

A radar/satellite image of the United Kingdom. The landmass is shown in brown, and the surrounding sea is in blue. A large, irregularly shaped area in the southern part of the UK is highlighted in a light blue color, indicating a specific region of interest, likely related to flood risk management as mentioned in the text. The text is overlaid on the map.

**RADAR/SATELLITE**

**Leeds City Council**

**LEARNING THE LESSONS:**

**Progress on Enhanced Management of Flood Risk in Leeds**

**An Annual Report by the Water Asset Management Working Group**

**June 2008**

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## 1. Introduction

In August 2004 and May 2005 several areas of Leeds experienced significant flooding due to unusually intense rainfall and the inability of the drainage infrastructure to cope with the increased volumes of water. The incidents highlighted several areas for improvement in terms of the resources available to maintain our assets and respond to floods.



Flooding at Barley Hill Road, West Garforth, in June 2007

In response to the first of these events, the Council set-up a cross-departmental working group - the **Water Asset Management Working Group (WAMWG)** - of senior officers from services with water or flood risk responsibilities to develop recommendations for improving our management of flood risk. The group developed a **33-point Action Plan** which was approved by senior elected members and senior officers in July 2005 and led to an **additional £1.1m** of revenue funding being provided to implement the Action Plan's recommendations. Although this work is on-going, the services represented on WAMWG have made consistently good progress in implementing the recommendations towards making the city more resilient to flood risk management. This does not, however, prevent the city from being at risk during severe weather events, nor does it mean that WAMWG's work is close to completion. A great deal of work remains to be done around understanding the nature of flood risk in Leeds and in taking forward the results of our on-going assessments.



**Dewsbury Road flooding in June 2007**

**In June 2007, Leeds experienced three further severe rainfall events** in quick succession which led to the flooding of 250 - 300 domestic properties city-wide. The River Aire flooded a limited number of city centre properties, but central Leeds narrowly avoided severe flooding. However, many residential areas were badly affected by flooding from watercourses (particularly from Wyke Beck, Meanwood Beck, Wortley Beck, Collingham Beck and Farnley Wood Beck), although many locations were also flooded by surface water run-off or surcharging of drainage systems as the ground and drainage infrastructure were unable to absorb extreme volumes of water. Whilst very serious, it is clear that the city could have been worse affected had we not already enhanced our flood risk management and had it been Leeds at the centre of the storms rather than South and East Yorkshire. Further significant, but less severe, flooding occurred again in Leeds on 21 January 2008.

The scale of **the June 2007 flooding necessitated a thorough fresh analysis** of what happened and how appropriate stakeholders might respond to the lessons learned. Locally, WAMWG officers engaged in a series of debriefings across services and with partner agencies. As a result, WAMWG submitted proposals to senior management in September 2007 for additional actions to be implemented by Council services. This led to the **approval of several additional steps funded by a further £100,000 in recurring revenue resources** which will see our flood risk management capabilities further enhanced. WAMWG's Action Plan is now in third stage and currently contains 46 current individual actions.

The Council's work was noted approvingly by the independent Pitt Review into the Summer 2007 flooding at the national level. The Review published its interim report, 'Learning Lessons from the 2007 Floods', in December 2007 with 92 interim conclusions and 15 urgent recommendations. As a result of the Council's groundbreaking work, officers have met with the Pitt Review Team on several occasions to discuss our approach which is informing the shape of the Review. It is already clear that the Review's final recommendations (due to be published on 25 June) will relate in large part to the roles of local authorities and will have far-reaching consequences for us if implemented.

This report constitutes a second annual update on the implementation of the Action Plan.

Richard Davies

Head of Risk and Emergency Planning / Chair of Water Asset Management Working Group

## 2. Leeds Flood Alleviation Scheme

There is a **long history of major floods occurring on the River Aire** (1775, 1866, 1947 plus a series of near-misses in 2000, 2002, 2007, 2008). Nevertheless there are **no formal flood defences along its banks** to protect the cultural and economic heart of the city, a number of key electricity distribution and waste water treatment installations, as well as residential developments and businesses located along other parts of its route. The city has flooded in the past and more frequently in recent years. For the most part, the **only protection afforded is by informal defences**, such as walls, where the standard of defences is assessed as providing protection against flooding on a 1 in 5 year basis (which means there is a 20% chance of flooding).



River Aire flooding in January 2008

Following earlier near-misses the **Environment Agency (EA) prepared a design for a River Aire Flood Alleviation Scheme**, but this was 'shelved' in January 2007 due to a failure to accrue a sufficiently high score under EA criteria. However, the events of June 2007 led to a change of heart by the EA and, following a meeting between the Chief Executive of the EA and the Leader of the Council (as well as the Council's Chief Executive and officers from WAMWG) **in July 2008, the scheme was resurrected.**



River Aire flooding in January 2008

The aim of the scheme is to implement flood defences along the River Aire over a 19km length from Newlay to Woodlesford and to integrate this with the Council's regeneration aspirations as well to provide wildlife, recreational and access benefits where possible. **Actual construction is anticipated to be begin in 2010-2011**, but even this timeframe necessitates a significant amount of work to be undertaken in between in terms of scoping, agreeing the outline design, assessment of cost, developing the business case and gaining approval from the EA and other partners before going out to public consultation. The **total cost of the scheme is estimated at around £80-£100m** and the EA's capital programme includes provision for £1.2m in 2008/09, £20K in 2009/10, and £15m in 2010/11. Clearly, however, a significant proportion of the funding requirements is not yet funded and a Project Investment Group is being convened to identify potential funding sources.

The EA is keen on the scheme being **undertaken on a partnership basis** and is working with the Council, Yorkshire Forward, Yorkshire Water, British Waterways, the Chamber of Commerce and other business interests to ensure a successful outcome. There are two task groups taking the required work forward: firstly, a group to produce a 'Leeds FAS Design Vision'; secondly, a group to oversee production of a 'Leeds Flood Risk Economic Impact Study' (EIS). The Impact Study will underpin the business case and will be used to develop planning policy, develop links to developer contributions, and use the EIS to seek partner funding for the scheme. These initiatives are now working under the guidance of a Leeds FAS Project Steering Group which is chaired by the Council's Chief Executive and has senior representation from key partners.

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### 3. Land Drainage Section

#### Maintenance of Council-owned Watercourses

Since January 2006, Council-owned watercourses have been maintained by the Land Drainage Section using a specialist contractor, Peter Duffy Ltd, under a term contract. This work takes a number of forms.

Routine maintenance of **grids and hotspots** is managed on the basis of risk assessment at an estimated annual cost of **£85,000** for 2008/09. Following the June 2007 and January 2008 floods, the number of hot-spots has been increased significantly: **32** locations are visited fortnightly, **21** monthly, **10** bi-monthly, and **1** every three months. The amount of debris collected on routine visits, along with the proximity of vulnerable properties etc, is used to determine the appropriate visit frequency. If a Flood Watch notice is issued by the Environment Agency, or a Severe Weather (rainfall) notice is issued by the Meteorological Office, then the highest risk locations are visited immediately, so far as is practicable.



Barwick Road grid on Cock Beck, Stanks, pre-fortnightly maintenance on 11 January 2008

Barwick Road grid on Cock Beck, Stanks, post-fortnightly maintenance on 11 January 2008



Barwick Road grid on Cock Beck, Stanks, pre-fortnightly maintenance on 21 January 2008

**Planned maintenance** of open channel watercourses has been prioritised in accordance with perceived risk. In 2007/8 this has led to the **desilting of about 2,210 metres of watercourse** at a cost of **£23,000** and the **jetting and relining of culverts** at a cost of **£50,000**.

**Reactive maintenance** is carried out when the Becks Inspectors, services, or members of the public notify us of blockages and Duffy's undertake this on our behalf. In 2007/8, this contractor was provided with 151 individual orders. The work included **open watercourse blockage removal** at a cost of **£70,000**. We have continued with our programme of **CCTV inspection and desilting of culverts** to identify and address blockages and structural problems which might give rise to flooding. This year we have covered around 6120 metres of culvert. Some repairs will require capital works.

Land Drainage has co-ordinated a number of improvements across the city. Effective, well-maintained grids and inlets to culverts are an essential flood-prevention measure and this year **new grids and inlet and inlet improvements** have been provided at a number of locations (including The Square, Kippax) to provide easier maintenance and a more effective safeguard against blockages. In addition, **new land drains** have been provided at a number of locations to alleviate surface water run-off from Council-owned land (e.g. at Horsforth Hall Park and Stanningley Park). Culvert repairs, and new grids, manholes and land drains have cost **£108,000**.



New grid at The Square, Kippax installed by Land Drainage





**New land drain being installed at Stanningley Park**



**New land drain being constructed at Horsforth Hall Park**

## **New Approaches to Known Flooding Problems**

The Council is at the forefront of a number of new approaches to resolving seemingly intractable flood risk issues.

The DEFRA-sponsored **West Garforth Integrated Urban Drainage** was a **£75,000** pilot project completed in April 2008 which involved a partnership comprising the Council, Environment Agency, Yorkshire Water, Pennine Water Group, and Bradford MDC. This area has a long history of serious flooding problems, mainly due to inadequate capacity and poor condition of private culverted watercourses in multiple ownership, and no agency seemed to be responsible for finding a solution. The main aim of the project was to see whether closer collaboration between agencies could identify innovative and feasible solutions, despite perceived regulatory difficulties. The project showed that, as soon as serious resources are made available for inspecting the condition of culverted watercourses, then opportunities for relatively modest actions (including desilting) become apparent that can have a significant beneficial impact. The Land Drainage Section constructed various improvements works (e.g. at Barleyhill Road) during the project.



Works being undertaken at Barley Hill Road,  
West Garforth



Following the third incident of serious flooding in four years in June 2007, WAMWG successfully bid for £90,000 of DEFRA funding (along with £100,000 of Council funding and £10,000 from the Yorkshire & Humber Regional Flood Defence Committee) to undertake the **Dunhills Flood Protection Pilot Project**. The project entailed protecting around 70

individual houses on this Halton estate from flooding from the Wyke Beck by using demountable flood protection boards and air-brick covers, which were installed at no cost to residents (see Section 12). This work was complemented by the EA's implementation of level gauge telemetry on the Wyke Beck, and an associated flood warning system and Flood Warden scheme. A deployment plan for residents was completed by PEPU in February 2008 and launched to the community at a public event at Corpus Christi High School. This pilot project will be used by the Council and DEFRA to investigate the effectiveness of protection measures when coupled with a flood warning scheme.

## Additional Resources

Since our last report Land Drainage has been given approval to recruit one additional officer to oversee planning and development control matters and a 0.5 post for administrative support.



**A newly installed rain-gauge at Middleton, Leeds**

Land Drainage has also ordered five rain-gauges – linked to the office via a telemetry system – in order to get a better understanding of differential rainfall patterns across the city. The first of these has been installed at Middleton and the remaining four will be strategically sited so as to supplement those of the EA with Otley, Wyke Beck, Wetherby and Garforth the likely locations.

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## 4. Bridges Section

### Clearing Blockages to Highway Bridges and Large Culverts

The Bridges Section is responsible for the management and maintenance of highway structures owned by the Council, including culverts with a clear span or internal diameter greater than 900mm.



Tree trunk stuck under a Otley Bridge on the River Wharfe

### Clearing Blockages under Highway Structures

The Bridges Section **removes debris from the major rivers running through the district** (Rivers Aire, Calder and Wharfe) where a highway bridge or culvert has caused a build up of debris. This tends to be done on a reactive basis when we are notified of the blockage.

The Section retains a diving team contractor to remove debris from watercourses as specialist personnel and equipment are required to carry out this work.



Entrance to Preston Hill culvert obstructed by debris

### Debris clearance at entrance to Highway Culverts

With support from the Land Drainage Section, the Bridges Section is also responsible for **clearing debris and blockages to culverts with a clear span or internal diameter greater than 900mm**. Significant effort and expense is sometimes involved in getting the necessary machinery into these locations to remove these obstructions. This activity currently costs the Council approximately £10,000 per annum.



Entrance to Carlton Bramhope highway culvert

## Culvert Survey Work

The Bridges Section has engaged the services of our private sector partner, Mouchel, to carry out **survey work to existing culverts**. The work involves surveying all culverts supporting a highway with a clear span or internal diameter greater than 900mm.

The survey work involves collecting simple but important data about each culvert. Data collected includes:

- Access details
- Distance of the culvert from a road
- Whether the culvert be inspected from the highway
- Details about the size of the culvert
- How far is it to the nearest property

Discounting structures on the rivers Wharfe, Aire and Calder, **all 350 highway culverts have now been surveyed**, with an additional 90 watercourse structures identified, at a total cost of £50,000. Survey work has included photographs at the upstream and downstream ends of the culverts.



**Difficult access to Stanhope Road culvert**

Approximately 50% of the survey data has been passed to the Land Drainage Section to **determine the flow capacity of each culvert**. The remaining data is currently being processed and it is anticipated that this will be forwarded by the end of June 2008. Any culvert found to be under capacity will be considered, on a risk basis, for inclusion in the Bridges Section Culvert Upgrading Programme.

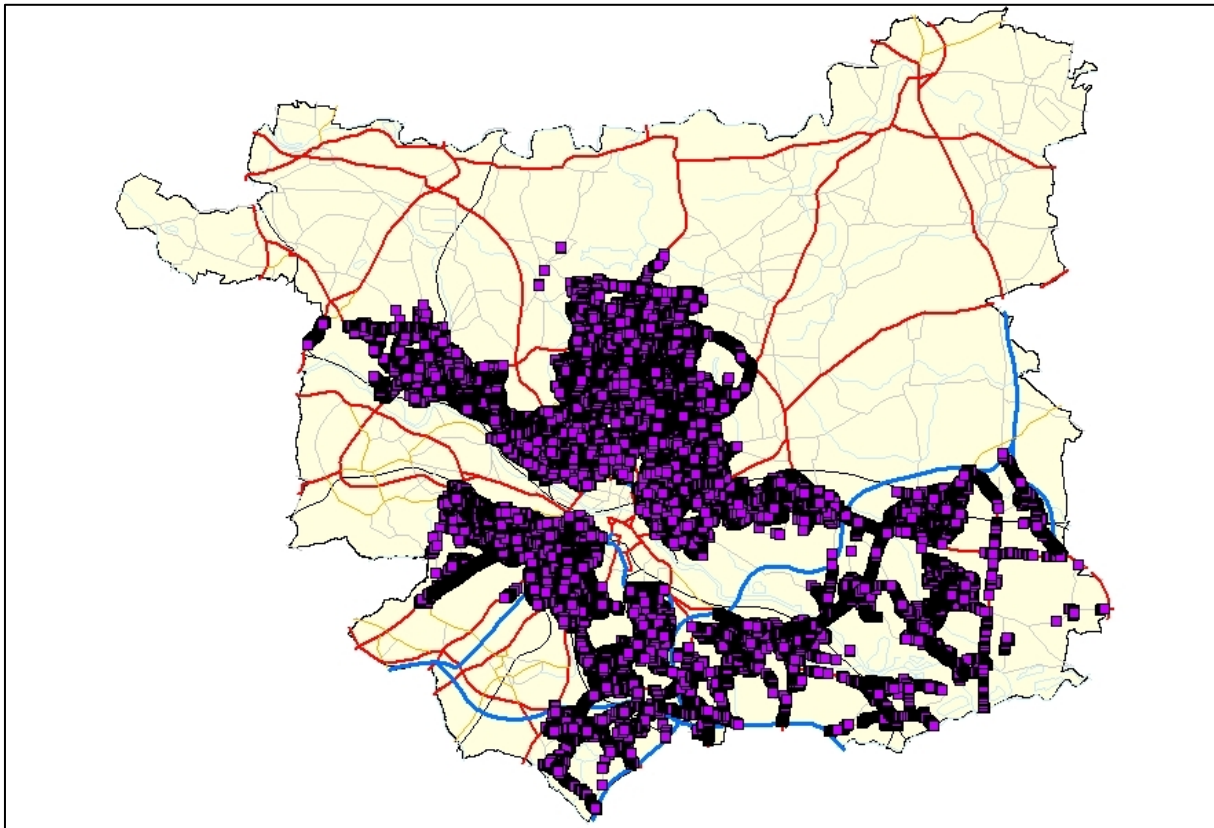
For further information, please contact:

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## 5. Highways Services

### Gully Data Collection

A highway gully is a metal grate covering a drainage pit, usually located on the edge of the road, which drains rainwater from the highway. The Council is responsible for maintaining the gullies on the public highway, for example through regular emptying using a suction machine.





Highway gully progress map, May 2008

In September 2006 Highways began a project to collect detailed data on the condition and geographical location of all highways gullies in Leeds and this is projected to run until mid 2009. As a result of this exercise, we have now **identified and logged 75,000 gully positions and associated data out of an estimated 130,000 gullies** across the city. Once captured, the data is uploaded into a Geographical Information System (GIS) application which can be used to visually display the gullies' positions and act as a link between the detailed attributes of each gully and other computer systems used for asset valuation, fault reporting and maintenance planning. The GIS system also facilitates the sharing of information across the Council and with partner agencies to provide a holistic approach to drainage management.

The data collected is already being used to work with the gully emptying teams in Environmental Services in order to **improve the efficiency of cyclical cleaning activities** as well as to allow more sophisticated targeting of maintenance work on problem areas. We are now able to have more accurate maintenance histories for each of the many gullies.

## Provision of Sandbags

The Council maintains **stocks of sand and unfilled bags** at its depots across the city for filling when needs arise. Highways Services purchased three rapid sandbag-filling machines with the earlier investment and these have already paid for themselves through their contribution to our responses to flooding in June 2007 and January 2008. Around 7,500 sandbags were deployed to over 250 locations in these events and around 2,000 sandbags are available for immediate deployment at all times. While sandbags cannot often prevent flooding when there is severe weather, they can help in some circumstances to limit the damage or protect properties that might have otherwise been flooded.

<p style="text-align: center;"><b>SANDBAG DEPLOYMENT CARD</b></p> <p>Your area has been identified as being at immediate risk from flooding. To help mitigate the impact, sandbags have been provided by <b>Leeds City Council</b>.</p> <p>The sandbags are taken from a limited stock held by Leeds City Council, and additional supplies cannot be guaranteed.</p> <p><b>These sandbags are provided to protect your house, not your garden.</b></p> <p>With this in mind, to ensure they are used to maximum effect, we would request that you:</p> <ul style="list-style-type: none"><li>• <b>Take only what you need to protect your house – place sandbags in your doorways and over air-brick covers</b></li><li>• <b>Offer assistance to any neighbours who may need help installing sandbags, or those who are away</b></li><li>• <b>Obtain additional stocks from builders merchants</b></li></ul> <p>To install the sandbags:</p> <ul style="list-style-type: none"><li>• Remove any debris from the area where the bags are to be placed.</li><li>• Place the bags lengthways and parallel to the direction of the water flow.</li><li>• Place bags in layers. Like a brick wall, make sure that in the next layer each bag overlaps the one below by half.</li><li>• Stamp bags firmly into place to eliminate gaps and create a tight seal.</li></ul> <p>Additional information on flooding can be found at <a href="http://www.leeds.gov.uk">www.leeds.gov.uk</a> The contact number for Leeds City Council is <b>0845 124 0113</b></p>	<p style="text-align: center;"><b>HAZARD!</b></p> <p><b>In cases of severe flooding, keeping water out of your house can do more harm than good, and may cause long-term structural damage.</b></p> <p><b>You should not aim to prevent water from entering your property through any windows, doors, airbricks etc more than one metre above the level of the ground surrounding your property.</b></p> <p style="text-align: center;"><b>HEALTH &amp; SAFETY WHEN LIFTING SANDBAGS</b></p> <div style="text-align: center;"><p><b>Bend your knees when picking up a sandbag</b></p><p><b>Keep your back straight when carrying a sandbag</b></p></div>
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**The sandbag deployment card**

Highways management has worked with PEPU and Land Drainage to **review and improve our existing processes for the deploying flood mitigation resources**, such as sandbags. In response to this, a sandbag deployment card has been developed for Highways operatives to distribute to residents when receiving sandbags. This informs them that the sandbags are only for mitigating the impact of flooding for properties and provides advice on safe handling.

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**Rapid sandbag filling machine in use at a council depot**



## 6. Environmental Services

### Highway Gully Cleansing

Environmental Services have continued to work closely with Highway Services in analysing the results from their survey to collect detailed data on the condition and geographical location of all highway gullies in Leeds. The inspections involved have highlighted a small level of blocked gullies requiring remedial action and led to discussions about how particular gullies might be better maintained.



'Wet Spot' team at work with one of the new gully cleansing machines

The aim of this process is to ensure there are quick responses for the **5,000+ identified wet spots** when severe weather anticipated, clear cleansing frequencies for low and high-risk locations agreed with Highways using effective route planning, and robust training in place for operatives. This process will be underpinned by **sample inspections of cleaned locations** by Highways inspectors to provide quality assurance and regular review meetings between Highways and Streetscene Services to ensure new schemes are picked-up.

#### Additional Resources

As part of WAMWG's initial recommendations in 2005, Streetscene Services leased two extra vehicles and recruited additional staff which enabled them to provide a **significantly enhanced gully-cleaning arrangements**. The standard frequency of gully cleansing is once every eight months, but the two additional machines allowed an increase in the cleansing frequency in wetspot areas to every three months. Following the June 2007 flooding, a number of options for further enhancing service provision were discussed by management, but these did not form part of the package eventually approved.

The June 2007 events also highlighted for service managers that we did not have the equipment in place to **pump-out flooded residential properties** successfully as had been previously thought. As a consequence, we have now purchased pumps to be fitted to all of our gully tankers to ensure that this capability is now in place following severe floods.

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## 7. Recreation

### Hot Spot Inspections

On receipt of severe weather warnings and flood warnings from partner agencies, Parks staff continue to check a number of Council-owned **parks or opens spaces which are prone to flooding** or which give rise to problems to neighbouring areas when heavy rain occurs.



Springhead Park depot, June 2007

### Remediation of Flood Damage

The flooding of June 2007 had a major impact upon Parks and Countryside's assets across the city, causing around £500,000 of damages. A good deal of this has been now remediated, including repairs to footbridge damaged in floods at Golden Acre Park, but a good deal of repairs remain to be done along the Wyke Beck Valley to damaged embankments, walls, and two bridges.



Springhead Park Rose Garden, June 2007



Wyke Beck flooding June 2007

## New Flood Defence Works

Officers have undertaken several **new works to improve the resilience of specific locations to flooding**. Firstly, at Springhead Park in Rothwell, a drainage gap has been created in the park wall to allow flooding from Dolphin Beck to drain floodwaters back into beck more quickly. Secondly, at West Park Fields a new catchment culvert and grid have been installed. Thirdly, on the Colton Estate, we have undertaken minor land reshaping to try to prevent continuing flooding of properties from an adjacent public open space.

For further information, please contact:

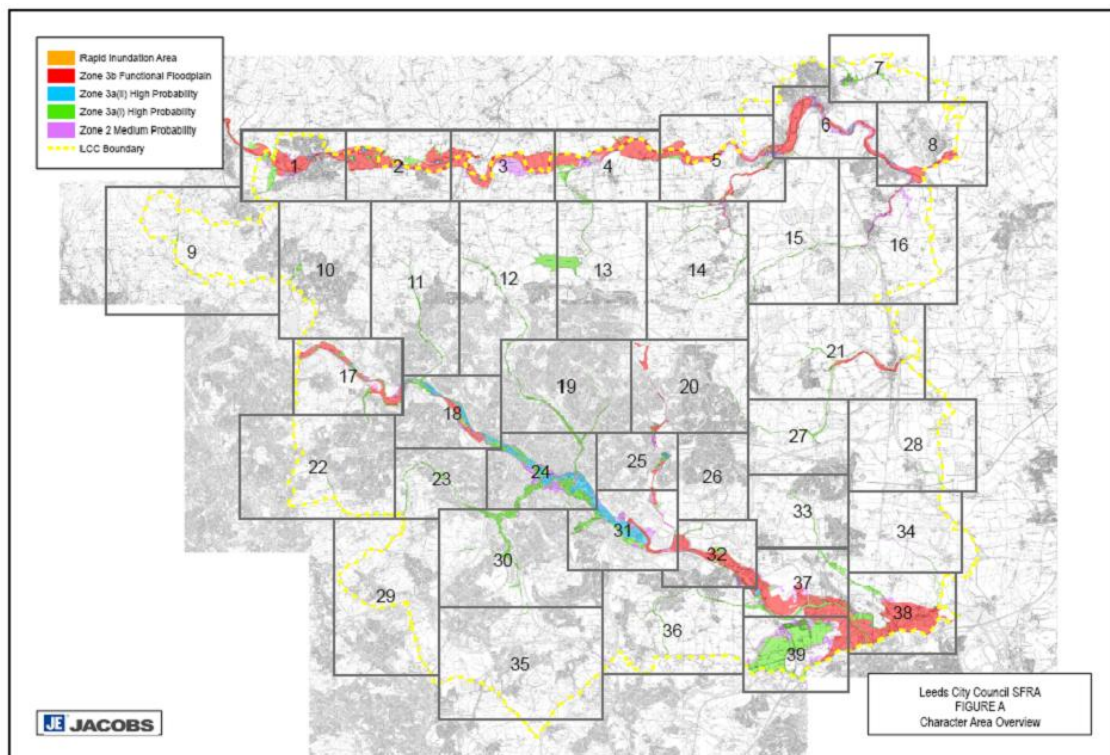
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## 8. Planning

One of the key learning points from the June 2007 flooding was that there needs to be a **more proactive engagement with planning functions** around flood risk management. As a result, senior officers from Planning and Economic Policy and Development Control have become members of WAMWG and are making important contributions in several areas.

### Strategic Flood Risk Assessment (SFRA)

In accordance with the requirement contained in the Government's planning guidance document, PPS25 Development and Flood Risk, the Council commissioned the preparation of a Strategic Flood Risk Assessment in October 2006 to bring together information on flooding from rivers and other sources to **provide a fuller picture of flood risk** across the district for the first time. The SFRA was prepared by Jacobs in consultation with officers from Planning and Economic Policy, Land Drainage, Environment Agency, and PEPU and was completed in October 2007.

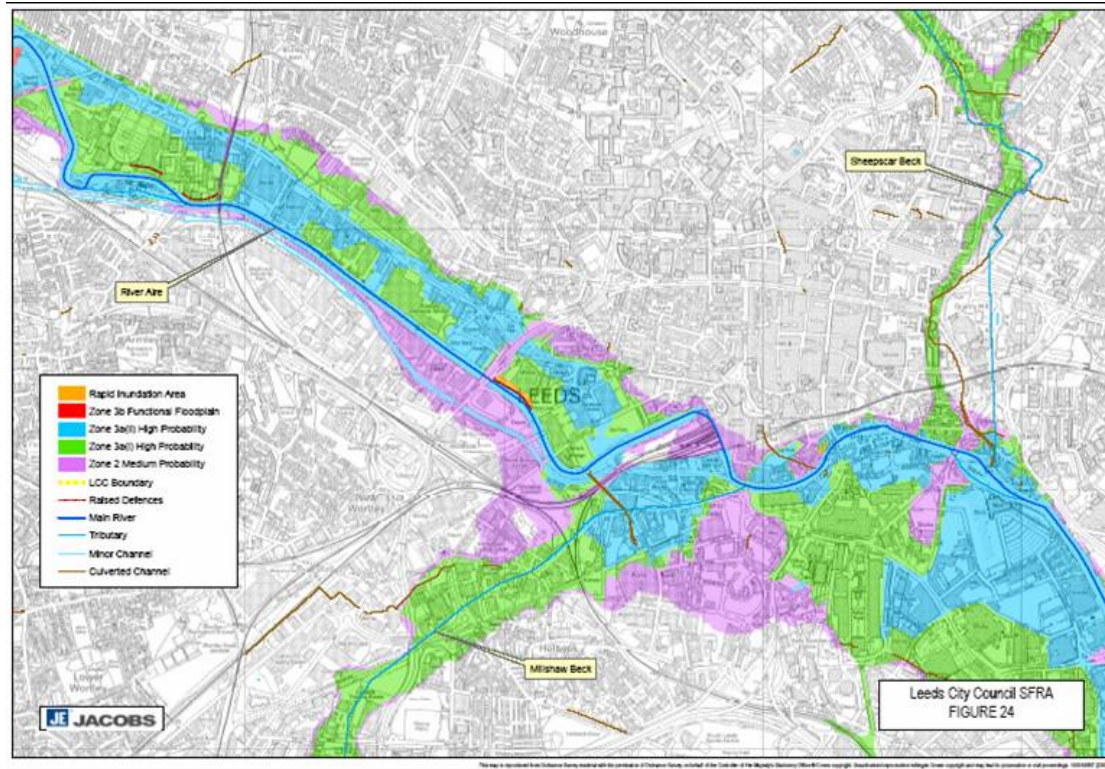


**SFRA Overview of Key Flood Risk Areas across the Leeds District**

The SFRA marked a **big step forward for the Council in managing flood risk** around planning in several other ways. Firstly, it provides a further refinement of the EA's Flood Risk Zone 3a by sub-dividing it into Zones 3a(i), i.e. areas subject to flooding up to and including a 1 in 100 year (1%) annual probability and Zone 3a(ii), i.e. areas subject to flooding up to (and including) the 1 in 20 year (5%) annual probability. It also provided an opportunity to identify the functional floodplain which is part of the duties of the Local Planning Authority in agreement with the Environment Agency: all areas shown on the SFRA as functional floodplain are those where water has to be able to flow or be stored in times of flood. These areas are currently protected from development under UDP Policy N38A which is being reviewed and updated in our Core Strategy.

The SFRA is now being used to **inform decisions on planning applications** and is also being used to help in the preparation of the Local Development Framework, which is the portfolio of documents that will replace the UDP as the statutory development plan.

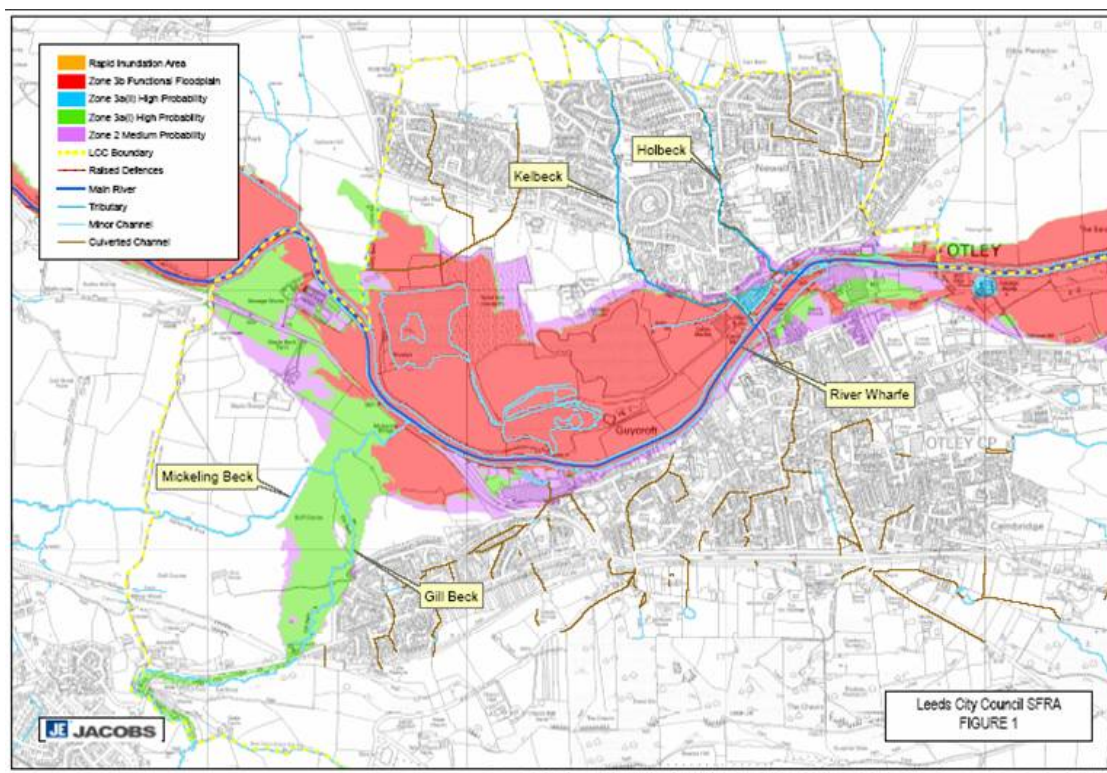
## Flood Risk Sequential Tests



### Flood Risk in Central Leeds

The Council now requires all planning applications for development in Flood Zones 2 or 3 to be accompanied by a **'Sequential Test'** in order to demonstrate that there are no other reasonable alternative sites of lower flood risk. The overall aim is to **steer development away from those areas with the greatest flood risk**, whilst balancing this with the Council's regeneration objectives and the need to ensure that areas are not starved of inward investment. This is particularly fraught in Leeds where the River Aire flows through the city centre and key regeneration areas, whilst the River Wharfe passes through a number of districts which need to remain sustainable places to live. The Council has provided guidance to developers on a methodology for undertaking the Sequential Test and has carried out a number of assessments on planning applications to determine whether the Sequential Test has been met.

Where it can be shown that there are sound planning reasons why a development needs to be located in areas of flood risk, then the Council expects to see a sequential approach to the positioning of uses within the site. This might mean that the most risky part of the site is used for open space, such as at Skelton Moor Farm. The Council is also carrying out its own Flood Risk Sequential Test on proposals in the four Area Action Plans that it is preparing. To date, this has been only completed for the Aire Valley Area Action Plan and the others will follow later this year. The Test will also be applied to the Core Strategy which is the overarching document indicating the broad areas of growth across the District. The Sequential Test will help to ensure that flood risk vulnerability is fully considered when allocating areas for future housing growth.



Flood Risk in the Otley Area

## Dealing With Planning Applications

The Council has continued to take into account flood risk issues in its consideration of planning applications and development proposals and, over the last year, we have **required flood risk assessments for 58 planning proposals**. We have consulted the EA on 144 planning applications, including 31 consultations on major developments, and we have applied the EA's standing advice in many other cases. We have obtained land drainage advice on approximately 1,000 applications. In the planning decisions that we have issued, 58 have included **conditions requiring flood alleviation and mitigation measures** and 108 planning conditions have been imposed requiring sustainable drainage provisions. We have also **refused planning permission** on 4 applications because of flood risk issues. Through pre-application discussions, we are encouraging developers to take into account flood risk issues at the earliest stage in the design of schemes, and encouraging early dialogue with the EA to design out or mitigate problems wherever possible.

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## 9. Sustainable Development

Sustainable Development is another service area which we felt needed to be become better engaged with our flood risk management agenda following the June 2007 flooding. It is already clear that there are significant overlaps in our work and the Head of Service has joined WAMWG to ensure that we exploit any synergies to the fullest.

### Climate Change Strategy



In June 2005 the Council signed the **Nottingham Declaration on Climate Change**, committing the authority to preparing a Climate Change Strategy, the draft of which was released for consultation in 2008. The authority recognises that climate change presents a **grave threat to the climate system** that has allowed people to flourish and that it is the greatest long-term threat to both the environment and our future development. The strategy

developed aims to **reduce the impact of climate change** incrementally by tackling specific issues which organisations in Leeds can influence by working together.

The purpose of the **strategy has two key planks**: firstly, in terms of **mitigation**, it seeks to reduce Leeds' contribution to climate change by minimising greenhouse gas emissions from all sectors and achieve reductions of at least 60% in total; secondly, in terms of **adaptation**, we aim to improve the city's resilience to current and future climate change by understanding the most likely climate scenarios and responding to the threats and opportunities presented.

The links to adaptation are most relevant to WAMWG's work and it is clear that one of the greatest threats to Leeds relates to how we adapt to future climate change in terms of the increase in flood risk. The observed weather trends for Leeds provide clear evidence of why there has been an **increase in severe weather related events in Leeds**, such as the increased frequency and severity of fluvial/valley flooding as well as the increased occurrence of flash floods adjacent to highways and watercourses.

### Natural Resources and Waste Development Plan Document

Due to recent changes in planning legislation, the Council is currently in the process of replacing its Unitary Development Plan (which has historically, guided our approach to development in Leeds) with a new **Local Development Framework (LDF)**, which will fulfil much the same role. Within the new LDF there is a Core Strategy, a Statement of Community Involvement and a set of 'Development Plan Documents' that lay out a detailed set of policies relating to how Leeds will be developed in the near future.

As a part of this LDF, we are preparing a **Natural Resources and Waste Development Plan Document** (NRWDPD) to highlight how the Council should promote the sustainable management of the area's natural resources. This is particularly important as many natural resources, such as minerals, land and energy, are non-renewable, limited resources; improving the efficiency of these resources' use is key to preserving their supply for the future.

As part of this approach, we have commissioned a **Natural Resources Flow Analysis** (NRFA) to review how resources are currently being used in Leeds, the amount of resources that are being used, and the capacity to achieve efficiencies in this use. The NRFA considers the flow of natural resources including: waste; minerals and aggregates; climate change and energy; land-use; **water resources, drainage, flood protection**; and air pollution. It explores the key sustainability issues related to these resources, including the threat of climate change, air quality and flooding. Using 2005 data for the Leeds district, the analysis identifies the resource input, output, stock and waste components of resource flow in Leeds. The NRFA will present a set of recommendations which will be taken on board during the preparation of the NRWDPD.

## **Aire Action Leeds**

Another key area of our work is our involvement in **Aire Action Leeds**, which is a river management partnership between the Council, Environment Agency, British Waterways and Yorkshire Water. The partnership's vision is to **create better waterways for people** and wildlife now and in the future, to protect and enhance improve the environment and to promote the usage of the waterways, in particular the River Aire, the Aire and Calder navigation and the Leeds-Liverpool canal. Making the distinctive waterways of Leeds a better place will benefit the wildlife and everyone who uses them whether they work, live or visit them. The partnership will report to the Leeds Strategic Flood Risk Partnership Board discussed in the later section on "Working in Partnership".

In pursuit of the partnership's aims, the partners are encouraging everyone who uses, or has an interest in, waterways to help look after their river, becks, canals and waterfront areas. One of the partnership's three sub-groups is also focussing on influencing planning and policy processes to improve the accessibility, character and environmental quality and is driving force for implementing the Leeds Waterfront Strategy. The sub-group is extensively involved in the development of the Leeds Flood Alleviation Scheme.

For further information, please contact:

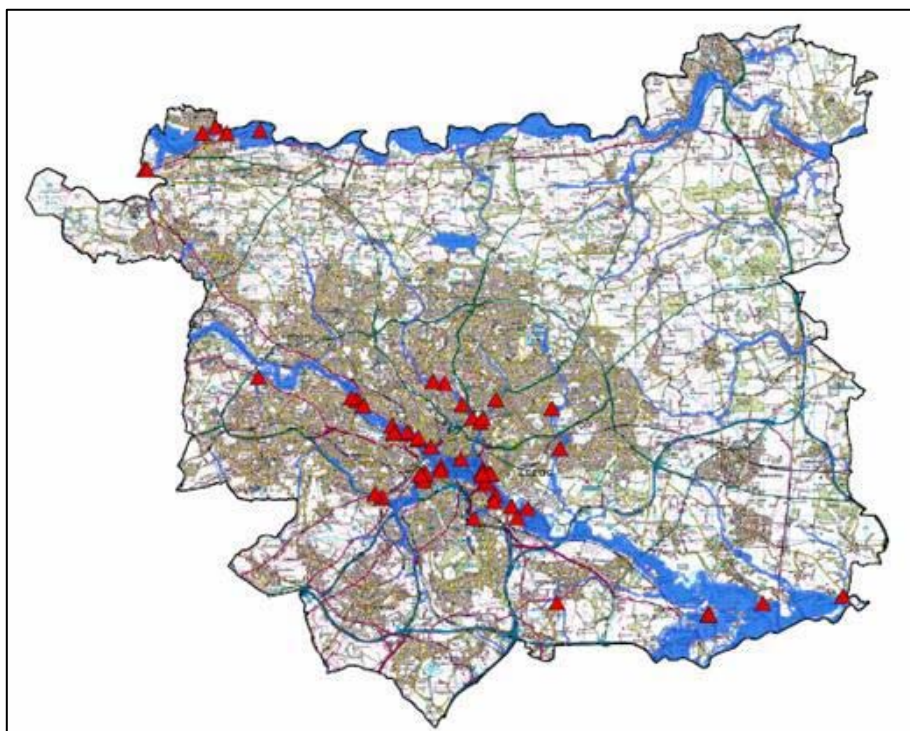
Tom Knowland  
Head of Sustainable Development  
Tel: (0113) 39 50643  
Email: [Thomas.Knowland@leeds.gov.uk](mailto:Thomas.Knowland@leeds.gov.uk)



## 10. Asset Management Section

### Flood Risk to Council Assets

The Council has nearly 30 separate databases holding property information and has just completed phase two of a four-phase programme to bring these together into the new 'Caps Uniform' Geographical Information System to allow greater sharing of information and flexibility of use.



The location of Council properties has been plotted within the new system and compared against national *flood risk maps* relating to the city's 'main rivers' provided by the Environment Agency. Initially, Asset Management identified a possible total of **60 Council properties at risk from identifiable sources of potential flooding** and this number will be further refined in the light of the recently completed Strategic Flood Risk Assessment which took the Environment Agency data a step further and looked specifically at the Leeds area.

A **programme of inspections** has been instigated to assess the actual level of risk and the buildings' vulnerability in order to determine what steps can be taken to reduce these and the potential impact should flooding occur. Additionally, plans from the new Caps system have now been made available to the Land Drainage Section to help them quickly identify Council ownership of land or property should blockages or potential flooding from watercourses be identified.

For further information, please contact:

Mark Cordingley  
System Supervisor  
Tel: (0113) 22 43820  
Email: [Mark.Cordingley@leeds.gov.uk](mailto:Mark.Cordingley@leeds.gov.uk)

## 11. Enforcement

Enforcement contributes to flood risk management in two main areas.

### Shopping trolleys

The Council now has a robust policy on the **recovery of abandoned shopping trolleys**, many of which were regularly causing watercourse blockages at key locations. Under the policy the charge of recovery is normally incurred by the owner, but the Council has identified a company called TCS which will remove such trolleys at no cost to the Council. The success of this arrangement can be measured by the fact that between 1 April 2007 and 31 March 2008, some **7,431 abandoned shopping trolleys were collected and returned** to the owning supermarket for re-use or destruction. The company has scoured the city for abandoned trolleys on all types of land, including watercourses, with the support of ecology officers and trolleys are now removed on **daily patrols across the district**.



Shopping trolleys removed from Wyke Beck after flooding event

## Flytipping Hotspots

In the past twelve months Enforcement staff have also surveyed bridges and culvert entries where debris and flytipping commonly occur. This information is being used to **erect signs advising the public who to ring to request removal of this debris** should they see build ups at these locations.



**Flytipping and debris in Sheffield Beck at Kippax**



**Flytipping in Farnley Wood Beck at Cottingley Springs**

For further information, please contact:

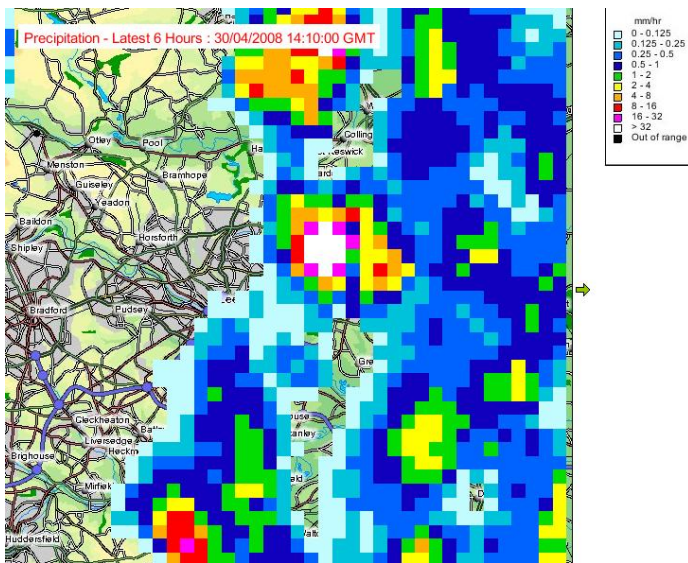
Graham Wilson  
Head of Enforcement  
Tel: (0113) 39 51501  
Email: [Graham.Wilson@leeds.gov.uk](mailto:Graham.Wilson@leeds.gov.uk)

## 12. Emergency Planning

The Peace and Emergency Planning Unit (PEPU) is responsible for ensuring that the Council is able to respond to flooding emergencies in an effective and co-ordinated manner through the provision of appropriate plans, resources and partnership with other responders and communities.

### Better Resources for Flooding Response

The June 2007 floods highlighted that the Council could make use of additional resources and technologies to enhance our ability to understand the impact of extreme rainfall events and also to respond more effectively to flooding incidents. These are as follows:



Firstly, we have purchased licences to provide live **access to the Met Office's rainfall radar data** using a system called **EnviroMet** to officers in Land Drainage, PEPU, and Highway Maintenance through which they can see which areas are being worst affected (and most likely to flood) and therefore target resources accordingly. This is already proving very valuable.

Secondly, the Land Drainage and PEPU offices as well as the Emergency Control Centre now have **live access to the Council's network of 300 CCTV cameras** (both LeedsWatch and Urban Traffic Control) around the city to enable officers to have a clearer idea of the

#### EnviroMet showing rainfall levels across Leeds

primary and secondary (e.g. on arterial roads away from the incident scene) impacts of flooding and how best to respond. Key flood risk locations can be viewed from cameras focussed on the River Aire, watercourses like the Wyke Beck as well as flood-prone highways.

Thirdly, Land Drainage are developing a single live flood incident information application using ArcGIS so that all relevant Council services have the same **overview of which locations have been flooded** and what resources should be deployed. This will shortly be linked to the SIEBEL system for use in handling sandbag requests from the public.

Fourthly, the Council's new Emergency Co-ordination Vehicle was once again successfully deployed to flooding in the Halton area in June 2007 and provided a key role in providing an **operational control point** for the various Council and partner organisations responding. The ECV was also used to deploy flood recovery resources to residents affected by flooding in Pudsey in that period.



**CCTV being used in Land Drainage to monitor water levels on the River Aire**

## Partnership Working with Other Local Responders

PEPU continues to co-operate with its partners in the West Yorkshire Local Resilience Forum to ensure that we are able to respond robustly to flooding on a multi-agency basis. As part of this, the West Yorkshire '**CONOPS**' multi-agency flood response protocol which sets-out clear roles and responsibilities was reviewed following the June 2007 and January 2008 flooding and has been reissued. Once DEFRA has issued its new outcome measures, the CONOPS will be subject to a final review and then exercised.

## Working with Communities

As part of the implementation of the **Dunhills Flood Protection Pilot Project** in Halton, PEPU developed and launched a plan for use by householders in conjunction with community representatives. In essence, this is a deployment plan providing practical guidance on how the community should respond in response to a potential flooding incident for which they would receive a flood warning from the EA. It explains in clear terms how they should install their **Floodguard door and airbrick units**, how and where to obtain information, and advice on how residents should respond to flooding. A **Local Community Flood Plan for Methley/Mickleton** is almost complete and could serve as a model for other communities.



Flood guard for a domestic air vent



Installation of a door flood guard

PEPU has continued to work with the Council's Contact Centre at Westgate to improve our **call-handling in flooding incidents** through the development of operators' scripts to use when members of the public call to request sandbags. The aim of these is to log appropriate information to assist in deciding where to deploy our limited supply of sandbags in line with the assessed need. This work links into Land Drainage's work on logging and sharing data on flooding locations via GIS and this will allow spatial analysis of sandbag requests.

For further information, please contact:

Mark Wilkinson  
Senior Emergency Planning Officer  
Tel: (0113) 24 74338  
Email: Mark.Wilkinson@leeds.gov.uk

## 13. Working in Partnership



For some years the Council has worked well with a wide range of partners in the improvement of our flood risk management. However, it has become increasingly clear that there are limits to what we can achieve through informal means and **we now need to work collaboratively** in more robust, formal ways if we are to achieve a step-change in our management of flood risk. The Pitt Review's conclusions have reinforced this message. We have therefore decided to re-address our partnership approach at several levels.



### Strategic Liaison

We have already agreed with our partners on the need to move from bilateral meetings with senior officers to create a multi-agency **Leeds Strategic Flood Risk Management Board** chaired by the Director of City Development encompassing Yorkshire Water, the EA and British Waterways. All other partnership forums would be required to report into this body to ensure that there is a complete overview of flood risk management work taking place with an impact on Leeds. This body would seek to: highlight the challenges faced in terms of flood risk; clarify one another's priorities, pressures and planned works; identify areas of planned work where greater co-operation is required to exploit synergies and avoid conflicts of interest; and commission joint projects to identify how the existing infrastructure could be evolved into one fit for the challenges of climate change. This forum will meet formally for the first time in July 2008.



### Technical Liaison

A **Leeds Flood Risk Technical Forum** with officers from the Council, Yorkshire Water and the EA has convened previously following flooding incidents, albeit on a relatively informal and ad hoc basis. We are now planning to place this group on a more formal footing so that it meets every 2-3 months, has clear terms of reference and the group's chair reports to the Leeds Strategic Flood Risk Management Board every 6 months. The group is intended to provide a forum for the assessment and investigation of technical issues of joint concern relating to drainage, flood management and flood defence risks/issues in Leeds. In practical terms, this is likely to include following-up incidents, the sharing of data, and agreeing risks and maintenance frequencies.



## Planning Liaison

Liaison between planning officers of key stakeholder organisations has also tended to be done on an informal basis, but at a meeting in September 2007 officers agreed that there was considerable merit in more formal co-operation. We are now taking steps to set-up a **Leeds Planning and Flood Risk Group** which will provide a forum for officers from the Council, Yorkshire Water and the EA to meet every two months in order to consider flood risk issues relating to planning and development control issues.

This new strategic approach to co-ordinating flood risk management links between key agencies also encompasses the Leeds Flood Alleviation Scheme, Aire Action Leeds (the successor to 'Eye on the Aire') and the West Yorkshire Local Resilience Forum's Flooding Sub-group.

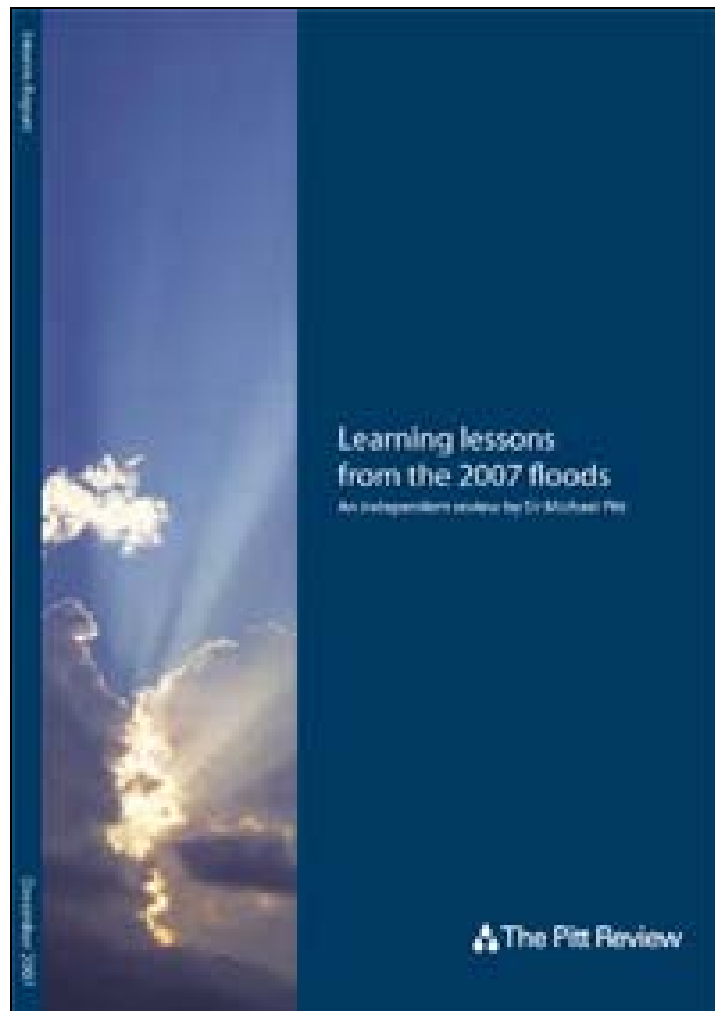
For further information about Working in Partnership, please contact the Group's Chair:

Richard Davies  
Head of Risk and Emergency Planning  
Tel: (0113) 24 74513  
Email: [Richard.Davies@leeds.gov.uk](mailto:Richard.Davies@leeds.gov.uk)

### 13. The Pitt Review

In December 2007, the Pitt Review published its interim findings in a report, ‘**Learning Lessons from the 2007 Floods**’, containing 92 interim conclusions or ICs (as supplemented by a further chapter in February 2008) and 15 urgent recommendations (all of which were accepted by Government). In March 2008 officers from WAMWG submitted a response to the report which welcomed the work and spelled-out how the work might be taken forward. Following our initial submission to the Inquiry in October 2007, officers from WAMWG have met with members of the Pitt Team on several occasions to discuss our experiences and illustrated to them what is needed through a visit to flood risk locations around the city.

It is already clear that the Pitt Review’s final recommendations will see **local authorities playing a much enhanced role in flood risk management** in a number of key areas. The following are two areas amongst a wider range of issues which are likely to figure heavily when the Review issues its final report in June 2008, although it is clear that many of these have already been taken on-board in recent DEFRA consultations.



#### Strategy and Ownership

The Review envisages a ‘new world’ for flood risk management informed by **a new statutory framework** that clarifies responsibilities and addresses all sources of flooding. Within this DEFRA would set national policy and the EA would provide a national and regional strategic overview providing the frameworks, tools, and mapping for local stakeholders. At the local level it is envisaged that **local authorities would lead on the management of surface**



**water flooding and drainage** with the support of all responsible organisations. This would involve: identifying areas at highest risk from surface water flooding and informing; compiling and maintaining a local register of all the main flood risk management and drainage assets, including an assessment of condition and details of responsible owners; developing Local Surface Water Management Plans as the basis for managing surface water flood risk to be accompanied by action plans setting out mitigating actions to be taken by partners; being the lead organisation in relation to multi-agency planning for severe weather emergencies and for triggering multi-agency arrangements in response to severe weather warnings. This implies a **major escalation of the flood risk management activities of the Council**, particularly the Land Drainage section.

## Planning, Development and Building Standards

The Review made a number of interim conclusions on planning and development which could have **far-reaching implications for our capacity** and where **permitted development** can occur. At a high level, it calls for PPS 25 to be rigorously applied by planning authorities, so that consideration is given to all sources of flooding risk and to ensuring that developers make full contributions to the costs both of building and maintaining any necessary defences. It also calls for the automatic right to connect surface water drainage of new developments to the sewerage system to be removed and for householders and business owners to no longer be able to lay **impermeable surfaces** as of right.

In terms of new buildings, it suggests that these should not be allowed in flood risk areas unless they are flood-resilient and that Government should incorporate **flood resistance and resilience requirements** for such properties into Building Regulations as part of the current process of revision. The Report also stated that Government should incorporate requirements for the resistant or resilient refurbishment of properties in high flood-risk areas which have been flooded into Building Regulations. It also foresees councils playing an active role in increasing the uptake of flood resistance and resilience measures in both domestic and business properties.

For further information about the Pitt Review, please contact the Group's Chair:

Richard Davies  
Head of Risk and Emergency Planning  
Tel: (0113) 24 74513  
Email: Richard.Davies@leeds.gov.uk

### Water Asset Management Working Group Terms of Reference

#### **Overall Objective**

To provide a forum for cross-departmental liaison on issues relating to the Council's water asset management responsibilities for reporting to the Director of City Development (quarterly) and City Development Scrutiny Board (annually).

#### **Specific Aims**

##### ***Corporate Consistency***

To provide a holistic approach to the identification and discussion of water issues within the Council focussed on the long-term needs of the city and community.

##### ***Legal Compliance***

To ensure that the Council's statutory, regulatory and common law responsibilities in relation to water assets are clearly stated and understood by relevant departments and that the relevant services conform with these.

##### ***Policy Conformance***

To ensure that Council policy on maintaining water assets and responding to floods is understood by relevant departments and that relevant services conform with this.

To review the Council's 'Policy on Maintaining Water Resources and Responding to Flood Incidents' on a regular basis to ensure this remains relevant.

##### ***Resilience and Continuous Improvement***

To maintain an up-to-date work programme seeking to ensure that the Council has plans, resources and investment strategies which fulfil Council policy, meet identified evolving needs and enhance the city's overall resilience to flooding.

##### ***Partnership Working***

To liaise on an on-going basis with Council services and external partners on issues impacting water assets in Leeds to ensure that appropriate solutions are implemented.

##### ***Awareness Raising***

To report to members and senior officers on progress and relevant issues on a frequent basis to ensure that water issues receive adequate attention.

##### ***Adding Value***

To ensure that – where possible – water assets are better exploited as community resources rather than being seen as risks to be mitigated.

##### ***Application and Sufficiency of Resources***

To review the application of existing revenue budgets and ensure resources are being effectively applied.

To provide advice to the Council on the appropriate level of investment required to fulfil our legal and policy commitments.

For further information about the work of the Water Asset Management Working Group, please contact the Group's Chair:

Richard Davies  
Head of Risk and Emergency Planning  
Tel: (0113) 24 74513  
Email: [Richard.Davies@leeds.gov.uk](mailto:Richard.Davies@leeds.gov.uk)

## APPENDIX 2: LOCATION OF IDENTIFIED HOT SPOTS FOR ENHANCED MAINTENANCE REGIMES

HOTSPOT	ASSET TYPE	INSPECTION	FREQUENCY
Hol Beck, Farnley Lane, Otley .	Highway culvert inlet grid	West	Fortnightly
Farnley Lane, Athelstan Lane, Otley	Highway culvert inlet grid.	West	Fortnightly
Kel Beck, Green Lane, Otley.	Highway culvert inlet grid.	West	Fortnightly
Hol Beck, Carr Bank Bottom, Otley.	Highway culvert inlet grid.	West	Fortnightly
Kel Beck, Weston Lane, Otley	Highway culvert inlet grid.	West	Fortnightly
Nunroyd Beck, Ghyll Royd, Yeadon.	Watercourse inlet grid, former railway culvert.	West	Fortnightly
Parkland View, off Henshaw Lane, Yeadon	Watercourse inlet grid, former railway culvert.	West	Fortnightly
Troydale Lane	highway culvert inlet grid.	West	Fortnightly
Nunroyd Beck, Leeds Road, Guiseley	Culvert entrance grid. Bridge no. 1005	West	Fortnightly
Red Beck, Oaklands Road	Watercourse culvert inlet grid	East	Fortnightly
Bagley Beck, Farsley Lane, Farsley	Watercourse outlet grid	East	Fortnightly
Stain Beck, Meanwood Road	Highway culvert inlet grid adj. Bridge no. 1082	East	Fortnightly
Throstle Carr Beck, Robin Hood	Watercourse culvert inlet grid	East	Fortnightly
Cock Beck, Barwick Road.	Highway culvert inlet grid. Bridge no. 1123	East	Fortnightly
Gledhow Lake, Gledhow Valley Rd, Gledhow	Outlet grid to lake and entrance to watercourse culvert	East	Fortnightly
Gledhow Lake, Gledhow Valley Rd, Gledhow	Sluice manhole, flow control chamber	East	Fortnightly
Wyke Beck, Halton Moor Grid	Watercourse culvert inlet grid	East	Fortnightly
Wyke Beck, Pontefract Lane Grid	Watercourse culvert outlet grid	East	Fortnightly
Mill Shaw Beck Outlet, Dewsbury Road, Balancing Pond	Outlet grid	East	Fortnightly
Mill Beck, Westwood Road - off Dewsbury Road	Watercourse culvert inlet grid and bridge no. 1184	East	Fortnightly
Farnley Wood Beck (14 Old Close - off Elland Road)	Open section of watercourse including bridge no. 1134	East	Fortnightly
Wykebeck Valley Road	Primary trash screen to watercourse	East	Fortnightly
Fleakingley Beck, Astley Lane, Swillington.	Astley Lane bridge no. 1152	East	Fortnightly
Kippax Grid, Hollins Beck, Station Road, Kippax	Inlet grid to watercourse culvert	East	Fortnightly
Southleigh Garth, Beeston	Highway culvert inlet grid.	East	Fortnightly
Gledhow Beck, Gledhow Valley Road, Gledhow	Inlet Grid to highway culvert, Bridge No 1127	New as at 11/12/06	Fortnightly
WykeBeck, Off Wykebeck Valley Road	Culvert beneath footbridge	New as at 11/12/06	Fortnightly
Off Middleton Grove, Middleton Park, Middleton, Leeds	Inlet Grid to watercourse culvert	New as at 11/12/06	Fortnightly
WykeBeck, Off Brooklands Crescent, Seacroft, Leeds	Pipe beneath bridge, Public sewer crossing watercourse	New as at 11/12/06	Fortnightly
Tyersal Beck, Tyersal Lane, off Smalewell Road, Pudsey	Footbridge-Ford across Tyersal Beck	New as at 11/12/06	Monthly
Finkle Lane, Gildersome	Inlet to culverted watercourse	New as at 11/12/06	Monthly
Swillington Lane, junction with Leeds Lane, Swillington, Leeds	Inlet to culvert beneath highway	New as at 11/12/06	Monthly

Off Queensway, Yeadon, Leeds	Inlet grid to watercourse culvert	New as at 11/12/06	Fortnightly
Mill Shaw Beck Inlet, Dewsbury Road, Balancing Pond	Inlet Grid	East	Fortnightly
Morwick Terrace, Off York Road, Scholes	Inlet to culverts beneath footbridge	New as at 14/5/07	Monthly
Kirkstall Lower Goit, off Kirkstall Rd, Kirkstall	Inlet Grid to Kirkstall Lower Goit	New as at 14/5/07	Monthly
Farnley Wood Beck, off Gelderd Rd, Beeston Royds	Inlet to culvert beneath highway	New as at 14/5/07	Monthly
Rocol, off Neville Grove, Swillington	Inlet to culverted watercourse	New as at 16/5/07	Monthly
Markham Avenue, Rawdon	Inlet grid to culverted watercourse	New as at 20/6/07	Monthly
Off High Ash Drive, Shadwell	Inlet grid to culverted watercourse	New as at 29/6/07	Monthly
Meagill Rise, Otley	Inlet grid to culverted watercourse	New as at 29/6/07	Monthly
Whincover Drive, Pudsey	Inlet grid to culverted watercourse	New as at 29/6/07	Monthly
(1) Off Holt Lane, Adel	Inlet grid to culverted watercourse	New as at 29/6/07	Monthly
(2) Off Holt Lane, Adel	Inlet grid to culverted watercourse	New as at 29/6/07	Monthly
(3) Off Holt Lane, Adel	Inlet grid to culverted watercourse	New as at 29/6/07	Monthly
Off Queenswood Drive, Adel	Inlet grid to culverted watercourse	New as at 29/6/07	Monthly
Station Road, Kippax	Inlet grid to culverted watercourse	New as at 2/7/07	Fortnightly
Off Ninelands Lane, Garforth	Inlet grid to culverted watercourse	New as at 5/7/07	Monthly
Airedale View, Rodley	Inlet grid to culverted watercourse	New as at 12/7/07	Monthly
R/O Holme View, Arthington, Leeds	Inlet grid to culverted watercourse	New as at 15/08/07	Monthly
Cookridge Lane, Cookridge, Leeds	Inlet grid to culverted watercourse	New as at 6/9/07	Two monthly
Scotland Lane, Horsforth, Leeds	Inlet grid to culverted watercourse	New as at 6/9/07	Two monthly
(1) Ring Road Farsley, Rodley, Leeds	Inlet grid to culverted watercourse	New as at 10/9/07	Two monthly
(2) Ring Road Farsley, Rodley, Leeds	Inlet grid to culverted watercourse	New as at 20/9/07	Two monthly
Brookfield Gardens, Rodley, Leeds	Inlet grid to culverted watercourse	New as at 12/9/07	Two monthly
Wilderness Woods, Temple Newsam	Inlet grid to culverted watercourse	New as at 30/10/07	Monthly
Off Gascoigne Road, Thorpe, Leeds	Inlet grid to culverted watercourse	New as at 30/10/07	Monthly
(1) Topcliffe Beck, Off Watering Meadow, Morley, Leeds	Inlet grid to culverted watercourse	New as at 14/11/07	Two monthly
(2) Topcliffe Beck, Off Watering Meadow, Morley, Leeds	Inlet grid to culverted watercourse	New as at 14/11/07	Two monthly
(3) Ring Road Farsley, Rodley, Leeds	Inlet to culverted watercourse	New as at 17/03/08	Two monthly
Kentmere Avenue, Seacroft, Leeds	Inlet to culverted watercourse	New as at 17/03/08	Monthly
East Chevin, Otley, Leeds	Inlets (various)	New as at 17/03/08	3 - Monthly
Kirkstall Abbey	Inlet to Goit Sluice Area	New as at 9/04/08	Two monthly
(4) Ring Road Farsley, Rodley	Inlet to culverted watercourse	New as at 24/04/08	Two monthly