National Audit Office

ENVIRONMENT AGENCY

Building and maintaining river and coastal flood defences in England

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SUMMARY

1 Around 469,000 households and businesses in England are at significant risk of flooding. Flooding can damage property and belongings, and any householders affected face the stress and inconvenience of having to move into temporary accommodation while their home is cleaned, allowed to dry out and repaired.[1] The cost of flooding will depend on the scale of damage and nature of the property, but existing research suggests that flood repairs can be up to £40,000 per household.[2] The Environment Agency expects the risks of flooding are likely to rise significantly over the next century as a result of, for example, climate change and the building of new houses.

2 The Environment Agency (the Agency) is responsible for managing the risk of flooding from "main" rivers and the sea in England and Wales.[3] The Agency's functions include the construction of new flood defences (£162 million in 2006-07), the maintenance and operation of existing flood defences (£176 million), as well as raising public awareness of the dangers of flooding and responding when such incidents arise (£39 million). The Agency has developed information and warning systems so that the public can determine whether their property is liable to flooding and register to receive automated advance warnings if a flood is likely to occur. Minimising the financial cost of flooding, however, largely depends upon the effectiveness of the flood defences, and this report focuses on the Agency's construction of new flood defences and the maintenance of 24,000 miles of flood defences and 46,000 flood defence structures.

Summary text continued

3 At the time of our last report on flood defences in 2001[4], 20 regional and local flood defence committees were responsible for overseeing the management of flood defences in England. Since then, the numbers have been streamlined to 11 regional committees and funding arrangements have changed so that the Environment Agency now receives a single grant-in-aid from the Department for Environment, Food and Rural Affairs (the Department) to allocate to the committees. Whilst the 11 flood defence committees still have a formal role in flood risk management in their local area, the Agency has started to recommend priorities to them on the basis of needs nationally. The Agency has also taken over responsibility for the management of critical ordinary watercourses from local authorities and internal drainage boards, and the Department is considering whether the Agency should also take on a greater role in coastal protection from local government. The key improvements in performance we identified during our examination were:

- **Greater oversight of flood risks.** The Agency implemented the 2002 Spending Review and recommendations from the 2003 Flood and Coastal Defence Funding Review which included taking on new duties, such as the responsibility for certain important rivers (known as critical ordinary water courses) from local authorities and internal drainage boards and integrated them into its existing inspection and maintenance regimes. In addition, the Agency is developing a more strategic approach to managing systems of neighbouring defences within individual river catchment areas as part of a shift in thinking, by the Agency and the Department, from flood defence to flood risk management more broadly.
- **Improved management of major construction projects.** Our examination confirmed that the Agency had improved its cost control by establishing a centralised team to oversee more complex construction work and through better risk management. The forecast outturn costs of the 43 major projects completed in 2005-06 were 7.2 per cent less than the total pre-construction estimates.
- **Protecting more people.** The Agency improved the standard of protection for 100,000 houses between 2003-04 and 2005-06 against the target which the Department set for the Agency of 80,000. The Agency appears to be on track to exceed a second target to protect 85,000 properties in England and Wales between 2005-06 and 2007-08. In addition, the Agency has mapped the probability of flooding for almost all the land in England and Wales. Over 99 per cent of properties are now covered and the information is available to householders for free at its website (www.environment-agency.gov.uk). Almost 300,000 of those properties at highest risk are now registered on the Agency's free, direct flood warning service.
- **The Agency has established a more rigorous system for classifying, recording and monitoring the condition of flood defence assets.** The Agency's database included a more comprehensive list of flood defences compared to when we conducted our previous examination. Our consultants, Atkins, also confirmed that the inspection process developed by the Agency was effective and practical.

4 Building on this progress, this report sets out those areas where there is room for further improvements in the Agency's value for money performance. The Committee of Public Accounts' previous report on flood risk management in 2001 concluded that complex organisational arrangements had led to inconsistent service levels across England.[5] Although the arrangements have been simplified, levels of expenditure on locally managed construction and maintenance work continue to vary across the country and do not yet adequately reflect the risk of flooding in each region. In addition, there may be an imbalance between the Agency's focus on the construction of new flood defences and its maintenance of existing assets. The Agency has not met its target to maintain 63 per cent of flood defence systems in target condition; and the Agency estimates that only 57 per cent of all systems and 46 per cent of high risk systems, such as those protecting urban areas, are in their target condition, with consequent risks should a flood occur.[6] In practice, however, the Agency's investigation of the autumn 2000 floods found that instances of flood defences failing were rare (less than one per cent of flooding was due to such instances).[7] Until the Agency develops more comprehensive data on the typical lifespan and maintenance costs of its assets, it is difficult to establish future resource requirements accurately, although the Agency has estimated that it requires an additional £150 million a year. In the meantime, there is scope to improve cost-effectiveness and thus reduce any additional funding that may be required.

5 To improve cost-effectiveness, the Agency needs to address:

- **Inconsistencies in the management of assets across the country.** Our analysis of Agency expenditure found that whilst all regions spent a higher proportion of their maintenance budget on high risk systems than on low and medium risk systems, the share on high risk systems varied from 24 per cent in the North East to 67 per cent in the Midlands and Thames. The variations reflect the fact that the Agency has only recently adopted a risk-based approach and are also a result of historic imbalances in the funding available to regional and local flood defence committees before the Agency started to receive a single grant-in-aid from the Department in 2004-05.

- **The absence of reliable data on the lifespans of assets while scientific research is ongoing.** As a result, the focus is on repairing faults identified rather than weighing up future maintenance requirements against the cost of asset replacement. The Agency confirmed that it is planning to develop asset plans to address this for a sample of 200 flood risk management systems across all areas during 2007. Deciding whether an asset should be replaced and the best time to do this should also be driven by the flood risk management policy for the whole river catchment or stretch of coastline. The Agency only expects, however, to complete 40 of its 68 Catchment Flood Management Plans (which set out a long term strategic plan for how flood risk should be managed in a river catchment or basin) by its December 2007 deadline and has set a new target for completion of December 2008.

- **The lack of a clear management policy for dealing with assets owned and managed by third parties.** Many of the flood defence assets on the Agency's database are owned and managed by third parties and the proportion in good or very good condition is lower than for Agency maintained assets. The Agency has very limited powers to force other bodies to improve the condition of their assets but does not necessarily notify the relevant third party when Agency inspections identify faults. The Agency is developing a national policy on the management of third party assets and seeking to codify regional land drainage by-laws which give powers over owners of structures obstructing the river channel.

- **The need for further changes to existing work practices.** The Agency's local construction and maintenance regimes are still influenced by long-standing working practices but are slowly responding to emerging issues, such as the greater emphasis on high risk defences. The Agency employed a workforce of 1,400 staff in 2005-06 (at a cost of £45 million) compared to 1,570 in 2001 to respond to flooding incidents, maintain flood defences and river channel capacity, carry out environmental and conservation works and minor construction projects.[8] From April 2007, the Agency substantially revised the pay structure of the workforce and reduced the number of allowances. The Agency had not yet devised common standards for some areas of its work, such as grass cutting, however, and has thus made only limited progress in benchmarking costs between areas and with other organisations.

- **The focus on the construction of new flood defences to protect large numbers of additional households and to meet the Department's Public Service Agreement target is unlikely to benefit smaller rural communities.** These less densely populated communities have not generally scored highly enough on the Department's assessment system to qualify for funding. In these circumstances, other possible solutions may be applicable, such as temporary or demountable flood defences. The use of such defences depends on the geographical conditions on site, such as whether the ground is level. Temporary and demountable defences have proved successful in trials in the Midlands but have not been widely used elsewhere. The Department and the Agency expect a new prioritisation system based on outcome measures to provide a more balanced approach.

- **The proportion of construction funds spent developing proposals, which limits the number of schemes that could otherwise be built.** According to the Agency's data, £76 million out of the £266 million construction expenditure in 2005-06 was on programme and project development, amounting to 29 per cent. Our analysis of planned spend in 2007-08 indicates that only 33 new projects are expected to start and 84 per cent of funds will be utilised on existing commitments. The Agency has an initiative under way to streamline the decision making process for flood defence construction schemes.

- **Weaknesses in its data systems.** 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 was not designed as an asset or work management system and it cannot hold data on the maintenance history of each flood defence or clearly link the inspection results to records of maintenance carried out. The Agency has taken steps to improve system performance but it is still unwieldy when extracting large volumes of data. The Agency has set a number of targets relating to maintaining and building defences in England but has found it difficult to collect sufficient data to monitor these effectively. For example, it is unable to produce a report which gives an accurate and satisfactory report of system condition, partly because not all the required data have yet been entered. By 2006-07, the year in which it was supposed to be met, the Agency had only just managed to set a baseline against which to measure progress against its target to reduce the cost of development and inception to 20 per cent of total project costs. The Agency has recently started to collect a central list of all flood defence projects, including those which are regionally managed. The Agency conducted only 26 post project appraisals between April 2001 and March 2006.

6 We recommend that the Agency:

i) Focuses attention more consistently on the maintenance of those flood defences which are considered to be medium or high risk. Area managers should develop maintenance strategies and work programmes to reflect this approach.

ii) Implements a national management policy for dealing with third party assets. Whilst the Agency may not have the authority to enforce repairs, the Agency should nevertheless bring such defects to the attention of the landowner or third party. The strategy should include a risk-based approach of writing to landowners or other third parties to highlight any significant deficiencies identified during inspection, the consequent risk to neighbouring land and property, and what actions they consider are necessary.

iii) Draws upon the findings of the planned benchmarking exercise to generate real maintenance efficiency savings by applying good practice from similar public and private sector organisations and from within the Agency's areas and regions more widely across the Agency.

iv) Introduces the planned improvements to training for staff involved in maintenance and emergency response during 2007. Regional managers should incorporate a minimum training requirement into staff objectives to monitor and encourage attendance on suitable training courses.

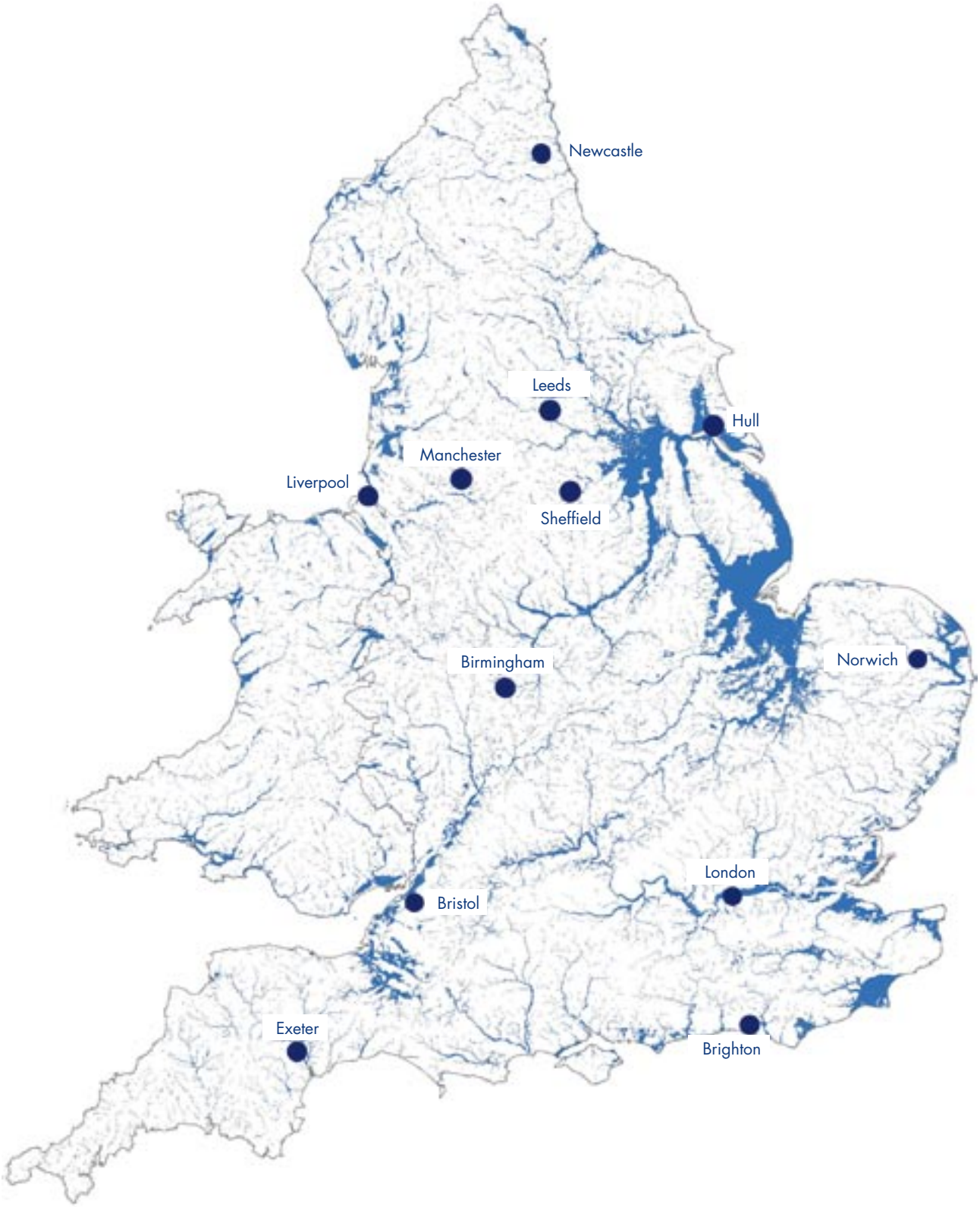
v) Conducts a review in accordance with OGC good practice at the end of each major project to determine whether benefits were realised and identify any lessons learned. The extent of each review should be tailored to the size and nature of the associated scheme, and the results held centrally so that they are accessible by other areas and regions.

vi) Streamlines its approval process so that detailed plans are not commissioned until the proposed project has been through a simplified gateway review and work is likely to start within, for example, the next two to three years, drawing on the current project by the Agency to reduce the costs of project development.

vii) Make improvements to the computer asset database, in particular to:

- Assess the long term suitability of the current computer database and if applicable, set out a timetable for the possible development of a replacement, drawing on the outcome of its current review;
- Improve its suite of reports which can be run nationally from the asset database each month to monitor progress by areas and regions in improving the condition of high and medium risk systems, improving data quality and completing inspections;
- Improve the quality and usability of data on asset management by delivering its targets for areas to include all information on the database, and including a cross reference on each inspection report to confirm that the remedial work has been done and where the paper based record can be found;
- Confirm that, following inspections, key remedial works identified have been completed satisfactorily, applying a risk-based approach so that more significant defects are followed up by inspectors, while more minor works can be checked by the maintenance manager on site.

1 The Environment Agency's analysis of the flood zones in England and Wales



Source: Environment Agency

NOTE

The map does not take account of flood defences.