cash resources are restricted, meaning that it will be targeted at land that is designated as SSSI (Sites of Special Scientific Interest).

The EA should be resourced to undertake catchment based land management plans to manage flood risk and identify specific sites where ecological land management activities to manage flooding might be undertaken. Even in places like the Berkshire Downs, there are areas of agricultural land which flood when water levels are high along the site of springs, but their drainage has been “improved”, which then increases the quantity of water ending up in villages downstream (Great Shefford is an example). As far as I know there is no comprehensive assessment of, for example, the River Kennet catchment, to identify land that is actively managed for flooding, who manages it, and there is no comprehensive plan for managing the catchment to reduce flood risk. As far back as the early 1800s, water meadows were created at Hungerford with the precise objective of reducing flooding downstream in Newbury. These were actively managed with sluices etc, but structures have since been abandoned. Sluices and so on that exist on the Kennet are, as far as I know, managed by lots of different people, especially water keepers employed by fisheries and landowners. They actually do quite a good job, but what they do isn’t as far as I know coordinated nor part of any grand plan.

*Sue Everett*

*September 2007*

Memorandum submitted by HR Wallingford (FL 108)

FLOODING LESSONS LEARNED REVIEW

1. **BACKGROUND TO OUR SUBMISSION**

1.1 HR Wallingford has been at the forefront of providing research and specialist advice on flooding and flood risk issues for 60 years both as a Government institution to 1982 and then as an Independent Research Organisation. Recent and ongoing research includes the development of a range of tools and methods to underpin the evolving flood risk management practice in the Environment Agency—tools and methods that were used to support the OST Foresight Future Flooding report and provide the Agency and Defra with much of its information on present day risks and impacts. HR Wallingford has acted to provide detailed forensic examination of events (for example the Boscastle flash flood) for EA.

1.2 HR Wallingford has been actively engaged in flood risk management research and practice in the UK for most of its 60 years. Major recent advances include:

- new Conveyance Estimation System (CES);
- guidance for local authorities and other stakeholders on development in flood-risk areas;
- work on Flood Resilience of new buildings;
- performance of existing flood defence systems;
- deterioration of flood defences;
- performance of coastal / sea defences;
- use of Temporary / Demountable protection systems

1.3 We continue to extend these and other techniques and guidance through a number of research projects, including leading and coordinating the largest ever EC research project on flood risk management (FLOODsite), and leading roles in national flagship research programmes sponsored by EPSRC (FRMRC) and NERC (FREE).
1.4 Our commentary is limited to specific remarks on scientific and engineering issues that contribute to impacts, lessons that may be learnt from experience of flood risk management planning in the UK and Europe. Our main concerns are over delays in up-take of techniques or guidance to reduce flood risk; inefficiencies in the flood protection system and the degree of public engagement in developing and meeting realistic expectations for defence or resilience.

2. THE WRONG TYPE OF STORM—WINTER v SUMMER EVENTS; USE OF EXTREMES ANALYSIS IN PLANNING AND DESIGN OF FRM

2.1 Floods take place throughout the year. Generally accepted views are that rivers flood in winter due to saturation of the land from extended periods of rainfall. In contrast, it has long been understood that urban drainage systems are most tested in summer due to short duration high intensity thunderstorms which are limited in extent. Analysis shows that summer floods in July are not particularly unusual (in that there have been many instances of serious flooding events in summer), including Lynmouth in August 1952, Boscastle in August 2004 and the Yorkshire floods in the summer of 2003.

2.2 The flooding in Gloucester, however, shared many characteristics of a typical winter flood (slow rise of water level, plenty of warning, velocities of flow that were not extraordinary). These complications demonstrate that flood risk scenario modelling must consider storm “events” in the context of preceding rainfall, and must consider appropriate roughnesses for a wide range of possibilities. Current single event statistical techniques used by many practitioners miss these critical interactions between rainfall events and fail to predict the true risk at a given location. Simplified methods also fail to capture the likelihood of multiple flood events occurring at different locations simultaneously and the heightened probability of a secondary or tertiary flood occurring at one location.

2.3 It is probable therefore that many models may have used the “wrong type of rain” to underpin designs and plans, without reflecting fundamental differences between winter and summer events, and without capturing interactions between rainfall events within the design statistics. This is compounded if estimates of river resistance are based on “winter” conditions (representing conditions in historic calibration events used by the models), but these floods were in the summer with much more vegetation, and hence greater resistance to flow. Flooding in Abingdon arose as intensive flow into the Ock was blocked by summer vegetation.

2.4 Improvements to flow modelling through the CES, and in continuous simulation of the flood system through links to weather radar, provide ways forward in our ability to understand the behaviour of a system and how best to manage it, but only when advanced capabilities are used in practice.

3. RISK IS MORE THAN PROBABILITY TIMES CONSEQUENCE—BUILDING IN RESILIENCE TO DEAL WITH EXTREME EXTREMES

3.1 Standards for drainage provision are very variable. Highway drainage may use 1:1 to 1:5 year return periods. Sewerage Undertakers design for a standard of protection of 1:30 years against sewer flooding (rarely achieved), but are measured against a 2:10 year standard (DG5) for internal flooding of domestic properties. New developments are required to meet 1:100 (fluvial) or 1:200 years (coastal / estuarial), standard to which the EA aspire. Reservoirs have a range of higher return periods associated with the risk to people downstream.

3.2 Different standards may be justified where there are implicit cost / benefit balances behind the standards. An alternative way of looking at this is that flooding is on a scale ranging from nuisance through to catastrophic. The fact that standards have been selected that are cost effective and affordable does not mean that catastrophic events are accepted by society. Expectations are deeply ingrained that society should be able to deal with (mitigate) all situations. A result of Hurricane Katrina is that blame has been apportioned to a range of organisations for not being able to deal with the disaster.

3.3 Current research is focusing on a risk based methodology (looking at all probabilities and consequences), but it still has a fiscal/damage cost approach to identify optimal management of drainage assets. This tends to minimise rare events due to their low frequency of occurrence. What is evident from the recent event is that above a certain threshold, disasters result in potentially extreme social consequences. Power grids and water supply infrastructure can be lost leading to potential short term social breakdown. Simulations of flood risk therefore needs to include the occurrence of potentially extraordinary events and the wider impacts that these may have, not just relating to damage/cost functions. This may apply not only to the direct impact of flooding, but also the consequential impacts due to loss of electricity, water supply, essential transport, and other high social dependency requirements.

3.4 It is widely noted that responsibility for drainage is distributed across many organisations, each with different legal remits, which does not encourage looking at flooding holistically. There are events where positive drainage provision cannot be made, so planning must take account of these extreme events and ensure that consequences are minimised. Thus hospitals, bungalows, water and sewerage works, critical infrastructure, or toxic / reactive industrial processes must be considered in terms of vulnerability and impacts that flooding can cause. For example, the Thames Barrier arose from the recognition that the
consequences of flooding London are very high and the required standard of protection was set appropriately high. The polder system in Holland are required to give 1:4000–1:10000 year standards of protection.

3.5 The lack of resilience in public infrastructure was clearly demonstrated this summer. Lessons from extreme events world wide (the Asian Tsunami, Katrina, etc.) have already shown that it is imperative that critical infrastructure and emergency services continue to function when they are needed most. The lack of clarity on the location and vulnerability of critical infrastructure compromised abilities to manage flood risk, to minimise disruption, and to recover quickly. Registers of critical infrastructure should be accessible and should show their vulnerabilities to flooding. There is little point in seeking to promote flood resilience for private houses (see output from HRW studies on FD2320—http://www.hydres.co.uk/—and work on Flood Protection products) yet fail to assess and improve flood resilience for national infrastructure.

4. TOWARDS INTEGRATED FLOOD RISK MANAGEMENT

4.1 Making Space for Water advocates an integrated approach, but current funding methods, the lack of analysis tools that support an integrated understanding of flood risk (all sources and pathways), and lack of innovative thinking in developing integrated strategies all tend to lead to single issue solutions. Perhaps most importantly, Making Space for Water is inherently a policy aimed at allowing more floods not less (but less damaging) yet it is unclear whether the public recognise or accept their critical role in achieving this, particularly in the absence of compensation.

4.2 Better awareness and building inherent resilience into the community (private and public) can really help reduce flood impact, but from media reports it appears that few of those affected were well prepared (even if informed).

4.3 It can therefore be seen that Making Space for Water is about managing flood risk, but

- Has “the public” understood or accepted this when the policy impacts on their own protection?
- Do some communities expect to be defended at all costs?
- What is the forum in which the public trade-off is done?

5. SPATIAL PLANNING

5.1 The new DCLG policy statement PPS25 covers development and flood risk, providing a framework for considering flood risk in spatial planning decisions at scales from regional planning to development control. Spatial planning decisions are tiered, developing policies at lower levels that are consistent with policies and principles at a broader scale. Planning officers are not normally specialists in flood risk and there is a need to improve the appreciation of the full spectrum of integrated flood risk management. It is important that the necessary physical and organisational infrastructure are available to manage flood risks from all events including extreme events.

5.2 Some development policies may make matters worse. Development of high density housing has potentially serious consequences for flooding. High densities result in intensive coverage by buildings and/or paving for which positive drainage systems will be unable to drain extraordinary rainfall. The inevitable surplus will flow over the ground seeking flood pathways. Current and planned housing densities will therefore cause greater damage as these flood flow away, or simply pond as in Hull.

6. EUROPEAN DIMENSION


- Member States will by 2011 undertake a preliminary flood risk assessment of their river basins and associated coastal zones.
- Where real risks of flood damage exist, they must by 2013 develop flood hazard maps and flood risk maps.
- Finally, by 2015 flood risk management plans must be drawn up for these zones. These plans are to include measures to reduce the probability of flooding and its potential consequences. They will address all phases of the flood risk management cycle but focus particularly on prevention (ie preventing damage caused by floods by avoiding construction of houses and industries in present and future flood-prone areas or by adapting future developments to the risk of flooding), protection (by taking measures to reduce the likelihood of floods and/or the impact of floods in a specific location such as restoring flood plains and wetlands) and preparedness (eg providing instructions to the public on what to do in the event of flooding).
6.2 All stakeholders must be given the opportunity to participate actively in the development and updating of the flood risk management plans. Risk assessments, maps and plans must furthermore be made available to the public. These three steps are to be repeated in a six-year cycle to ensure that long-term developments are taken into account. The Directive creates an EU framework for flood risk management that builds on and is closely coordinated and synchronised with the 2000 Water Framework Directive, the cornerstone of EU water protection policy. There are other European level actions which will support the work in Member States in implementing the Directive including the Integrated Project FLOODsite (led by HR Wallingford in the UK), the research funding network CRUE (led by Defra) and EFAS, the European Flood Alert System, being developed at the Commission’s Joint Research Centre (Ispra, Italy). The future management of flood risk within the UK will be set within the context of the Directive and its reporting requirements and should make use of the knowledge and evidence-base arising from such international collaborations as those above. In the context of the EU stakeholder group for the EU Action Plan, the UK approach to understanding flood risk is seen to represent best practice whilst the Dutch probably have the most rigorous management of flood risks. Any actions that are developed as a result of lessons learnt will have to be developed within this context.

7. References


Institution of Civil Engineers (2001), Learning to Live with Rivers, Institution of Civil Engineers, Thomas Telford, London.

http://www.crue-eranet.net/

http://www.floodsite.net/

Various Environment Agency Reports provide useful background, particularly previous lessons learnt reports, including:

— Bye report of Easter 1998
— Winter 2000–01
— Boscastle Flood 2004
— Carlisle Flood 2005

Paul B Sayers
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HR Wallingford

September 2007

Memorandum submitted by the Association of Drainage Authorities (FL 109)

SUMMER FLOODS 2007

Summary

1. The extreme rainfall that led to widespread and prolonged flooding in summer 2007, causing severe disruption and damage across a large swathe of the UK, has drawn close attention to drainage management in this country.

2. The Environment Agency is doing an in-house Lessons Learnt Report; the government has set up an enquiry under the Cabinet Office, chaired by Sir Michael Pitt; and EFRA have also announced they too are to enquire into flooding. Whilst it is important to learn the lessons from each flood, it is equally as important to use those lessons, so it could be wise to dust off previous reports such as those on the 1998 and 2000 floods. These drew attention to the need to maintain our investment as a country in our flood risk management facilities. The Environment Agency at the moment has insufficient funds to do the required maintenance and has to prioritise its expenditure.
3. As we have seen from the problems of a water treatment works being taken out of action and a power station being only narrowly saved, water level management forms the basis of a civilised society, as it allows those utilities upon which we now depend—water, power, communications and transport—to function effectively. The event has also drawn attention to the large areas of land in the UK that are below sea level and rely every day on water level management activities of the Internal Drainage Boards. This enables people and property to be at an acceptable level of risk.

4. There is a need to address the balance between policy and practice and for organisations to be enabled to have a greater output. It has been estimated that the planning process for capital works has been extended from “six to twelve months” to “twelve to eighteen months” as a result of increased administrative procedures. There has to be a better balance between proper procedure and output.

5. For a sustainable solution there is a need to balance the three “legs” of sustainability—environment, social and economic factors—and there is a widespread belief that a new balance point needs to be sought. This is because, currently, habitats and wildlife have to be protected by law whereas reducing flood risk to people and property is operated only under permissive powers.

**Rainfall**

6. The event is characterised as being of long (3 months) duration; high monthly totals and high intensity over 3 hour periods. The Met Office reported that 387.6 mm of rain fell across England and Wales during the period of May to July, making it the wettest for this period since records began in 1766. Not only has the rainfall maintained high monthly totals but it has come at high intensities, the most extreme falling in North Yorkshire in June when Fylingdales received 103.1 mm in 24 hours whilst in July Pershore College in Worcestershire received 120.8 mm.

**Staffing Issues**

7. IDB staff and others worked tirelessly during June and July to deal with the serious flooding and its ensuing aftermath. Many areas of the country and many thousands of people will certainly have been saved the misery of flooding thanks to the efforts of the unsung heroes. The event occurred not only at a time when some staff were taking leave but was of such a prolonged nature that those staff who were available worked long hours to meet the challenges.

8. Another effect that was evident in this event was the need for staff to move more quickly from normal operating mode to event mode. There is a need for organisations to empower staff to use their professional engineering judgement when an event is under way.

**Operational Matters**

9. Issues that have been raised include:

   — decisions about use and timing to start using flood storage areas;
   — COWs—since the EA took over some Critical Ordinary Watercourses, less maintenance has occurred than previously;
   — the timing of change in EA from usual operations to flood mode;
   — the lack of ability in EA to make decisions in reaction to levels;
   — maintenance vs. environment; and
   — local operation review of maintenance.

**Maintenance**

10. Many factors contributed to the inability of our rivers to carry away the heavy rainfall of this summer and under such exceptional and sustained rainfall flooding is certainly unavoidable. However, in some places, lack of maintenance is likely to have exacerbated the flood and there have been strong concerns regarding the Environment Agency’s reduction and withdrawal of maintenance procedures within many IDB boundaries.

11. Siltation in channels not only reduces their conveyance and storage capacity but can also adversely affect the gravity discharges from other watercourses into them. It is also necessary to maintain the country’s investment in other related infrastructure such as pumps and sluices so they will be ready for use when needed.

12. It is likely that this particular flood will have been exacerbated by maintenance not being done in some places between April and July for environmental reasons. Indeed there was one instance where pumps at the end of a drainage network could not be used to their full capacity as weed growth in the channel had
13. Ottringham Level Drainage Board, like many others, suffered severe flooding. It occurred in Ottringham village and a substantial acreage of surrounding agricultural land. The board have felt strongly that this is compounded by the EA’s failure to dredge the outfall at Stone Creek into the River Humber for over 20 years, whilst similar views have been expressed regarding dredging of the River Stour.

14. Further maintenance concerns stem from incentives for environment schemes within the single farm payment scheme where farmers are encouraged not to conduct ditch maintenance for a 4 or 5 year period.

15. Attention has been drawn to the issue of storage on the floodplain.

Cost of the Event

16. The cost of the event to all the organisations involved has not yet been quantified but is likely to be significant in some cases in relation to their budget and balances. Costs arise from overtime, pumping costs, extra staff and damage repair work. There has also been a delay to the normal maintenance and progression of capital works.

Funding

17. Indeed at the height of the drought in 2006 the flood defence budget was raided by DEFRA to offset the payments to Rural Payments Agency.

18. Although the media attention on the Summer 2007 floods has already abated, as I write this in September there are many still suffering the effects of flooding of their house or business. These businesses—whether retail, industrial or agricultural—will take months or even years to recover. The cost of the damage shows just how cost-effective it is to spend public money on flood risk management. We have a habit in this county to reacting to these storm events rather than planning in a structured way, as public memory is exceedingly short.

Design Standards

19. The question frequently asked in flooding situations is: “Who is to blame?” At a time when a month’s rainfall falls in three hours it cannot be possible to protect and therefore we must design for exceedance and build flood resilience into our property and infrastructure.

20. The question that is also being asked very widely is “Is this an example of global warming?”. However, people’s memories are short and events of 1968 and other years show that as a country we have experienced this scale of event before. Only time will tell whether these will become more frequent as the result of global warming.

21. However there is a need to review design standards.

Organisational Structure

22. There have been calls for the Environment Agency to be split and an obvious one is for the regulatory side to be in a separate side from the operational. This would have the merit of the operational side being a stand-alone organisation focused on rivers, but could have the downside that for probably two years the output would be severely diminished whilst new systems and people were put into place. It would however produce a smaller organisation thus reducing its overheads and speeding up decision making.

Media

23. The media were very active on the subject of drainage and flooding matters and the ADA office handled enquiries from journalists from the national press, radio and television. Many IDBs also responded to regional media enquiries. The ADA contacts resulted in quotes in newspapers (eg Sunday Times, Daily Mail), live and recorded news interviews on radio (eg Radio Five Live, Radio 4 Today Programme) and television (eg BBC News 24, Channel 4 News, BBC One’s The One Programme) by Jean Venables, and briefing of research journalists for programmes such as Panorama and File on Four.
**SOME MISCELLANEOUS COMMENTS**

24. This particular event was typified by being extremely variable across the country. Whilst some areas of Cambridge were experiencing normal rainfall, a few miles north a month’s rainfall fell in three hours and there were indeed record rainfalls for two consecutive months. This shows that standard national policies cannot be rolled out when there are such varying circumstances. For example, it was necessary to move from summer to winter operating levels to assist the drainage even though it was June and these decisions in some cases should probably have been made more quickly.

25. What is certainly changing is public expectation. There is now a belief that these floods will be managed and it will have to be argued that this cannot be possible. We will have to look at the various aspects of flood risk management starting from spatial planning, drainage, flood risk warning, flood defences and water level management as well as building resilience into properties and infrastructure.

26. During the flood event it was distressing to see so many people walking, cycling, driving through flood water or indeed allowing children to play in flood waters. There is not just the water quality issue but the danger from hidden trip hazards and missing manhole covers.

27. These comments have been drawn from comments received, especially from Internal Drainage Boards, during and after the Summer 2007 Flood Event.

*Jean Venables*
ADA Chief Executive
*September 2007*

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**Memorandum submitted by Gloucestershire Constabulary (FL 110)**

**GLOUCESTERSHIRE WATER EMERGENCY 2007**

**CHIEF CONSTABLE’S MEMORANDUM**

We have aimed to make the document as accurate as possible, however, due to a number of independent reviews and de-briefs being conducted by other agencies, information contained within the document may need further clarification as detailed reports become available.

1. **EXECUTIVE SUMMARY**

1.1 Operation Outlook was the multi-agency response to the emergency resulting from the unprecedented flooding in Gloucestershire in July 2007 which was the largest peacetime event this Country has seen in terms of complexity, duration and those affected. Gloucestershire Constabulary led the Strategic Co-ordinating Group and the Gold, Silver and Bronze Command structure, co-ordinating the response to the emergency. Much of the success of the operation can be attributed to the investment made by Gloucestershire Constabulary and the Gloucestershire Police Authority in the Gloucestershire Tri-Service Emergency Centre (GTEC), and Police Headquarters. These facilities ensured seamless communication between the emergency services as the events of 20th July 2007 unfolded, by providing the platform for the Gold and Silver Command arrangements and accommodating representatives from each of the agencies concerned. The design of the HQ, opened in December 2005, to accommodate a Strategic Co-ordination Centre (SCC) ensured effective lines of communication and rapid decision making to meet the challenges of the emergency situation.

1.2 Also key to the success of the operation was the work that had previously been undertaken by the Local Resilience Forum (LRF) and its constituent members. The extensive planning, training and exercise regimes delivered by the LRF ensured that senior representatives and their staff were familiar with the concept of emergency planning and in particular the SCC and associated arrangements. These measures together allowed the response to the emergency to be rapidly established and successfully managed. The plan to regionalise the fire control centre at Taunton, should be revised to allow for continuation of the Tri-Service facility at Gloucester. This background of partnership and investment has also been demonstrated by the County gaining “Beacon Status” for emergency planning.

1.3 The Gloucestershire Strategic Recovery Co-ordination Group is a multi-agency group comprises representatives from all the key agencies concerned in the post-emergency recovery work. The Chair of the LRF, a Constabulary Chief Officer, is a member of this Group to ensure that the distinction between recovery and resilience issues is clear and the work co-ordinated.

1.4 A number of issues arising from the flooding clearly need addressing and are brought to the attention of the Committee:

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- All agencies need to re-visit their contingency plans and re-evaluate worst case scenarios and plan accordingly.
— The resilience of utilities across the Country needs to be reviewed and addressed as a matter of urgency.
— National and regional Utility companies need to engage at a local level with Local Resilience Forums so as to identify key local risks and confirm contingency arrangements.
— There must be an increased capacity to supply basic needs to communities in the event of an emergency.
— There needs to be a strategic reserve of light, heat and sanitation Countrywide.
— The Tri-Service Emergency Centre should be maintained and strengthened through continual commitment and investment.
— The County and Government need to consider fully the impact of continuing to build new homes on flood plains.
— There should be a specific requirement for national agencies to attend Strategic Co-ordinating meetings when so requested and to ensure consistency of representation.
— The importance of maintaining county-based structures needs to be recognised as these represent a suitably strategic organisation, but one, which has local roots and knowledge.
— There should be a review of national reserve emergency supplies of food, water, feeding and cooking amenities.
— Gloucestershire Constabulary is a strategic Force.

1.5 Most of these considerations are relevant at a national level, and therefore there should be a national review of contingency planning in terms of contingency reserves of basic utilities including food, water, shelter and sanitation. These reserve provisions would be available in the event of threat of disruption to basic living requirements from terrorism or environmental threat, as well as from conventional or CBRN attack in the event of war.

1.6 There were three fatalities that are all subject to a Coroner’s inquest. The Chief Constable would like to reaffirm his sincere condolences to family and friends of those who lost their lives.

2. INTRODUCTION

2.1 Prolonged heavy rainfall resulted in widespread flash flooding across Gloucestershire which began on Friday 20th July with what the Met Office had warned would be “a major rainfall event”.

2.2 Early forecasts released by the Met Office at 0554 hrs on Friday 20th July indicated that “rain will be persistent and locally very heavy at times throughout the day, with “fresh north east winds”. A precipitation forecast issued at the same time stated that “current indications from models imply that the highest rainfall totals will probably be over the Welsh mountains and more south eastern areas of the region. The rain should weaken and become more showery in nature overnight and through Saturday”.

2.3 On the basis of the Met Office forecast, the Constabulary had not issued any additional information regarding the weather conditions expected for Friday 20th July. The earliest indications of the evolving emergency came from Ambulance, who were beginning to have difficulty in responding to their 999 calls. Silver control was established at 1529 hrs on Friday 20th July as a consequence of the changing events.

2.4 The report also indicated that a heavy rainfall warning was in force at the time of issue. It would appear that there was no indication of the unprecedented amount or duration of rainfall that eventually fell on the County. It is interesting to note that whilst the best intentions of the forecast indicated the anticipated precipitation levels, there was no indication of the effects this rainfall would have on already fully-saturated ground.

2.5 Approximately 1,600 calls were made to the Constabulary in the first eight hours of the crisis, and it soon became apparent that this was not just a major rainfall event but also a flooding crisis. Many homes across the County were directly affected by flooding, and around 350,000 households were without drinking water for 17 days after the Mythe water treatment plant at Tewkesbury was inundated by the floods.

2.6 Gold Command was initiated on the evening of Friday 20th July at County Police Headquarters and Operation Outlook was the name given to the multi-agency response to the flooding and associated issues in Gloucestershire. The emergency phase finally ended with the return of drinking water supplies on 7th August.

2.7 Preliminary assessment by the Centre for Ecology and Hydrology (CEH) indicates a combination of factors contributed to the flooding. Exceptionally high rainfall levels had resulted from the jet stream following a route further south than usual, and the high pressure cell from the Azores that would usually influence our weather bypassing Britain. These phenomena, combined with a sustained series of low-pressure systems over the preceding 12 weeks, had added to the unprecedented rainfall levels. Indeed the May and June rainfall total was the highest on record for Britain by a substantial margin.

37 Available from www.ceh.ac.uk
2.8 In a “normal” summer flood risk is low due to dry ground through which water can drain away. However, this year due to the record levels of rainfall and flooding in June, the soil was so saturated it could not cope with the rainfall of July. In addition urban drainage systems were overwhelmed by the intense rainfall resulting in localised “flash floods”.

2.9 The role of anthropogenic carbon as the root cause of climate change has been cited as an explanation for these “freak” weather patterns. Other theories would contest climate change is simply part of a natural global cycle on which human activities have little impact. Such debates are beyond the scope of this report, however what is clear is that the weather leading to the July flooding could become more frequent no matter what the reason behind climate change.

2.10 The events of the two week water emergency were unprecedented and Gloucestershire emergency services, County and District Council as well as other agencies, responded with flexibility and energy to ensure emergency supplies and the restoration of water.

2.11 These were unprecedented events however they are no longer, and all agencies therefore need to use the benefits of experience to protect the County.

3. Flooding in Gloucestershire

3.1 Historically Gloucestershire is no stranger to flooding. Flooding is a regular part of life in many parts of Gloucestershire, but 1947 is the benchmark year in living memory for every subsequent flood. Comparisons with 1947 are difficult but it seems likely that the overall effects of the 2007 floods were substantially greater. Changes in landscape cannot be ruled out as contributory factors at this stage. This would be for other enquiries such as the Pitt Review to determine.

3.2.1 The Severn, after rising in the Welsh Hills, flows generally north-eastwards into England before turning southwards to reach the sea through the Bristol Channel. The basin is generally sparsely populated (approximately 1.5 million): the majority of the population lives in the larger towns. Riverside towns on the Severn include Llanidloes, Newtown, Welshpool, Shrewsbury, Ironbridge, Bridgnorth, Bewdley, Worcester, Upton-upon-Severn, Tewkesbury and Gloucester.

3.2.2 There has been flood prevention work on the upper and middle reaches of the basin but this has not been extended to the lower sections.

3.2.3 There was extensive flooding in the Severn Uplands area in 1998, 1999 and Autumn 2000.

3.3.1 The Middle Severn, covers the length between the Perry and Teme confluences, a distance of 119 km. Here the river drains a catchment that lies mainly within the counties of Shropshire and Worcestershire and covers an area of 2,634 km².

3.3.2 The River Severn runs broad and deep between fairly high banks over a clay bed. In the upper catchment there are two large impounding reservoirs, Llyn Clywedog and Llyn Vyrnwy. The river regularly floods in winter, in some reaches, up to 6–8 times a year.

3.4. Severn and Avon Vales

3.4.1 The area of Severn and Avon Vales is centred on the broad flood plain around the confluence of the Rivers Severn and the Warwickshire Avon.

38 A Severn strategy scoping report.
3.5. River Severn

3.5.1 From the Teme mouth, just below Worcester, to the Gloucester Weirs, the 46 km length of the Severn drains an area of about 1000 km\(^2\). The only other large town is Tewkesbury although there are numerous smaller riverside towns and villages such as Kempsey, Severn Stoke and Upton-upon-Severn.

3.6. River Avon

3.6.1 The River Avon catchment covers much of the County of Warwickshire and parts of Leicestershire, Northamptonshire, Gloucestershire, Worcestershire and the City of Coventry. The head of the river is near Naseby in Northamptonshire and it meets the Severn at Tewkesbury. The Avon is the longest tributary of the River Severn (179 km).

3.7. Areas at Risk from Flooding

3.7.1 The River Severn has been subject to several high profile floods during 1998 and 2000. The main urban areas affected by flooding on the Severn are Shrewsbury, Ironbridge, Bewdley, Worcester, Upton-upon-Severn, Gloucester and Tewkesbury. However, in the Worcester to Gloucester area there are more properties at risk of flooding outside the towns than found within the main urban areas.

3.7.2 There are indications to suggest that in recent years flooding has occurred in areas not previously at risk, particularly on tributaries. Flooding may be getting worse, or the catchment may be experiencing an abnormally wet period, or it may be returning to normal after an abnormally dry period.

3.8. Tidal Effects of the Severn

3.8.1 Surges of water in areas covered by flood water are often unpredictable due to, amongst other factors, the undulation of the ground over which the water flows. There is also the issue of flooding in the water table caused by the saturation of the ground that may equally be prone to flooding despite being some distance away from rivers or water courses. Comment to this effect was made by a representative from the Environment Agency at a GOLD Command meeting reinforcing the unpredictable nature and circumstances in which various types of flooding can occur.

3.8.2 The Severn estuary is subject to the second highest tidal rise in the world. The basic geology and geomorphology of the Severn estuary is complicated but the combination of the underlying geology and geomorphology and the exceptional tides and estuary river flows regularly produces the effect known as the Severn Bore. At a time of inland flooding, the substantial effect of flood water, with the incoming water of the tide, aggravates the effect of flooding in the Gloucester flood plain area (Alney Island, Castlemeads and Gloucester Quay) reducing the outward rate of flow from the inland flooded area. The Walham electricity sub-station is situated near Alney Island and the Castlemeads electricity sub-station is located on Alney Island.

3.8.3 Recent effects of planning and building are not within the scope of this report, nor is it within the competency of the police to comment upon relatively recent planning decisions and building operations. However, it must be said that since the benchmark flooding of 1947, there has been the completion of the Gloucester northern bypass, built on a causeway, as well as substantial residential and business development in the flood plain areas. Many households, together with the utility sites at Castlemeads, Walham and other premises were affected by water rising from the saturated ground in the flood plain.

3.9. Overview of Flooding in Severn and Avon Basin

3.9.1 The low-lying areas near the rivers Severn and Avon suffered from excessive flooding in light of the events of 20 – 21st July and this led to the search and rescue phase of Operation Outlook.

3.9.2 During this phase, a fatality occurred which is subject to a Coroner’s inquest. Two other fatalities occurred on the night of Wednesday/Thursday 25–26th July at Tewkesbury rugby ground when two individuals were attempting to pump out the clubhouse. These fatalities are also subject to a Coroner’s inquest.

3.9.3 The situation then stabilised for several hours before flood water moving in volume from the upper and lower Severn met water seeking to flow from the Avon, at the confluence of the two rivers at Mythe Bridge.

3.9.4 The water appears to have backed up and overflowed at Mythe Bridge, flooding the nearby treatment works, the intakes of which were also subject to excessive pressure from an exceptional flow of water from the Severn.

3.9.5 This water then moved in volume to affect the Alney Island, Castlemeads and Gloucester Quays areas, peaking at approximately 2200 hrs Monday 23 July.

http://www.severnboresdirect.co.uk/bore2.htm
3.9.6 The recession of this water was delayed by the twice-daily effect of the incoming tide.

3.9.7 In addition, low-lying areas near the river were subject to rising water from the saturated ground.

3.9.8 It must be noted, however, that the Environment Agency, briefed Gold Command to the effect that the detailed consequences of the general movement of water across the flood plains is extremely difficult to predict because of the effect of surges across undulating ground.

3.9.9 At no point until 22 July was Gold Command alerted to the excessive potential of flooding at Mythe or Walham.

4. Military Aid to Civil Powers (MACP) and Formal Request for Military Aid for the Civil Authorities (MACA)

4.1 Prior to a formal request for MACA, Royal Air Force (RAF) search and rescue helicopters were deployed during the initial response to the emerging emergency on Friday 20th July. There was therefore a military presence in Gloucestershire from Friday evening. The request for MACP came from the Silver Co-ordinating Group as a result of the escalating nature of the situation. Also as part of the initial response, military liaison officers were an integral part of the Group. Lead elements from HM Coastguard and Severn Area Rescue Association (SARA) were also available for deployment from an early stage.

4.2 As an inland County the emergency services had not anticipated nor foreseen the use of search and rescue aircraft as part of incident response. Therefore ground to air communications, with military aircraft, was not an established facet of the Silver or Gold Command arrangements. A means to communicate with the RAF helicopters had to be set up as a separate system by the military and this was enhanced by the early contributions of the military liaison officers. This has been noted as a future modification to our own systems of communication. The rescue phase of Operation Outlook constituted the largest search and rescue operation mounted in peacetime by the RAF.

4.3 Following the formal request from the Chief Constable for MACA, on Sunday 22nd July, the contribution and role of the military in this emergency cannot be underestimated. A critical function performed by the military aid throughout the emergency was the co-ordination and development of a logistical plan for distribution of water, as well as assisting in the delivery of bulk water, which included bowsers and bottled water to distribution points across the County. For the duration of the emergency, all military aid remained under the direct command and control of Gold Command.

4.4 Military aid was also vital in providing engineering expertise together with lift and shift capacity to build temporary defences at Mythe and Walham.

4.5 Military aid was released as soon as the situation had stabilised and there were suitable resources in place to maintain the basic provisions for the people of Gloucestershire.

4.6 Military aid formally ceased on 31 July, when full responsibility for the distribution of emergency water supply was formally handed over to the County Council and STW.

5. The Loss of Water and Threatened Loss of Electricity

5.1 Mythe Water Treatment Works

5.1.1 Mythe is fundamentally the single source of water supply for Cheltenham, Gloucester and Tewkesbury. The water treatment works was established 100 years ago and currently produces 120 mega litres of water for Gloucestershire every day. Gold Command was informed at 0900 hrs on Sunday 22nd July that at 0200 hrs the same day, the Mythe had been breached and the site evacuated. There appears to have been no early warning or indication other than a request made at 0002 hrs on Sunday 22 by Fire to arrange for the urgent attendance of an engineer at the treatment plant.

5.1.2 This was approximately seven hours after flood water had entered the treatment works. Gold Command had no prior warning of the likelihood of this being a risk of happening, from any of the respective agencies. STW estimated that it would take between 7 and 14 days to restore supply, an estimate that proved to be accurate.

5.1.3 Gold Command encouraged a more prompt restoration of water supply, but, due to major engineering works, this period could not be foreshortened, this was not possible. The engineering challenge was considerable and STW should be complimented on completing the restoration of the equipment in 8 days from disruption of supply. The disruption to the supply of water, however, left Gold Command in the unprecedented situation of having to supply 350,000 people with water for drinking, cooking and basic sanitation purposes.

5.1.4 The challenge was unprecedented in modern times, but relatively quickly Gold Command was able to ensure approximately 6 million litres of drinking water was distributed every day, 3 mega litres from bottled water and 3 million from bowser supplies. The initial bowser distribution process developed by STW proved ineffective because of there being initially too few bowser to cover the area affected and inadequate
numbers of small, rigid tankers to transfer water from bulk tankers to locally distributed bowsers. With the assistance from Gold Command and the Military the distribution problem was effectively resolved by Thursday 25 July and bowsers were then replenished three times daily.

5.1.5 It is important to note that there were no adverse effects reported in relation to people going thirsty or dehydration, inability to cook and boil water, or basic sanitation problems. Essential users, including hospitals, were identified early on and supplies maintained throughout. The County and District Councils and their network of volunteers ensured that supplies of water were provided to vulnerable individuals and households.

5.1.6 However, it is important to note that supplies to 350,000 people in Gloucestershire were only available for the duration of disconnection through bottled water and bowsers. This was despite attempts to provide alternative mains water solutions throughout the emergency. There was some initial panic buying of bottled water on Sunday 22 July, although residual mains water continued to flow to some parts of the County until Monday. Panic buying ceased by Monday 23 July as a result of commercial supplies running out but being replenished by the first emergency supplies of bottled water. Emergency supply centres were set up across the County manned by various combinations of STW officials, various District and County Council officials and volunteers overseen by police personnel. There were few incidents of anti-social behaviour and damage to bowsers.

5.2. Walham Electricity Sub-station

5.2.1 The threat to Walham sub-station, operated by National Grid, was of a critical and extreme nature. The sub-station supplies electricity from the National Grid to 600,000 people in Gloucestershire, effectively the whole of the County, as well as to areas in the South Midlands and South Wales. Alternative supplies could have been found for South Wales but not for Gloucestershire.

5.2.2 The potential threat to Walham was identified and driven by Gold Command. At 1007 hrs on Sunday 22 July at the Gold meeting, the Gold Commander tasked the Environment Agency to contact Central Networks to determine any future problems with supply of electricity from the Walham sub-station. At the same meeting, the Environment Agency was also tasked to provide maps of the likely flooding in and around the Quay, Hempsted, Alney Island, Castlemeads and Walham.

5.2.3 There was no early warning or indication from the National Grid or the Environment Agency as to the potential risks to Walham of flooding and the subsequent loss of electricity to the County and surrounding areas.

5.2.4 As previously noted, the sub-station is situated on a flood plain near to the River Severn and has been there for many years. The surrounding area is routinely flooded but not to the extent as to place the sub-station under threat. Therefore the threat that was reported to Gold Command on Sunday 22 July was not only unexpected but also unprecedented. A representative from the National Grid was subsequently present in Gold Command for the duration of the emergency.

5.2.5 The risks were immediately apparent to Gold, as loss of electricity would have meant that households could not have boiled water, cooked food, including baby food, and provide basic heating. Furthermore, essential services within the County would have been reliant on generators and sewage would not have been pumped. Street and domestic lighting would have been lost for the duration of the emergency.

5.2.6 It was anticipated that the loss of electricity could be for up to 3 weeks. Gold Command therefore made an immediate decision to ensure that barriers and pumps were in place to protect the sub-station and contingency arrangements made to ensure emergency supplies were provided. However, the primary intent was protecting the integrity of the sub-station. At no time were plans developed for the evacuation of the County. This would have been an inappropriate reaction.

5.2.7 Emergency barriers were provided from the Bristol/Bath area by the Environment Agency (EA) and these, reinforced by sandbags, were constructed throughout the remainder of Sunday 22 and Monday 23 July using civil and military personnel. Throughout, a major pumping operation continued using nationally supplied equipment under the direction of Gloucestershire Fire and Rescue Service. The critical point was high water on the evening of Monday 23 July for which the prediction from the EA indicated that the measures already in place would be sufficient to save the plant, and this proved to be the case. High water passed at 2200 hours without the plant being compromised. Estimates vary as to the precise margin of safety but at no point was it two inches from the top of the external emergency barriers. There is no doubt that the major pumping operation and the huge effort of building the Hesco barriers saved the Walham electricity sub-station from being lost, however, it must be noted that the critical risk to the sub-station came from an internal threat from rising flood water which came through the ground as a result of saturation and the rising water table, and not as a result of the external Hesco barriers being overwhelmed by flood water. It is a fact that internal rising flood water came within 2 inches of the base of the switching gear. This factor must be a vital consideration in future contingency planning to protect the utility sites from flooding.
5.3. Castlemeads Electricity Sub-station

5.3.1 The Castlemeads sub-station, operated by Central Networks, transfers electricity to the south Gloucester City area. Therefore, resources and effort were primarily focussed at Walham. Gold Command made the decision to switch off the sub-station to prevent substantial damage to the switching gear when it became threatened by the flood water. Power was subsequently lost to a small percentage of the population of Gloucester for a few hours on Monday 23 July, but this prompt action allowed power to be resumed the following day re-supplying the majority of homes and businesses affected, once the flood water had receded.

5.4. Cooperation with Utility Companies

5.4.1 Severn Trent Water, National Grid and Central Networks all provided staff to Gold Command throughout the emergency. It was, however, evident that the situation exceeded previous experience and contingency planning, and solutions had therefore to be dynamically developed in cooperation with the Police, Fire, Military, Health and other participating agencies. This included the provision of Hesco Bastion defences at the Mythe and Walham to limit the effects of future flooding. It should be noted that STW and electricity company representatives worked hard to provide solutions to the problems with which they were confronted. It should also be noted that the re-commissioning of the Mythe Treatment Works and the re-supply of the Gloucestershire mains networks were significant feats of engineering.

5.4.2 The Hesco Bastion barriers at Mythe and Walham are of a temporary nature, and are intended to inhibit the lateral flow of water across the sites. These will not inhibit rising water from saturated ground, or water pressure on the waterworks’ intakes. It is for the Utilities themselves to address these issues. Central Networks has already provided enhanced external barriers for protection at Castlemeads.

6. Control and Co-Ordination

6.1. Local Resilience and Planning

6.1.1 Gloucestershire has invested heavily to ensure the infrastructure is in place for emergency management. This has undoubtedly secured the successful response to the flooding emergency. However this same level of investment is not replicated across the Country, and it is not clear that other parts of the Country could have managed a similar emergency as efficiently and effectively.

6.1.2 The Beacon Scheme recognises excellence and innovation in local government. The Gloucestershire local authorities successfully bid for and were awarded Beacon Status in March 2007 in recognition of the way they plan for and respond to major emergencies. Gloucestershire was one of only 7 authorities to achieve the award out of 29 applications.

6.1.3 Factors in the successful bid were partnership working and community involvement. County and District Officers regularly plan, train and exercise together and the judges were particularly impressed with the way they worked with partner agencies in the LRF to ensure that they can respond effectively to any emergency. The Gloucestershire local authorities also have a well established but unique volunteers accreditation scheme, which ensures that suitably trained volunteers are available to assist in caring for those affected by an emergency and they are also recognised as a centre of excellence for Business Continuity.

6.1.4 The Gloucestershire LRF was created in 2005 as a replacement for the County Major Incident Co-ordinating Group that had been working together since its’ formation in 1989. This was as a direct result of the Civil Contingencies Act 2004, which laid statutory duties on certain agencies to plan, train, exercise and respond to Major Incidents in a co-ordinated fashion. The agencies, referred to as category 1 responders, include the Police, Fire Service, Ambulance Service, Health Services, Local Authorities, Maritime and Coastguard Agency and Environment Agency.

6.1.5 Further agencies make up what is known as category 2 responders and include the utilities and other companies concerned with the national infrastructure, such as the Highways Agency. It was evident as a consequence of the events created by the emergency that the utility companies were unfamiliar with the Gold, Silver and Bronze structure of incident management and response.

6.1.6 A Constabulary chief officer is currently the Chair of the LRF. The LRF has a long history of engagement and commitment to ensuring emergency preparedness within the County. Joint planning, training and exercising has enabled successful response to the recent flooding events and previous chemical incidents such as the fire at Andoversford. LRF Gold awareness training, which has been delivered over a number of years, enabled executives and support staff from Category 1 responders and the military to be familiar with the Strategic Co-ordinating Centre accommodation and processes.

6.1.7 It became clear as the emergency progressed that Severn Trent Water (STW) needed help. STW had intended to use the bowsers as the sole solution for water distribution. Their experience to date had been limited to short-term disconnections and localised distribution for short periods of time. The STW plan soon collapsed and it became clear they had neither the infrastructure nor resources to maintain sufficient supplies of drinking water to those affected by the emergency. On the Chief Constable’s instigation, two senior officers from West Midlands Police were deployed to STW’s headquarters, in Coventry, in support of the operation, and the emergency response from STW began to greatly improve. Although not a statutory
responsibility, the police alongside the military assisted in the distribution of bottled water, and the staffing of a centralised water distribution point at Cheltenham Racecourse. This facility delivered approximately 3 million litres of bottled water to the County daily.

6.1.8 Engagement of and communication with communities was recognised as being an essential prerequisite to a successful operation. This was achieved through the tasking of Police Safer Community Teams that remained in place throughout the emergency and through the use of Independent Advisors. These measures ensured the feelings and difficulties within communities were understood and addressed and enabled the monitoring of any community tensions and an appropriate strategic response from Gold.

6.2. Gloucestershire Constabulary County Headquarters

6.2.1 The Constabulary was successful in securing £17 million PFI funding for a purpose built headquarters that was able to transform in part into a Strategic Command Centre (Gold). The building was completed in December 2005. The events of July/August 2007 have highlighted the return on investment identified within Vision5 and continuing into Vision2010, the Constabulary’s over-arching strategic plans.

6.3. Gold Command Suite and Local Emergency Centre

6.3.1 The Gold Command Suite is a permanently established space that provides the nucleus for the Strategic Co-ordination Centre (SCC) to immediately establish a control centre in the event of a major incident or event.

6.3.2 The Gold Command Suite has excellent and immediate communications systems, including IT, telephony, terrestrial and non-terrestrial television and radio facilities which are core to Gold Command.

6.4. Strategic Co-ordination Centre Overlay

6.4.1. Outside of the Gold Command Suite itself, the SCC facility is activated when there is a major incident, utilising accommodation that is used on a daily basis for a lower priority need. The size and nature of the overlay is dependent on the particular incident, but in all cases it is able to rely upon excellent and immediate communications.

6.4.2. The command structure adopted in responding to the emergency situation is the well-recognised and established Gold, Silver and Bronze system. These are respectively the Strategic, Tactical and Operational levels at which a situation is dealt with. This structure was adopted for the emergency.

6.4.3. In an emergency situation requiring a multi-agency response it is well established, and laid out in the Association of Chief Police Officers (ACPO) Emergency Procedures Manual, that it is the responsibility of the Police to establish and chair the Strategic Co-ordinating Group. This occurred.

6.4.4. One of the key factors in the successful response to the emergency is the investment that Gloucestershire has made in the Gloucestershire Tri-Service Emergency Centre (GTEC). This accommodates all the emergency services in the same building and allows for excellent communication and effective co-ordination of resources in response to the emergency. Without doubt the absence of GTEC would have led to a delayed and potentially chaotic initial response to the emergency. As it was, GTEC ensured that co-ordination between the three front line emergency services was on the “front foot” early in the emergency.

6.4.5. Gold was initiated at 18:00 hours on Friday 20 July. The formation of the Strategic Co-ordinating Group brought together key agencies who could draw on their combined resources to address the dynamically developing situation, and quickly make strategic decisions that were pragmatic and co-ordinated the actions of all agencies. In the absence of this set up cooperative working is hindered, communication is strained and duplication of efforts inevitable.

6.4.6. The SCC worked extremely effectively in response to the emergency and this can be attributed in the main to a number of factors.

6.4.7. Firstly the police officers and police staff of Gloucestershire Constabulary showed professionalism, willingness, enthusiasm, dedication and flexibility in support of the operation. Many of whom worked far beyond expectations, and these outstanding efforts should be recognised.

6.4.8. Secondly, Gloucestershire has a strong history of partnership working that extends long before the introduction of the LRF. Training, planning and exercising with our partners has developed strong relationships, and provided a familiarity with the concepts of emergency management and the facilities available. This ensured the establishment of the Strategic Co-ordinating Group was rapid and with roles and responsibilities clearly understood, enhancing the effectiveness of the response.

6.4.9. Thirdly, the Police Head Quarters (HQ) provides a purposely-designed Strategic Co-ordination Centre (SCC) to accommodate agencies. This set-up places all the agencies on an open plan floor adjacent to the Gold Command Room. This is flexible and can easily be expanded to accommodate other additions to Gold. Each person is provided with access to a telephone, computer, Gold e-mail addresses and the Gold
Messing Application (GMA) (software that records actions and policy decisions by the Strategic Coordinating Group). Without this purpose-designed accommodation the response to the emergency would be fragmented and lack the same high level of co-ordination, leading to a hindered emergency response.

6.4.10. Fourthly, the County has one of only three Tri-Service (Police, Fire and Ambulance) emergency control centres in the Country (GTEC). This was opened in 2002. This routinely ensures co-ordinated management of incidents involving the three services, and enhanced Silver Command facilities which enables early instigation of joint command management. This was evident in the early hours of the emergency on 20 July, and enabled the three County emergency services to get on the “front foot” and stay there.

6.5. Silver Command

6.5.1 On Friday 20 July at 15:29 hours a Silver Command was set up at the GTEC, again in accommodation designed for this purpose, as the impact of the torrential rain brought Gloucestershire’s transport infrastructure to a standstill. Informal dialogue and co-ordination had taken place as the emergency evolved due to the close proximity of on duty staff from police, fire and ambulance.

6.5.2 The management of the emergency demonstrated that Gloucestershire Constabulary is a strategic force, having both the capacity and capability to deal with what has been described as the “largest peace time operation this Country has seen”. The Constabulary also continued with daily business, for example in dealing with a murder that occurred on day four of the operation.

6.5.3 Non-essential staff were sent home to preserve utilities at HQ. By the end of the first week police staff who do not normally face the public were being used in a completely different role in water distribution. Officers and other essential staff were placed on 12-hour shifts for the duration of the emergency. The dynamic use of resources gave Gloucestershire Constabulary the flexibility that was required to deal with the emergency without calling for mutual aid.

6.5.4 The de-brief process and review of the Operation Outlook is still at this stage work in progress, however early indications are extremely positive. Whilst there are some minor issues that will be addressed, these should not detract from the overall huge success of the operation.

6.6. Dissemination of Information

6.6.1 A Gold Media Cell was established with a clear strategy in relation to the dissemination of information to the public, both via the media and through postal delivery of health information. From the start it was determined that Gold Command should be as frank with the media and public as possible, and to see the media as an ally, not an inconvenience.

6.6.2 A daily press conference was held at County Police Headquarters, attended by local and national media, led by the Chief Constable. The live news bulletins communicated relevant and timely information and also delivered the Chief Constable’s key messages which were “patience and forbearance, use of common sense, listening to key messages and be a good neighbour”. 24 hour media broadcasting was used to optimum effect and feedback indicated that people felt reassured and that the flow of information was greatly appreciated. Media information was provided to other interested stakeholders, for example local Members of Parliament (MPs).

6.6.3 All press releases and attendance at press conferences was co-ordinated through Gold to ensure consistency and clarity of messages and so as to avoid any contradiction between agencies. It was ensured that the expectations of the communities of Gloucestershire were managed whilst at the same time providing an honesty and realism about the situation. Public reassurance and maintenance of confidence were identified as key themes throughout.

6.6.4 Health information and advice in relation to flooded properties was disseminated on a number of occasions via the Royal Mail. Their support in this function was greatly appreciated. The Gold Commander negotiated with Union representatives from the Royal Mail to postpone strike action to ensure that delivery of important leaflets. Without the delivery of this important health information contained in the leaflets, the delay in the restoration of water supplies to the affected areas would have been much more protracted. Health information was provided in a number of formats to seek to ensure the needs of all members of communities, including those more difficult to reach or whose first language is not English, were met.

6.6.5 There were a few incidents where media reporting was inaccurate or unhelpful. This should not detract though from, on the whole a good relationship with the media who were a vital part of the emergency response in ensuring a flow of information. The media nationally and, especially, locally were notable in providing timely and, within the limits of a dynamic event, accurate information. There was some sensationalising at the beginning of the emergency but in the main, a sense of responsibility characterised media coverage in this emergency.

6.6.6 The emergency officially ended with mains water being formally declared fit for drinking. Gold Control stood down on Friday 6 August.
7. 

**Benefits of Experience**

At this point a number of issues seem prevalent to highlight for the committee’s consideration.

7.1 *All agencies need to re-visit their contingency plans and re-evaluate worst-case scenarios and plan accordingly.*

All agencies need to re-think scenario and contingency planning and extend these to include previously unthought-of circumstances and plan accordingly. Whilst it would be impossible to cover every eventuality, agencies should at the very least ensure contingencies to deal with the forces of nature are fully considered and robust. In the light of climate change contingency planning must not be static but quickly grasp and move with these changes.

7.2 *The resilience of Utilities across the Country needs to be reviewed and addressed as a matter of urgency.*

The loss of function at Mythe left the majority of the County without mains water for an extended period. This cannot be allowed to happen again, and alternatives should be easily and quickly available. Although Walham maintained its function, the consequences to the County and beyond are clear, had this utility been lost. Alternative electricity sources from the network need to be available in the event that Walham cannot function. Exposure to single points of failure is planning to fail.

Medium term flood defences at Mythe, Walham and Castlemeads provided through Hesco Bastion defences should not become the long-term solution. Rigorous defences need to be put in place to prevent the potential loss of function at such crucial installations in the future event of flooding. Urgent consideration needs to be given to flooding as a result of the rise in the water table, in certain areas particularly around the counties utilities and the affects of ground saturation. The Hesco Bastion barriers will be no defence to water coming up through the ground as experienced at Walham, there should be no assumption that similar defences will stop Mythe from being lost in the future.

The question needs to be asked as to whether the existing County’s flood defences are fit for purpose and what additional defences are required. The economic, social and emotional costs on the County as a result of the flooding have been vast. Any future investment in flood defences should take account of these costs.

7.3 *National and regional utility companies need to engage at a local level with Local Resilience Forum.*

Engagement with the LRF will assist in the identification of risks at local and strategic levels, with the application of shared knowledge ensuring the aversion of unnecessary scenarios being played out. The Gloucestershire LRF has previously made representations that the engagement of utilities should occur at this level and not be confined to national and regional forums as at present.

7.4 *There must be an increased capacity to supply basic needs to communities in the event of an emergency*.

The County needs to increase its capacity to supply utilities, feed communities and supply other basic needs in the event of another sustained emergency situation. Using existing distribution networks could be one solution that should be explored.

7.5 *There needs to be a strategic reserve of light, heat and sanitation Country-wide.*

7.6 *The Tri-Service Emergency Centre should be maintained and strengthened through continual commitment and investment.*

Lessons learnt from events of 9/11 and the London bombings of 7/7 2005 demonstrated the strength of a Tri-Service co-ordinated approach from the initial response to a significant event or incident. Events in Gloucestershire in July/August 2007 illustrated that the Tri-Service centre provided an efficient and effective co-ordinated response, an instant Command and Control infrastructure and an informal dialogue that promotes decision-making processes and action. The integration of the three emergency services at the Tri-Service centre allowed Gold Command to be on the front foot.

7.7 *The Government need to consider fully the impact of continuing to build new homes on flood plains.*

This has the potential to further increase the number of communities in Gloucestershire who could be adversely and dramatically affected by flooding to the point of losing their homes. Also the attraction of buying such housing given recent events should weigh in considerations.
7.8 There should be a specific requirement for national agencies to attend GOLD Command meetings when so requested and to ensure consistency of representation.

7.9 The importance of maintaining County-based structures needs to be recognised as these represent a suitably strategic organisation, but one which has local roots and knowledge.

7.10 There should be a review of national reserve emergency supplies of food, water, feeding and cooking amenities.

7.11 Gloucestershire Constabulary is a strategic Force

In dealing with the flooding crisis, the Constabulary was able to demonstrate its strategic capabilities as a County Force, without the need for mutual aid when dealing with an event of this magnitude. A regional response would not have been able to maximise local knowledge, experiences and co-ordinated such a dynamic and flexible response. The emergency equally highlighted the strengths of local entities including fire, ambulance and regional army brigades.

8. COBR

8.1 Liaison with COBR functioned well throughout the emergency, and the attention, visits and support from the Prime Minister, the Secretary of State for the Environment and the Minister of State for Local Government and Communities was very well received. It was not entirely clear whether COBR could always easily access emergency supplies and the build up of contingency reserves should be considered as a matter of urgency.

8.2 Most of these considerations are relevant at a national level, and therefore there should be a national review of contingency planning covering contingency reserves of basic utilities including food, water, shelter and sanitation. These reserve provisions would be available in the event of threat of disruption to basic living requirements from terrorism or environmental threat, as well as from conventional or CBRN attack in the event of war.

9. Appreciation

9.1 A big part of the success story in handling the emergency was the spirit and resilience displayed by the people of Gloucestershire. It was evident by the activities of individuals and groups of people, that there was a keen sense of ownership and responsibility both throughout the emergency and when dealing with the aftermath to resume normality and to help those less fortunate than themselves.

9.2 From first responders, agencies, voluntary groups and the wider people of Gloucestershire, there was a sense and feeling that generally everybody responded positively to the emergency. Although there were isolated occurrences of damage and disorder, people queued in an orderly fashion and there were numerous local support schemes assisting vulnerable locations and individuals. This was characteristic of the resilience displayed across Gloucestershire.

9.3 The Chief Constable would like to take the opportunity in expressing his sincere thanks and appreciation to everyone who helped, whether directly or indirectly, in the response and continuing recovery work in relation to the Gloucestershire water emergency of 2007.

9.4 The Chief Constable would like to extend particular thanks to those agencies represented in Gold Command, working alongside Gloucestershire Constabulary.

— Gloucestershire Fire and Rescue Service
— Great Western Ambulance Service
— Gloucestershire County Council
— Environment Agency
— Government Office South West
— Health Protection Agency
— Public Health (PTC)
— Gloucestershire Primary Care Trust
— RAF RLO
— ROYAL LOGISTICS CORP (9TH SUPPLY REGIMENT)
— 39th SIGNAL REGIMENT
— ROYAL ENGINEERS (10th FIELD SQN)
— 43rd WESSEX BRIGADE
— ROYAL NAVY
— Severn Trent Water
Thank you for the letter of the 21 August inviting me to send a memorandum to the Environment, Food and Rural Affairs Select Committee.

Your letter specifically asks for my views on the control and co-ordination arrangements that were used and the adequacy of the dissemination of information to the public. In Gloucestershire the Gold/Silver/Bronze system worked extremely well throughout the two weeks of the emergency. There may be several reasons for this, but not least amongst them will be the existence of the Tri-Service Emergency Centre (GTEC), which ensured there was integrated command and control from the very start of the emergency. Further, relations with the media worked well, taken on the whole over the fortnight. This was especially so with the local media. There were some isolated incidents where this was not the case, but these should not detract from the whole.

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Supplementary memorandum submitted by Gloucestershire Constabulary (FL 110a)

Thank you for the letter of the 21 August inviting me to send a memorandum to the Environment, Food and Rural Affairs Select Committee.

Your letter specifically asks for my views on the control and co-ordination arrangements that were used and the adequacy of the dissemination of information to the public. In Gloucestershire the Gold/Silver/Bronze system worked extremely well throughout the two weeks of the emergency. There may be several reasons for this, but not least amongst them will be the existence of the Tri-Service Emergency Centre (GTEC), which ensured there was integrated command and control from the very start of the emergency. Further, relations with the media worked well, taken on the whole over the fortnight. This was especially so with the local media. There were some isolated incidents where this was not the case, but these should not detract from the whole.

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10. Glossary

ACC—Assistant Chief Constable
ACPO—Association of Chief Police Officers
CC—Chief Constable
COBR—Cabinet Office Briefing Room—Meeting of the Civil Contingencies Committee.
DCC—Deputy Chief Constable
DMA—Dedicated meter areas
DWI—Drinking Water Inspectorate
EA—Environment Agency
GFRS—Gloucester Fire and Rescue Service
GMA—Gold Messaging Application
GTEC—Gloucestershire Tri-Service Emergency Centre
HQ—Head Quarters
HR—Human Resource
IA—Independent Advisor
LRF—Local Resilience Forum
MACP—Military Aid to the Civil Power
MP—Member of Parliament
PNC—Police National Computer
RAF—Royal Air Force
SARA—Severn Area Rescue Association
SCG—Silver Co-ordinating Group
SCC—Strategic Control Centre
SCT—Safer Community Team
STAC—Science and Technical Advice Cell
STW—Severn Trent Water

Gloucestershire Constabulary

September 2007
It is important, indeed vital, that the Committee understands the fundamentally different nature of the emergency in Gloucestershire. There was an initial emergency concerning the disruption associated with the flooding on 20–21 July. However, the disruption to water supply and the threatened dislocation of electricity supply took the emergency into a different order.

Therefore the key issues arising from the most recent flooding in Gloucestershire concern the level of protection afforded to our communities from the risk of flooding and that afforded to our critical national utilities of water, electricity and gas.

Particular focus should be given to the resilience of the utility companies, their ability to cope in the face of significant disruption, the contingency plans they have in place and the degree to which they are exposed to single points of failure (such as at the Mythe water treatment plant and the Walham electrical substation).

Similarly, the degree to which communities can access strategic reserves of lighting, heating and sanitation in the event of significant and enduring disruption must be addressed with vigour. This is a national, not local issue of great importance and urgency.

I hope you find these observations and those made in the enclosure useful which I propose to expand upon in the memorandum to be submitted in due course.

I will be very happy to provide a preliminary brief to the Committee Chairman, Rt Hon Michael Jack MP. I believe this would be most valuable.

This letter is simply a way of a preliminary response to your letter of 21 August. I will be submitting a full response for this Committee’s attention in due course.

T J Brain
Chief Constable
Gloucestershire Constabulary
August 2007

Memorandum submitted by Datchet Parish Council (FL 115)

THE JUBILEE RIVER AND THE THAMES DOWNSTREAM OF WINDSOR.

Further to the Environment, Food and Rural Affairs Committee’s announcement that it will hold an inquiry into flooding, Datchet Parish Council makes the following submission for the Council’s attention and concerning the Jubilee River in Berkshire.

SUMMARY

1. The Environment Agency (EA) is responsible for the design, construction and operation of the Jubilee River (scheme). This scheme has been shown to be of substandard design and/or construction, is still awaiting further repairs as at September 2007, and may never be able to meet its water flow design capacity.

2. First, it is our view that The EA should not have the right to divert floodwater through the “press of a button” (via the Jubilee River) onto undefended villages downstream of Windsor, a situation which currently exists.

3. The EA is responsible for flood defence, but has neglected dredging of the Thames (for flood defence purposes) for over ten years. This neglect may result in an ever-worsening situation, with the attendant increased risk of flooding in the future.

4. Maintenance of local watercourses by the EA is in our view inadequate eg failure to remove fallen trees or other obstructions from local brooks and watercourses, a failure which directly impacts the efficacy of flood drainage resources.

5. On behalf of the people of Datchet we ask that Thames dredging is reassessed for flood defence purposes and be re-introduced immediately, should the efficacy of such practice be proven.

6. The EA’s legal duties and responsibilities for existing flood defences should be urgently clarified. Currently concern exists as to the scope of the EA’s duties and whether such duty overrides the rights of all or just certain property owners, businesses and agencies, in establishing and/or operation of flood defences.
POINT-BASED SUBMISSION

1. The Maidenhead, Windsor and Eton Flood Alleviation Scheme (MWEFAS) was conceived in the 1980’s, considered at a public Inquiry in 1992, construction commenced after Ministerial approval in 1995 and was named Jubilee River (JR) in mid-1992. The main construction consists of a 12 km man-made unlined channel that takes flood water out of the Thames at Maidenhead and returns it into the Thames at Datchet.

2. The purpose of the MWEFAS was to reduce the risk of flooding in the areas of Windsor, Eton and Maidenhead where development had taken place on floodplain.

3. During the MWEFAS planning stage, Datchet received assurances from the National Rivers Authority that the MWEFAS would not be detrimental to the downstream villages (ie use of MWEFAS would not exacerbate flooding downstream).

4. At £110 million, the Jubilee River was (and remains) the most costly fluvial flood defence scheme ever built in this country.

5. On first use in January 2003, when the EA diverted water via the JR, many hundreds of households downstream of Windsor suffered flooding for the first time since 1947. In addition almost every structure along the JR was damaged.

6. Demands for a Public Inquiry into the 2003 flood event were rejected.

7. Since the January 2003 flood event, evidence has emerged that confirms the JR was of sub-standard design and construction, and was also incorrectly/negligently operated by the EA during the flooding.

8. Taplow sluice design omitted a stilling basin, Manor Farm weir was designed back-to-front, Slough weir protection was washed away and the Myrke embankment (which was on the verge of collapse) had to be dismantled and rebuilt.

9. Repairs to date total about £4 million and are currently incomplete. The JR is unable (and may never be able) to carry its design capacity.

10. The EA have reached a £2.75 million out-of-court settlement with JR’s designers (via their insurers).

11. Despite assurances from the National Rivers Authority that the MWEFAS would not be detrimental to the downstream villages, the EA now divert floodwater at the press of a button (via the Jubilee River) onto undefended villages downstream of Windsor. This is not just unfair but also of surely questionable legality ie the arguably deliberate potential for knowingly putting property and assets at risk of flooding.

12. Since construction of the MWEFAS commenced, the EA has neglected dredging of the Thames for flood defence purposes, a necessary though costly practice, in the eyes of many environmental experts, for the alleviation of flood risk. The EA has a duty to maintain the Thames for navigational purposes, but only a “responsibility” to maintain the Thames for flood defence purposes.

13. It is apparent locally that EA watercourse maintenance (i.e. designated Main River) is inadequate.

Datchet Parish Council
September 2007

Memorandum submitted by the British Damage Management Association (BDMA) (FL 116)

EXECUTIVE SUMMARY

As the certifying authority for recovery and restoration technicians the BDMA is especially aware of a number of critical factors that impact on the effectiveness of recovery procedures carried out in the immediate aftermath of flooding.

As far back as 2000 the BDMA highlighted the importance of devoting resources to supporting a robust recovery strategy in conjunction with the investment in flood defence. It argued that even the most sophisticated defence initiatives could not ensure the absence of flood incidents and a refusal to address the response infrastructure was dangerously naïve. It referred to this naivety as “The Canute Syndrome”.

The BDMA’s concerns have since proved well founded with Boscastle, Carlisle and this year’s major floods demonstrating that such incidents are not always related to predictable or manageable encroachment of coastal or river capacity.

The BDMA believes there are some key issues that are critical to efficient and cost effective recovery after major flooding incidents. These relate to a general lack of understanding of the essential technical/specialist procedures that should be commenced as a matter of urgency in the immediate aftermath of an incident, the need to ensure this front line response is carried out by professionally qualified personnel experienced in this specialist area, and communication to flood victims of what the recovery and restoration of their property is likely to entail, in other words the management of expectations.
These issues are outlined in detail in this submission.

It is also essential that all those involved acknowledge the importance of identifying a method of categorising what constitutes a major flood incident and recognise that such incidents cannot be recovered under the same protocols as those followed where damage is less widespread and extreme. The need to agree a strategy for responding differently to major events at the commencement of the recovery phase is therefore paramount.

While many lessons have been learned from previous incidents of extreme flooding, there is much that could be done to improve the experience of flood victims, reduce the timeline to reinstatement and achieve cost effective solutions in these circumstances.

The following issues, highlighted by the experiences of the BDMA and its members in the field during the severe floods of June and July 2007, relate to the recovery phase and are submitted for consideration by the committee:

1. **Education**
   a. There is a general misconception that work required to recover properties after flooding is of a general building nature. In fact it is essential that specific procedures are carried out by properly qualified damage management technicians as a first response in order to stabilise the property, mitigate secondary damage and assess recovery options. It is only when a property has been professionally dried out, decontaminated, stabilised and sanitised that building restoration work can commence.
   b. This is understood in principle by the majority of insurers but the infrastructure which enables this type of response is not designed to support the type of major incidents we have seen this summer.
   c. Flooding at this level will always leave resources stretched but it is essential protocols are developed which identify a point at which the incident is classified as “major” and there is agreement that in these circumstances a different set of response procedures then automatically come into force.

2. **Capacity**
   a. At present the major insurers normally roll out flood recovery work to a pre-defined list of contractors with whom they have a prior/ongoing agreement. This will generally include a commitment by the contractor to nationwide coverage, an agreed pricing structure and a guaranteed minimum response time.
   b. In normal circumstances this, no doubt, works well for both the insurer and the nominated contractor. However, the restrictions of this practice are exposed when major flooding incidents occur.
   c. Due to the nature of the majority of these agreements, it is only the larger organisations which can meet the requirements such as national coverage, etc. Consequently, in recent years, many of the smaller specialist damage management companies and individuals, with a wealth of experience and expertise in this sector, have gone out of business and are no longer available.
   d. The remaining smaller practitioners, who are required to operate independently, will struggle to access insurance led work. The anomalies of this situation are highlighted in a major flood incident or “surge” occurrence.
   e. The recent demands on all involved in the recovery of flooded properties have unsurprisingly overwhelmed the system and, in such extreme circumstances, it is unreasonable to expect turnaround to be completed within a normal timeframe. However, while some flood victims have had to wait for lengthy periods before commencement of recovery and restoration of their property, qualified experts have been available but unable to access work on insured properties.
   f. This is not only illogical and unacceptable to all concerned, but entirely avoidable if there was agreement to operate a different system in major incident situations.
   g. It is also true to say that the fixed price agreements set up with nominated damage management contractors can become impractical in a surge situation and maybe these too could have some room for adjustment at times when flooding has been classified as a major incident.

3. **Communication**
   a. There is no doubt management of recovery following major flood incidents is continually improving. However, in our experience and that of our members, many flood victims, who may be waiting longer than would normally be expected, are left bewildered and unsure of what lies ahead due to a lack of communication. This adds greatly to the stress already being experienced in this type of situation.
   b. In order to address this issue with regard to our own industry the BDMA has published a series of documents to support flood victims at various stages of the recovery process.
   i. A Self Help Sheet sets out some of the things victims can do themselves without prejudicing their insurance claim. It also includes advice on keeping safe and healthy in the vicinity of water...
damaged properties. At the height of this summer’s incidents this document was published on all the major news channel websites and digital text pages and a BDMA representative answered questions on local radio stations across the flood hit areas.

ii. A leaflet entitled Understanding Basic Flood Recovery Procedures identifies procedures damage management technicians may need to carry out to stabilise and dry out affected properties. It also explains the objectives of these procedures and how they are measured.

iii. The Record of Flood Recovery Activity allows flood victims to keep track of work carried out and see what remains to be done. The document also includes space to note details and contact information relating to the contractor/s involved.

c. Since the end of June over 40,000 copies of these documents have been freely distributed to victims in the flood affected areas via local authorities, Environment Agency offices, emergency planning officers, the Red Cross, BDMA members and other agencies. A number of MPs have also requested stocks for their surgeries. The documents remain available to order in bulk or download via the BDMA website at www.bdma.org.uk.

d. In addition to facilitating a better understanding of their situation, these documents empower flood victims by giving them some level of control and ownership of their recovery, which is critical at a time of severe stress.

e. Feedback to date indicates that this initiative has had an enormous impact and has proved to be a valuable tool in supporting flood victims at this vulnerable stage.

4. “COWBOY CONTRACTORS”

a. The documents outlined above offer the additional benefit of acting as a deterrent to unscrupulous contractors. For those who are uninsured, often the most vulnerable, being in a position to outline what they expect from a contractor they are appointing allows them to be more discriminating in their choice. Anyone without experience or understanding of what is required is unlikely to be willing to sign up to the contractor record, for example, giving the property owner a valid reason to go elsewhere.

5. CONCLUSION & RECOMMENDATIONS

a. The importance of utilising professionally qualified technicians as front line responders in the immediate aftermath of flooding cannot be overemphasised. After the 2000 floods over £80 million of flood recovery and restoration work had to be re-done due to unsatisfactory procedures. Latent mould growth is just one of the problems that can arise many months after work has been completed and property handed back to the owner, posing additional risks to health. Yet we still see instances where essential processes are cut short or bypassed in order to move things forward more quickly. This is not cost effective, efficient or timely in the long term and customer satisfaction gained initially through quick fix solutions is soon lost when further disruption ensues.

b. As the BDMA pointed out several years ago, investment in supporting a robust and professional recovery strategy should go hand in hand with development of flood defences. As we have seen, flooding will continue to occur and we must be prepared to deal with it effectively.

BDMA

September 2007

Memorandum submitted by English Heritage (FL 117)

THE IMPACT OF THE SUMMER 2007 FLOODING AND ADVERSE WEATHER ON THE HISTORIC ENVIRONMENT

INTRODUCTION

This paper has been put together with information supplied by English Heritage, the National Trust and managers of some World Heritage Sites. It is obviously not a full picture but is intended to give a snapshot of the likely total impact of the recent flooding on the historic environment.
**Numbers of Properties Affected**

At the time of the crisis, the Secretary of State for the Environment, Food and Rural Affairs, Hilary Benn, estimated that 15,000 homes could be flooded. It seems likely from the partial information set out below that the number of listed buildings affected runs into the hundreds. There were probably well over a thousand unlisted historic buildings in conservation areas affected in some way. We understand that the Environment Agency is mapping the areas that were affected by flooding on their GIS. When we have this information we can identify how many listed buildings, scheduled monuments and other nationally designated assets were within the flood area.

**Costs**

Total UK costs from the recent floods and adverse weather are estimated by the insurance industry at between £2.2 billion and £3.3 billion. The upper estimate is from Fitch Ratings and includes motor-related claims. Within this overall cost, the Chartered Institute of Loss Adjusters put the costs of the Yorkshire floods at £1.5 billion, made up of £0.8 billion domestic and £0.7 billion commercial claims. In a normal year total weather-related claims in the UK are between £0.5 billion to £1 billion.

Estimating costs for historic buildings and sites is very complex. Although it is sometimes asserted that refurbishment of historic properties is more expensive than general refurbishment costs, the fact that the repairs may be less extensive than a non-conservation repair, that the works will generally be carried out with a higher level of workmanship and will use more durable materials may result in higher costs for the initial outlay which are off-set by the longer life of such work compared to modern techniques. In most cases it can be assumed that Loss Adjusters take into account listed or conservation area status in estimating repair costs and therefore most historic environment costs are likely to be included within the overall estimate made by the industry.

There will be uninsured costs over and above those covered by insurance, for example damage to scheduled monuments through erosion from watercourses, to drainage systems and to historic parks and gardens. The damage on some of these, particularly those not open to the public as visitor attractions might not become apparent for some time.

There may also be costs associated with decontamination. Drying-out times for historic fabric are likely to be longer than for modern buildings to avoid damage to fabric.

**Regional Information**

*North West*

Damage to the English Heritage sites at Birdoswald Roman Fort, (an English Heritage property) part of the Hadrian’s Wall World Heritage Site and Brough Castle (an English Heritage property) in Cumbria.

No reports of damage caused by the recent floods but Carlisle City Council may have figures for costs following the January 2005 floods.

*North East*

Brinkburn Priory (an English Heritage property) suffered minor damage in the adverse weather conditions with limited repairs needed.

*Yorkshire*

Visitor attractions:

At Fountains Abbey World Heritage Site, Ripon (owned and managed by the National Trust) there was direct damage from floodwater of historic fabric; may also include undercutting of heritage river defences (yet to be assessed). There was damage to buildings and structures damage and reinstatement and the balance relates to loss of commercial fixtures and fittings plus loss of revenue (that revenue ultimately being used to pay for conservation work) Substantial work may be needed in the longer term for works that will reduce the risk from future flooding.

St Peter’s Church, Barton-upon-Humber (an English Heritage property) there was floor subsidence due to compaction of fill material by being waterlogged.

At Mount Grace Priory, nr. Northallerton (an English Heritage property) there was damage from floodwater of historic fabric.
Other Historic Buildings and Sites:

The DCMS representative at GOYH is co-ordinating information-gathering at a regional level. English Heritage did a quick ring round of most of the affected Local Authorities and of those spoken to, found that Sheffield City Council was the only Authority to have done any kind of assessment. They identified 46 listed buildings (4 Grade II*, 42 Grade II) affected by the floods. At least 32 of these appear to have sustained damage and one of these (a milepost) is missing. 7 of the 8 listed bridges have sustained damage, two potentially serious. Two listed churches are likely to have suffered from internal damage. A complex of Grade II* former industrial buildings, relatively recently converted to residential use, sustained some damage along with flooding of some apartments. English Heritage is not aware of any cost estimates for the damage to the historic structures. Some are likely to have been insured, but others (bridges, milepost, weirs and viaducts) were probably not insured.

In Rotherham, the Chantry Bridge and Chapel were affected. The arch of the new chantry bridge attached to the Scheduled Ancient Monument disappeared under the water. It is likely that the cellar of the Chapel was flooded but it has not been possible to assess the damage yet.

More than 10,000 homes were evacuated in Hull and Doncaster was also badly affected. Other Local Authorities have said they are aware of flooding of a number of listed properties in villages and have had a number of enquiries from owners of listed houses and from insurance companies about repairs to plaster work and drying out etc.

West Midlands

Historic Buildings, sites and areas

The main settlements affected in the West Midlands region were Upton on Severn and Tenbury (Malvern Hills) and Evesham (Wycheavon) are still taking stock. Many listed buildings have been affected in all three towns although the insurance/lack of insurance position is still unclear. Worcester and Bewdley were also partly flooded. Several older road bridges have been damaged or destroyed across Worcestershire and Warwickshire according to TV news but so far English Heritage has had no contact with the County Council and how many are listed is not known.

At Ironbridge Gorge World Heritage Site in Shropshire, costs still being collated but there was some impact at the museums. 60 houses, most of which are listed, in the gorge flooded twice. The biggest impact was on Coalbrookdale where residents were evacuated. The estimated insurance costs of the flood are £10 million for loss/damage to contents, £53 million for building and structure damage and £350,000 for loss of stock. To date the clean-up costs have totalled £24,000.

Only four churches are reported to have been flooded in Worcester diocese: two in the Broadway area were not seriously damaged because flood waters rushed through en route to somewhere else. The third, Severn Stoke, regularly floods and was awaiting an Environment Agency flood defence scheme. The fourth is not known to English Heritage at present.

East Midlands

In the Derwent Valley Mills World Heritage Site, Derbyshire, the North Mill at Belper appears to have been the only significant structure to have been flooded, with almost 2 metres of water in the basement. Other structures which may have been affected, although English Heritage has not received any reports, are the weirs on the River Derwent.

The only other reported incident is the need to replace lights in the undercroft at Lincoln Medieval Bishops’ Palace as they had become waterlogged from heavy rain.

East of England

There are no known costs relating to flood or severe weather damage related to this recent event.

South East

Blenheim Palace World Heritage Site in Oxfordshire, has suffered a certain amount of damage, primarily to a number of large section of the listed Park wall but also to the visitor business as a result of flooding in the Pleasure Gardens, necessitating the temporary closure of part of that area. There was some flooding in basements. There was a significant loss of business to the estate and repairs to damaged fencing and gates on the estate not covered by insurance have had to be undertaken. Some estate properties outside the World Heritage Site were affected.

Around 1,500 properties were flooded in West Oxfordshire including buildings in Oxford (250+ properties), Pangbourne (200 properties) and Abingdon. Some of these are likely to have been listed buildings or in conservation areas.
South West

Visitor Attractions:

English Heritage is currently re-excavating a tunnel to the centre of Silbury Hill, the Neolithic mound with a view to comprehensively backfilling it with chalk and thus stabilising the Hill. Work had to be halted due to collapses within the Hill. Our conservation engineer believes that conditions, if not caused by the heavy rains, were significantly exacerbated by the weather. Work has now recommenced with an adapted method of tunnelling. The additional work is considered to fall within the category of “unforeseeable ground conditions” within the contract and English Heritage is therefore liable for the additional costs. Given the nature of the monument and fact that the combination of ground conditions and the weather, it is unlikely that this would have been insurable.

Hailes Abbey (an English Heritage property) was particularly badly affected with the site under 9 inches of water on Monday 23 July, although the museum and shop were not affected. The overflow car park surface was washed away, areas of turf were ruined, toilets put out of use and low level masonry work damaged.

The new visitor centre at Goodrich Castle (an English Heritage property) flooded in the earlier spell of heavy rain on 19–20 June.

A number of English Heritage properties were either forced to close or close early as a result of the severe weather on 20, 21 and 22 July: Wenlock Priory, Buildwas Abbey, Kenilworth Castle, Witley Court, Stokesay Castle and Wroxeter.

Kelmcott Manor (run by the Society of Antiquaries) suffered some damage.

Other Historic Buildings, sites and areas:

The main impact as far as English Heritage’s advice and grants work in the south west is concerned has been in Tewkesbury and Gloucester. In the former many historic properties appear to have been flooded but most damage should be covered by insurance. Tewkesbury Abbey flooded for the first time in living memory. Tewkesbury is significant because as well as being an important historic town it has received considerable grant aid from English Heritage in the past. In Gloucester, the extent of damage has not yet reached English Heritage but we anticipate it being less in relation to individual historic buildings.

English Heritage has been dispatching copies of their publication on dealing with flooding and has offered technical advice where required. The published advice is available via the website at http://www.english-heritage.org.uk/server/show/conWebDoc.2854

English Heritage

September 2007

Memorandum submitted by the RSPB (FL 118)

1. SUMMARY

   — The RSPB believes that operating authorities need a wider range of mechanisms to control growth in flood risk in a socially equitable, cost-effective and environmentally sustainable manner.

   — The RSPB calls on government to take decisive action in its Climate change Bill to reduce our emissions of green house gasses by 80% by 2050.

   — The RSPB believes that restoring river corridors and creating wet washlands will bring multiple benefits for flood risk, diffuse pollution control, biodiversity, landscape and amenity.

   — The RSPB believes that the management of soils, vegetation and water storage in the rural landscape should be seen as the “first line of defence” against flooding.

   — The RSPB calls for a fundamental overhaul of the funding and governance structures of drainage authorities to ensure Government investment delivers the greatest public benefits.

   — The RSPB calls on Government, The Environment Agency and Local Authorities to protect floodplains from development.

   — The RSPB calls on Government to address legal uncertainty over water company responsibility for the adoption and maintenance of SUDS.
2. The Impact of Floods on People and Wildlife

2.1. As recent events have shown, flooding can have a devastating impact on communities, individuals and businesses, often lasting long after the waters have subsided. Although the greatest economic damage occurs in towns and cities, the impact and anxiety caused is no less real for those affected in more isolated rural locations, where it is often difficult to justify construction and maintenance of defences on economic grounds.

2.2. Wildlife can also suffer from floods. The RSPB reserve at Minsmere in Suffolk, for example, lost all but one of its bittern nests this year, a potentially serious impact upon the total UK population. At the same site, rare purple herons were prevented from nesting after the rainfall in May. In Cambridgeshire, over 500 pairs of wading birds were flooded out of the Ouse Washes.

2.3. There are other, less obvious environmental consequences of flooding. Raw sewage or other pollutants often contaminate floodwater, particularly where industrial complexes are inundated. This cocktail of chemicals from transport, industry and agriculture can have long-term implications for species and habitats.

2.4. Of course, flooding is an essential element of natural ecosystems and even in the heavily modified rivers and wetlands of England, this summers floods brought winners as well as losers. For instance, re-wetting after the dry April enabled early breeding wading birds to fledge successfully, and waterfowl appear to have been productive on the additional areas of shallow floodwater. However there is little doubt that the resilience of wetland species has been severely compromised by land drainage and flood defence policies that have destroyed, fragmented and isolated wetland habitats.

3. Why Floods Have Become a Problem

Climate change

3.1. Historic emissions of greenhouse gases have already committed us to a changing climate. The European Environment Agency has reported that in the UK we are likely to face increased overall rainfall in winter and more frequent and severe storms throughout the year.

3.2. The Government’s Foresight Future Flooding report makes a clear case for the escalating likelihood and costs of extreme flood events to 2080 under any of the IPPC scenarios. Although this has been widely accepted in the scientific community, the UK government’s climate, energy, transport and land use policies are not yet sufficiently integrated to tackle the many ways in which we all contribute to climate change.

Floodplain wetland fragmentation

3.3. Wetlands support a wealth of biodiversity and can provide a range of ecosystem services including pollution control and floodwater storage. However, centuries of land drainage and flood defence have destroyed all but a few fragments of England’s wetland ecosystems often leaving them isolated from rivers and each other. This has not only reduced the capacity of river corridors to store water and mitigate flooding. It has also made wetland wildlife increasingly vulnerable to catastrophic flooding as, faced with rising flood water levels, even relatively mobile species such as birds have little opportunity to find refuge in the surrounding landscape.

Rural land management

3.4. There is little doubt that farming has changed in ways that could be hydrologically significant such as:

- loss of hedgerows and larger fields
- cultivation practises compacting soils reducing their water storage capacity
- land drains connecting the hill top to the channel
- cracks and mole drains feeding overland flow to drains and ditches
- unchecked wash-off from bare soil
- plough lines, ditches and tyre tracks concentrating overland flow
- tramlines and farm tracks which convey run-off quickly to watercourses
- channelised rivers with no riparian buffer zone

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41 European Environment Agency Report No. 2/2007 “Climate change and water adaptation issues”.

42 Foresight Future Flooding, Office of Science and Technology: www.foresight.gov.uk

3.5. Defra-sponsored research into flooding and land management found substantial evidence linking agricultural intensification with surface run-off at a local scale. Although run-off of soil and water is not likely to be seen as a problem by farmers, the effect on those impacted by “muddy flooding” can be devastating. In his paper on muddy flooding in the South Downs, Butler assessed the impacts of the floods of winter 2000 in seven local settlements: property damage was estimated at £1 million, with traffic disruption and clean-up operations running to £5 million.

3.6. Although the local impacts are clear, the same Defra research found little direct evidence linking changes in land management to increasing flood risk at a catchment scale. However it is important to note that the authors stress this may be because there have been very few studies.

3.7. This remains a very active area of research and work carried out by WWF Scotland points to a very positive relationship between flood generation and the management of the river Devon and its catchment.

Land drainage and river engineering

3.8. Historically, the over-riding emphasis of land drainage policy has been to move water off land into rivers and out to sea as quickly as possible. Defra’s review of land use and flooding touched briefly on this issue and cited a study by Baily and Bree which demonstrated that flood peaks were 60% higher on rivers that have been arterially drained in comparison with unmodified rivers. Similarly, Robinson showed that whilst the impact of sub-surface land drains is dependent on soil type, overall “studies of flow records from individual catchments indicate that the combined effect of field drainage and arterial works is to increase streamflow peaks (and dry weather flows) whether or not maximum flows are increased or decreased at the field scale. At the regional scale artificial drainage was a statistically significant parameter shortening catchment responses times.”

3.9. Therefore, while land drainage and river engineering may be effective in reducing water levels and flood damage at a local scale, there is little doubt that the loss of natural attenuation through floodplain storage increases the speed and size of flood peaks as they propagate downstream.

Urban planning

3.10. Rivers and floodplains have attracted settlements for millennia leaving a long legacy of building floodplain development and defence. The growth in value of defended land (both because of increased prosperity and new development) makes the economic justification of defences easier while the construction/ improvement of defences encourages further development. This self-perpetuating loop locks society into escalating costs as maintenance and improvement struggle to keep pace with climate change and sea level rise. The apparent control of flooding also hides a growing residual risk that must be dealt with when, inevitably, defences fail or are overtopped.

3.11. Urban areas are not just at risk from river and coastal flooding. British towns and cities rely on drains and sewers to dispose of surface water and, as the flooding in Hull demonstrates, when these are overwhelmed the damage can be devastating. Damage from intra-urban or pluvial flooding is set to grow dramatically as our ageing sewer and urban drainage infrastructure struggles to cope with connections from urban expansion and, most significantly, the heavier rainfall associated with climate change.

4. What needs to be done

4.1. A portfolio of responses: The RSPB believes that operating authorities need a wider range of mechanisms to control growth in flood risk in a socially equitable, cost-effective and environmentally sustainable manner.

4.2. The Government’s Foresight report highlighted how climate change could drive flood risk to unacceptably high levels. Relying on hard defence and flood warning will do nothing to tackle underlying drivers of rising flood risk and are unlikely to be cost effective, socially equitable or environmentally sustainable into the long-term.

50 The Foresight Flood Study estimates an increase in annual flood damages between 2 and 20 times higher than currently by 2080 depending upon climate change scenarios.
4.3. As a result we believe it is time for the portfolio of measures described in the Government’s strategy “Making Space for Water” (MSfW) to be translated into action. We envisage a system that continues to prioritise areas where flood risk poses the greatest social, economic or environmental problems but where the selection of the solution is aided by cost-effectiveness analysis looking at a broad range of options to reduce flood risk and deliver wider Government policy objectives including:

- Land use change
- Increasing housing and infrastructure resilience
- Flood defence schemes
- Migration of assets (e.g.: of caravan parks or property)
- Flood and coastal erosion assurance schemes.
- Purchase of property.

4.4. These may not all be directly funded by the Environment Agency, Defra or even Government, but they must work in an integrated manner to reduce risk.

Tackle climate change: The RSPB calls on government to take decisive action in its Climate change Bill to reduce our greenhouse emissions by 80% by 2050.

4.5. The Foresight study makes it clear that reductions in emissions across all sectors of society would substantially help to manage future flood risk. We have now reached a point where urgent mitigation and adaptation are required to address the climate crisis, and it is widely acknowledged that for the UK to contribute its share in keeping global warming below a 2 degree average, we must reduce our emissions by 80% from the 1990 baseline by 2050. This commitment must be made now, on the face of the Climate Change Bill.

4.6. Restore floodplains and river corridors and create wet washlands for multiple benefits: The RSPB believes that restoring floodplains, river corridors and creating wet washlands will bring multiple benefits for flood risk, diffuse pollution control, biodiversity, landscape and amenity.

4.7. Although the impact of river and floodplain restoration is site specific, in general it offers an opportunity to slow the movement of water and increase storage in a catchment. In general this will bring give communities more time to respond to flood warnings and increase resilience and effectiveness of existing defences, particularly in the face of climate change.

4.8. Wetland creation and the “re-naturalising” of river corridors will also play a key role in helping wildlife adapt to a changing climate, providing corridors for species to move through and creating a network of semi-natural wetlands for populations to disperse to in response to cycles of drought and flood.

4.9. Connectivity between floodplains and rivers has also been shown to be extremely important for fish, riverine invertebrates and plants. Creating a more natural flooding regime in some rural areas could be important for restoring a thriving river ecology and achieving the objectives of the Water Framework Directive.

4.10. Of course there is nothing new about using storage as a tool for flood risk management and there are a number of urban areas that rely on engineered “washlands” for their defence. Historically these have been designed to remain dry in order to maximise storage at the expense of biodiversity. However, as the Agency/RSPB scheme at Beckingham Marshes shows, the creation of wet washlands offers significant potential for habitat creation, contributing to the delivery of UK priority BAP targets alongside flood risk management; in effect delivering multiple land use outcomes.

4.11. Reward responsible land management: The RSPB believes that the management of soils, vegetation and water storage in the rural landscape should be seen as the “first line of defence” against flooding.

4.12. Filling the evidence gaps on catchment scale effects of land use and management change should be a priority for Government’s response to the floods of 2007. The lack of direct evidence must not be used to justify inaction but instead encourage an adaptive approach that allows the flood risk and land management community to “learn by doing”. Such an approach could benefit people across a catchment, not just those communities that qualify for hard defences, and the measures could also benefit biodiversity, diffuse pollution control amenity and landscape.

4.13. Flood risk management is identified as a secondary objective of the existing Environmental Stewardship scheme and many of the options have the potential to deliver some benefit for run-off control. However, it cannot be assumed that the application of the current Environmental Stewardship scheme will automatically deliver significant flood management benefit by default. Where success in controlling muddy flooding has been reported, this was achieved through the direct targeting of measures including the use of set aside, an option which is no longer available to farmers.

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51 See www.foresight.gov.uk/Previous_Projects/Flood_and_Coastal_Defence/Project_Summary/Projectsummary.htm for a summary of the report’s findings and recommendations.
4.14. That is not to say that the current cross-compliance and agri-environment model cannot be adapted to deliver run-off control and local flooding benefit. However, it is important to recognise that the current budget is limited and that there is little scope for increasing the range of objectives without undermining delivery of current SSSI PSA targets, Natura 2000 condition and biodiversity targets. Any new or extended scheme for flood risk management would require significant new funds to be made available to the Rural Development Programme through treasury, modulation and, ultimately, further reform of the Common Agricultural Policy.

4.15. Manage rural land drainage for maximum public benefit: The RSPB calls for a fundamental overhaul of the funding and governance structures of drainage authorities to ensure Government investment delivers the greatest public benefits.

4.16. There is little doubt land drainage will continue to play a significant role in managing flood risk in certain locations. However it is estimated that 500,000 hectares of agricultural land are currently defended where it is uneconomic to do so, while drainage and inappropriate ditch management have been identified as among the top ten issues impacting on SSSI condition by land area. Given this background, it would be difficult to argue that the governance or practice of land drainage is fit for purpose today, let alone ready to take on the challenge of climate change.

4.17. We see a new role for operating authorities with the emphasis shifted from simple “drainage” to “water level management” that delivers the greatest benefits to society rather than perpetuating historic practices and local interests. This step change in approach will be a challenge for the Environment Agency and require a fundamental overhaul of funding and governance structure of Internal Drainage Boards.

4.18. Avoid development in areas of high flood risk: The RSPB calls on Government, The Environment Agency and Local Authorities to protect floodplains from development.

4.19. The RSPB supports the tougher policy on development and flood risk signalled under PPS25 and its supporting guidance. In particular, we welcome new call in powers for the Secretary of State where Environment Agency advice is ignored. However, we are concerned a significant gap still exists between the policy and practice. For example in the Aylesbury designated growth area for instance, 11% of the housing will still be built in high-risk areas beyond the ABI’s guarantee of affordable insurance.

4.20. This “business as usual” approach simply stores up problems for the future for the sake of expediency now.

4.21. Drain urban areas with sustainable drainage systems: The RSPB calls on Government to address legal uncertainty over water company responsibility for the adoption and maintenance of SUDS.

4.22. Modern British towns are essentially impervious to water but this does not need to be the case. A number of UK and international examples have demonstrated how, rainwater recycling, green roofs, settling ponds and porous paving can play a role in storing and cleaning water before passing it on, at a controlled rate, to rivers. These “Sustainable Urban Drainage Systems (SUDS) also offer improved amenity in the urban landscape and, unlike traditional piped systems, they can be designed to fail safe so that residents have ample warning before their capacity is exceeded.

4.23. Despite the obvious advantages of SUDS, their use in England remains the exception rather than rule. One of the key stumbling factors is that SUDS do not fall within the legal definition of “sewers”, so water companies are not able to adopt their ownership and maintenance easily. We call on Government to address this at the earliest opportunity.

5. The Way Forward

5.1. As the Government’s “Foresight” report noted, public opinion and “outrage” expressed in the wake of a widespread disaster can be significant factors in policy development. We are concerned that recent flood events will put pressure on government to apply short term “fixes” to flooding by reverting to the more “visible” option of raising defences, increasing channel dredging and the improving the “efficiency” of rural drainage networks. This “business as usual” model will do nothing to tackle fundamental issues underlying the growth of flood risk, will lead to further damage the environment and, ultimately may exacerbate problems now and into the future.

Instead the RSPB calls on Government to accelerate delivery of the reforms promised by Making Space for Water. Only then will the benefits of sustainable flood risk management be recognised by the public.

RSPB

September 2007

55 See www.cira.org.uk/suds/case_studies.htm for examples at Hopwood motorway services, Cambourne residential development, Bristol business park and Dumferrline eastern expansion.
Memorandum submitted by Peter J D McNally (FL 125)

Flooding at Hannington Wick

It will probably come as no surprise to you that I and my other neighbours at Hannington Wick were all flooded in the evening of the 20th and 21st of July this year. Despite being in an area with a high water table this has not occurred ever before and certainly not in the knowledge of one of my neighbours who has kept records for the last 50 years.

The various ditches running through Hannington Wick down to the Thames flow from South to North were well able to cope with the heavy rain fall on Friday morning without any of the houses in Hannington Wick being flooded. After the downpour in the morning the water levels at Hannington Wick were beginning to subside when at 7.40 pm my family and neighbours were telephoned to be told to evacuate as the water levels were expected to increase during the next 24 hours.

When I arrived from abroad on the 22nd July the house was completely flooded, water flowing from across the fields at the back of the house up to 18 inches deep along the drive at the front of the house.

Was the flooding inevitable? We understand that heavy storms had been forecast on Tuesday or was it due to a surge back of the level of the Thames because the flood gates lower down the Thames between Lechlade and Reading had not been opened?

The residents and the insurers need to know the answer to this question. Most of the houses in Hannington Wick had been there a long time. Had they been sacrificed to some more recently built housing estates further down the Thames? 350 year old properties such as mine are almost impossible to protect in view of their size and age and due to the high level of the water table.

I and my neighbours would like to be advised what precautions or other actions can be taken to avoid or mitigate such a reoccurrence.

For example what is the procedure for opening the lock gates between Hannington Wick and Reading? Who has the responsibility for regulating the water level in the upper Thames? What actually happened on the 20th and 21st July? Could this have been avoided by lowering the water levels in advance of the storms between the locks?

It is difficult to make sense of the information provided to us. We have been advised that the Environment Agency was originally responsible for regulating the level of both the main river of the Upper Thames and the principle feeders streams. We understand that they are no longer responsible for maintaining the banks and ditches leading to the Thames, weed clearing and the removal of debris and other fallen trees. We understand that they are still monitoring the level of the river electronically at the various locks. In 1989 we understand that the Environment Agency had a team of some 250 workers keeping the ditches and streams clear of obstructions. We understand that the workforce has now been reduced to 69 and the responsibility for clearing the ditches is no longer theirs.

We also understand that the responsibility the clearing the ditches adjacent to the roads is no longer up to the local council.

We would like to know who now has the liability for keeping these ditches cleaned and free of obstructions.

The flood was anticipated on Tuesday. No-one was informed in Hannington Wick until 7.40 on Friday evening. Should not the water levels between Hannington Wick and Reading have been lowered in anticipation of the storms of Friday?

We are told the levels of water along the Upper Thames are electronically monitored by the Environment Agency. We are also told that the system is extremely unreliable and subject to a number of glitches and incorrect readings. Who is responsible for the lock keepers down the Thames? Who decides what action to take when there is a threat of heavy storms? What happened on July 21st? Why were we only warned on 7.40 on Friday evening? Why were there no sand bags or other flood barriers delivered earlier? Some I understand were delivered between 8 o’clock and midnight on Friday evening, and then far too few.

What can now be done to prevent a future catastrophe? I and my neighbours and our insurers have substantial losses. My car is a write-off and my insurance premium is increased by 25%. I have to pay the first £10,000 of the cost of the damage to my 350 year old listed property and sustain massive disruption for several months.

I and my neighbours suspect we are the households that have been sacrificed to protect a probably larger number of households further down the Thames.

We need to have answers as to what happened on the 21st and 22nd of July which resulted in these losses and what action the government/Environment Agency can take to insure that we are not the easy victims of similar occurrences in the future.

We need to know who exactly was in charge—was it the Environment Agency? What was the responsibility of the council? Who else was involved? Or was it just an act of god?
It seems to us there is not clearly defined area of responsibility. The Environment Agency has been deprived of the resources to carry out proper flood protection and the local councils had been made to abrogate any responsibility. We the residents and tax payers have been left to foot the bill. Is it not time for the government to sort out this problem and deal effectively in allocating responsibility and accountability to the Environment Agency in a clearly defined manner?

Is there anything you can do to determine what actually happened and what action could be taken to mitigate such problems in the future? I and my neighbours will be most grateful for anything you might be able to do to help.

Peter J D McNally
September 2007

Memorandum submitted by Margaret Thompson (FL 127)

FLOODING

As you will see I am a Witney resident but was a fortunate one as I did not suffer from the flooding directly.

I was born at Cassington Mill on the Evenlode in 1962 and saw the flooding effects at that time. From the age of about 5 I remember seeing the waters rise in the winter leaving only hedges and trees standing. In the 70’s and 80’s the river management under the Thames Conservancy improved the situation and as children we would see the dredging barges on the Thames during the year.

One of the operatives is still in contact and could tell you all a lot about the management of the rivers in the area as this was his area of expertise. He does not have fancy degrees etc but a working knowledge of the water ways. This team of men kept the rivers well managed allowing the weed to grow up in the summer to hold the water levels up and then dredge them in the autumn to keep the flooding to a minimum. This is just the same as the millers did over time with their stretches of water.

The trees along the banks were looked after too with regular pollarding to avoid the branches ending up in the water and to stop the trees splitting and dying. The water meadows were just that, areas that took the excess water and benefited from the rich silt deposits. These areas were used in the summer for animals. Farmers and landowners kept the ditches clear to allow for the run off.

My family own Cassington Mill and have run a caravan park there for years but decided to close in 2000 due to the effects of flooding. The river is approximately 20 feet wide as we kept it clear for our customers to benefit from but below us the river has been left to “go back to nature” by the Environment agency, and is about 3 to 4 feet wide now. This is a subject which has angered us for a long time. We have 2 mill ponds and a lot of sluices here which mean we have a working knowledge of the subject. One mill pond has been allowed to fill up with debris and now has fairly large trees on an island in it. When the water was rising a lot of the excess went into this area and was contained but now has nowhere to go so rises and covers the land. A river which becomes 4 feet wide from 20 feet means that the water is forced into a smaller space and has by the law of physics to rise hence the flooding.

I have pictures of the Windrush where the water course is clear and the banks tidy as the blanket industry until fairly recently used both the water power and the banks for the blankets. They need to manage the water course for economic reasons.

All these rivers were managed water ways until the Environment Agency got hold of them and a few classroom taught people came up with the idea of “back to nature”. It is probably a money related idea. I cannot remember, but have been told that the rates used to have a small portion on the bill to cover dredging and river management.

Please can we have some common sense and ask the older generation to teach us how to manage the rivers again (before they pass on) and get this all back into proportion. Stop the abject misery for the poor people who have been subject to the flooding this particular year (not disregarding previous floods) and actually manage the rivers.

Perhaps the Insurance industry (who now do not wish to cover flood damage, and who would blame them) would be willing to assist in this matter, put the flooding back onto the local authority and allow monies to be collected to be used to assist this problem. Most of the expensive flood defences would not be needed, if this matter were controlled properly, and last but by no means least the poor people who for what ever reason are now trapped in this unfortunate situation be given some relief.

I would be very happy to meet and speak with the inquiry as I feel so strongly about this subject.

Margaret Thompson (Mrs)
October 2007
Memorandum submitted by Ewan Larcombe (FL 128)

SUMMARY

1. The Environment Agency is currently unwilling or unable to ensure that existing watercourses and flood defences are maintained, thus increasing the probability of flooding.

2. Create a new independent Flood Defence Agency (using existing EA/Defra employees whose work is currently primarily flood related.)

3. Give the Agency the legal duty to maintain the Thames for flood defence purposes, with appropriate powers as required.

4. Change the culture and ensure that higher ranking employees are properly qualified and have a good understanding of Applied Fluvial Geomorphology or similar. Reintroduce “Flood Defence”.

5. Existing river and flood defence maintenance to be the priority, with new flood defence schemes taking second place.

6. The Agency must be honest, transparent and accountable for their actions/inactions. When things go wrong, action should be taken against responsible individuals.

7. Ensure that consultations are easy to understand and receive wide publicity.

8. Create the position of Ombudsman for Flood Defence.

9. Place a duty on local Parish and Town Councils to regularly monitor and record the condition of all elements of their flood defences, to communicate with geographically adjacent authorities, and report potential problems to appropriate authorities.

SUBMISSION

1. Over recent years, the Environment Agency has taken over responsibility for thousands of miles of Critical Ordinary Watercourse from the local authorities. These watercourses are not being maintained by the riparian owners or the Environment Agency, leading to reducing capacity and increasing probability of flooding over time. Any maintenance that does take place is cosmetic and superficial. Trees are trimmed, paths cleared and fences repaired and painted. Local authorities have lost both the resource and the experience. The Environment Agency appears unwilling to use their powers to ensure that riparian owners fulfil their obligations towards watercourses and flood banks. I can give examples of flood banks that have been eroded or deliberately deconstructed, subsiding and failing banks, and watercourses with near zero flow due to bed-rise that the Environment Agency will not permit to be cleared or re-graded. In my opinion, the Environment Agency is currently unwilling or unable to ensure that existing watercourses and flood defences are maintained, thus increasing the probability of flooding.

2. Today the Environment Agency suffers from an internal conflict of interest. Previously the National Rivers Authority would ensure that that watercourse capacity was maintained, but now the Environment Agency will produce a long list of reasons why a watercourse cannot be dredged. I believe we need to create a new independent Flood Defence Agency (using existing EA/Defra employees whose work is currently primarily flood related) whilst simultaneously removing the barriers to flood defence maintenance.

3. The Environment Agency has a duty to maintain the River Thames for navigational purposes, but only the responsibility to maintain the Thames for flood defence purposes. The reality is firstly that the primary purpose of the Thames for thousands of years is that of a drain, and any commercial or recreational use is a bonus. Secondly (and more importantly) nobody else is willing or able to take the actions necessary to maintain the capacity of the Thames. Over time, the capacity of the Thames has reduced and the water level has risen. I recommend a significant reduction in the Standard Headwater Level of the Thames. There is a need to record the entire catchment existing watercourse capacities, and to compare actual capacities with the model capacities required in order to reduce the probability of flooding. There is a need to give the Agency the legal duty to maintain the Thames for flood defence purposes, with appropriate powers as required.

4. The National Rivers Authority (and prior to them the Thames Conservancy) had employees in Wellington boots with considerable experience and thorough understanding of the watercourses. With the arrival of IT, Environment Agency employees believe they can control the elements from the safety of a remote keyboard in a warm, dry office. The practice of “Flood defence” has been replaced by “Flood Risk Management” and the probability of flooding is increasing. We need to change the culture and ensure that higher ranking employees are properly qualified and have a good understanding of Applied Fluvial Geomorphology or similar.

5. Much existing river and flood defence maintenance has been abandoned. In my opinion it is pointless producing new flood defence schemes when existing defences are not working properly. Water causes flooding because it is trapped and unable to escape. The ancient watercourses both natural and manmade...
need continuous monitoring and regular maintenance. In particular, the bed of the Thames has risen since
dredging for flood defence purposes was abandoned. Local dredging now only takes place on receipt of
complaints that boats are scraping the bottom.

6. The £110 million Jubilee River scheme is still awaiting repair and unable to carry its design capacity.
On first use at only 66% of capacity in January 2003, hundreds of homes suffered flooding for the first time
since 1947. The Environment Agency had no right to divert floodwater onto undefended villages. Sub-
standard design, construction and operation led to structural damage, £4 million repairs and a £2.75 million
out-of-court settlement. The Agency “closed ranks” with consultants and contractors (all with incestuous
pecuniary interests and protecting each other) to deny liability. These people are all paid with public money,
and we the public are also their customers. Environment Agency employees are no longer capable of
determining whether their consultants or contractors are giving good advice or service. I believe that the
Agency must be honest, transparent and accountable for their actions/inactions, and this behaviour starts
from the top. When things go wrong, and members of the public are affected or disadvantaged, action should
be taken against responsible individuals.

7. Environment Agency consultations are very complex and poorly publicised. In particular, the EA will
notify a Borough Council about a consultation, who themselves then fail to respond or to pass on the
information. It would be easy to notify all parish and Town Councils by e-mail, thus ensuring that
consultations are easy to understand and receive wide publicity.

8. There is a need for an independent authority to consider complaints against the Environment Agency.
Create the position of Ombudsman for Flood Defence.

9. The local people have a vested interest in flood defence maintenance. They are best placed to know
and understand local flood defences, to recognise shortcomings and the need for maintenance, and the
implications of changes. We should place a duty on local Parish and Town Councils to regularly monitor
and record the condition of all elements of their flood defences, to communicate with geographically
adjacent authorities, and to report potential problems to appropriate authorities.

Ewan Larcombe
October 2007

Memorandum submitted by Dr R A Barnes (FL 129)

FLOODING ON 20 JULY 2007

SUMMARY

My home was flooded on 20 July. The immediate cause was Oxfordshire County Council’s failure to
maintain the road drainage system coupled with unusually heavy rainfall.

I have warned OCC Highways of the developing problem on several occasions over (at least) the past four
years but no remedial action has been forthcoming. Friends, colleagues and contractors have also described
experiencing flooding due to a failure by Oxfordshire, Gloucestershire and Wiltshire County Councils to
maintain road drains. The Committee may wish to explore this cause of quite extensive flooding in areas
remote from rivers and flood plains.

BACKGROUND

1. My home is situated in a rural area of Oxfordshire. It is not near a river and is not on a flood plain.
The road drainage system in the vicinity consists of open ditches linked under the carriageway by culverts.
Rainwater is supposed to pass from the carriageway, across the adjacent grass verges and into the ditches
by means of gullies cut through the verges. These are called “grips”.

2. Ditch maintenance is the responsibility of adjacent landowners although the Highways Authority
apparently has powers to clean them if free water is seen to pass across the surface of the carriageway.
Maintenance of the culverts and grips are the exclusive responsibility of the Highways Authority.

3. My home lies very close to a road junction where several ditches come together to form a land drain
which runs through my property. This merging of drainage water is supposed to be achieved by five culverts
all within a few tens of meters of my home.

4. I have lived at my present address for 20 years. During that period it has never before been flooded,
despite other periods of exceptionally heavy rainfall. Unlike 20 July these have occurred in winter when the
fields were already waterlogged and carrying standing water.
5. As far as I am aware, in the past 20 years Oxfordshire County Council has only once turned out to clean the culverts but could not locate many of them. They have only re-cut the grips once over the same period, excavating small (20cm) channels at random locations along the lanes. In some cases these were on high ground where drainage water does not accumulate. Because of their small dimensions, all the new grips were blocked by new vegetation within two years.

6. Over the past decade it has become apparent that failure to maintain the road drainage system was having profound effects on carriageway water retention in the area generally, not just outside my home. This, in turn, has caused a serious deterioration in road surfaces by both hydraulic action and freeze/thaw action.

7. I have brought the situation to the attention of the Highways Authority on several occasions over the past four years and have communicated my concerns to an OCC Director of Services. No remedial action resulted.

8. Flooding of the carriageway outside my home became so serious last winter that passing vehicles sprayed standing water over my garden hedge (1.8–2.0m high). This prohibited the pleasant and peaceful enjoyment of my garden. I again contacted the Highways Authority and my local (Conservative) County Councillor but no remedial action was forthcoming.

9. On 20 July this year, during a period of heavy rain—onto dry soil—the inevitable happened. Runoff, unable to enter the ditches because of an absence of grips and unable to pass from ditches on higher ground to those on lower ground because of blocked culverts, took the only available option and rushed down the carriageway of three lanes as raging rivers to meet outside my home.

10. A torrent of water suddenly appeared under the front hedge heading straight for the house. Although my wife and I protected the front door with hay bales and constant baling out with buckets (for 3.5 hours), water entered the rear of the property as it sought a path to the still only partially full land drain.

11. It was very clear to my wife and I that it was not any lack of capacity on the part of the ditches or land drain that caused our home, garden and outbuildings to be flooded but that the runoff could not enter them or follow the appropriate down gradient drainage pathway.

12. Friends, colleagues and contractors have also described experiencing flooding due to a failure by Oxfordshire, Gloucestershire and Wiltshire County Councils to maintain road drains. The Committee may wish to explore this cause of quite extensive flooding in areas remote from rivers and flood plains.

Dr R A Barnes
October 2007

Memorandum submitted by the Consumer Council for Water (FL 130)

FLOODING LESSONS LEARNED—RECOMMENDATIONS TO THE EFRA COMMITTEE

INTRODUCTION

The Consumer Council for Water (CCWater) is the consumer organisation that represents water and sewerage consumers in England and Wales. We welcome the opportunity to contribute to the EFRA Committee’s Flooding Inquiry. We have also submitted evidence to the Cabinet Office’s Flooding Lessons Learned Review.

The summer 2007 floods seriously impacted on peoples’ lives. Homes and businesses were severely damaged by flood water, many people had to leave their homes and the impact on the local economy was significant. To ensure that future protection is as effective as possible and that incident response is rapid and efficient, it is clear that better planning is needed going forward.

Our key concern about future flood incidents relates to the need to ensure adequate protection for water industry assets, to prevent the loss of supply and sewer flooding incidents, and also the need to improve water companies’ response to incidents, particularly the communication they have with their customers during these times.

BACKGROUND

During 2007, there have been many flood events across the country including Yorkshire, Wiltshire, Berkshire and Gloucestershire. In addition to the flooding of properties, the Gloucestershire floods in July 2007 also resulted in the loss of water supply to around 140,000 households.

The loss of supply that resulted from the flooding was so unprecedented that in response to this, CCWater
carried out qualitative research to explore the views of consumers that were affected. We did this to better understand their experiences and their perceptions of how the incident was managed, and also what they want to see happen in the future. We are currently carrying out quantitative research to further explore consumers' experiences.

Many of the views expressed in this submission are based on the findings from the qualitative research. But we also draw on experiences from our involvement in the Hexham loss of water supply in 2005, and the floods that affected Hull and the Thames region earlier in 2007.

**Summary**

Following are the key recommendations from CCWater:

- Water consumers should not pick up the bill for general flooding. Flood protection should be reviewed and funded by the Environment Agency, and ultimately the tax payer.

- There needs to be a clearly defined communications process in the case of declared disasters, both nationally and locally. During the loss of water supply in Gloucestershire, customers considered communication to be a top priority. Key lessons from the Hexham loss of water supply also highlighted the need for better communication between the various agencies, and for those agencies to be aware of CCWater and how it can help, particularly in respect of communicating with customers.

- Key organisations and their responsibilities in the event of flooding need to be identified and defined now. They need to work together to take a strategic approach to flood risk management including the response to the loss of essential infrastructure. CCWater needs to be involved in that process where water and wastewater assets may be at risk.

- National standards on the minimum amount of water to be supplied in emergencies need to be reconsidered after recent experience showed that Severn Trent delivered 10 litres per head per day more than the minimum requirement of 10 litres per head per day.

- New housing developments must create space for the water to flow in outside spaces. The creation of balancing ponds, lagoons and green spaces is essential for protecting homes against flooding, as well as creating bio-diversity opportunities.

- Water and sewerage companies should be statutory consultees for planning applications that could impact on water and wastewater infrastructure. This would allow companies to inform planners of their capacity to take more sewage and surface water into their systems. Indications are that the flooding in Hull was due to inundation of the drainage system during heavy rainfall.

- Consumers felt strongly that the loss of water supply in Gloucestershire should not have happened and more importantly that it should never happen again. However, the majority did not want compensation for the loss of water supply. They felt this would reduce the funds available to future proof the water supply.

- The Mythe water treatment works that flooded in Gloucestershire had been assessed by Severn Trent as being at low risk of flooding, its defences being up to the level of the 1947 floods. CCWater is concerned that other treatment works may also have been assessed as low risk. We think Ofwat should therefore review all companies’ risk assessments into vulnerability to extreme weather.

- Customers also need to be reassured that funds previously allowed in companies’ price limits by Ofwat have been spent appropriately on making water and wastewater facilities resilient to this and similar incidents.

- The consumers who took part in our research saw no evidence that Severn Trent had a contingency plan in place. The Interim Report into the Hull floods by the Independent Review Body concluded that there had been no contingency plan in place for the failure of Bransholme Pumping Station. Companies’ contingency plans therefore need reviewing in the light of these experiences, and their existence communicated to consumers.

**Addressing the Objectives of the Flooding Lessons Learned Review**

1. **Flood risk management and how to adapt to the risk of flooding**

   The recent floods across the country have demonstrated the significant impact floods can have on infrastructure, homes and ultimately consumers.

   Whilst we accept that it is not possible to accurately predict weather conditions and plan for all eventualities, there are some fundamental approaches that can be implemented now that would significantly minimise the potential for flooding in the future. These are:

   - A joined-up approach is needed on flood management, land drainage, surface water drains and sewers. One organisation, perhaps Defra, should have responsibility for making sure that the other bodies responsible are working together with well-defined plans.
— Full consideration should be given to the risk of flooding when new housing is being planned. New housing developments must create space for the water to flow in outside spaces. The creation of balancing ponds, lagoons and green spaces is essential for preventing homes from flooding, as well as creating bio-diversity opportunities.

— Water companies should be statutory consultees during the planning process, particularly for larger developments that will have a significant impact on the capacity of their infrastructure. This will allow them to tell planners about their capacity to take the sewage away without the risk of sewers flooding. Some consultation criteria would be needed so that water companies are only consulted on applications that could impact on their business, for example housing developments. We assume that there would be a large number of applications that water companies would not need to be consulted on, such as smaller loft conversions or external changes to the appearance of a property.

— Sustainable urban drainage systems should be pursued rather than impervious surfaces and car parks, with responsibility for maintenance clearly defined.

Preventing development on flood plains to allow the water to flow and flood naturally is a simple solution that would minimise flood problems. However, we saw in Hull that not all floods are due to rivers. There, the local sewerage network was inundated after 110mm of rain fell when soil was already heavily saturated. Where flooding does happen, householders should have the option of a grant to help pay for flood defences, such as air brick covers and door protectors, although this is no substitute for long term investment and more robust remedial measures.

Stopping flood water and sewage from entering peoples’ homes is very important and just relying on insurers to clear up the mess is not enough, nor is it acceptable to customers. Guidance should be given to existing homes which are at risk of repeated flooding as to what they can do to minimise flood damage—for example, citing of electrics, practical flooring. When it comes to refurbishment after a flood they can then consider their options.

2. Vulnerability of critical infrastructure

The impact of flooding on critical infrastructure can have serious and far reaching effects. In July 2007, Thames Water was affected by flash flooding that made roads in their area impassable and resulted in pumping stations and a water treatment works being inundated. Whilst water supplies to customers were maintained, customers were still impacted. The company response times to queries and appointments were impacted as operations teams were unable to move around the area easily, and customers’ properties suffered repeat sewer flooding because of the strain on the sewerage assets.

In the case of the Gloucestershire floods, loss of water supply also took place. On 22 July 2007 Severn Trent’s Mythe treatment works was submerged by rising flood water and subsequently shut down, cutting off mains water supply to around 140,000 households in Tewkesbury, Cheltenham, Stroud, Upton and Gloucester. In total this affected around 350,000 people who were informed that their supplies could be off for 14 days.

Some of the customers involved in our qualitative research told us that the loss of water supply left them feeling like they were in “a return to the dark ages”. Added to this were a number of properties which also temporarily lost their power.

Mythe water treatment works had been historically assessed by Severn Trent as being at low risk of flooding. Following flooding there in 1947, they had done some work to protect against flooding at 1947 flood levels. However, this level of protection was not enough to cope with the July 2007 floods. Consumers felt strongly that the flooding and resulting loss of water supply should not have happened and, more importantly, that it should never happen again.

We are concerned that other water companies’ treatment works may also have been assessed as low risk. We think it is vital that in the light of climate change predictions, Ofwat urgently conduct a review of companies’ risk assessments to ensure that their assessments of vulnerability to extreme weather remain valid. It is also necessary to ensure that funds previously allowed in companies’ price limits by Ofwat have been spent appropriately on making water and wastewater facilities resilient to this and similar incidents.

Respondents to our research want to see action not just regarding Mythe, but at a national level. These views were expressed not just as a reaction to recent flood levels but in the belief that with predicted increases in extreme weather events, flooding is likely to happen more often, and at significantly higher flood levels. However, it cannot be assumed that consumers should automatically fund such improvements to defences and infrastructure. Affordability remains a serious issue for many water customers who already struggle to pay their water bills.
3. **Response to the emergency**

A key message from the consumers who took part in our research was that they saw no evidence that Severn Trent had a contingency plan in place for the loss of water supply. Also, the Interim Report into the Hull floods concluded that there had been no contingency plan in place for the failure of Bransholme Pumping Station. It is therefore critical that companies' contingency plans are reviewed in the light of these experiences and integrated with other agencies' emergency plans.

“I think all the rescue services and all these people they did extremely well but what I wonder is, did they prepare in advance if something like this happened? Was there anything that was already set up that they could say okay, this is an emergency. This is what we’ll do. That’s what they should have had.”

Upton.

The Interim Report into the Hull floods states that no single agency accepts responsibility for elements outside their terms of reference. In Gloucestershire, customers were aware that there were a number of different organisations involved in responding to the emergency, but it was not always clear to customers who was responsible for which aspect of the response. Going forward, key organisations and their responsibilities need to be identified and defined in order to prepare and plan for the next event. They should work together to take a more strategic approach to tackling flood risk management including the response to the loss of essential infrastructure.

CCWater in its role as the consumer representative should be part of this planning. After the loss of water supply in Hexham in 2005, WaterVoice, our predecessor, contacted emergency planners to make them aware of how we could help. CCWater needs to do this again to renew contact and ensure we are part of the process, and emergency planning teams also need to update their records and regularly review contact details.

In Gloucestershire, our qualitative research obtained views on how customers felt that Severn Trent had responded to the loss of supply. The following issues were raised:

- Customers felt that the distribution of bottled water was managed effectively, with some customers still having spare supplies even after the water was turned back on.
- Severn Trent’s management of the location and filling of the bowsers was not considered as effective, particularly as promises to keep them topped up were not fulfilled.
- Large tankers had difficulty accessing the streets where the bowsers had been left, and the water had to be transferred to smaller trucks, adding to delays.
- The placement of the bowsers was not considered to be well planned, with the distribution taking no account of the density of the population in that street/area.

“Obviously, there was no plan . . . and the siting of the bowsers was haphazard. There were areas that were bereft of them, and the refilling of the bowsers was haphazard, until the Army [became involved].”

Cheltenham

Customers acknowledged Severn Trent’s hard work in providing temporary water supplies and restoring their mains water supply. They felt that, for the most part and under difficult and extremely unusual conditions, Severn Trent had done a good job.

However, Severn Trent may have fared better had it known more, or been advised, about the local circumstances and infrastructure. If it knew the best locations for bowsers and the size of the roads accessing those sites, it may have been able to meet its promises to fill bowsers quickly.

4. **Issues for wider emergency planning arising from loss of essential infrastructure**

The impact of losing infrastructure creates a number of problems. In most of the flooding incidents this year, flood water made it difficult for people to move around their area. In the case of Upton upon Severn, this meant that their flood barriers did not arrive in time due to delays on the motorways.

For some customers, the flooding also resulted in power cuts which meant that they had no way of getting information through the television or radio. Respondents to our research were clear that what they wanted to see in such events was direct communication from the people responsible.

The key planning issues we have identified following our involvement in the floods are:

- Clear, consistent and constant communication is essential. It needs to start early in the process and cover a range of media, not relying on communication methods that need electricity if power is out. Including CCWater in the earliest emergency contacts by water companies and emergency planners will help get the message out to consumers, and will enable CCWater to help consumers that contact it for advice.
— The security and emergency measures direction requires water companies to provide a minimum of 10 litres per person per day in emergency circumstances. Severn Trent provided 20 litres per person per day. This suggests that a review may be needed of what the minimum should be, with consideration given to a higher minimum standard.

— Logistics need consideration. The failure of the flood barriers to arrive at Upton should not have happened. However, their redeployment to protect the Walham electricity station prevented 100,000’s customers from being without electricity. This example shows how there is a need for more locally based, mobile flood defences, and the need to identify, in advance, critical infrastructure.

— All major services including utilities need to review their flood defence and contingency plans. They should consider the population in an area so that the response provided is proportionate.

— Plans should take account of the type of urban/rural environment that the company works in. If streets are not wide enough for tankers, there should be an alternative plan.

“Severn Trent Water put the big lorries out then they had to tip it into a smaller lorry so they were doing twice the work, they needed the little lorries to get through the streets. I think they did very well personally.”

Upton

— Plans need to take account of where to access additional volunteers to help staff who are working exceptionally long hours. Volunteers played a vital role in distributing bottled water in Gloucestershire.

— During the Gloucestershire loss of supply, the army became involved and helped to reassure consumers. However, an alternative approach might have been for the Government to have set aside “disaster” money to pay for other water companies’ workers to be redeployed to the emergency area.

— Whilst vulnerable people were provided for during the loss of water supply, it is clear that with flooding and the loss of water supply, the term “vulnerable” takes on a new meaning. Water companies’ vulnerable group lists do not include people who are unable to carry bottled water and take buckets to bowser, or who needed special bottled water for babies. Whilst lists from the councils and GPs could provide this information, it is clear that a central list needs to be created that is consistent and includes all classes of customer that could be considered vulnerable under different emergency situations. We recognise this would be a huge task, but we consider that it would be worthwhile and offer reassurance to consumers. In the meantime, water companies need to maintain their extra care registers, particularly to include care homes, as recommended following the Hexham loss of supply.

5. Issuing arising from the transition from response to recovery

The key message we received from consumers who took part in our research was that they want to see direct communication from those responsible not only throughout the incident, but also afterwards, during the recovery phase.

— The importance of maintaining communication was emphasised in Gloucestershire where because there was no direct contact from Severn Trent, some consumers did not realise they should not yet be using water for cooking and washing up.

— Severn Trent should have built on, and improved, the dialogue they had with their customers throughout the Gloucestershire incident. Many customers wanted to hear directly from Severn Trent and to see a real presence from the company.

— The importance of listening to those affected, even after the event, was emphasised when some customers told us that the £3.5m Community Fund from Severn Trent was not welcomed. Those consumers said that they would rather that money was spent on making sure the loss of water supply never happened again.

6. Lessons for the future

The recent flooding across the country and the loss of supply in Gloucestershire has identified a number of lessons that can be applied to any emergency situation. The key priorities are to ensure that:

— Key assets are protected from flood waters to ensure continuity of supply in the future. This includes making sure that all emergency plans and risk assessments are re-assessed to reflect recent experiences and lessons learned. We endorse the Hull review’s recommendation that a list of strategic sites and infrastructure is drawn up.

— Communication is clear, consistent and continuous. Consumers need to know what is happening and what they need to do. There needs to be a clearly defined communications process in the case of a declared disaster involving national and local media, with clear bulletins and information being given at specified time slots.
— Disaster recovery plans and contingency plans are reviewed in the light of the experience of these events and their existence communicated to customers.

— Companies are allowed to invest in their assets to ensure resilience for future eventualities. The Hull review suggested that the 1 in 30 year design standard for sewers needed changing to account for climate change. The most effective way forward is likely to be an approach that balances keeping the water in the catchment through sustainable drainage, removing streams from entering combined sewers and improving some assets.

— Climate change is not ignored. We need to develop a more sustainable approach to flood management.

— Key organisations and their responsibilities are clearly identified and defined. They should work together to take a more strategic approach to tackling flood risk management including the response to the loss of essential infrastructure. This would include involving CCWater where water and sewerage customers are affected, so that we can represent their views and feed information directly to them.

We also echo the recommendations in the Scottish Government’s flooding issues review which emphasises the need to:

— Set up a forum to help people and communities become more proactive through better awareness of flood risk and preparedness for flooding.

— Pursue the possibility of an individual property grant scheme.

— Link to catchment strategic planning and River Basin Management Planning.

— Ensure reducing the risk of flood damage is an objective of the Government. It should seek to promote rural land use solutions as part of its strategy for flood risk management.

— Set up a forum to continue to advise the Government on flooding matters.

7. **How to co-ordinate responses to flooding**

What is clear from the Gloucestershire flooding and loss of supply is that a number of organisations did work closely together to restore supplies to customers and ensure that they were provided with adequate temporary supplies. Whilst this may have worked well, it was not always clear to customers who was responsible for what.

— Key organisations and their responsibilities should be identifiable and they should work together to tackle flood risk management and the loss of essential infrastructure.

— Work needs to be taken forward now to improve communications between all the agencies responsible for dealing with flooding and loss of critical infrastructure, eg local councils, national government, the Environment Agency and water companies. Where water and sewerage customers are impacted, CCWater would also need to be involved.

— We echo the Scottish Review of Floods report which calls “for stakeholders to work together to ensure that a more strategic, catchment level approach is taken when considering flood alleviation options.” and the response to the loss of essential infrastructure.

— As already emphasised, a clearly defined communications process is key.

— There needs to be a centrally held list of customers who could be considered to be vulnerable in different emergency situations, so that this is easily accessible and accurate.

8. **What access to support, equipment and facilities is needed in an emergency**

From the comments customers provided during our research, we believe that in the event of the loss of water supply, easy access would be needed to:

— Bottled water and special bottled water for babies.

— Adequately stocked bowsers in easy to access locations.

— Tankers able to negotiate narrow roads, or roads with parked cars.

— Manpower to relieve those working excessive hours.

— Lists of vulnerable consumers, which during the loss of supply includes customers who may not be able to carry bottled water or drive to distribution points.

— Information about the numbers and density of the population in an area.

— A supply of water butts to allow consumers to collect their own water.

— Water efficiency advice, eg hippos, so when they can flush the toilet, it uses less water.
9. Communication

As already stated throughout this submission, communication needs to be a key priority during any emergency incident.

Severn Trent’s communication throughout the loss of supply was considered by customers to be patchy and inconsistent and it was not always clear to them who was in charge of the situation or responsible for certain aspects of the distribution of water. This was the area most criticised by our respondents in terms of their response to the situation. Particular areas of criticism include:

— Information regarding the location of bowsers was considered poor.
— Respondents with babies were initially unaware that they needed special bottled water for babies and of the location where they could get this.
— Not everyone received the letter from Severn Trent regarding the restoration of mains water.
— Customers found it difficult to get through to Severn Trent and, when they did, responses from Severn Trent call centre staff lacked confidence and did not reassure.
— There was also criticism for Severn Trent’s low profile in media communications.

“There’s always somebody who’s listening to the local radio who’s going to call somebody else. I heard from somebody who was actually in Yorkshire at the time . . . and somebody else would find out because they were queuing up in Sainsbury’s wondering why everybody was buying water.”

Cheltenham

In addition, channels of communication were also questioned. Local radio and Sky Television were mentioned as having been the best sources of information, along with the local “grapevine”. Media reporting was felt to have focused more on flood victims perhaps at the expense of those without water supply.

Work is therefore needed to ensure that areas of responsibility are clearly defined and communications improved between the agencies responsible for dealing with flooding and loss of infrastructure, eg local councils, national government, the Environment Agency and water companies. Where the loss of infrastructure affects water and sewerage assets, CCWater should be involved.

During the Gloucestershire flooding, our website contained useful information for those consumers able to access it. We also did regular press releases and interviews and met with consumers to find out about their experiences. Our daily liaison with Severn Trent enabled us to keep customers that contacted us informed of the latest developments.

10. What worked well

Respondents acknowledged Severn Trent’s hard work in providing temporary water supplies and restoring their mains water supply. They felt that, for the most part and under difficult and extremely unusual conditions, Severn Trent had done a good job. And in the Interim Report into the Hull floods, the fact that the pumping station worked as well as it did during the extreme rainfall was praised.

Whilst communications to affected customers appeared to be mainly through the media, Severn Trent’s use of its website and telephone information line was considered up-to-date and informative. It was also very effective in keeping the local CCWater office updated on a daily basis so that we could inform customers of what was happening. This was essential to be able to keep customers that contacted us fully informed.

Prompt distribution of bottled water to customers was considered good. The volunteers who helped distribute the bottled water were praised at the same time as noting Severn Trent’s absence or, at least, their low profile. The Red Cross and the army were also considered an asset to the situation.

“My opinion was that, until the army arrived, Severn Trent were absolutely hopeless. The army appeared and they set up on the racecourse and suddenly it all started to happen.”

Cheltenham

“They (Severn Trent) worked really hard, all through the night.”

Tewkesbury

During the loss of supply, customers reported a real community spirit with neighbours looking out for each other, particularly the elderly or less able. It was clear from our research that customers had shown great resourcefulness in dealing with the loss of water supply.

Consumer Council for Water

October 2007
Memorandum submitted by Mary Dhonau (FL 131)

I am disappointed that the Environment Agency has omitted to mention that there was significant flooding in Worcester and surrounding areas. They also failed to acknowledge that the temporary barriers arrived at Hylton Road but were not deployed as the operative due to erect them were stuck in flood waters trying to get into Worcester.

Lessons should be learned that the barriers should be stored locally and local personnel trained to deploy them to avoid reoccurrence.

I understand that they may well have been overtopped but at least the residents would have had time to move their possessions to safety and make the necessary preparations for evacuation.

Mary Dhonau
Coordinator
The National Flood Forum

Memorandum submitted by Bill Sherwood (FL 132)

Letter from W Sherwood to David Taylor MP, Committee Member, 3 September 2007

I was interested to read your “The Commons Touch” piece in the Ashby Times this week. I’m no engineer, but I’ve had a few thoughts on the complex problems of flooding and its avoidance.

Increased and faster run off as a result of development is clearly a significant factor, especially for locations downstream. Similarly some flood avoidance schemes appear to facilitate a quicker dispersal of water in some locations resulting in problems further downstream. Residents in Selby have blamed flooding they’ve experienced on the protection work carried out at York for example. It seems that the run off of water must be retarded to at least reduce the flood surges that we have experienced recently by:

1. Designing buildings to store rainfall for supplying suitably filtered water for non-drinking quality uses—toilet flushing, car washing, dish washing, clothes washing, bathing and showering etc.
2. Designing retarding reservoirs into building projects (including roads) so that significant quantities of water can be held back at times of excessive rainfall and subsequently released in a controlled manner when appropriate.
3. It may be possible to predict severe rainfall sufficiently in advance to enable water companies to lower reservoir levels in advance in a controlled way so that the same reservoirs have capacity to absorb some of the surge water when it arrives. Alternatively, if we can rely on higher levels of rainfall, reservoirs could be maintained at lower levels to enable take up of flood surges.
4. Ensuring that new developments are sensitive to existing natural drainage and watercourses, avoiding the temptation to straighten channels or “improve” banks with concrete and steel that serve to speed up water flows.

On the other hand, it seems that the demand for development land will mean that projects will continue to be carried out in flood plain areas. If this is the case, then thought will need to be given to building design to mitigate the effects of intermittent flooding by raising the current ground floor levels above predicted flood levels, not forgetting to raise garage, car park and road levels too.

As for areas affected by regular flooding like Upton on Severn it is difficult to see what can be done in the short term. It’s all very well to suggest diverting water away from residential and commercial areas to where it will cause little or no damage but is there capacity to do this effectively without affecting livelihoods in the agricultural community? If flood plains in agricultural areas are reserved for grazing rather than arable use then maybe this would provide some of the answer by deliberate flooding of selected areas, but this would require barrier controls on rivers to facilitate this. I also wonder what we can learn from flood control in the Fens. I recently visited Denver Sluice near Downham Market which is a major piece of waterway engineering that enables diversion of significant volumes of water to Essex when required, the beginnings of a national water grid perhaps. Could similar schemes in different terrain be feasible elsewhere in the UK?

As for rising sea levels, we can surely learn much from Dutch engineers who had so much to do with the successful draining of the Fens in the past.

Bill Sherwood
September 2007
Memorandum submitted by Patricia Lee (FL 133)

I understand that your committee examining the floods of this summer meets today. Can I draw your attention to the plight of Ripon which was flooded for a second time in recent years (the first occurring in November 2000)? Levels were as high as 2000 on 15 June and the same people who had to leave their homes then were similarly affected and most are still in temporary accommodation.

After the floods in 2000 the Environment Agency came up with a comprehensive defence scheme (in itself an expensive exercise I imaging) which would involve building a dam across farmland to hold any sudden rise in spate water. The scheme has been accepted by all the authorities but there is no funding. It could go ahead now but there seems to be no will. Are you in a position to give us any help here?

We feel that because we had our flood a month before the rest of the country that our concerns will have been lost beneath those problems. If you need chapter and verse on this our MP David Curry will have all the detail.

On a general point I should say that the Environment Agency seems to have done little if any work on the Rivers Skell and Laver which caused the problems. Trees lie in the river bed and huge banks of cobble and sand mean that the water has nowhere to run. At least some dredging was done in 2000. The old river boards were familiar with their catchment areas and much more on top of the job.

Patricia Lee
October 2007

Memorandum submitted by Tony Smith (FL 134)

1. My name is Tony Smith and I live with my family in Quedgeley, Gloucester.

2. I am sorry that I have missed the Committee deadline of 13 September 2007, but I believe it is worth adding my story from the flooding on 20 July, however small in impact when compared to the massive floods elsewhere, in case it may be needed to support a line of comment or action by your Committee.

Briefly, The deluge of rainwater on 20 July overwhelmed the surface water drains which stopped taking water at about 2.30 pm that resulted in the rainwater collecting in the lowest point in my area and then quickly flooding my house and that of my neighbour’s, the first time ever in the life of both properties built in 1993. The depth of the water in the house was about three inches. I could not enlist the help of the Fire Service through the 999 system since it was dealing with other emergency calls. Other neighbours rallied round and between us, with the help of a submersible pump purchased that afternoon, the water was drained from the two houses in about five hours. At 8.25 pm, water began flowing again through the drainage system, by which time no standing water remained in the houses other than that soaked up by the carpets. But, the damage to the house and contents at floor level had been devastating.

3. Since that day I have been in contact with Severn Trent Water. From numerous contacts I have discovered that the rainwater drains feed into Dimore Brook that flows for part of its course at the back of my property and alongside the Gloucester/Sharpness canal. On 20 July the rainwater drains stopped working because the brook itself burst it’s banks, meaning that the rainwater from my part of the estate could not flow into the stream. Severn Trent Water charges me on my regular water bill for taking away surface water but, when challenged in writing, merely stated that it could not be faulted because of the unprecedented rainfall on the day. I have in turn responded suggesting Severn Trent Water should take a greater interest in ensuring the flow of surface water is not hindered by a partially blocked brook that is overgrown with vegetation. I await a response, however there are other points I wish to make for consideration:

(a) The brook belongs to British Waterways for the part that runs alongside the canal. Where it deviates from the canal another owner is responsible, whom I do not know. The path that runs along the brook belongs to Gloucester City Council.

(b) According to people who have lived or worked in this area there has always been a brook in the same location before the construction of mine and several hundred other houses built on the estate. Moreover, those same people say that the brook has not been enlarged to accommodate the extra rainwater flow from this estate and another being built now.

(c) The vegetation and trees that grow on the banks of the brook are cut back once per year, about September time, and the debris cleared away. This does not appear to be adequate if the flow of water is to be unhindered. I believe this aspect had a major bearing upon the cause of the flood on 20 July—the rainwater was hindered in it’s flow along the brook, thereby preventing surface water from the estate flowing into the brook. In considering the brook, perhaps it needs widening and deepening, together with the introduction of a more frequent clearance programme, perhaps even quarterly.
SUMMARY

4. On 20 July 2007 the heavy, prolonged and unprecedented rainfall overwhelmed the drainage system in parts of Highclere Road, Quedgeley, Gloucester, that resulted in at least two houses being flooded by rainwater. The drainage system normally takes the surface rainwater into Dimore Brook, but the overgrown vegetation and debris littered brook could not absorb the deluge of rain on 20 July, with the result that the drains stopped working and rainwater collected and eventually flooded two houses.

5. Dimore Brook is owned by British Waterways for that part of the brook that runs alongside the Gloucester/Sharpness Canal; that Company arranges for the brook to be cleared of debris and the vegetation to be cut back on one occasion each year. Who is responsible for other parts of the brook I cannot say, but is divided ownership likely to be a factor in why the brook failed to take away the rainwater as expected? Also, is the frequency of brook clearance adequate? I am trying to find answers to my questions by contacting Severn Trent Water, the City Council and the Environment Agency, but these are early days as yet.

Tony Smith
October 2007

Memorandum submitted by the Alde and Ore Association (FL 136)

COMPREHENSIVE SPENDING REVIEW: FLOOD DEFENCE EXPENDITURE

Like the Association of British Insurers (see their press statement at Annex A\(^56\)) the Alde and Ore Association considers the provision for flood defence expenditure in the latest Comprehensive Spending Review (CSR) is totally inadequate. The Government have clearly failed to grasp the problems facing coastal communities. We support the view of the newly launched SCAR’s (Suffolk Coast Against Retreat’s) that expenditure on defending our coasts and tidal rivers needs to rise to at least £30 million a year (see Annex B\(^57\)). We also welcome the joint statement by Suffolk County Council, Waveney District Council and Suffolk Coastal District Council challenging the latest Environment Agency proposals for the Blyth Estuary (Annex C).\(^58\)

In his press statement the Secretary of State, Hilary Benn, announced that expenditure on flood defences over the next three years will be increased by at least £2.15 billions well short of the £3 billion, ie £1 billion a year, which it is widely recognised is the minimum needed nationally to cope with the challenge of climate change and sea level rise. Interestingly he describes the increase for each year as being “the minimum we will spend in each of the coming years”. This is probably explained by the announcement in the CSR documentation that DEFRA is currently planning to dispose of assets worth £52 million by 2010–11. It appears the Treasury have agreed that these savings may be reinvested in capital programmes.

But underlying these figures is the assumption that DEFRA will achieve net cash release savings of £379 million by 2010–2011 and a reduction in the Department’s running costs (administration budget) of nearly £100 million by 2010–11 which represents a reduction of over 20% of estimated spending in 2007–08. This implies significant manpower cuts in DEFRA staffing levels.

As far as the East Coast is concerned we have been told by the Environment Agency that little of this increase in flood defence expenditure, assuming it takes place, will be seen in Suffolk. By far the greater part is already committed to approved projects already in the pipeline and priority will be given to people and property in inland areas.

What we are not told is what happens if we have another farming crisis or management fiasco such as that which occurred when the Treasury insisted on cuts in DEFRA’s spending following the rural payments system debacle. Although the Treasury has included in its contingency reserve figures (the AME Margin) £6 billion over the next three years for unforeseen expenditure the convention is that any expenditure beyond that provided for in Departmental budgets should be sought from savings from within the Department’s agreed budget. Because a very large part of DEFRA’s expenditure is subject to EU common agricultural policy rules DEFRA’s scope for finding offsetting savings, if needed, is very limited.

The Alde and Ore Association will continue to press for increased expenditure by Government and associated bodies to prevent flooding. Current policies, if replicated in our area, will put hundreds of homes
in Aldeburgh, Orford and other local villages at risk. We firmly reject the Government’s present policy for the Suffolk coast which effectively amounts to abandoning most of our coastal and river defences as part of the policy of “making space for water”.

David Andren
Chairman
The Alde and Ore Association

October 2007

Supplementary memorandum submitted by The Alde and Ore Association (FL 136a)

We note that your Committee is currently preparing a report on flooding. In view of the risks to coastal communities, exemplified by the recent threat of flooding along the Suffolk coast as a result of a tidal surge on 9 November, we strongly support the initiative taken by SCAR (Suffolk Coast Against Retreat) to extend your study into the problems facing coastal communities.

We recommend that you invite our MP the Rt Hon John Gummer together with other local representatives to a special hearing of your Committee. We note that you have already invited MPs from inland areas affected by flooding earlier this year to attend a meeting of your Committee but consider the special problems of coastal communities need separate consideration.

In particular we would ask your Committee to look at the implications of the Environment Agency’s recently announced draft strategy for the Blyth river which has been declared unacceptable by a wide range of bodies including Suffolk County Council, Suffolk Coastal District Council, the Waveney District Council, SCAR, the Blyth Estuary Group as well as our Association. Further details can be found on our web site at www.aldeandore.net.

The Alde and Ore Association

December 2007

Memorandum submitted by Ms J D Budden (FL 137)

I am writing to you because although I don’t live in an area that was affected by the floods earlier in the summer, in Exmouth we were subject to flash flooding after 22mm of rain fell during 13 May. I live on the side of a hill, well away from any streams and outside the Environment Agency’s flood map but my property was inundated by a sewer surcharge that came within a whisker of coming inside. South West Water has now fitted a non-return valve to my sewer, which should prevent it happening again. However, I have discovered that there is a general lack of preparedness in identifying and meeting the urban flooding risk in the light of the more frequent intense torrential rain that climate experts attest can be expected. I wanted to write to you because I consider that the lessons that you uncover about the areas that flooded so badly will undoubtedly apply to the rest of the country as well. It is merely a question of where torrential rain falls.

No one knows or shares information about drainage

It seems to me that knowledge about existing infrastructure and natural watercourses such as springs or culverts is patchy, split between lots of organisations or lost in the archives, if it was ever mapped. So it is impossible for anyone to know what will happen if there is prolonged intense rain. In Exmouth, South West Water are intending to start a survey of their sewers at the end of this year, which will take until 2009 to complete. But of course they don’t deal with surface water, which although it often goes into their combined sewers is apparently the responsibility of Highways. The area where I live is predominately clay. We found a storm drain on our property that had been tarmaced over and did not show up on the environmental report we received when we recently moved here—whether it appears in any of the councils’ archives is unknown to me and how would I find out?

Planners cannot assess the impact of redevelopments in urban drainage

The area was predominately developed in the early and mid 20th century and now the large houses in their big gardens are being redeveloped as flats or the gardens subdivided for infilling. Although the planners now have to take cognisance of flooding risk how can they do so if they don’t have basic information? If the combined sewers cannot cope with the additional usage on them, it is the community not the developer who pays the social costs of this.

While I understand the planners stipulate that no surface water should go into the sewers from redevelopments there is nothing to show what will happen in heavy prolonged rain to surface run off where there is higher density building on what was previously gardens or with the continued increase in paved
drives. There is also the whole question about the status of the water companies, which are apparently defined as statutory undertakers but not statutory consultees so that they cannot be held to any advice they give on planning matters.

A properly assessed flood risk might require increased investment unwelcomed by the organisations concerned

I wonder if organisations have been slow to survey because if they identified the potential flooding risk for individuals or areas they would then be under pressure to spend more money?

If it were shown that any water company had to make a major investment to reduce the potential for urban flooding their share price would plummet. People believe rightly that any extra investment will mean that their water bills will increase yet more. There has been opposition to SW Water taking over private sewers on the grounds that the costs would be passed onto customers. According to the Devon County Council representative I was talking to the Council only has the money to deal with issues where flooding of property has already occurred.

Although SW Water have denied this, my experience (and the persistence that others have suggested that you need) indicates that despite wanting to do a good job the water companies lack the appropriate resources to do this. (A friend of mine in a totally different water company area was told that they had no money to upgrade the sewage system to stop her front garden flooding from the sewers after heavy rain). As someone else said to me there is no preventative work in the private sector. It isn’t considered to be cost effective. The local authorities are generally strapped for cash and so they have no resource or incentive to do an audit of weaknesses in their surface water run off systems or to update them in line with current best practice.

There is no attempt to inform or educate the community

At present the community sees the problem as either the County Council’s or the water company’s. At community meetings residents may complain about water pressure or sewer surcharges but there is no attempt by official representatives to inform the community as to the issues; to educate them concerning the part they can play in helping to conserve water or prevent its immediate run off in times of heavy rain or to encourage them to report minor problems that may indicate a potential weakness in the system. When we were nearly inundated I was surprised how many of the people I spoke to had had occasions when water backed up their loos or the manholes in the roads leaked or they got foul water in their front garden. Few had reported these problems. There may be a number of reasons for this. If it doesn’t directly affect your property why would you bother? You might not know whom to tell anyhow and people always worry about the impact on the sale price of their home. Also they consider it is a waste of time as no one does anything. All the organisations are adept at saying why they cannot do anything or taking so long that people give up. This contributes to disenchantment with all public organisations.

There is no government leadership

The government doesn’t give a lead on this. Rain harvesting systems which would alleviate the costly situation of treating water to drinking quality only to flush down the loo and treat it again are too expensive for ordinary people to contemplate (even assuming they know of their existence). I understand there is no British Standard for semi porous drives and most people are unaware of them. I wrote to DEFRA about why they weren’t promoting SUDS and they wrote back to tell me that they were concentrating on reducing water leaks. This is very admirable but I do not see why the department is not also investigating the efficacy of and setting standards for SUDS as well. Climate scientists have been telling successive governments since the 1980s about the likely effects of climate change, which questions the whole basis of the risk/cost assessments on which so many infrastructure decisions are made. Why is the government still only focused on leaks? The price of SUDS is not going to come down until they are better known and so become in effect mandatory on all new building, like double-glazing.

Local Development Frameworks won’t be adequate unless they are underpinned by a flood risk assessment

My understanding is that Local Plans are due to be replaced by Local Development Frameworks that will last until 2026. I don’t see how such frameworks can be developed unless the risks for urban flooding are assessed in each area and a local strategy that applies to all the organisations involved is put in place to deal with the risks, which can be used in setting out redevelopment criteria.
How many more people are going to have to suffer?

Flooding is a terrible thing for individuals to cope with. It undermines your basic security in “home” and means that you are fearful of going out if there is any prospect of rain. The government response to the floods this summer was very much about people getting back to normal. How can people ever get back to normal if they fear that their homes will be inundated again? I think that as more and more people experience the current appalling problems that have happened in the Midlands, people will start to become very angry that their lives are being undermined in this way.

What happened in the flood hit areas was predictable

From what I have discovered over the last four months I am not at all surprised at the level of flooding that was experienced by those who had the misfortune to live in areas (even without rivers) where there was prolonged heavy rain this year. It could have happened anywhere in the country. There is a plethora of organisations who are concerned with urban drainage, which don’t work together and either don’t have or wish to spend the money necessary to ensure that the risk of urban flooding is minimised. They don’t involve the community who remain blissfully ignorant of the potential problems or what they could be doing to help reduce the risks. The government is being slow to react and failing to give a lead to ensure that matters don’t get worse.

At present I am sure that many people saw what happened during the summer as an act of god—one of those unfortunate events that could not have been predicted or prevented. However, as such events become more frequent, the public attitude will no doubt change. I do hope that the Select Committee report helps to prevent many more people having to suffer the misery of their home and possessions being fouled and totally spoiled by helping to increase pressure for an effective and funded strategy to deal with urban drainage flood risk.

Ms J D Budden
October 2007

Memorandum submitted by Mr D F and Mrs A L Edwards (FL 138)

With regard to your investigation into the recent floods, we were flooded out in June twice at our home (due to my wife’s foresight we are in our present address, Council owned sheltered housing accommodation). I’m 70 and my wife 65 and we lost everything, furniture, possessions et cetera.

We’ve had no help from East Lindsey Council whatsoever apart from a derisory £100 Argos voucher from a Housing Liaison Officer and was told we were lucky to get this, which we still have not received.

It’s apparently been an on-going situation with drains et cetera since the year 2000 of which we were not informed of when we bought our bungalow for £104,000 2½ years ago which is now a white elephant round our necks.

Before moving there has been a series of meetings between East Lindsey Council, East Lindsey Drainage Board, Water Board, Highways Dept who all pass the buck to each other. Why was something not done after the first incident in 2000? How, at our ages, can we be allowed to lose our life savings like this.

Mr D F and Mrs A L Edwards
October 2007

Memorandum submitted by Miss D Thorne (FL 140)

I am a small landowner in Somerset. In June as you all know Mother Nature decided to open the heavens on us, as a result Gloucester and Somerset flooded. This should not have happened had the EA did its job or allowed the drainage boards and engineers to do their jobs, ie drain the land!

My own story is I own a small-holding on the Godney/Glastonbury moor. I produce organic vegetables for sale on my market stall and from the gate. As a result in June we knew that the Pilton weekend heavy rain was forecast, so we phoned the EA to ask that the rivers to be pumped down to allow for the downpour. I was asked on what authority did I have to ask for this to be done. “I own the land and I did not want my crops to be destroyed”.

In their wisdom as usual they did not do as myself and many farmers asked. As a result my land and many others land was flooded for 3½ weeks. My greenhouses and outbuildings all under water. My crops, everything destroyed, one 20 foot greenhouse was washed away; a year’s work gone. I don’t know how I will survive. It has taken the EA three months to reply to my letters and only then when I threatened them.
I cannot fault the drainage board and their engineer; but I do think it's about time these people were brought to task and made to pay for the damage they have done. Would you let this agency do £20,000 worth of damage to your property and sit back and say that's OK? No, I think not!

I find the conservation lobby is too powerful and have no idea how to protect our land or wildlife. When a fish comes before a person's livelihood I think we had better say God help us all! I am very angry and so are a lot of people I have spoken to. It's time to start getting things cleared up i.e. drainage, rivers and ditches. Allow the drainage boards to do their jobs. I, for one, am seriously thinking of not paying my drainage rates ever again. It's time you people woke up! Gloucester was your wake up call. We want action before it's too late! How many more people's lives and businesses have to be lost through incompetence?

Miss D Thorne
October 2007

Memorandum submitted Mr C G Mann (FL 141)

There seems to be no end to the flooding and the long lasting damage that is caused by this uncontrollable deluge of water, many questions have been asked and many reasons given as to the cause, i.e. houses and factories being built in flood plains, low laying land areas covered in tarmac and concrete, inadequate drainage and maintenance of the system with little or no thought of prevention or emergency back up.

Surely one of the main factors of this problem has been created by landowners and farmers who have systematically raped the landscape by removing mile after mile of hedgerow and infilling ditches alongside them, any trees that were in the centre of the fields or in the way of the new monster machines were felled, ponds filled, rivers and water courses diverted/neglected now choked with weeds creates a back up of water in turn causes serious flooding.

Dredging now seems a thing of the past!

These hedges and ditches were our first line of defence with relative control over mother nature now it seems big is beautiful with the size of the fields with gigantic acreage poor old mother nature is placed on the back burner until she fights back and regains control leaving the unfortunate who live in the flooded areas to mop up remove the damage wait 'til things dry out and hope there is enough insurance cover in place for all the damage and inconvenience.

All the changes made to the countryside are upsetting the balance of nature not only to the water tables but with the constant destruction of the flora and fauna which will be lost forever.

Mr C G Mann
October 2007

Memorandum submitted Ms Jane Edwards (FL 142)

I would like to point out that this area in Cheltenham has been flooded three times in one year, 18 August 2006, 25 June 2007 and 20 July 2007. The water comes down Whaddon Road like a river, we do not live near a river where the banks overflow. This is surface water which has no where to go but land in the basements of five houses in Whaddon Road and five houses in Cleeve View road. The garages and gardens of these properties are also filled with water as is the back alleyway. These houses are 100 years old (they have not had these problems for 100 years) and we are experiencing flooding regularly. The 25 June and the 20 July we had the added joy of sewerage. My insurance company has had to rectify this three times now in less than a year. There has been a lot of development further up the road and I believe that the sewerage and drainage systems can not cope, unfortunately we are taking the worst of the problems. These have to be resolve and fast.

Please contact me with some urgency. We have not just been effected by a “1 in 100 year” occurrence as the environment agencies predict. I understand that this happened 24 years ago and Severn Trent put in some update to the sewers then, obviously this is not enough.

Jane Edwards
October 2007
Memorandum submitted by Mr Jack Wrightman (FL 143)

In all the welter of words on flooding one feature seems to have been overlooked. Since the early 1950s agricultural land drainage has increased enormously. Also over much of the country’s arable land hedges and ditches have been taken out to form larger fields. These two features greatly increase the rate of runoff of rainwater. Such areas are larger by several orders than the often cited “land landscaping” created by residential and communal developments. Such changes are likely to be much more significant in re-assessing flood risk and the management of flood water.

In the early 1990s whilst examining M27, M4 and M1 for earthworks associated with widespread floods, the impact of land drains discharging water into the top of cutting slopes was a factor in stability.

Of course, in times of drought farmers need to irrigate crops and one partial solution could be the creation of judiciously sited small agricultural reservoirs to control runoff as well.

It may be that these features have already been taken into account by river basin managers, but I have yet to see them mentioned in the lay or technical press. Given the number of fingers in the “flood dyke” it seems doubtful.

I hope this note is useful in your committee’s examination.

Jack Wrightman
October 2007

Memorandum submitted by Peter Butterworth (FL 144)

I understand that you have been appointed as Chairman of the Environmental Select Committee Enquiry regarding the floods this year. Having recently retired from the Environment Agency after 31 years service I wondered if it would be appropriate for me to give you a first hand account of the Flood Warning System in the South East of the Environment Agency Wales?

You will find when you interview senior officers, ie Management Team and Director Level you will not be told the truth. Because they are completely out of touch with an issue at ground level ie Flooding. They will rely on briefs and when they get completely “out of their depth” please excuse the pun, they will lie their way through the issue.

An example of this was yesterday morning 11 October 2007 Baroness Young gave an interview to BBC Hereford & Worcester. She was asked about the flooding issues in Upton-upon-Severn: the main issue was that the flood barriers for Upton could not be erected because they were stored 20 miles away and when the level of the flood raised, the delivery lorries were unable to get through. Ms Young insisted that the flood barriers were stored out of town as the request of the residents.

Yesterday evening 11 October 2007 Radio Hereford & Worcester interviewed the residents’ representative and he confirmed that they wanted the flood barriers stored locally. He commented that the Baroness was liberal with the truth.

This is only one example and I do not want to waste your time. However, in my opinion your Select Committee will not get to the truth of the flooding issues regarding the Environment Agency unless you interview a group of employees and ex-employees representing the EA in England and Wales.

I will give you a few examples of what is actually happening in the South East area of the Environment Agency in Wales.

1. Are you aware that a Flood Warning Officer is paid a Standby Allowance during the whole period of a drought.
2. Management Team members earning £35k to £70k stand on a bridge at night in Wales and shout through a loud hailer to the local residents. They then take the next day off in lieu to sleep. Therefore they are not “available” when the telephone complaints come in and do not take the flak from the public.
3. Management Team members are on the Flood Warning rota because “it is a good little earner”.
4. A Senior Flood Warning engineer £35k + always works the night shift because he can double his monthly salary and sleep all the next day.
5. Millions of pounds are being wasted annually by the Environment Agency but all you will be given is the “party line” on flood issues.
6. The Team Leader of Flood Warning does not trust the telemetry system in place at a cost of millions of pounds and therefore sends out other officers in the Agency to check the manual reading. This could involve travelling from St Mellons in Cardiff to the Elan Valley being a round trip of approximately 180 miles in a car for which the Officer would receive a mileage allowance.
Thank you for your time. If you would like a more detailed report of wasted revenue in the Agency regarding flood warning please contact me. If all the wasted revenue had been used for Capital Flood Schemes more towns in England and Wales could have been protected. I am quite prepared to give you actual facts under oath.

Peter Butterworth
October 2007

Memorandum submitted by Richard Long (FL 145)

SHORT TERM URBAN FLOOD FORECASTING

Urban flood forecasting would help water companies, local authorities, the Environment Agency, the emergency services and highway authorities be better prepared when adverse weather conditions occur.

Urban flood forecasting works by reading Met Office short-term weather forecast data in the 1 to 6 hour in the future range from the Met Office FTP site. This data is available to water companies by subscription. Depending on the location, the weather forecast data is at either 1x1 km or 2x2 km resolution as predictions of rainfall intensity at five minute intervals. The forecast rainfall data is used as input to a fast drainage network simulation system. The network simulations are automatically re-run every time updated weather forecasts are downloaded, producing predictions of flooding from the sewer system. A flood routing system uses mapping and digital ground model data combined with local knowledge where available to determine the likely impacts of the predicted flooding. At impact thresholds that can be default values or preset for specific areas, the urban flood warning system will go into alert mode and can be configured to text, call, email or page duty staff with details of the predicted incidents, including location, predicted timing and severity. Warnings would be updated as revised forecasts are processed.

The urban flood forecasting system would be configured to run continuously without the need for operator intervention. The flow chart below illustrates the process.

The benefits of urban flood forecasting could be:

1. Mobilisation of call centre and operations staff before the flood emergency happens.
2. Time to put contingency plans into operation.
3. The opportunity to check standby pumps and other equipment are operating.
4. Setting up traffic diversions in advance of gridlock occurring.
5. The opportunity to get emergency services and operational crews to critical locations in advance of the emergency.
6. Improved service to the public.
7. Warning of likely pollution events in rivers resulting from overloading of the drainage system during rainfall.

An urban flood forecasting system would include a number of components, many of which already exist having been developed for other purposes. Some limited further development could now make such a system a reality.

<table>
<thead>
<tr>
<th>Component</th>
<th>Availability</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather forecasts 1 to 6 hours ahead in the form of predictions of rainfall intensity over 1 or 2 km squares</td>
<td>Available now in many areas. Other areas would require installation of weather radar stations. Data is available to download from ftp site.</td>
<td>Met Office</td>
</tr>
<tr>
<td>Software to convert radar forecasts into input data for drainage network simulator</td>
<td>Available now</td>
<td>Black &amp; Veatch/Met Office</td>
</tr>
<tr>
<td>Interface to take rainfall forecast data and covert it into runoff for input to drainage network model</td>
<td>Development required</td>
<td></td>
</tr>
<tr>
<td>High-speed drainage network simulator to convert runoff into sewer flow and predictions of flooding.</td>
<td>Available now</td>
<td>FastNett fast sewer network simulator from Mouchel Group</td>
</tr>
<tr>
<td>High-speed two-dimensional flood flow surface routing simulator to take predictions of flooding from drainage systems and route them over land</td>
<td>Available now</td>
<td>Flood Risk Mapper from Mouchel Group</td>
</tr>
<tr>
<td>Flood impact assessment tool to identify which properties are likely to flood</td>
<td>Available now</td>
<td>Part of Flood Risk Mapper from Mouchel Group</td>
</tr>
<tr>
<td>Generation of alerts</td>
<td>Development required</td>
<td></td>
</tr>
<tr>
<td>Software environment to control automatic downloads, simulation and warning cycles</td>
<td>Development required</td>
<td></td>
</tr>
</tbody>
</table>

Summarising the above table, the “difficult” parts of the system, ie the weather forecasts and hydraulic simulation engines already exist. They simply need to be connected and wrapped in an overall control system.

Perhaps the biggest area of uncertainty is whether the Met Office forecasts are sufficiently accurate to avoid many false alarms being generated while failing to predict things that subsequently happened. Analysing archive data of forecasts and actuals that the Met Office hold and are willing to make available could test that.

Richard Long
November 2007

Memorandum submitted by Engineering Services, Calderdale Metropolitan Borough Council, West Yorkshire (FL 147)

1. Executive Summary

This submission examines three aspects of flooding and flood risk which are considered to be key issues in a wide ranging subject.

1.1 Insurance

Developments in the insurance industry need to be addressed by government and insurers to work out an equitable way forward regarding properties at risk of flooding.
1.2 Records

The lack of records of ordinary watercourses (especially those which are piped or culverted) hampers engineers investigating operational problems and those engaged in development control. It requires some agency to be given the funding and the duty to establish & maintain records.

1.3 Development Control

There is conflicting advice and insufficient specifics in the guidance being produced to help Local Planning Authorities control run-off and promote the use of SUDS. Enforcement is not affordable except for the most serious breaches of planning law neither is it a practical proposition without improved documentary process.

1.4 Conclusions

The submission concludes that further reviews of law, regulation, guidance and funding are needed to empower and support those responsible for operating national flood prevention policies and managing the non-main river infrastructure which in most cases are local authority drainage managers or engineers.

2. Insurance

2.1 It was brought to our attention, by a contractor acting on behalf of insurers on a case in Halifax, that a change of attitude to claims is taking place. A meeting was held with a Senior Claims Manager at one of the companies involved (Halifax Insurance) to discuss the matter and gain first hand knowledge. He confirmed that his company is moving (or may already have done so) to a position in which they only consider claims from householders for damage to watercourses if they serve the insured “buildings” to dispose of surface water.

2.2 Our case in point, which has massive cost potential for the residents, would not be covered under the policy terms, which he described.

2.3 There was further confirmation of hardening attitudes in a news report on 10 October 2007 in which insurers were threatening to withdraw cover entirely in flood risk areas unless more central funding is made available for flood protection.

2.4 Although there must be a commercial limit to what the industry and its customers will stand it seems the original purpose of insurance (spreading financial liability) is being forgotten as certain risks increase.

3. Records

3.1 Lack of statutory records of ordinary watercourses causes a number of problems.

3.2 Responsibility for land drainage has always rested with riparian owners in areas with no Internal Drainage Boards and as the Land Drainage Body’s powers are all permissive there has been little or no impetus and no funding for anyone to keep records of watercourses, in particular enclosed watercourses.

3.3 Until relatively recently these systems were essential for drinking, agriculture, power and industrial process (including draining mining operations) and used to be managed by the owners of mills and other properties served by them who obviously had a keen vested interest in their maintenance. As the majority of these uses have now decayed the systems are falling into disrepair and local knowledge disappears with the demise of the engineers who used to care for them.

3.4 Consequently there are few if any records kept from which to identify conflicts during development. Experience shows that we cannot rely on developers bringing their existence to our attention and co-operating with reasonable requirements to deal with them. Poor quality diversions and built over culverts are all too common.

3.5 When it comes to operational problems we often have to rely on exhaustive investigation to identify problems and bring them to the attention of the relevant riparian owners, most of whom had no idea of their responsibilities and often insufficient funds/insurance to cover costs.

3.6 When the land on which the problem is located is not registered the Council has a choice of do nothing or incur mounting costs, which it is unlikely ever to recoup.

3.7 There is no legal requirement for vendors to point out the existence of watercourses to purchasers unless there is a known and unresolved flooding problem. It is doubtful whether even this requirement is complied with in many low profile cases.

3.8 Given the wise move to bring private sewers and lateral drains under the control of the Water and Sewerage Companies it is somewhat incongruous that the land drainage infrastructure (which is on average much older and in worse condition than the sewer network) should remain entirely in private ownership with no duty placed upon any public body to keep records or police the activities of riparian owners and the funding to manage these.
3.9 The Environment Agency’s Flood and Coastal Defence Database might be cited as an opportunity to address this situation. However, it does not have the capacity to hold records of minor watercourses and it is unlikely to be the most suitable repository. A simple GIS based mapping application is what is needed.

3.10 Furthermore if the duty, and adequate funding to populate a record are not lodged with a suitable statutory body nothing will progress.

4. DEVELOPMENT CONTROL

4.1 Protecting watercourses

Maintaining adequate control of development affecting watercourses is very difficult. First we have to know that the development is taking place. This is very difficult to keep track of as the planning system does not require commencement notices. Then we have to know that there is a watercourse at risk, which without records relies purely on local knowledge if it is already culverted. The landowner may be the best source of local knowledge but he/she may have an initial vested interest in not disclosing the information.

4.2 Enforcement

Enforcement of planning conditions is both very difficult and expensive because:

— The conditions are made on the advice of a host of consultees.
— There is no clear starting date for development under a planning approval, no commencement notice etc.
— Development is often delayed for years after an approval (especially an outline) consequently it is not feasible to “monitor” all cases.
— If the work affecting watercourses is done without planning permission of course (permitted development or minor engineering works not requiring PP) the first the Land Drainage Body may know of the matter is when it blocks or collapses which may be years after the work. The same may apply to development for which the building control function is “contracted out”.

4.3 Sustainable development

4.3.1 There is a wealth of information available to developers and planners (and their consultees) to guide us on how to produce sustainable development for the future.

4.3.2 However the uptake is very slow. Developers are unlikely to voluntarily provide sustainable drainage if it is more expensive or complex to procure without specific controls assigned to planners. This is further exacerbated in some areas by incompatibility between Water Company and Highway Authority policies in relation to soakaways for highway drainage.

4.3.3 The cornerstone of these matters in planning terms and the document most often referred to is PPS25. However this has missed an opportunity to set standards in detail and has left things somewhat uncertain. The recent Practice Guide does little to turn this around and is such a large and detailed document that small developers in particular are unlikely to become quickly familiar with its content—good or bad.

4.3.4 We find ourselves often having to re-iterate the need for Flood Risk Assessments of “other risks” and defending our position in relation to brownfield developments.

4.3.5 The industry still takes its lead from the EA’s comments and the EA is understandably very much tuned into fluvial flooding. Some Councils are producing local guidance which tries to address this but changing perceptions is a slow process.

4.3.6 There is little specific guidance on how to manage run-off from brownfield sites and what is there is inconsistent. Many developers believe after reading PPS25 that it is sufficient to demonstrate no detriment or just marginal improvement to comply with Government guidelines and there is good evidence to support that stance.

4.3.7 For example in PPS 25:

Key Planning Objectives “… reducing risk to and from new development”.
Responsibilities—Owner/Developer “… designs which reduce the flood risk to the development and elsewhere”.
Appendix E2 “… should where practicable reduce flood risk”.
Appendix F6 “should as far as is practicable, be managed in a sustainable manner to mimic the surface water flows across the site prior to the proposed development”.
Appendix F10 “… peak flow rates of surface water leaving a developed site are no greater that rates prior to development …”.

4.3.8 and in the PPS 25 Practice Guide
at paragraph 4.9 off-site impacts “ . . . the developed rate of run-off should be no greater than the existing rate of run-off . . . ”.

4.3.9 However at the tail of 4.9 there is referral to a CIRIA document (EA/DEFRA/W5-074/A), which partially counters these weak statements as follows:
“In the case of brownfield sites, drainage proposals will be measured against the existing performance of the site (although it is preferable for solutions to provide run-off characteristics, which are similar to greenfield behaviour)”.
and
“ . . . run-off discharged from urban developments to replicate or achieve a reduction from the greenfield response of the site . . . ”.

4.3.10 Developers and some consenting and implementing authorities have yet to show genuine enthusiasm for this guidance.

4.3.11 In order to produce sustainable development for the next generations to enjoy we must in the PPS 25 Practice Guide (next edition) or in some other national standards framework:
(a) Make some directive to WASCs and Highway Authorities to overcome policy / specification clashes in the matter of SUDS.
(b) Set firm targets for reduction of peak discharge from all sites. Greenfield rate (or even less) is the preferred option.
(c) There are of course practical limitations on attenuation. A minimum physical dimension for detention devices (say 75mm) would be an aid to operational efficiency. This would naturally lead to a minimum impermeable area to which attenuation might be applied of around 300 square metres.
(d) We should allow only a few exceptions to this in relation to brownfield development.
One might be a development with excellent existing infrastructure, which requires no intervention to service the proposal and in which it is not physically possible to introduce attenuation to the system owing to site constraints.
Without such firm guidance we will not maximise the opportunities to make a difference, which are presenting themselves every day in our Planning Offices.

4.4 Conclusions

4.4.1 A review of the law, regulation and responsibilities for ordinary watercourses is urgently needed to support Land Drainage Bodies trying to make their input to reducing flood risk.

4.4.2 PPS 25 needs amendment to include some specific levels of control of surface water run-off.

4.4.3 These changes are needed urgently if we are to make a difference.

David Turner
Group Engineer

Howard Glenn
Land Drainage Engineer

Engineering Services
Calderdale Metropolitan Borough Council, West Yorkshire
November 2007

Memorandum submitted by Professor Keith Beven (FL 148)

EXECUTIVE SUMMARY

This evidence refers to four issues: land management and flood runoff generation, flood forecasting, and the impacts of climate change on flooding, and institutional issues.
— Links between land use management and flood runoff generation are complex and strong linkages have only been seen at small scales. It is difficult to identify evidence of the impacts of change on floods at larger scales given large climatic variability. However, every opportunity should be taken to encourage the use of small scale mitigation measures, eg. as part of farm management plans.
— Land use planning does have a major effect on costs of flooding. Allowing development in flood risk areas with associated defences will not necessarily protect against all floods, and must take account of whole catchment knock-on effects.
— The National Flood Forecasting System is a valuable development but there now needs to be a spread of good practice in modern adaptive flood forecasting to all catchment areas.
— In small catchments improvements in forecasting rainfall inputs will be the only way of providing forecasts with sufficient lead time for people to react.
— There is no strong evidence that we are yet seeing the impacts of climate change rather than climate variability. There have been periods in the past of increased frequency of flooding. Predictions of the impacts of climate change must take account of the inherent uncertainties in the estimates.
— The Environment Agency has not sufficiently grasped the issue of uncertainty in both its own data and the model predictions commissioned from consultants.

EVIDENCE

1. My name is Keith Beven. I have been Professor of Hydrology and Fluid Dynamics at Lancaster University since 1991. I have previously worked at the Institute of Hydrology, Wallingford (now part of the NERC Centre for Ecology and Hydrology), and the Universities of East Anglia, Leeds, and Virginia. I have also been a visiting Professor at the University of California, Santa Barbara, USA, the Catholic University of Leuven, Belgium, the Ecole Polytechnique Federale de Lausanne, Switzerland, and Uppsala University, Sweden.

2. My work as a hydrologist has been primarily concerned with rainfall-runoff modelling, flood frequency estimation, flood inundation estimation, flood forecasting and estimating uncertainty associated with model predictions. I have published 300 papers and authored or edited 7 books. I am currently the lead investigator on the Defra FD2120 project on “Analysis of historical data sets to look for impacts of land use and management change on flood generation” and the theme leader for Risk and Uncertainty in the EPSRC/Defra/EA Flood Risk Management Research Consortium (FRMRC). I have previously contributed to the Defra FD2114 review of land use effects on flood runoff generation and the Defra FD2118 review of Board Scale Modelling.

My evidence refers to 4 issues: land management and flood runoff generation, flood forecasting, and the impacts of climate change on flooding, and institutional issues.

LAND MANAGEMENT AND FLOOD RUNOFF GENERATION

3. My involvement in the Defra FD2114 and FD2120 projects has shown that given the natural variability of the climate, it is very difficult to identify clear trends in flood runoff generation except in very local circumstances eg where there has been significant urbanisation or forest harvesting on small catchments. On larger catchments, such changes are more piecemeal and will have a smaller effect on the overall response, making the effects of change difficult to identify given the natural variability of the climate and the uncertainties in rainfall and discharge datasets. Patterns of change in land management will also interact with channel and drainage management effects. In fact, it is possible that such changes will have different effects on runoff generation under different conditions. Field drainage and upland gripping, for example, will tend to increase the storage capacity of the soil prior to a flood event (reducing runoff) but once the soils are saturated, the drains and grips will provide faster pathways to streams and the main channels. Blocking the grips will slow down the time it takes runoff to get to the stream, but will mean that the soils are more likely to saturate and provide a higher volume of runoff. Speeding up runoff that would normally contribute to the peak of a flood would help reduce the flood peak; slowing runoff that would normally discharge from a catchment before a flood peak, might increase the magnitude of a peak. The processes are complex, and the spatial patterns of measures need to be taken into account in catchment flood management plans (hence, as in the Carlisle flood in 2005, the perception on the part of some residents that flood defences in one part of the catchment had made the flooding worse elsewhere). Scaling up local changes to the catchment scale is a topic of research in the new FRMRC2 project, but predicting the impacts of land use change on floods is likely to be highly uncertain for the foreseeable future.

4. Small scale experiments do demonstrate that particular land uses and management strategies do increase flood runoff, even if the effects cannot easily be identified at larger scales. There are also small scale experiments that show that management strategies (eg tree planting or ploughing across runoff pathways to increase infiltration) and local runoff detention structures can reduce runoff. What is not clear is the relative costs and benefits of encouraging local detention schemes in both rural and urban developments in reducing flood risk at larger scales. However, all opportunities to create joint benefits to reduce runoff (eg the siting of tree planting in Farm Environment Plans) should be taken and guidelines for good practice in reducing runoff developed.

5. Land use planning also has a direct impact on flood damages. The very rapid increases in flood damages over the last three decades have been due much more to the development that has been allowed within flood risk areas than to any significant increase in the occurrence of flooding. Of course, such developments are often only allowed when there is also some flood protection undertaken, but local

planning committees do not necessarily appreciate the knock-on effects that protection in one location might have on the risk of flooding downstream (and possibly outside their Authority area). The Environment Agency can only advise planning committees and in many cases their advice against developments has not been heeded. In addition, it is often not properly appreciated that even if a development is protected against the “one in one hundred year” event, there is a 1% probability that a bigger event will occur next year, and the year after, and the year after that . . . In Carlisle, the plans for flood defences that were on display at the time of the event would not have protected the town against the flood which was bigger than the “100 year” event. Flood proofing of new developments in a way that retains maximum storage capacity for the flood plain while minimising the costs of damage should be considered as a recommended strategy in considering the potential for future floods. There may be both building regulation and insurance mechanisms for promoting proofing rather than defense strategies.

**Flood Forecasting**

6. The investment in the National Flood Forecasting System (NFFS) by the Environment Agency will be an extremely valuable foundation towards improving flood forecasts in the future by putting all the different forecasting systems onto a common foundation. The models that have been implemented are, however, mostly legacy models. This has the advantage that there is sometimes local experience of their use and limitations in the past. It has the disadvantage that the models are mostly not using up-to-date data assimilation and uncertainty estimation in presenting results to decision makers for flood warning purposes. There now needs to be a process of spreading best practice adaptive forecasting methods across the NFFS.

7. An important concept in flood forecasting is that of “lead time”. A forecast needs to have sufficient lead time to be useful to allow warnings to be given and people to react. In larger catchments in the UK, lead times of 6 to 36 hours can be achieved by forecast systems using rainfall inputs, but in smaller catchments (such as Boscastle) that might be subject to flash floods, the only way lead times can be increased would be by basing predictions on rainfall forecasts. The MetOffice NIMBUS scheme for combining propagation of rainfall radar estimates into the future with NWP rainfall estimates is adequate for detecting the potential for high rainfalls that could cause local flooding but not yet adequate for local forecasting with sufficient lead time to enable a public response to warnings. This might improve as the resolution of atmospheric NWP models reduces and new generation radar systems come on-line, but this is still a research issue. We have tried to test the use of high resolution NWP for flood forecasting purposes, but because of the difficulty of running the MetOffice Unified Model outside its normal range and computing environment, we have been able to look at only a very limited sample of events. A more general evaluation will be constrained by the limited numbers of sub-daily raingauge measurements in many catchments. The point accuracy of such measurements is still needed to complement the more general but much less accurate (especially in extreme events) radar coverage.

**Impacts of Climate Change on Flooding**

8. Floods occur rarely. They are also difficult to measure. Under extreme conditions gauges get washed away or topped over and carrying out check measurements at gauging sites can be both logistically difficult and dangerous. Thus the data available on flood discharges is limited and of variable quality. We cannot control the occurrence of floods in time, and improving the quality of measurements would be expensive. The consequence is that we should expect that any predictions about flood levels and discharges (for example, of the 1 in 100 year or 0.01 annual probability of exceedence event) will be associated with significant uncertainty. We should also remember that statistically there is a finite (if small) probability that the next event will be bigger than the design flood for defences (as noted above in respect of Carlisle). A larger event does not necessarily indicate a change, but can arise within the natural variability of flood events.

9. It is convenient to analyse the limited data that we do have statistically but as well as the uncertainty about flood magnitudes, there will also be uncertainty about the form of the distribution of events, and how the magnitude of events might change over time with changes in catchment characteristics (eg continuing urbanisation), land and channel management strategies (eg the recent publicity over the reduction in the EA maintenance programme in small channels) and the potential effects of climate change. The statistical analysis assumes stationarity, we suspect that the distribution of events might well be changing over time.

10. Analysis of such changes is highly constrained by the quantity and quality of the data available and the variability of the natural process. Thus, as with the land use effects, it is very difficult to distinguish any changes in flood characteristics by an analysis of the available data. There is some evidence that in the last 10–15 years, the number of flood events exceeding different threshold discharges has been increasing as a result of increasing winter rainfalls, particularly in the west of the country. However, there does seem to have been other periods of increased frequency of flooding in the past. There is no strong evidence therefore to conclude yet, that we are seeing the effects of climate change rather than climate variability. We should therefore be very wary of drawing strong conclusions based on model estimates of changing flood

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frequencies based on estimates of change from GCM models. We know that such models have difficulty in predicting current extremes adequately (one of the reasons for moving to ensembles of models in UKCIP08) and should expect their predictions of future conditions to be associated with significant uncertainty. Such uncertainties are not necessarily only statistical in nature, but making realistic estimates of the uncertainties might change the nature of decisions that are based on the model predictions.

11. This clearly does not mean that, as more data are collected in the future, we might not see detectable changes in flood frequency, only that those changes are and will be difficult to distinguish from natural variability. Some allowance should be made for the potential for future change but the current EA guidance to allow for 20% above the current estimate of the 100 year discharge needs revisiting to allow for the uncertainties in making such an estimate. The 20% figure is acting effectively as a precautionary value. Given the uncertainties involved in estimating flood exceedence probabilities, a precautionary rather than model prediction approach, might well be an appropriate but will require a re-evaluation of the decision making framework and planning guidance.

INSTITUTIONAL ISSUES

12. Since the formation of the Environment Agency there has been a significant loss of experienced staff to consultancies. In general, the preparation of flood risk maps, and catchment flood management plans are contracted out by the EA to consultants. Reorganisation has also meant that some understanding of local conditions in particular catchments has been lost (and indeed, the recent reorganisation means that in some cases, responsibilities for some catchment areas are now split between different sections within the Agency). There appear to be few mechanisms in place to record this local understanding when expertise is lost due to retirements, transfers or loss to consultancies. While it is entirely appropriate that the EA should make use of the expertise available in consultancies, it is not clear that there is sufficient expertise to allow critical assessment of the reports produced by consultants which often depend on complex and uncertain model calculations and uncertain data. The Agency has not fully grasped the uncertainty issue (or how to constrain it): it does not ask consultants to estimate uncertainties associated with model predictions; it does not assess the uncertainties associated with its own data sets. It could be more pro-active in this respect. There will be a cost involved in taking account of uncertainties in decision making, but the robustness of decisions might be improved.

Prof Keith Beven
November 2007

Memorandum submitted by Michael A K Bell (FL 149)

This letter is in reply to the letter I wrote to Mr Michael Jack MP with regard to flooding on rivers in the south west of England and North Yorkshire and he has told me to put forward my ideas to you.

The cost of flooding already incurred and possible in the future would, I think, make my idea feasible. If we accept that rivers over thousands of years have silted up at various points along their journeys to the sea and, by flooding, eventually found a new route past the silted up point. This silting up has rapidly increased with mans’ activities including agriculture and, accepting the fact that to dredge rivers is unacceptable, due to the fact that under low flow conditions the surrounding lands would have a much lower water table.

So we need a scheme which lowers the water level in the rivers at a time when heavy rain fall occurs in this flood plain or in the catchment area up stream of the flood plains. To dredge rivers is a disaster for river life and my scheme would limit the effects of this work over the period of the scheme.

My idea would be to create an artificial flood plain or compensation reservoir upstream of the flooding, (no this isn’t a dam). We would build a moveable barrier across the river, which would, in effect, be an adjustable (for height) weir. The weir would be sited at a point in the river with a flat plain on each side for, say, approximately one mile and then a rise in ground level to minimum height of, say, 7 metres, this rise in ground feature along with an earth wall extending out from the weir. Choosing the right site will allow us to enclose this flood plain and allow possible back-up of the river level. This weir, under normal conditions, would disappear into the river bed and allow normal transition of wildlife up and down the river.

By monitoring the river level upstream (torrential rain in the hills) we can immediately raise the weir and control the amount of water rushing down to natural flood plain. If we have torrential rain down stream of the weir (in the natural flood plain) we can monitor the rising river level and immediately raise the weir to compensate and allow the river to absorb more flood water from the populated areas.

Ah! Ah! You’re going to say but what does he do with all this water building up behind the weir if we can’t allow it back down the river. By controlling the river level downstream we allow the river to absorb more floodwater actually coming into the river from run-off from roads, from buildings and from farmland.
We now have the problem from sustained raising of the weir, by raising the weir and controlling river levels downstream we have a build-up of water in our compensation reservoir, the second part of this scheme now takes place. When the build-up of water exceeds, say, seven metres in our artificial flood plain I would now connect a pipeline from the weir to the low tide mark in the river estuary.

This sounds expensive but I would look at the possibility of using recovered high grade plastic to make lined pipes, say, seven metres in diameter and sinking a section at a time into a trench in the centre of the river bed, savings in length and improvements in gradients of the pipeline could be made if bends in the river could be cut short. This involves disturbance in the river bed but I wouldn’t think that laying sections of pipe at a time would involve more sediments than the river in full flood.

Perhaps the pipelines from the two weirs in the Avon and one on the Severn could be linked at their confluence to continue down to the sea. Perhaps at the outlet of each weir pipeline we could have another pipeline linking each weir and continuing towards London for a water extraction scheme.

In summary, siting of the position of each weir is critical in that we include small rivers, streams etc. upstream of the weir as we can but still maintain as much height above sea level as we can. We have gains at every stage of the schemes, we can use the earth from the pipeline trench to build the earth wall out from the weir to high ground features, the earth walls could be grazed by farm animals and used to move away from the rising waters when the weir is in a raised condition.

The first gain is reached when the weir and earth walls are constructed and we have limited time for some control of the river level. The second gain comes when the pipeline gets past the areas of flooding and, or when, the pipeline passed any areas of silting up of the river bed, at this stage by opening the valve gates in the pipeline we can speed up the water flow to the end of the pipeline wherever this has reached. When water levels recede in the compensation reservoir the fields can return to normal. Careful monitoring of the river level allows for:

1. Controls heavy upstream flows down to the floodplain.
2. Compensates for runoff into the river downstream of the weir (and flooding of populated areas) by control of river levels downstream of the weir.
3. Under normal conditions allows for migration of wildlife in the river.
4. A water extraction scheme for the southeast?

In additions to flooding on Avon/Severn Rivers, recent bad flooding occurred in the Malton (North Yorkshire) areas, due mainly to water flowing off the North York’s moors. Could this weir and artificial flood plain be employed in the river Rye which carries enough water which we could control to make a big difference to the flood problems in Malton/Norton? Dependent on elevation and topography can we position a weir somewhere north of Butterwick and run a pipeline west to the river Swale and create a flood area on the river Swale.

This suggestion may seem strange, putting more control water into (eventually the river Ouse) Swale and the problems in York. With this flood plain on the Swale we now have the opportunity to kill two birds with one stone in that we control water downstream into the Ouse and we continue the pipeline down the Swale into the Ouse and past York. Eventually the pipeline reaches the river Humber and the excellent water quality could allow us to include this in a water extraction scheme.

At some time in the future when we find a cheap way of generating power we could insert pumps downstream of the weir to assist flow in the pipelines and transport water as part of a water extraction scheme.

I suggest savings could be made in some unnecessary work initiated to try and alleviate the flooding we have at present. Funding could come from a myriad of sources/Europe, insurance companies, agriculture and water companies. If we carry out the work over, say, 20 years the benefits for our children could be huge.

Thank you for taking the time to read my suggestions.

Michael A K Bell

October 2007

Memorandum submitted by John Rossetti (FL 150)

I was prompted by a passage I heard on Radio 4 tonight, to listen on the internet in full to Mr Duncan Jordan and others from Gloucestershire talking to your committee.

May I draw your attention to a past service that, owing to the younger ages of the parties in the room, you and the committee may not be aware of.
It is that of a facility now missing in this country, “buffer depots”. These existed in the ’50s and ’60s under the ministry of supply, to provide large quantities of food and other materials to be used in the event of an emergency. I can remember as a BBC Cameraman going around the country filming inside these depots and being amazed at the facilities they offered. From Green Goddess fire engines, to sand bags, crowd barriers, pumps, and even ambulances, boats, tinned food, flour, blankets, etc etc.

These as far as I know, are all now closed or sold off, and the point made by Mr Jordan, that obtaining large quantities of the right materials in the event of an emergency was a problem is, I think, a direct result of these depots being closed.

For whatever reason, society lives in an age of “just enough at the time”. As an example, the Oil Fire in Hemel Hempstead which I attended as a News Cameraman and I remember being told “off the record” that it had stretched the emergency services to an extent that had there been a second emergency, it would not been possible to adequately cover it.

Supermarkets rely on the constant and regular drip feed of supplies and if, heaven forbid, there was a run on food or water for example, they could not cope, the same, it seems, applies to the authorities that when there is a natural disaster, like flooding, we do not the spare capacity that these depots previously offered.

It is clear that other local emergencies and floods similar to those in Gloucestershire will continue to occur, and that a requirement for the fast bulk supply of materials will be required in the future and maybe the reintroduction of these depots should be considered.

**COMMENTS re: FLOODING**

On a separate note, I live very close to the Alder Bourne, a stream that was, only 10 years ago, fairly fast flowing, more than able to keep its self clear of obstructions by the pressure of its own flow, and as a result, the maintenance requirement of land owners or parish councils was minimal.

Over the years the local water authority has drawn so much from its source and along the route that it is now not much more than a trickle and as a result very overgrown. When there is heavy rain it always floods in varying degrees along its length because of the weeds etc, as a result it no longer has the ability to carry any significant flow when it does occur.

I used to own a canal boat and because of British Waterways regular maintenance they are almost always clear and rarely flooded, but still, all around the country there are similar problems to the “Alder” with brooks, streams and small rivers. These are not very good at looking after themselves unless they have a good continuous flow, if they do not, they need maintaining, most do not have a regular flow, or are maintained, and as long as that situation exists, there will always be problems.

Thank you for your time.

*John Rossetti*

*November 2007*

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**Memorandum submitted by Dr Nick Haycock (FL 152)**

We have concluded a review of the flooding in South Worcestershire in association with the Wychavon District Council and the Environment Agency. Flooding in the Village of Sedgeberrow (River Isbourne that flows into the River Avon at Evesham) resulted in 60 residents being airlifted and 93 homes flooded to a depth of 2.5 metres. Water levels rose by 1.6 metres in 20 seconds.

The analysis of the catchment and runoff regime over the last 35 years suggests a marked degradation of runoff regime. In the 1970s a 1:10 year flow was 26 cumecs, in 2000s, this flow now equates to 38 cumecs. The result of land use change and rapid arable development in the Isbourne catchment, especially post 1975, appears to coincide with the largest shift in the the runoff regime of the catchment. The net result is that a 2005 flood defence scheme for the Sedgeberrow village was designed to 1:100 standard but the revised flow classification of the flood regime, taking into account land cover changes, now places this scheme as providing a 1:40 year level of protection. Flood flows for given return periods have grown by 28–31% over the last 35 years for this catchment.

If the committee are interested in this work and the implications and observations from a area that took the full brunt of the 156mm that fell on the 20 July, please let me know. The EA and ourselves have now classified the floods that hit the village of Sedgeberrow as having a return period of 1,600 years. The met office identify this area as having the highest rainfall depth of that day.

For your information, our company undertook flood analysis and river scheme design work at Lewes (2000), Ripon and Boscastle (2004) and has undertaken flood advisory work for the National Trust, English Heritage and Royal Palaces for over 10 years. We have worked in association with many UK universities.
and continue to provide specialist flood modelling work for Halcrow and the main engineering consultants in the UK. Equally our small team is the main technical advisors for the Venice Mainland Drainage Authority. I hope there maybe an opportunity to supply evidence to the Committee.

Dr Nick Haycock
November 2007

Memorandum submitted by the River Dene Action Group—Wellesbourne (FL 153)

SUMMARY

The River Dene Action Group—Wellesbourne represents a group of people in Warwickshire who have suffered major flooding twice in the last nine years.

This note assumes that many other submissions will have covered the topics of increasing frequency of flooding, and the need for higher budgets to cope with this. We want to raise two issues which may have been given less airtime.


The Defra methodology considers the immediate (though discounted) cost of building repairs and contents renewal, but makes no allowance for the consequential losses particularly:

- Increased insurance premiums or excesses.
- Houses becoming unsellable.

And, although it may be hard to quantify, the cost both financial and emotional of houses being uninhabitable for six months.

It may be helpful on a day-to-day basis to have practical method for rationing funds, but to have a properly informed discussion about the real nature of the problem and long term solutions, surely we need to understand the full costs.

2. The priorities of the Environment Agency.

Some organisations faced with a crisis in one of their areas of operation would just ask their benefactors for more money: others would look critically at every aspect of what they do and how they do it in order to focus resources where they are needed most. The second of these groups can act in a measured way, or they may simply rob Peter to pay Paul.

Local observation and anecdote suggest that:

- Time and money is wasted on trivia.
- Flood defence budgets have been raided in the past to meet other needs.

We would be grateful to the committee for examining these issues.

1. INTRODUCTION

The river Dene is a tributary of the Avon, joining it just East of Stratford-upon-Avon. Wellesbourne is a large village straddling the river and much of the centre including the affected part is a conservation area. Some buildings are listed.

It has been flooded twice in the past nine years, affecting about 60 houses—over half of them to a depth of more than 60cms, and 85% to at least 30cms. One third of the homes are occupied by pensioners.

After the 1998 event, a report by the Environment Agency concluded that it would not be “cost effective” to spend £100K improving the defences to give 1 in 100 year protection, opting instead for repairs to the existing defences costing £24K and providing (allegedly) 1 in 75 year assurance.

Following the second flood in July 2007, a survey was carried out among the victims, and 46 of the 60 houses were represented (a couple of the houses were vacant and some people had decamped and could not be reached). This has been presented to the Environment Agency, and we understand a copy has been sent to your Committee by Professor Green of FHRC.

The survey shows that the cost of building repairs is £2.5 million and of replacing contents £1.0 million.

Six weeks after the flood, only 37% were living in their homes, and only half expected to be back by Christmas.
2. Cost Benefit Analysis in Planning Levels of Protection

We don’t presume to nitpick the detailed methodology of cost benefit analysis, but we do ask you to consider the variables which have simply been given no consideration in the models which are used. In particular:

2.1 Insurability

Among our local victims are people who have been told that their insurance renewal will be subject to:

— 20% excess;
— £10,000 excess; and
— a report from the Environment Agency on flood prevention.

And of course many premiums are not yet due for renewal, so the full situation is probably not yet revealed.

2.2 Houses being unsellable

Two floods in nine years has a devastating effect on the saleability of a house if there is no prospect of improved protection. If a house is hard to insure, it becomes extremely hard to sell.

Apart from the obvious impact on the indebtedness or net worth of families, this has specific implications for:

— people changing jobs and having to move; and
— pensioners seeking to downsize or release equity.

If we assumed a 20% reduction in house values, this would amount to £4.5 million compared to a buildings and contents cost of £3.5 million. In other words, the real cost to individuals is more than double the real cost of reinstating their homes.

2.3 Costs of homelessness

Many people are still homeless and will not be back by Christmas. Some are in caravans, some with relatives, and some in hotels or rented accommodation. In all we estimate that 500 person months will be spent away from the 60 houses affected.

The emotional and physical strain for the elderly living in caravans in the winter, or for young families crammed into holiday cottages, though harder to quantify, should also be feature prominently in considering the importance of improved protection.

2.4 Implications for cost benefit analysis

The cost benefit calculations as they are currently done give only a partial picture of the costs. This may serve a short term purpose in allocating scarce funds between different possible projects, but it fails to provide a true picture of the financial and other pain that flooding brings.

For better understanding of the longer term needs of the country as extreme weather events become more frequent, don’t we need an appreciation of the real costs.

It might even help deter building in flood plains.

3. The Priorities of The Environment Agency

We don’t want to have a general rant about the EA. The people we have had dealings with since the flood have all been very professional and sympathetic, and we believe they will do their best to get us improved protection. However, a couple of local observations suggest that flood prevention may not always be given the priority it deserves.

3.1 Time and money wasted on trivia

There is a weir downstream of the village in the middle of farmland close to the sewage works. A footbridge carries a path over it. For safety reasons there are galvanised steel railings around it and across the bridge.

A few years ago a programme of mowing the surrounding grass was instituted. This serves no useful purpose at all, and could even be said to look ridiculous in an unkempt rural context.

More recently, several workmen spent more than a week painting the galvanised railings black, and replacing a stile on the bridge with a kissing gate.
Even more contentiously, they then covered the railings with stainless steel mesh so that when the floods came all the field debris washed up against the mesh forming a dam. The force of the water was such that the railings are now bent.

If the resources used in this futile enterprise had been spent on maintaining the flood defences, we might not now be writing to you.

Is anyone asking tough questions about avoidable expenditure?

3.2 Raiding the flood defence budget.

Perhaps it would be more diplomatic to call it re-deployment of resources to meet other more pressing needs, but there is a persistent rumour round here that the floods budget was raided to help sort out the recent farm payments fiasco. The sad thing is that no-one is surprised or shocked.

Is it true that flood defence drops down the priority list when it is out of the headlines?

The River Dene Action Group—Wellesbourne

December 2007

Memorandum submitted by The Witham First and Third District Drainage Boards (FL 155)

Whilst I am well aware that the deadline for submission of evidence has long gone, I have been informed that your Committee will be visiting Lincoln on 30 January to take further oral evidence. I sincerely hope that you might find time to take evidence from myself and possibly explore suggestions to improve the current situation.

I have 35 years experience in the public sector, 33 of which have been involved in drainage. Initially in County Highways, followed by a short spell with a Borough Council prior to ten years with a Water Authority before taking up my current post as Clerk/Chief Executive to two Drainage Boards covering 100,000 hectares of rural and urban areas of mid Lincolnshire.

I represent the County’s Drainage Boards on the Resilience Forum; am Founder, and remain Hon Sec, of Lincolnshire Clerks Society; Employers Side Secretary of the Pay and Conditions Committee; a former Branch Secretary and was Strategic Commander and organiser of ADA 2000, which is still widely recognised as the best ever trade exhibition of its kind in Europe.

I currently sit as a Member of a DEFRA pilot on integrated drainage. I regularly contribute articles to the ADA Gazette and enclose a copy of the most recent article which will explain why I missed the deadline for submission of evidence.61

Out of the working environment I am Chairman of my local parish, which was hit by the 2007 floods, and have experienced the frustrations regularly expressed in media interviews.

I would venture to suggest that whilst many of this summer’s experiences may not have been preventable, the public perception of isolation, confusion and sheer lack of accountability could be addressed. However, in order to improve the current situation it is vital to understand how we got into this position-the history.

Whilst not perfect, responsibility for land drainage prior to 1974 rested with local authorities and, in the areas of greatest need, drainage boards, all overseen by the River Catchment Boards, who had responsibility for adopted main rivers. Each organisation had their own drainage engineers.

The creation of the Water Authorities in 1975 resulted in water supply, sewerage and drainage becoming encompassed in one authority. However, the Highways Authorities retained their Highway drainage powers and local authorities retained permissive powers to oversee drainage within their districts. However, the local authority engineers transferred to the Water Authorities, consequently, there was no technical expertise. The drainage boards remained as the only organisation with experience and capability.

The Water Authorities invested heavily in water supply and sewerage but drainage was the “Cinderella” service and it came as no surprise when privatisation was mooted in 1987 that a new organisation, the National Rivers Authority, was created to rid the water companies of responsibility for main rivers. However, the water companies retained urban surface water sewers, many of them combined sewers.

The National Rivers Authority did become a very focused organisation and years of neglect of the rivers systems were beginning to be rectified until the government of the day decided that the boast of “biggest environment body in Europe” would be achieved by encompassing the NRA’s 6,000 staff into a newly-formed Environment Agency. The Agency have powers over all drainage matters in England and Wales but over the years have exerted a continual centralisation policy, diluting local influence and control; reducing maintenance funds for frustrated local engineers and becoming aloof and distant.

61 Not printed.
Throughout the changes, Drainage Boards have remained, evolving into more professional units providing local schemes using local money, controlled by local politicians and farmers to become more efficient, effective, transparent and accountable.

I propose that your Committee considers the creation of Drainage Boards throughout the nation, based in river catchments, with Members drawn from the local authorities and electors within each catchment, to co-ordinate and oversee all flood and drainage related matters. This can be quite easily achieved using existing legislation at relatively little cost.

I suggest that the Boards be provided with additional powers to address the lack of investment in urban drainage schemes with the eventual return of all surface water into the public sector.

I trust that you will consider my proposals and find a little time to allow me to expand upon my thoughts.

The Witham First and Third District Drainage Boards

December 2007

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**Supplementary memorandum submitted by The Witham First District Internal Drainage Board and The Witham Third District Internal Drainage Board (FL 155a)**

I attended the oral evidence session at the Lawns in Lincoln and was impressed by the Committee’s grasp of the main issues. I did inform you that I would write to you following the session.

I was disturbed by some inaccurate “facts” provided by some witnesses and consider that a response is necessary.

The main inaccuracies relate to evidence provided by Mr Mark Harrison, the landlord of the Black horse public house in Blyton, near Gainsborough. Mr Harrison was critical of my presentation to the Citizens Jury held in Gainsborough and of the maintenance regime of the Gainsborough Internal Drainage Board.

I did stress at the outset of my presentation that I was referring to the policy of the Boards under my stewardship and would re-iterate and can prove that these two Drainage Boards, whose area is over 15 miles from Gainsborough, clear every watercourse of vegetation every year and sludge out and reform on a ten year cycle. However, in addition, I have established that Mr Harrison’s premises do not fall into any Drainage Board area. Indeed, the nearest Drainage Board is over half a mile downstream of his premises. Consequently, the lack of maintenance downstream of his property is due to riparian owners failing to maintain the watercourse properly, as the activities of the Drainage Board could not affect the Black Horse at Blyton.

I have been involved, at the request of West Lindsey District Council, with the problem relating to the Bovis Homes development which Mr Harrison referred to. I can confirm that West Lindsey District Council refused consent for the development, a decision which was overturned by the Planning Inspectorate. The site is not, however, built on a flood plain as Mr Harrison claimed but on a sloping site either side of a small watercourse. Whilst I have not, as yet, received details of the surface water disposal system from the development, I would not be surprised, given the history of the site, if the development contributed towards accelerated run-off (faster flow of water) into the dyke. However, the main problem with this site is that a local builder illegally culverted (piped in) the stream downstream of the site using a totally inadequate pipe to increase the plot sizes. He has since been declared bankrupt and had ceased trading. The residents who now occupy these two dwellings will continue to be flooded on a regular basis unless the dyke is restored (involving the loss of car ports, walls, garden sheds, trees, shrubs, fuel stores et al) or the culvert is replaced by a much larger one. The cost—several thousand pounds—will fall on the householders.

In the submission of Steve Batty, whilst he did praise Drainage Boards in general, he did refer to their failure to attend meetings relating to the Humber and its environmental status. Having briefly investigated the claim, I can confirm that all of the Drainage Boards from the south bank of the Humber were represented at all meetings. However, the much smaller, less well-resourced Boards on the north bank did not have the same commitment. This matter is currently being addressed by the Review of Internal Drainage Boards. Recommendations approved by DEFRA and the Association of Drainage Authorities are being implemented.

The balance between maintenance and nature conservation remains a very delicate issue and is often dependent upon the attitudes of the relevant officer in the local Natural England office. Whilst I have long standing agreements relating to the most appropriate timing of maintenance and improvement works, I occasionally have difficulties whenever staff changes occur. Of a much more aggressive nature is the RSPB who have twice instructed me to stop all activities over all my drainage districts (some 100,000 square hectares—approximately 400 square miles) when I have reported sightings of relatively rare species. You might be astonished to hear that the Board no longer inform the RSPB, as a matter of course, when rare species are sighted. However, we retain strong and successful links with the Hawk and Owl Trust and the British Ornithological Society.
If I might take the opportunity to comment on other matters discussed: Mr Tipping asked why so many farmers and other residents are not on the Environment Agency Flood Warning Scheme? The short answer is that the current scheme is not fit for purpose, particularly in sparsely populated rural areas. I have personal experience of being woken several times during a night to be informed that “all clears” have been declared for areas many miles from my place of work or home address. I am aware of some urban residents who have removed their details from the scheme, despite being flooded, as they are constantly instructed to take their animals and belongings to higher ground as a problem is imminent over thirty miles away.

The principle of flood warning is sound, the relevance to those being warned requires considerable fine tuning.

The Environment Agency website causes confusion as the majority of Lincolnshire residents do not consider themselves to be part of “Anglian” region as local government is East Midlands based.

In my “spare time?” I am a long standing Chairman of a small Parish Council in West Lindsey District. There were a number of properties flooded in June. Despite over 34 years experience in land drainage and flood defence, I find that obtaining reasonable, reliable information, particularly from the water undertakers and the County Highways, is extremely difficult and frustrating. I can empathise with many of the comments made by the witnesses. The websites of these Boards (www.witham-1st-idb.gov.uk and www.witham-3rd-idb.gov.uk), include maps of the drainage infrastructure for which the Boards are currently responsible. This is in line with Board’s policy for accountability and transparency. I believe that the Drainage Boards are the only public (or private) authority to take this stance. Indeed, the water companies levy a charge to view the locations of their assets.

The task which you undertake is confusing and complex. It is further complicated by the increasing domestic use of water, the refusal of water companies to upgrade infrastructure and the effects of climate change.

I offered my services to you in late December and do so again. However, whether or not you take up my offer, I trust that you will ensure that the evidence you consider is factual.

C J Elkington
The Witham First District Internal Drainage Board
The Witham Third District Internal Drainage Board
January 2008

Memorandum submitted by British Water (FL 157)

SUSTAINABLE DRAINAGE SYSTEMS AND MANAGING SURFACE WATER FLOOD RISK

A review of sustainable drainage systems for surface water control and their potential impact on flooding.

SUSTAINABLE DRAINAGE SYSTEMS AND FLOODING

British Water and its Sustainable Drainage Systems Focus Group has prepared this paper to provide the Environment, Food and Rural Affairs Committee with information on the impact of sustainable drainage systems on the control of surface water drainage and mitigation of the potential consequences and impacts of excessive rainfall, including flooding.

It should be clearly stated at the outset that drainage systems are designed to manage defined maximum volumes of water; these defined maxima are based on historical rainfall records. If design maxima are exceeded then drainage systems will be over-whelmed and flooding will occur, inadequate design and lack of maintenance may also be contributory factors.

Climate Change predicts increases to the incidence of excessive rainfall events which will challenge the adequacy of existing drainage systems and design criteria for new projects. Professional judgement will influence design selection for a project but this will be predicated on accurate data providing sound modelling of future climatic patterns on which to base design specifications for effective sustainable drainage system.

There are many factors that contribute to flooding and the construction of an adequate drainage system is but one. Historical urban and rural developments and plans for future developments will, in combination with the vicissitudes of climate change, continue to challenge the effectiveness of drainage systems.
The principles embedded in the philosophy of sustainable drainage systems will maximise their effectiveness and minimise the future impact of excessive rainfall events in urban and rural situations. However, the siting of future developments will have a crucial impact on the ability of sustainable drainage systems to minimise the incidence and consequences of flooding.

The management of stormwater is a challenging problem which is exacerbated by uncertainty about future drivers such as climate change. Historically in the UK and most of the developed world, stormwater problems have been addressed using systems (drains, sewers and watercourses) to dispose of excess stormwater runoff as quickly as possible away from urban areas in particular, to points where it is no longer believed to be a problem.

The realisation over the last century that stormwater disposed of in this way can lead to problems downstream due to high flows, flooding, watercourse erosion, pollution and consequential ecological impacts, has led to the development of alternatives to piped and channelled drainage systems that try to more realistically replicate the natural physical, chemical and biological processes of evapotranspiration, filtration, detention, and dispersion.

A major facet of these new “natural” stormwater management approaches is the need for greater engagement of those involved in development planning, maintenance, operation and in general sustaining the performance of these systems.

Extracts from Executive Summary of the Global Watch Mission Report Sustainable drainage systems: a mission to the USA. March 2006. This DTI funded mission was initiated and managed by British Water, the report is available via the British Water website http://www.britishwater.co.uk/document/Default.aspx?uid=82a4662-711d-437c-bd6b-e94138d98ab2

1. **Introduction**

This paper has been prepared to outline and encourage the implementation of contemporary surface water management techniques (sustainable drainage systems) that authentically contribute towards sustainable development.

With respect to Gro Harlem Brundtland “Sustainable drainage is drainage that meets the needs of the present without compromising the ability of future generations to meet their own needs.

(Adapted from “Our Common Future” Brundtland 1987).

The widespread implementation of sustainable drainage systems (also known as “SUDS” or best management practices “BMPs”) should be integral to the surface water management strategy in any and all developments. This will provide the platform to mimic the response of the existing catchment and its surfaces, ultimately with some betterment, negating any increased off-site flood risk that development could cause.

2. **Terminology**

The term SUDS came into use to describe a drainage philosophy primarily for urban environments (Sustainable Urban Drainage Systems) and in general accentuated the use of natural features eg swales, balancing ponds. The philosophy has evolved and is now applied to all drainage systems whether urban or rural and including natural and engineered structures, thus the derivation of SUDS became Sustainable Drainage Systems. However it retains a strong emphasis on “natural” systems which also have an obvious amenity value.

The term SUDS is UK terminology, the philosophy it describes amounts to best practice and this is reflected in a term that is used in many other countries Best Management Practice (BMP): other terms are WSUD—Water Sensitive Urban Design (Australia) and LID—Low Impact Development (USA). Although BMP does not include an obvious reference to drainage it encourages a more holistic approach which includes a recognition of the potential for urban and rural systems to interact and influence the effectiveness of linked drainage systems. The phrase sustainable drainage systems is increasingly used so as to be inclusive of solutions (BMPs) in urban and rural situations and including natural and engineered structures.

An integrated water management system leads to benefits elsewhere and Sustainable Drainage helps in the management of flood risk, improve water quality in the environment and can contribute to increased biological and ecological diversity. (Drainage Assessment—A Guide for Scotland 2007)

3. **Overview of Sustainable Drainage System Design requirements**

A contemporary sustainable drainage methodology for managing surface water runoff should use Best Management Practices to focus on three key areas:

- controlling surface water quantity (reducing off-site flow rates);
- improving surface water quality; and
— providing added development amenity value.

Provision of all three in equal measures will not always be possible or necessary.

It is anticipated that contemporary sustainable drainage techniques shall be used throughout any and all developments to control surface water runoff and help manage residual flood risk in line with current planning requirements.

Traditional (pipe and chamber) systems can be designed and implemented as sustainable drainage components, if dictated by development constraints, but a contemporary methodology must replace conventional thinking (ie a flow controlled contemporary system replacing a freely discharging conventional system).

The limited experience of sustainable drainage systems in the UK means that better arrangements need to be in place to ensure good design and construction. This requires a whole life performance perspective and the education and training of all stakeholders, especially planners and building control officers. In addition schemes . . . in which up-front bonds have to be lodged prior to construction should be considered in order to ensure that these systems are properly constructed. This may necessitate the establishment of specialist drainage inspectors . . . who may also be trained in other stormwater management aspects such as local flood risk management advice to householders and property managers. (Global Watch Mission Report: Sustainable drainage systems: a mission to the USA 2006)

Three key tenets should be developed as part of an integrated and sustainable surface water management strategy:

1. Maximise a reduction in natural runoff by the use of infiltration techniques wherever feasible.
2. Manage the residual flood risk as well as reducing the total volume of surface water runoff discharged.
3. Maximise quality improvements in surface water runoff.

All three tenets can be satisfied using natural or proprietary techniques alone or in combination.

In order to ensure that the sustainable drainage system is designed to mimic the natural characteristics of the catchment and attain the key tenets above, the surface water management train should ensure that the application of runoff control is considered for three key stages during the conveyance of surface water to the regional fluvial or tidal outfall. These stages are:

(a) Prevention.
(b) Source control.
(c) Site control.

4. DRIVERS AND BARRIERS

There are both drivers and barriers to the design and uptake of truly sustainable drainage systems, the impact of which can vary depending on site and size of a development.

Drivers for Sustainable Drainage

There are many contemporary drivers for the implementation of sustainable drainage techniques, including:

— Making Space for Water.
— CIRIA design guidance C697.
— Sewers for Adoption.
— The Building Regulations.
— Interim Code of Practice.
— Code for Sustainable Homes.
— Designing for Exceedence.
— Approving authority and stakeholder requirements.
— Contemporary thinking and the aspiration for sustainable development.

New surface water drainage systems are typically designed to cope with an event likely to happen, on average once every 30 years. The Government should review flood risk protection standards for inland, coastal and surface water flooding to ensure that they are still appropriate in view of climate change. (Environment Agency: Review of summer floods—2007)
Barriers to implementation of sustainable drainage systems

Currently, for every driver there is often a barrier preventing implementation of some sustainable drainage techniques:

- Concerns regarding adoption of many natural techniques.
- Longevity and whole life issues, including maintenance.
- Misunderstanding of contemporary sustainable drainage techniques.
- The required land-take for some natural techniques.
- Too many surface water design standards with contradicting requirements.
- Shortfalls in the planning process.
- Ambitious housing densities.
- Unfulfilled retrofit potential; green roof technology.
- Future floodplain development and not brownfield reclamation.

It is apparent from US practice that there are considerable benefits from providing greater incentives for the use of innovative stormwater management techniques. These are most effective where the stormwater costs are clearly identifiable within charging schemes.

. . . Clearly identifiable costs and discount or rebate opportunities can aid in engaging each of the stakeholders . . .

In many areas of the USA separate stormwater utilities (municipal or private) deliver a service associated with a defined income stream as above.

. . . There are clear advantages of such utilities; however, they need to be properly positioned within an integrated water management and planning system. (Global Watch Mission Report: Sustainable drainage systems: a mission to the USA 2006)

5. Natural and Proprietary (Manufactured) Best Management Practices

Contemporary sustainable drainage should be achieved by designing and implementing a blend of natural and proprietary BMPs, complemented by traditional drainage techniques where required. Some techniques can be very simple; for example, downpipe disconnection as a BMP technique, either as new build or retrofit, has been available as a drainage option for quite a while with unfulfilled potential.

US experience has shown that the incremental and localised small-scale management of stormwater . . . can collectively provide significant benefits to managing local and downstream water quality and quantity . . . In the UK it is likely that stormwater disconnections (retrofit) as part of a portfolio of approaches will become increasingly important (if not essential) to meet the requirements of the Water Framework Directive, as they could potentially reduce both discharge volumes and remove significant pollutants from discharges into natural water bodies. (Global Watch Mission Report: Sustainable drainage systems: a mission to the USA 2006)

Seamless integration into the infrastructure of a development is required to create an authentic and contemporary sustainable drainage system. Such integrations may include, although not be limited to the following.

A. Natural Sustainable Drainage

These structures will be focused around natural techniques and materials and integrated into the landscape, which may include utilising engineered features. Without doubt, where development constraints permit, the maximum sustainable drainage return against the key tenets of quantity, quality and amenity will be best achieved through the implementation of natural techniques.

Such techniques include green roof technology, surface water planter boxes (in footways or as kerb extensions into the highway), rainwater gardens (located in larger landscaped areas), grass or planted swales, infiltration trenches and basins, unlined open channels, detention basins (dry features), balancing ponds (wet features) and temporary floodable areas (where deemed acceptable in terms of residual flood risk).

They can be designed to operate with or without infiltration and will all generally afford excellent attenuation and bioremediation properties. It is usual to integrate proprietary flow control devices in many of these BMPs to restrict discharge into the receiving downstream system. Health and safety considerations may need to be reviewed.
B. **Proprietary Sustainable Drainage**

These BMPs are a range of manufactured techniques that include porous or pervious surfacing, retrofit green roof technology, geocellular storage systems, on or off-line detention tanks (constructed from a range of materials), flow control devices, hydrocarbon separators, advanced material filtration and absorption technologies, treatment train systems containing modules of specific processes and traditional piping.

They will all be integrated into the surface water drainage infrastructure and generally be hidden below ground.

Proprietary systems are providing solutions for dealing with particular water quality or quantity problems (in the USA) . . . Although these systems are effective when applied appropriately and can provide some valuable solutions for removing contaminants, there is no evidence that there is a “magic bullet” device that can provide all of the treatment needs in a single unit. (*Global Watch Mission Report: Sustainable drainage systems: a mission to the USA 2006*)

C. **Bioresiludation**

Bioresiludation is a natural surface water cleansing method utilising the biological and biochemical processes available from the natural flora (micro-organisms, plants, trees, etc) to remove levels of contamination associated with urban pollution, diffuse or otherwise.

Certain plants have the ability and tolerance to take up high concentrations of toxic chemicals, hydrocarbons and metals included, and to process some of them to less toxic derivatives. The same natural cleansing principles can be applied as source control treatment to the pollutant load where the surface water runoff originates.

Harnessing the bioremediation potential available in natural sustainable drainage may become commonplace as the improved surface water quality targets set by the Water Framework Directive become actively enforced by the Environment Agency.

Aside from their natural filtration properties, the importance of plants as a sustainable drainage BMP should not be overlooked. For example, the value and contribution of mature trees within a catchment is a valuable technique to provide a natural treatment train for rainfall surface water interception (including flow rate reduction), evapotranspiration, infiltration and bioremediation.

6. **THE TOOLBOX OF SUSTAINABLE DRAINAGE TECHNIQUES**

If misused, the term “SUDS” can be confusing. It sometimes conjures up a misplaced belief that all SUDS should contain only natural BMPs and this simply isn’t correct. The successful balance for a contemporary surface water management train must lie in a toolbox of sustainable drainage techniques that includes natural, proprietary, traditional and lateral (soft techniques, such as public engagement) BMPs.

For example; if some desired natural techniques are not technically feasible on a project, for which there may be a variety of reasons, eg adoption issues, then a development’s surface water system can still be designed as authentic sustainable drainage by satisfying the residual quantity and quality targets with proprietary techniques.

It is also clear that the selection of contemporary sustainable drainage techniques goes beyond the defined key tenets of quality, quantity and amenity, although all three are the prime considerations for authentic and valid sustainable systems.

Novel and more flexible approaches to stormwater management are becoming increasingly important for addressing the drivers . . . The technologies to do this . . . are emerging . . . (to) assist with particular applications in the UK, such as high density housing, retrofitting to resolve existing problems and to meet the requirements of the Water Framework Directive. Compared with the USA, the UK has greater challenges as to how stormwater can be managed due to limited space in urban environments. (*Global Watch Mission Report: Sustainable drainage systems: a mission to the USA 2006*)

Recent experience has underscored the importance of considering construction and maintenance towards successful sustainable drainage implementation for the long-term; and there is an overriding need to understand the whole life issues of sustainable drainage BMP selection for the UK water industry.

Regardless of the techniques implemented, it is essential that both visible and invisible sustainable drainage structures are seamlessly integrated into the proposed landscape architecture. This is essential for the long term success of contemporary sustainable drainage on any development site.
Technical guidance giving a brief outline of the proprietary systems and components available was published by British Water in partnership with the Environment Agency in 2005. It can be downloaded from the British Water website http://www.britishwater.co.uk/document/Default.aspx?uid=a05d6e5b-51ab-445f-a3dd-eaa01d216f1b

There is a lack of general public awareness of collection, transmission and treatment of sewerage and drainage. The mindset of the public is that of “out of sight out of mind”. There is a lack of understanding of how to minimise environmental impacts of personal activities, or appreciation of the need to pay for drainage costs. (Environment Agency—2003)

7. SUSTAINABLE DRAINAGE DESIGN

The toolbox of techniques available for contemporary sustainable drainage implementation is many and varied. Consequently, so are the design methods, of which there are too many to detail here.

It is necessary to stress the importance of a robust design process, using the correct guidance and tools for each bespoke project.

Design guidance may be sought from, although not necessarily limited to, the following:

— CIRIA design guidance C697.
— Sewers for Adoption.
— The Building Regulations.
— British Water Technical Guidance to proprietary sustainable drainage systems and components—SUDS.
— Industry developed “Source Control” software.
— Adoption.

8. OTHER RELATED ISSUES

The significance of sustainable drainage systems and the selection of Best Management Practices in this context is affected by related factors.

A. Flood Risk Management

Artificial drainage systems designed to manage surface water runoff can pose a flood risk if the system is overwhelmed.

This may occur if the amount of surface water runoff exceeds the system’s capacity or if the system becomes blocked or surcharged by the receiving watercourse.

It is wrong to raise public expectations that you can prevent floods. No matter how much engineering we put in, there will always be the possibility of a flow in excess of its design capacity. We should be talking, therefore, in terms of flood risk management, not prevention. By acting wisely, we might at least reduce the frequency with which the system fails and the severity of the disaster when it does.

We might not be able to reverse the shortcomings of the past—there is no real possibility of retrofitting every town and city with separate storm drains—but we can avoid repeating them in future. (Jean Venables, ADA in response to summer floods 2007)

Current planning policy guidance considers surface water management a key flood risk issue and sustainable drainage techniques should be employed to manage residual flood risk wherever feasible. The majority of development planning applications requires a Flood Risk Assessment (FRA) to be carried out. The FRA must clearly demonstrate that sustainable drainage techniques have been used to mitigate against any residual surface water flood risk.

B. Climate Change

Increasing global temperatures and changing weather patterns confirm that climate change is a reality. Therefore, an allowance for the impact of climate change is a critical part of any assessment of flood risk and inclusion of design mitigation measures, including sustainable drainage implementation. Current planning policy guidance requires an FRA to demonstrate that sustainable drainage design peak rainfall intensity has been increased in line with the development’s design life. There is still a debate as to the size of the allowance that needs to be factored in to provide for potential consequences of climate change on rainfall and the consequences for surface water and other drainage systems.
LIST OF REFERENCES FOR TECHNICAL AND REGULATORY INFORMATION

5. Making Space for Water.
6. CIRIA design guidance.
7. Sewers for Adoption.
8. The Building Regulations.
11. Designing for Exceedence.
12. Industry developed “Source Control” software.

Dr Ian H Pallett
Technical Director British Water

BRITISH WATER

Overview

British Water is the lead trade association for the UK water and wastewater industry representing all areas of the supply chain including contractors, consultants, manufacturers, equipment suppliers, and many specialist service providers such as leading law firms, academic departments and environmental publications.

British Water is recognised as the voice for the water industry supply chain. It has unrivalled access to and is consulted by government, regulators and customers. It provides information on home and overseas water and wastewater markets and provides access to prospective customers, partners and suppliers.

It promotes the UK water industry expertise in the international market place. It manages international trade visits and seminars with government support and assists with programmes for international government and industry figures visiting the UK.

As well as actively promoting best technical and commercial practice, British Water represents the interests of the UK water and wastewater industry in the development of technical standards, both in the UK and Europe. It provides the Acting Secretary-General and secretariat for Aqua Europa, the European federation of supply chain trade associations which is recognised by the European Commission as the representative body for the supply chain.

An active commercial programme of conferences, seminars, training and accreditation schemes and publications provides additional value for members and the industry.

Structure

British Water has three major divisions the UK Forum, the International Forum and the Technical Forum. Each Forum has subgroups to facilitate discussion and promotion of focussed interests.

The Technical Forum has a range of Focus Groups covering technical issues of commercial interest to members. One, the SUDS Focus Group, promotes best practice in the development of sustainable drainage solutions and provides a forum for discussion between industry, regulators and government. It initiated the Global Watch mission to the USA 2006.

The British Water SUDS Focus Group comprises 40 representatives from 24 companies across the spectrum of British Water membership—consulting engineers, contractors, equipment manufacturers and academia. A numbers of actively participating members meet regularly and they are joined by representatives from the Environment Agency and Department for Communities and Local Government. This paper has been prepared by a sub-group representing the diverse expertise of the Focus Group:

Alex Stephenson (Convenor) Hydro International Ltd
David Schofield, Arup
Alan Corner, Halcrow Water
Gareth Samuel, Hepworth Building Products
Memorandum submitted by Mr Tim Fairhead (FL 158)

Last Tuesday’s You and Yours consumer affairs programme on BBC Radio 4 featured the Chairman of the Environment, Food and Rural Affairs Select Committee, Michael Jack MP, and he discussed the Committee’s investigations into last year’s severe floods. The comments of listeners were also invited and I hope you do not mind if I make some comments on this issue based upon more than a decade of experience of sustainable development issues.

The 2007 summer floods in England will go down in history as the worst since 1947 and they caused much human misery, disrupted lives and commercial losses. Indeed, over a dozen people tragically lost their lives and over 50,000 homes were damaged. The total costs to householders, businesses, councils, central government and insurers will run into billions.

In particular, the floods illustrated the current vulnerability of certain essential utility functions such as water pumping stations and electricity substations, the transport of temporary flood barriers and the co-ordinated organisational responses when it comes to dealing with unexpected flooding emergencies. If I may, I would like to offer a few observations for consideration having worked in the area of sustainability issues for years especially since we are likely to see more extreme flooding and other severe weather events in the coming decades.

LONG TERM ADAPTATION STRATEGIES FOR THE DECADES AHEAD

Adaptation to extreme flooding events might well require that a number of measures be undertaken including improved river and drainage capacity, bypass channels, storage wetlands, dry reservoirs which fill with flood water and other appropriate measures including consideration of whether compensation could be paid to landowners in deliberate sacrificial areas. There are a couple of sources of expertise with a wealth of experience and knowledge that the UK Government could tap into right now and that would save much time, effort and expense.

The different ministries of the Netherlands have had decades of experience of spatial planning on fluvial river foreland regions and coping with flooding events. Not only has the Netherlands had similar issues to deal with, it, like England, has a very high population density so they are used to dealing with the conflicting demands of land use. The relevant Dutch ministries include the Housing, Spatial Planning and Environment Ministry (www.vrom.nl/pagina.html?id=25089) and the Transport, Public Works and Water Management Ministry (www.verkeerenwaterstaat.nl/english). Here in the UK we have the renowned centre of excellence that is Middlesex University’s Flood Hazard Research Centre (www.fhrc.mdx.ac.uk).

There is the opportunity for briefings, policy seminars and secondments and exchanges for staff from the Department for Communities and Local Government, DEFRA, the Environment Agency, planning authorities and regional planning bodies with their Dutch counterparts and to take advice from the UK’s Flood Hazard Research Centre and relevant Dutch academic institutions. Indeed, it might be worth considering putting such collaboration with the Netherlands on a formal co-operation basis. My own professional experience in land management conservation issues is that my Dutch colleagues have been only too willing to share their knowledge and expertise.

PRACTICAL BUILDING AND PLANNING ISSUES

To its credit, the Norwich Union insurance company has issued guidance on making a home flood resistant (www.floodresilienthome.com). The flood resilient home has a number of features including tiled floors, waterproof plaster, electrical sockets and wiring one third the way up the ground floor walls, plastic skirting boards on the ground floor and so on. It costs a lot to refit an existing undamaged house, less when a necessary refit after a flood and very much less if all the necessary features are already included from the start in new build housing in potentially flood prone areas. Making such standards mandatory is a potential option. Ensuring that the next generation of homes are built to a higher standard of water and energy efficiency as well will ensure that homes make a lower climate change contribution and water demand. These resilience measures could be extended to cover commercial, retail and service outlets in flood prone towns by, for instance, the Building Research Establishment and Norwich Union co-operating to provide comprehensive advice to local businesses that are potentially likely to be affected.
There are also some house layouts that are less likely to suffer destructive effects and they are already being built but their use in flood prone areas is not yet widespread. There are the two storey coach house and three storey town house designs where the ground floor is primarily occupied by the garage, entrance hall and stairs so there is a much reduced risk of the occupants’ furnishing and appliances being ruined. Similarly, new low rise designs of residential flats have been built where the ground floor is given over entirely to parking spaces with the residential elements starting on the first floor upwards. Again, this means there is a potentially significant reduction on domestic flood damage.

There is one area of great concern I am personally aware of that is worthy of investigation. There are dozens of cases each year where the Environment Agency is consulted on a planning development and in response the Agency issues the highest possible caution against building because of the extreme flood risk only to find that this advice is then ignored by the planning authority so storing up problems for the future. Perhaps there is a case for making the Environment Agency advice mandatory for the most inappropriate developments notwithstanding the move to a call-in procedure for planning issues involving significant flooding risks. In other cases where the Environment Agency has significant reservations, planning consent could be conditional upon the developer liaising with the Environment Agency so that flood defences are built in to a development to the Agency’s satisfaction at the outset and at the developer’s expense.

These planning, land use and building considerations could all seem to indicate that it is the appropriate time for new/significantly revised planning policy guidance and technical advice notes on purely flood issues for all local planning authorities in England and Wales though I appreciate that this would require cooperation between Department for Communities and Local Government and the Welsh Assembly Government.

The adoption of suitable strategies and advice now will go a long way to reducing the future costs of extreme flooding events and would result in a significant reduction in human suffering. Thank you very much for considering these comments.

Tim Fairhead
January 2008

Memorandum submitted by Chris Blunkell (FL 160)

Biographical Information

I am a communications advisor and writer, working extensively with central government and academic organisations in recent years. In July 2007 I initiated and designed a collective consultation response to the draft Shoreline Management Plan for North Kent on behalf of my community, and am now pursuing ideas for improving the quality of public engagement in regional decision-making.

Summary of Evidence to Flood Inquiry

— Government should be applauded for exercising foresight with regard to the possible impacts of climate change, and I have no issue with Shoreline Management Planning (SMP) in principle. However, current policy, and my experience of its application, suggest that it is unlikely to succeed in its objectives and satisfy principles of governance and sustainable development.

— SMP is a dense and fluid policy area involving many players and agendas, which places an onus on the consulter to properly educate consultees as part of the consultation process. Procedural guidance advocates a participatory approach for shoreline management, with arguments made for coastal communities discussing their futures with relevant officers prior to SMPs being commissioned.

— This has not been my experience in the case of Faversham Road where, despite the valued support and advice of local authority officers, poor process has been mitigated substantially by the efforts of private individuals at their own cost.

— There is evidence that operating authorities as well as communities stand to benefit from structured, properly-funded, and wide-ranging exercises in public participation with the aim of developing strategic futures. Such exercises should encourage imaginative approaches from all quarters, and rule out no solutions in advance.

— As it stands, the SMP policy places a significant burden on those affected by decisions to pursue managed realignment resulting in the loss of sea defences. Rectifying this requires policy and recommendations to contain mechanisms for compensating in full those affected by, for example, loss of property.
SHORELINE MANAGEMENT PLANNING IN NORTH KENT
CHRIS BLUNKELL, Faversham Road Residents Association

1. Since July 2007 I have campaigned on behalf of local people for changes to the recommendations to the Shoreline Management Plan for North Kent (SMP) as it applies to our stretch of coastline. This submission offers some thoughts on issues of policy making and governance, and underlines the importance of public engagement in contentious issues such as this.

Faversham Road and its people

2. The SMP policy recommendation that affects the community represented by the Faversham Road Residents Association runs along the Thames estuary from Faversham Creek at the western end to the Blue Anchor, Seasalter, at the eastern end. The majority of land—that to the west of the Sportsman—is uninhabited. That between the Sportsman and the Blue Anchor—with beach to the front and marshland to the rear—is occupied—by permanent residents, holiday home owners, and a small minority that falls in between the two groups. A significant proportion of these people have enduring roots in the area, but whilst this attachment runs deep, it is not blind. People are conscious of a flood risk (although they may not agree with the authorities on its severity), and some have suffered floods. But, as one local has put it on making the decision to buy there: “we understood the risks of flooding but felt the benefits outweighed the drawbacks and accepted the risks”.

3. A summary of the draft Shoreline Management Plan for North Kent was received by residents on 9 July 2007. To paraphrase, we were told that the South East coastal group, recommended “...a policy of ‘managed realignment’ for our stretch of shoreline, and that possibly in as little as 20 years time the maintenance of existing defences would cease and a new defence line constructed inland”. We were told that our homes were likely to be lost in the process, with no prospect of being compensated as things stood.

4. Faversham Road residents applaud the government for exercising foresight with regard to the possible impacts of climate change, and have no issue with Shoreline Management Planning in principle. However, we believe that in its current form the policy is unjust—placing a significant burden on those affected by decisions to pursue managed realignment—and contrary to accepted international, national and regional principles of governance and sustainable development.

5. We believe that in this case the draft plan:
   — failed to acknowledge the importance of this stretch of coastline and marshland to people who live in and visit the area,
   — failed to recognise the true historical, cultural and economic importance of the area; and
   — threatened the well-being of people who are resident, and who own property and businesses in Faversham Road.

6. These failures in this case, we believe, were predicated on weak processes, patchy use of data and analysis, and insufficient adherence to procedural and other guidance and advice in developing the plans recommendations. And we consider the policy of SMP itself to be deficit-based, unjust, narrow, and contrary to agreed principles of international, national and regional governance.

SMP—the planning process

7. Defra procedural guidance stresses that plans do not: “...set policy for anything other than coastal defence management (although) development of the plan cannot be carried out in isolation”. (Defra 2006:11) The draft plan itself expanded upon this line, explaining that Defra recommends compliance with guidance in the shape of Directive 2001/42 EC of the European Parliament and of the Council, “...which is intended to ensure that environmental considerations are taken into account alongside other economic and social considerations”. (Defra 2006:13) To this end, the guidance continues: “The SMP should seek to maximise the use of existing information, assessments and knowledge” and that “any additional information gathering is conducted prior to commencing SMP development.” (Defra 2006:14) Whilst the draft plan arguably satisfied the guidance with regard to technical matters (despite omissions and inconsistencies to which we will return), it was our view that it failed with regard to

Data and analysis

8. Procedural guidance for SMP explains that it: “needs to consider people, natural historic and socio-economic realities” (Defra 2006:12), and that “...key requirements are for the decision-making process to be robust, transparent and auditable ... The requirement for auditability requires ... that recommendations are traceable back to source information”. (Defra 2006: 13) To this end, the guidance continues: “The SMP should seek to maximise the use of existing information, assessments and knowledge” and that “any additional information gathering is conducted prior to commencing SMP development.” (Defra 2006:14) Whilst the draft plan arguably satisfied the guidance with regard to technical matters (despite omissions and inconsistencies to which we will return), it was our view that it failed with regard to
issues concerning people, natural historic and social-economic realities. Whilst some residents understood the argument of sacrificing the area for the greater good should it be required, the majority of residents felt that the plan undervalued Faversham Road and its environs culturally, historically and economically.

9. As well as sacrificing unique and hitherto protected marshland, residents believed the loss of this area—including what one described as “a pioneering group of buildings unique in Kent” would deprive the area—heavily reliant on tourism—of an important part of its appeal. But in the absence of figures to support the plan’s conclusion that such activity—both current and potential—is inconsequential, it was hard to avoid the conclusion that “rural = expendable” is considered analysis enough by decision-makers.

Climate change and risk assessment

10. Residents acknowledge that the International Panel on Climate Change (IPCC) is broadly agreed that climate change is happening and on the nature of its likely effects. However, there have also been calls from noteworthy sources for caution in predicting both the extent and timing of those effects, and in making social policy around such predictions. Parsons et al point to substantial errors in loss prediction undertaken by this SMP’s consultant Halcrow in North Norfolk, and SMPs undertaken for South Foreland to Beachy Head, and Beachy head to Selsey Bill. Lowe (2005:2) points out uncertainties associated with climate modelling.

11. Our response also drew attention to the fact that no notice has been given to the knowledge and experience of the people who have lived here and observed conditions on a day-to-day basis—in some cases for several decades. If, as we suggested, the plan has failed to take into account the testimony of local people in its assessment of, for example, tidal activity and its impacts, then we really cannot commend its analysis as being properly evidence-based.

12. To conclude on this point, residents no not argue that the operating authority was necessarily wrong in its use of data, simply that there is an element of contestability in forecasts and other perspectives to consider, and that due caution should be exercised when imposing policy that has such severe implications. To quote one academic, “Identifying the middle ground—the point at which risk mitigation is both precautionary and acceptable, appears to be the challenge for actors from all sectors who are aware of the potential for change but are also wary of overstepping the boundaries of what is deemed ‘acceptable’.” (Lowe 2005:3)

13. Accordingly, our collective response to the plan recommended:

— An amendment of the “hold the line policy” from 20 years to 50 years between The Sportsman and the Blue Anchor.

— That, as previously agreed, funds should be released for sea defence and beach maintenance work at Faversham Road.

Policy, principles and governance

14. Although we are now hopeful that at least some of our recommendations will be accepted as part of the final SMP, due for ratification in 2008, the plan will contain no consideration of forms of compensation for those who stand to lose by it over time. Although we accept that the blight we feared will probably not now materialise in the same way—at least not for now—others will not be so fortunate as the same process unfolds elsewhere. As things stand, a single generation of residents is expected to shoulder the burden of any loss for the public good—a point eloquently made by Malcolm Kerby of the Coastal Concern Action Group.

15. He points out that Article 1 of the First Protocol of the Human Rights Act (1998), which enshrines the European Convention on Civil Rights into British Law, says that people are entitled to the peaceful enjoyment of their possessions. Article 8 says that everyone has a right to his or her home and that, certain caveats notwithstanding, there shall be no interference by a public authority. Article 14 says that government has a duty to prevent discrimination on any ground—including that of property. I agree with his view that SMP as it stands does not comply with the spirit of these articles.

16. Nor does SMP satisfy regional principles for strategy-making and planning. The vision document, “Kent People in Partnership for a Better Tomorrow”, places great stress on sustainable community strategies, and principles which: “Integrate social, economic and environmental interests and make progress on all three fronts together, not promoting one at the expense of the other.” (Kent Partnership 2006:6) The document goes on to describe sustainable communities as being “inclusive and safe”, “well run—with effective and inclusive participation, representation and leadership”, and “fair for everyone.” By contrast, a recent study by the Tyndall Centre for Climate Change Research—“Living with a changing coastline: Exploring new forms of governance for sustainable coastal futures” (O’Riordan et al 2006:17)—finds: “The Defra base of flooding and coastal management to be too narrow a policy setting . . .”

17. Defra’s own UK principles of sustainable development (www.sustainable-development.gov.uk/what/principles.htm), to which the UK government as a whole has signed up, says that for a policy to be sustainable it must respect all of the following five principles—reproduced here in abridged form.
(i) Living within environmental limits . . .
(ii) Ensuring a strong, healthy & just society: Meeting the diverse needs of all people . . . promoting personal well-being, social cohesion and inclusion, and creating equal opportunity for all.
(iii) Achieving a sustainable economy: Building a strong, stable and sustainable economy . . . in which environmental and social costs fall on those who impose them (Polluter Pays) . . .
(iv) Using sound science responsibly: Ensuring policy is developed and implemented on the basis of strong scientific evidence, while taking into account scientific uncertainty (through the Precautionary Principle) as well as public attitudes and values.
(v) Promoting good governance: Actively promoting effective, participative systems of governance in all levels of society—engaging people’s creativity, energy and diversity.

18. Whilst it is clearly concerned for the environment (principle 1), SMP positively avoids the question of the well-being of those affected by managed realignment. The principle of “the polluter pays” articulated in principle 3 also suggests that it should not be the victims of climate change who pay the price for its effects—in our case the people of Faversham Road—but the perpetrators. If that is all of us, it is surely legitimate for those affected by the policy—itself developed in response to forecasts of climate change driven by pollution—to be compensated for any loss from the public purse. Principle 4 invokes the “precautionary principle”—a moral and political principle which states that if an action or policy might cause severe or irreversible harm to the public, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action.

19. So—the “precautionary principle” not only makes unsafe any policy that will harm people, it places the onus on the policy maker to demonstrate that the policy is safe in this regard. By contrast, our experience is that consultation has placed the onus on the community to demonstrate that the policy is wrong.

Consultation and public engagement

20. Shoreline management is a complex and fluid policy area, and that simply giving information to residents and asking for coherent responses is wholly inadequate. I would estimate that I have spent upward of 150 hours contesting the North Kent SMP—time that I could, and should, have spent supporting my family.

21. By contrast, SMP procedural guidance (Defra 2006: 25) states: “A participatory approach for SMP preparation is recommended. This will involve other bodies . . . including, for example . . . community interests”. Given the gravity of the implications of the draft SMP for them, residents were unimpressed with the operating authority’s decision not to involve them a) as participants, and b) given its decision to consult, not to have done so more rigorously, and earlier in the process. Although, residents were nominally represented in the consultation process by a regional politician, they were surprised not to have been approached for their views for this purpose early in the proceedings and, given this concern, were dubious as to how effectively their interests had been articulated and pursued. Other local elected members also reported being in the dark over the proposals until late in the day. Accordingly, we believe that the draft SMP failed the Defra test of being “inclusive” (Defra 2006: 26). Failure to link environmental rights to human rights through appropriate consultation may also constitute a breach of the Aarhus Convention, to which the UK is signatory.

22. Whilst residents are conscious of (and grateful for) the efforts of local authority officers to provide residents with information and guidance, we would observe that these efforts were “discretionary” when what was really required was a structured, formal and transparent process.

23. Instead, the consultation process has bred mistrust and encouraged the belief that ulterior motives are at play. Some believe that the area is to be sacrificed to absorb the costs of sea defence work elsewhere, whilst others are concerned that plans may be afoot to develop the area. Whatever the rights or wrongs of such views, poor consultation practice has left an “information void” that encourages negative speculation and the view that consultation is a “tick box” exercise rather than a genuine attempt to involve local people in a decision of seminal importance to them.

24. Accordingly, our collective consultation response made a third recommendation:

— A detailed commitment in the SMP for the operating authority to partner residents, property owners and business owners, and other stakeholders in developing a vision for the area that covers issues of social justice and well-being as well as environmental, historic and economic concerns.

Conclusion

25. SMP is unjust and must be changed. As it stands, the policy asks those affected by recommendations of realignment to shoulder its costs on behalf of society, and we believe those affected are disadvantaged from the second that recommendations are accepted. This offends the Human Rights Act, and Defra’s principles of sustainable development. A failure to address this—and to demonstrate that it has been addressed—surely sees the policy fail by the precautionary principle.
26. Rectifying this is perfectly simple. First, SMP recommendations must contain mechanisms for compensating people in full for any loss incurred as a consequence. Second, SMP procedural guidance with regard to involving people in decision-making must be followed, with operating authorities leading structured, properly-funded, and wide-ranging exercises in public participation. It is not enough to tell people that they are to lose their homes without compensation, to tell them that if they want to challenge recommendations they must do so on the basis of the data, and then to simply give them a pen and a piece of paper.

*Democracy in action?*

27. If, as we hope, a revised recommendation to “hold the line” for a minimum of 50 years is approved for Faversham Road, one could argue that democracy has been served and an acceptable solution found. By contrast, I would argue that poor democratic practice and policy making have mitigated largely by the efforts of private individuals at their own cost with the encouragement and assistance of particularly diligent and helpful local authority officers.

28. SMP procedural guidance (2006:25) recommends a participatory approach involving community interests and Hutchinson et al (2006:p.iv) argue for coastal communities discussing their futures with officers of both operating authorities and the local planning authority or regional planning body before SMPs are commissioned. Such discussions, he says, requires long and careful nurturing and for capacity-building to ensure participants have a secure grounding in the issues.

29. I would go further. I want to see processes involving residents, other stakeholders and local people and with the aim of developing strategic futures. Such processes should look at where people will live, and how. They should analyse the economic, cultural, social and environmental potential of areas under consideration—with a view to ensuring they are enjoyed by all. Perhaps most important of all, such processes should aim to free up the imagination of all those taking part, with no solution ruled out. Issues of climate change should of course be a key component, providing a great opportunity for authorities to educate people on these issues, and to gain a clear idea of what people want and are prepared to do towards that end.

30. Guidance on good participation/consultation can be found in O’Riordan et al “Living with a changing coastline: Exploring new forms of governance for sustainable coastal futures” (2006:1) advocates “...improved dialogue between the multitude of stakeholders who are affected by coastal change” and that “It is apparent that social issues, as well as economic and environmental matters need to be carefully considered”. It also offers a methodology for consultation that appears to me to be thorough, manageable and—in stark contrast to the deficit-based approach that seemed to characterise the SMP as it applies to Faversham Road—places the development of shared solutions at its centre.

*Bibliography*

Lowe, T (2005). ‘Dangerous claims’: Is the way we perceive climate change leading to a precautionary approach or an irrational response? Tyndall Centre for Climate Change Research, Norwich.
Memorandum submitted by Prudential Property Investment Managers Ltd (PRUPIM) (FL 161)

1. PRUPIM is a part of M & G, the investment management arm of Prudential Plc in the UK. With over £19 billion invested in properties in the UK, PRUPIM is the leading property investment management company in the UK. PRUPIM has interests in a wide range of development projects and has involvement in schemes where flood management schemes can make a positive contribution to reducing flood risk as well as providing safe, new development in sustainable locations. We welcome the opportunity to submit a supplementary memorandum to the Committee’s inquiry into flooding on the particular issue of planning and development in relation to flood risk.

2. Following recent events, climate change and flooding are now recognised as major public concerns. This is entirely appropriate, however PRUPIM are concerned that the debate at present is failing to recognise the positive benefits which can be achieved through appropriate flood management schemes. We believe a more balanced approach is needed, specifically recognising the real opportunities that are offered by flood management techniques such as landraising and upstream storage. Such techniques can not only reduce flood risk for existing communities, who might otherwise be subjected to increasing risks as a consequence of climate change, but also offer opportunities for sustainable new development well-related to existing settlements.

3. PRUPIM has already made submissions to Government in respect of Planning Policy Statement 25: Development and Flood Risk, and its draft Companion Guide, in support of this view. In these submissions, we raised concerns, that whilst flood management techniques are recognised, the guidance fails adequately to explore the potential that they have to enhance flood protection for existing communities and thereby reduce risks to residents and businesses alike. We believe that the failure to explore such options and to include positive guidance as to their use represents a lost opportunity on the part of Government, and hope that the Committee might seek to further investigate the potential benefits of developing a positive policy framework in this way.

4. We believe this is particularly given Government targets on delivering a significant increase in the supply of new housing and the widely acknowledged constraints on land supply. Combined with the importance of delivering well-located sustainable development as part of efforts to combat climate change/the effects of which are thought to be one of the causes of the recent floods/we strongly feel that opportunities involving flood management schemes should not be rejected where they can make a positive contribution to the development of sustainable communities.

5. One such example is the Taunton Riverside Development in Somerset, where a business, retail and leisure park development was brought forward in land partly within the River Tone floodplain. By creating a reservoir within the floodplain to provide replacement storage for that lost to landraising, the developer was able to provide additional store and improved conveyance, resulting in improved flood protection not only for the new development but also the town of Taunton.

6. The development of the Northampton South West Sector to bring forward commercial and residential development partly within the floodplain of the River Nene is a further example. In this instance, the developer created a strategic flood storage reservoir on the River Nene to compensate for lost flood storage from development in the floodplain, as well as capacity for additional run off and improvements to the river. As a result, the development planned for mitigation of effects within the development, and provided spare capacity to reduce flood risk in the surrounding area.

7. In this and other cases, flood management schemes form an integral part of the development plans and are funded by the developer. However, under current planning guidance, such schemes are treated as exceptions despite the positive benefits that accrue through reduced risk of flooding to existing properties. Whilst these schemes accorded with the relevant guidance, we feel that as examples they raise the question as to whether guidance should not be more proactive in promoting and actively supporting opportunities where developments bring flood defence benefits to surrounding communities where they arise.
8. One of the Pitt Review’s Interim Conclusions (IC8) indicated that PPS25 should be rigorously applied by local planning authorities, including giving consideration to all sources of flood risk and ensuring that developers make a full contribution to the costs both of building and maintaining any necessary defences. PRUPIM is concerned that such an approach does not recognise the potential benefits of flood management schemes associated with new development and promotes an inflexible, rigid stance.

9. Opportunities do exist to address flood risk without reliance upon public finance. We urge the Select Committee to take into account these opportunities by encouraging the development of a policy framework that offers positive support to potential development schemes that deliver a reduction in flood risk both to existing and new communities.

We welcome the Committee’s work on this important subject and are happy to offer further information to the inquiry.

PRUPIM

February 2008

Memorandum submitted by BBC Radio 4: You and Yours (FL 162)

You and Yours is BBC Radio 4’s flagship consumer and social affairs programme broadcast between 12 noon and 1 pm every weekday lunchtime.

The programme has 3.181 million listeners per week. Their average age is 59. 56.1% of You and Yours listeners are female. 43.9% are male.

The social grading of listeners breaks down as follows:
- A and B: 36%.
- C1: 36%.
- C2: 14.4%.
- D and E: 13.6%.

Introduction

Between 15 January and 22 January working in conjunction with the House of Commons Environment Food and Rural Affairs Select Committee, we gave our listeners the unique opportunity to contribute directly to the Committee’s report looking at whether we’re managing flooding in the most effective way, via our phone in.

Our phone in programme “Call You & Yours—Flooding” was broadcast between 12.00 hours and 13.00 hours on Tuesday 22 January 2008 on BBC Radio 4. We asked our listeners to give us their views on:

“Are you one of those dealing with the aftermath of the recent floods? What lessons do you believe were learnt after the severe floods of last summer? Do you think more could be done to prevent all floods and should those with homes most at risk do more to protect themselves?”

Response

We had a good response—about the usual for a call in. Over the course of two weeks we received 101 emails and 79 calls and texts. They break down into six broad categories:
- 32% (58 listeners) called expressing concern about house building on flood planes or gardens that have been concreted over. In some places, front gardens being concreted over was a requirement of planning permissions being granted.
- 6% (11 listeners) commented on climate change, feeling this was contributing towards flooding.
- 30% (55 listeners) commented on drainage issues. Some felt that gulley drains and ditches have not been properly maintained and that rivers should be dredged.
- 8% (16 listeners) expressed concern about resources being diverted from flood defences or insurance difficulties.
- 4% (8 listeners) drew international comparisons.
- 17% (32 listeners) made general comments.
1. Examples of those expressing concern about house building on flood planes or gardens that have been concreted over

Tricia St Clair—Devon

I live in Cullompton, Devon. Last autumn we were given information about a house building proposal by the Mid-Devon District Council over the next 15 years. It is a proposal to build hundreds of new homes. The sad aspect is that the map included with the proposals shows quite clearly that many of the homes will be directly on flood plain and all of the developments butt up against flood plain land. The stupidity of this project is beyond belief. It is all well and fine to say that houses can be build with flooding in mind, etc, but what about the houses nearby, the knock on effect of building on such land is enormous as we know.

Lisa Mead—Forres

Michael Jack stated that our ancestors were less aware than we are today about where to build, and consequently they built towns on floodplains. I believe that our ancestors were in fact far more aware of the vagaries or nature and how to properly manage land, and in fact, building on floodplains was a result of class structures: poor people ended up living in risky areas, whereas the rich tended to live on higher ground. The most valuable comments I heard on your programme related to the need to replant forests and hedgerows in order to reduce the risk of flooding at lower levels. Removal of hedgerow and tree cover is one way in which our current farming strategies show our lack of awareness of cause and effect in the natural world.

Jacqui Spencer—Plymouth

I live in Plymouth and the Council have just replaced our pavement of paving slabs and grass verge with tarmac. When I queried this I was advised that this is Council policy now. It is clearly cheaper to maintain but will surely not help flooding in the future and is not a very green policy.

Thank you.

2. Examples of people who commented on climate change

John Walker—Dolwyddelan

We need to hear more about tackling the grassroots causes of more regular and sudden flooding, which is global climate change. We know that increased rainfall has a climate change “fingerprint” on it.

I wonder how many of the people’s lives which have been disrupted by flooding have given any thought to how their actual lifestyles are making the problem worse. For example, one wonders how many people who have been flooded in their homes are still flying away on holiday—with all the climate change impact that aviation is known to bring.

We need to hear more about the root causes of the kind of flooding we will see more of—and that means changes to lifestyles, not the continual bleating of agencies that they are under-funded.

Greg Glendell—Somerset

The great danger in planning against flooding is to over react, and cause another problem; summer droughts. With climate change, our weather is likely to have higher “winter” rainfall while having more cases of summer droughts. So, the Environment Agency should be co-ordinating land-use policy to ensure storage of winter rains, which will be needed in the summer. So, we’ll need more reservoirs. Large-scale planting of native tree species on our uplands could be used to replace most of the subsidised sheep-farming currently on the hills. The new woodlands would act as a great “sponge” to hold water during heavy downpours, but releases it “slowly” later, thus reducing the chances of flooding downstream. The new woodlands could be semi-commercial in use, being harvested on long coppice/thinning rotations for timber and paper products. This integrated approach would be more economic than sheep farming while preventing both floods and droughts, and creating new (carbon-rich!) wildlife habitats for the public to enjoy; so, everyone wins!

3. Examples of people who commented on drainage issues

Richard Smith—Cheltenham

We live in Cheltenham, beside the river Chelt, and were flooded last July. We got o lightly compared with some—it was a flash flood that put a couple of inches of water through the house, and was gone in an hour or two. I feel the major issue around here is controlling runoff. Rivers & streams rise ever more rapidly, and indeed water floods down streets, because of the increasing areas tarmacked over. The planning system could and should control this, eg by requiring effective drainage or runoff storage. But obviously nobody’s going to do this unless they are made to.
Phil Smith—Liverpool

Yet another broadcast on flooding with hardly a mention (one brief contribution) on one of the major issues affecting flood frequency and intensity. I refer to the gross mismanagement of upland catchments which has been ongoing for decades. Over-grazing, moor-gripping and agricultural “improvement” etc have systematically destroyed the water-holding capacity of upland ecosystems, including especially peatlands. Information on this is widely available in the ecological and conservation literature but is largely ignored by the media and politicians. I suspect one of the reasons for this is that attending to the problem would require the cooperation of large land-owners; these are people who often do not welcome interference with their interests and have influence in high places. The methods for improving water-holding capacity of the uplands are well-established and inexpensive. They need to be implemented on a large scale. If I was a resident of the Severn/Wye flood-plain, I should want to know why this is not being done.

Nick Forest—Oxfordshire

Following flooding last July at our 150 year old converted Barn in West Oxfordshire, my wife and I are currently living in Oxford whilst the house is being restored. All the properties in our hamlet were affected, along with several, other farm properties within half a mile. We hope to move back to our house by the end of February.

In the meantime I have worked with local landowners who have done an outstanding job reengineering and clearing nearly 1.5 miles of ditches around Carswell Marsh. There is one problem remaining in order to get the water to the River Thames which is a mile from the houses in our hamlet. The ditches run into a “brook” approximately 200 yards from the river and then runs parallel and close to the river for four miles before the water runs into the Thames. Along the length of the brook it therefore has to cope with all the run off water on the South side of the Thames valley for that distance, with only a small fall. I am told is owned by the environment agency. The question arises as to why this brook runs parallel to the river and within a few hundred yards of it for such a long distance but given that it does, then high quality maintenance of the brook to ensure an adequate flow under flood conditions is essential. Having walked the length of the brook, there are several areas in need of attention. I physically took a detailed 20 page letter with many photographs of the problem areas to the environment agency requesting action on 10 December and posted a second copy on 9 January. After heavy rain in December I measured the flow rate in the brook as 0.22 mph when many acres of fields adjacent to the brook were heavily flooded. As of today I am looking forward to their response. One employee I spoke to at the agency told me that the ditches “are not maintained as they used to be”.

I am not surprised that flooding appears to be a greater problem than when these old properties were built.

4. Examples of people who expressed concern about resources being diverted from flood defences or insurance difficulties

Paul Thompson—East Riding of Yorkshire

In our village (Gilberdyke) in the East Riding of Yorkshire it has been acknowledged by all agencies involved that without the water being able to run from the village down to the river Ouse at Blacktoft, very little useful flood defence work within the village would be possible. It was deemed imperative that the Environment Agency funds the MTP application to widen and deepen the dykes down to Blacktoft to provide a pumping station to lift the water into the river. Unfortunately they will not invest in a modern pumping station as there are no funds available. They have even hinted that our small village raise £1million to fund this. This is obscene when you consider that prince William is now learning to fly and has been approved to train as a pilot. It costs at least £2.5 million to train a pilot on fixed and rotary wing aircraft and that money is being completely wasted on him. Considering our area could benefit significantly from a new pumping station and infrastructure it is a disgraceful waste of resources. I despair.

Kevin Jones—Argyll

Many of the people complaining about flooding have bought houses where flooding is to be expected. For example, Bewdley and other places along the Severn. I don’t see why the taxpayer should now be required to protect them.

5. Examples of a person who drew international comparisons

Tricia Divers—Dorset

I used to live in Singapore, originally a marsh. When it rained it was worse than ever seen in this country BUT there were never floods. In this country we used to dredge rivers and canals, regularly, keeping them clean and deep. The silt was put on the land making it more fertile. Drains were maintained but to “save money” all of this was stopped. We are now suffering the consequences of cost cutting and thousands of
people are having their homes ruined. The river Stour runs at the back of my house. It regularly floods on
the opposite bank and yet, even now, the council are considering building on the flood plane. Why do people
never learn! It is not the council that will suffer but the individuals who buy the intended properties.

6. Examples of people who made general comments

Alan—Penrith

After the appalling floods in Carlisle two years ago the biggest problems were Builders over-charging for
renovation, poor workmanship and landlords over-charging for temporary accommodation. These anti-
social activities need to be prevented and there should be some mechanism to regulate them. If someone is
guilty of exploiting the misfortune of others they should face some public exposure to protect others.

Jenny Budden—Devon

Michael Jack said that one of the things they want to hear from the public is how much protection from
floods they wanted. You reported on the programme that you had received more emails hostile to increasing
taxes to pay for flood defences and blaming those who moved into property on the flood plain for their own
woes. What these correspondents apparently don’t realise is that flash flooding doesn’t only occur on the
flood plain. Like one of your contributors we live half way up a hill and none of the environmental reports
we received prior to moving here suggested any history of flooding. Yet our house was nearly inundated by
a flash flood due to a sewer surcharge.

What people don’t seem to realise is that flooding can occur anywhere and can be caused by what someone
has done further up the water course—eg many more people concreting over their drives may not affect them
but properties further down the system suddenly find that they have a flooding problem for the first time.
Therefore it is short-sighted and complacent to suggest that it is nothing to do with you!

I am emailing you this as you said you would be summarising the contributions for the Select
Committee.—Thanks for doing this programme. I found it very informative and very good broadcasting.

You & Yours feedback

This programme prompted a good response on “Call You & Yours”. The subject was at the forefront of
a lot of people’s minds because of the recent flooding at the weekend. Many people were keen to offer
solutions like proper maintenance of the drainage system or planning regulations to stop building on our
flood plain. A number of people told us of their experiences last summer and again in recent weeks when
they were once again flooded. Many were keen to offer us their experiences and listeners seemed keen to be
involved with the radio programme because of the potential to help shape the Committee’s final report.

Rabeka Nurmahomed
Producer
BBC Radio 4: You & Yours
January 2008

Memorandum submitted by Landmark Information Group (FL 163)

1. Landmark Information Group is the market-leader in the provision of environmental (including flood
risk) reports to home buyers and their legal advisers, supplying over 50,000 a month. We work closely with
bodies like the Environment Agency (EA), British Geological Survey, the Ordnance Survey, as well as many
private data holders, to ensure that consumers are able to make an effective risk assessment prior to
purchasing commercial or residential properties.

2. Events of recent months have demonstrated only too clearly how important it is that the public fully
understands the implications of environmental risks for their properties and we welcome the opportunity
to submit a supplementary memorandum to the Committee on this particular issue of flood risk information
and consumer awareness.

3. The Environment Agency has recently stated that the vital first step for consumers to achieve better
flood prevention is to find out if they are at risk. Landmark supports this view, and believes that in seeking
to inform consumers as part of better preparation for floods, it is critical that consumers understand what
flood risk information they are getting, and how reliable it is. One of the issues highlighted by the events
of the summer of 2007 is the discrepancies between different flood data sources that consumers rely on. The
incidents of flooding in places where floods have not occurred in living memory, or where the Environment
Agency does not indicate a risk, have increased. For example, pluvial flooding (sometimes known as “flash
flooding”) in Kingston-upon-Hull caused major disruption, and yet large parts of this area do not feature in the Environment Agency floodplain records. However, some data available from the private sector identifies the area as at high risk. (Please see enclosed map at footer of document).

4. This situation has been repeated numerous times throughout the country and over the different periods of flooding, with significant consequences for those members of the public in affected areas. It highlights that, in part because of the different causes of flood mentioned above in point 3, no single source of data is, as yet, adequate.

5. In order therefore to provide consumers with the most comprehensive information to inform their risk assessment, it is necessary to combine numerous data sources, for example Environment Agency official data, insurance claims data and information from the British Geological Survey on groundwater flooding and geological indicators of flooding. The private sector does this, and it will be important that it continues to do so.

6. It can only do so, however, through a competitive market driving innovation. For example, Norwich Union has created a new flood map, and Landmark has collated the EA, NU, BGS and other unique data sets to provide the most comprehensive report available. In addition we have added an assessment of the risk. We have also commissioned a unique new flood map of the UK which will provide yet another more accurate analysis of flood risk than any single data set that currently exists.

7. None of this innovation and development would happen without a competitive market for flood information. Other property risk searches provide an illustration of how competition can drive up accuracy and quality whilst driving down the cost to the homeowner. Environmental reports, for example. Conversely, property searches operating without competition have not come down in price.

8. Awareness on the part of consumers is a critical first step. Both the public and private sectors should work together to build awareness of the need for consumers to ensure they are aware of the risks to their property. In doing so however, the Government must not lure consumers into a false sense of security about the information that they are relying on. Only with the right information can consumers then take the right measures—and make the significant investments they might need. Making such big decisions based on Government-backed data may have implications for Government where such data is less accurate than information available elsewhere.

9. There are those who propose that flood due diligence should become a part of the conveyancing due diligence process as part of a Home Information Pack. We are agnostic on this issue, and certainly would not want a requirement that consumers pay in every case for inaccurate information. However, we do believe that there is a due diligence issue here for solicitors acting on behalf of the buyer, as there is with contaminated land.

10. It is unrealistic to expect Government to foot the bill for solving the flood issues in the UK. Such a task, with the changing climate, is simply unfeasible due to cost. Expecting the insurance industry to pick up the pieces is also unrealistic, and their models will become increasingly sophisticated to weed out problem properties and areas. We believe consumers, therefore, must act to protect themselves through understanding any risk, to a significant level of accuracy, before they buy.

11. We make this argument without prejudice to the importance of addressing other aspects of the flood defence system, for example drainage infrastructure, planning requirements and investment in physical flood defences.

12. Landmark firmly believes therefore that the fundamental key to any solution is to ensure consumers have the information and can make a decision based on their own attitude to that risk. Only by succeeding in raising awareness among consumers of the risks associated with flood, and giving them the tools with which to make an appropriate assessment of the risks, will we succeed in achieving better management of flood risks in the UK.

We welcome the Committee’s work on this important subject and are happy to offer further information to the inquiry.

James Sherwood-Rogers
Managing Director
Landmark Information Group

February 2008

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62 Not printed.
Memorandum submitted by Bucklebury Flood Alleviation Committee (FL 164)

We are a small action group representing the villagers of Bucklebury in Berkshire, which was severely affected by the July 2007 flooding. 26 out of 28 houses were inundated, causing an estimated £2.4 million in damage. We have formed a self-help group/action committee, whose activities may be monitored on www.floodalleviation.co.uk.

We began with the simple goal of preventing a re-occurrence of the flooding which caused so much anguish and loss in our community. We have been given great support by many organisations: the EA, West Berkshire Council, our local MP Richard Benyon, landowners and more recently Norwich Union and the ABI.

It has become apparent that the Bucklebury story is a useful encapsulation of the issues, as as we work towards a permanent solution to our local problems, we feel that our experience and growing knowledge of how things work (or don’t) might be of use in a wider forum. We invite members of the Select Committee to visit us to see firsthand the issues “on the ground”, as a means of helping sharpen the analysis and recommendations in the final review.

We have followed the submissions to the committee so far, and have read in depth the Pitt interim report and those of the ABI and the Environment Agency. As a general remark, all seem to have uncovered most of the issues, but further work is to be done.

There are three issues derived from our local experience that we believe should be addressed:

— Clarify responsibility and accountability for watercourse maintenance. Who is legally responsible for maintaining watercourses and who is legally liable if an unmaintained watercourse has reduced capacity and thus bursts its banks and floods houses? The EA, councils or landowners? The Pitt report recommends that there be “dialogue”—we recommend a stronger decision on “where the buck stops”.

— Secure watercourse maintenance budgets. The chance of flooding after a given rainfall event must not be dependent on budget variation. The EA must recognise that their flood probability analysis is dependent on their own budget allocation. If maintenance is reduced, the risk changes, thus all stakeholders must be informed if the maintenance regime is to be diminished, so that alternative measures may be put in place.

— Clarify the criteria for capital investment decisions. Disaster Management is important, but prevention is a better solution—but where should the money be spent? Both Pitt and the EA have inconsistent criteria: “best value”, “highest risk”, “cost/benefit analysis”, “greatest number of properties”—which should it be?

In closing we are supportive of the review and offer our help in any way the Select Committee sees fit.

Bucklebury Flood Alleviation Committee

February 2008

Memorandum submitted by Julian Jones (FL 165)

I write at the suggestion of OFWAT, following your Chairman’s appearance on Radio 4’s “You & Yours” (sample correspondence with OFWAT attached).63

I attach the proceedings of our local “Water for Tomorrow” conference, an Agenda 21 event.64 As you may be aware there are no effective Agenda 21 water plans (chapter 18) in place, they should have been by 2000—were they in place & properly implemented, our national flood and drought problems would have been greatly moderated.

Mention was made in the Radio 4 programme of the use of “Hydraulic Breaks” to attenuate flooding within farmland, and I attach a Defra Pilot Proposal (Stroud Exemplar) produced for Severn Trent Water in 2003 that uses this approach, (it was never taken up).65 This also provides some detail on a similar low cost approach to capture, control and treatment of foul flooding from sewers in an urban context.

This arises from an holistic overview based on the natural water cycle, and is extremely low in cost to implement (estimated > 75% savings on all water charges), whilst also greatly facilitating renewable energy potential (small scale hydro, pump storage, biomass, etc), agricultural diversification and greatly benefiting public health. It is lack of appropriate regulation that allows the present situation, though the model proposed also physically deconstructs the present water company business model and this has delayed uptake of this by them.

By using three basic natural methods to ameliorate both flood (and drought):

— Upstream retention (low cost seasonal impoundments), simple hydraulics and cheap construction.

63 Not printed.
64 Not printed.
65 Not printed.
Infiltration, impoundments (and other additional optional features) can, according to soil type and design, greatly assist aquifer recharge, ie “turn on the sponge” this is a dramatic and key effect that is overlooked.

Evaporation, above measures can reduce evaporation which in turn reduces further down wind precipitation.

Further information is available if required. We are keen to pursue this and I feel also my medical colleagues might like to contribute, with specific detail from Gloucestershire.

Julian Jones  
(Hon Water Scientist, Cranfield Postgrad Med Sch & Glos NHS) for Water21  
February 2008

Memorandum submitted by Tony Adams (FL 166)

I am the Flood Working Group Coordinator for West Lindsey District Council and have been since flooding in August 2004. In addition to coordinating the partners to the group, I have undertaken much of the investigation of matters not the specific role of a partner agency. As such I have hands on experience of some of the exacerbating circumstances to the flooding.

I welcome the invitation made at the close of the Select Committee oral evidence submission at the Lawn, Lincoln on 30 January 2008 when the Chair invited any additional evidence.

As such I write to introduce three matters, as follows:

1. Development and failure to ensure adequate onward systems for disposal of surface water.
2. Agricultural practice—effect on permeability.

In writing I advise that the matters I bring to your attention are my opinion and tendered independently of West Lindsey District Council.

1. Development and failure to ensure adequate onward systems for disposal of surface water

Time and time again during investigation of internal flooding within the district, I have established that:

Development in some way shape or form has been an exacerbating factor; frequently there has been no apparent regard to disposal of surface water off site. There are many examples of connections into inadequate onward systems and frequent occurrence of inappropriate culverting.

It should be born in mind that Water Companies and Highways are not responsible for disposing of surface water from land or private property yet both discharge what they do collect to systems, many of which are privately owned, either directly or indirectly. Developers similarly discharge to these “private” systems and examples of connections for whole developments to 100mm and 150mm onwards systems are becoming frequent as is flooding in the vicinity becoming apparent.

The Land Drainage Act does not make provision for upgrade or maintenance of these systems as it is primarily for maintaining flow or carrying out essential works. Neither it nor the overall planning process appears to adequately allow for the whole system and the rate of expansion within it.

2. Agricultural practice—effect on permeability

On 25 June 2006 I travelled from the East coast of Yorkshire through to Lincoln, my route took me mainly through arable land off which water was streaming and roads were literally being closed as I passed through the floods upon them. The flood water was not coming off upland moors or peat bogs but flowed through the hedges at the edges of saturated fields. The same was the case in West Lindsey on 21st January 2008.

It is therefore a matter of concern that upon hearing evidence from Natural England and more significantly from the National Union of Farmers at The Lawn, Lincoln on Wednesday 30 January 2008, that no mention was made of an apparent widespread change to arable farming that has been taking place which is likely to have impacted greatly upon soil permeability. I refer to the practice of “discing” in preference to ploughing.

This practice came to light during an enquiry into complaints of odours in 2004 when it was evident that less ploughing takes place now than did some years ago.

The enquiry revealed that many crops do not need deeply tilled soil and therefore the practice of incorporating nutrients into soil to a depth below the likely uptake is wasteful and inefficient, whereas discing the surface not only retains nutrients where they are required, but also effectively reduces wasteful leaching of the nitrates.
Enquiry was made to DEFRA at that time over the term “incorporation” as it related to good agricultural practice. It appeared to be an acknowledged issue and the subject of research for further guidance in relation to odour complaints which originated from the incomplete incorporation of organic materials by discing methods.

Information received at the time of enquiries in the field also appeared to suggest that the practice was widespread, to the extent that many farmers no longer own ploughs. It is however acknowledged that discing methods differ with some very deep capability where it is required.

It is therefore suggested that when land is no longer ploughed and instead shallow discing methods are applied; soil structure becomes settled, removing significant pockets of air. These pockets would have been filled with water at times of prolonged rainfall whereas now fields become saturated much more quickly. It is therefore suggested that reduction of deep cultivation may be a cause of rapid agricultural run off, which appears to have increased in recent years.

Soil compaction, as above produces a partial barrier that slows the passage of surface water downwards to the water-table. It also seems reasonable to assume that soil compaction at higher levels and reduced incorporation of organic material at greater depths will have an adverse effect upon porosity, worm populations and the interactions of deep cultivation and passage of water generally.

It should also be noted that there is some evidence of land at the periphery of urban areas having been purchased by development companies and put into set-aside; I am also aware of two examples of set-aside exacerbating run off related flooding.

3. Gulley Maintenance—lack of confidence, transparency and accountability

Failure to adequately maintain surface water gullies in adopted roads was believed by this officer to be a significant factor in flooding during August 2004. This opinion was derived out of:

— the many reports of failure;
— apparent absence of a robust maintenance schedule; and
— apparent inability and evasion in responding to these allegations.

Indication was that there was a general lack of knowledge as to locations of gullies and drains that was compounded by uncertain ownership and responsibility. This state of affairs was still apparent as a National scenario upon discussion with officers from different parts of the country at a “Highways” drainage course in Leeds in December 2007.

In bringing this matter to your attention I would like to demonstrate that the problem is being addressed locally, as follows:

Progress

There has been gradual improvement since 2004 with gully cleansing increased to twice annually in flooding hot spots.

Improved accountability from inability to say if or when gullies had been cleaned, to a situation whereby specific areas could be accounted for within a fortnight.

Suggestion that all gullies should be subject of tracker tracing for purposes of recording cleansing operations received tentative agreement in 2005 and a more positive confirmation was received in 2007.

— Parish Councils are in the process of being asked to review highways mapping and mark upon them any missing gullies.
— Gulley cleaners now have trackers that can pin point them to 10m.
— A new post is being considered to administer the process.

Confidence in gully cleaning and proactive fault finding is therefore increasing—at least locally.

I trust that the above is of help and in closing I advise that although I am not qualified in drainage I have the following experience and qualifications:

4½ years as the coordinator of the Flood Working Group.
7½ years as an Environmental Protection Technician.
An HND in Environmental Landscape Management.
NVQ Level 3 in Conservation.
OND in Engineering.

Tony Adams
February 2008
Memorandum submitted by Peter Mills (FL 167)

THE PITT REVIEW

I have read with interest the review document and I am somewhat disappointed to observe that some aspects of the role of the Environment Agency in the general flood scenario have been somewhat overlooked. I would like to make the following points:

1. As a flood victim in the Thames flooding of 2003 I believe that the EA should be tasked with the responsibility for flood defence. It is very unrealistic for such an organisation to take the easy option of claiming that they are responsible just for flood risk management and to ignore the real problem of flood defence.

2. In the case of the Thames, it is ludicrous to have the EA responsibility for navigation as its only statutory responsibility when the number of vessels on the Upper Thames has reduced over the years to an all time low at the current time. This “statutory responsibility” probably dates back to the time when the Thames was the main artery for goods/freight carrying in the Thames Valley. Nowadays, the few remaining vessels on the Upper Thames are private, shallow draft pleasure vessels. Whilst the EA is hiding behind this responsibility the real problem of flood defence has been overlooked.

3. It has been proved that the silt levels in much of the Upper Thames have increased and this impacts on the capacity of the river to carry flood water away. In spite of this, the EA persistently refuses to carry out dredging in the areas most affected.

4. The EA is not held in high esteem by those who have been most impacted by flooding. The main reason for this is the attitude displayed when any major flooding occurs. A large organisation such as this should, reasonably, be expected to be supportive of local organisations who represent local views. In my experience, the whole effort of the EA seems to be one of defensiveness in order to avoid any risk of accountability.

Yours Faithfully

Mr P C Mills
March 2008