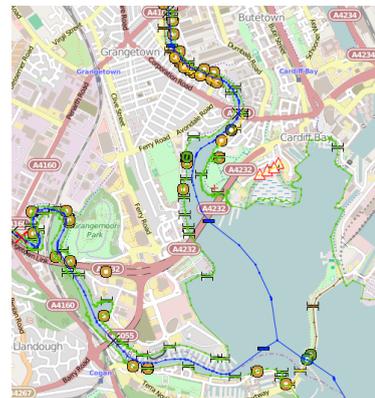




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# Wales Coastal Flooding Review Project 6 Report – Recommendations 31 & 32



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## Context

Following the coastal flooding of late December 2013 and early January 2014, the Minister for Natural Resources, asked Natural Resources Wales (NRW) to undertake a two stage Review into the coastal flooding events. The Minister requested that the Review be undertaken in collaboration with all Risk Management Authorities in Wales. Phase 2 of this Review identified 47 Recommendations for future progression and in January 2015 NRW published a Delivery Plan outlining a proposed way forward to address each Recommendation. The Minister directed NRW to collaboratively implement the Delivery Plan in 2015/16 with supporting funding made available.

Thirty of the Recommendations have been packaged into ten Projects to reflect common themes. The remaining seventeen Recommendations stand independently outside of these projects with individual leads for progression.

The 10 Projects and their broad technical themes are listed below:

Project 1 – Flood Forecasting and Coastal Design

Project 2 – Flood Warning and Forecasting

Project 3 – Community Resilience

Project 4 – Operational Response

Project 5 – Coastal Defences

**Project 6 – National Coastal Defence Dataset and Inspection**

Project 7 – Skills and Capacity Audit and Roles and Responsibilities

Project 8 – Review of Coastal Groups

Project 9 – Coastal Adaptation

Project 10 – Infrastructure Resilience

Recommendation 31 and 32 form Project 6 – **National Coastal Defence Dataset and Inspection**. This document gives an overview of the considerations and proposals for Recommendations 31 and 32.

## Background to Recommendations

Project 6 of the Delivery Plan addresses two of the 47 Recommendations identified. They are two separate but closely linked areas of flood risk asset management - asset data management (Recommendation 31) and asset inspection (Recommendation 32). The requirements of the two Recommendations can be found in full in Appendix 1.

The initial focus of the project was on Risk Management Authorities (RMAs) who maintain and inspect flood risk assets on the coast. However, many of the issues raised apply equally to 'landlocked' Authorities. As a result, it was decided at an early stage to include RMAs without a coastal element in the exercise. A complete list of the RMAs, and other organisations who took part in the exercise, can be found in Appendix 2.

The aim of the report is to investigate the issues raised through the Wales Coastal Flooding Review (WCFR) and to evaluate the options available in addressing them. Finally, a set of specific asset data management and inspection recommendations are made to improve how these vital areas of flood risk management are delivered in Wales in the future.

## Approach taken for Project 6

A key element of the project was to understand how asset data management and inspection are currently being carried out by RMAs in Wales. Such information will help to formulate views on what opportunities and barriers exist to achieving the Recommendations. To get this understanding of how asset data management and inspection is carried out, two information gathering exercises were used. These were:

### ***RMA questionnaire:***

There are currently 28 RMAs in Wales. It is important to get a baseline level of understanding of how asset data is managed and assets inspected amongst the various RMAs across Wales. A questionnaire was issued in July 2015 to all Local Authorities (LAs) in Wales plus Network Rail, Dwr Cymru Welsh Water (DCWW) and both Trunk Road Agencies. The timing of the questionnaire was co-ordinated with other WCFR surveys to avoid excessive workloads on RMAs.

The questionnaire was designed so that it could be completed relatively quickly – typically around 30 minutes. It consisted of simple tick boxes and free text sections to allow the recipients to elaborate on their answers where required.

### ***Natural Resources Wales (NRW) coastal asset data review:***

Although it was decided that Project 6 would encompass assets across the whole of Wales, the quality of asset data on the coast was given specific focus. A review was carried out of coastal asset data held on the NRW asset management database called Asset Management eXpert (AMX). The first phase of AMX was launched in July 2015 as a replacement for the legacy Environment Agency (EA) asset management database. The review focussed on the frequency of inspection between NRW Areas and whether asset ownership was a factor in how often an asset is inspected.

## ***Rec 31: Produce a complete national dataset of coastal protection and defence assets including details of areas benefitting.***

### **Flood risk asset data management**

In general, asset ownership can be broadly grouped into three main categories – NRW, LA or third party owned.

On the coast, flood risk assets come in two main types - coastal protection and flood defence assets. Coastal protection works are designed to offer protection against erosion by the sea and are generally the responsibility of LAs. Flood defences are intended to prevent inundation by the sea, and are generally the responsibility of NRW. For inland watercourses, powers to build and maintain flood risk management structures are spread across NRW and LAs dependent on whether the watercourse is designated as a Main River or Ordinary Watercourse respectively.

Third party asset owners own and maintain a considerable proportion of assets along rivers and the coast. Third party assets sometimes act as flood defences even though they may not have been constructed for flood protection purposes in the first instance.

Having good quality data on assets that operators own and maintain is a vital component of successful asset management. This applies equally to flood risk management assets, where having a good level of understanding of the asset stock is important not only on a day-to-day operational level, but also on a strategic level for longer term investment planning.

The importance of having a comprehensive and up-to-date database of flood risk assets has been acknowledged for some time. Successive post flood event reviews such as the Bye Report (1998) and Pitt Review (2008) have highlighted the need for a database of not only RMA assets, but also third party owned assets that have an impact on flood risk. The ability of this information to be shared widely amongst RMAs has also been identified as an important requirement.

The last fifteen years has seen developments in the area of flood risk asset systems to tackle these issues. The creation of the National Flood and Coastal Defence Database (NFCDD), Asset Information Management System (AIMS) and the recently developed AMX system, have brought about improvements in how flood risk asset data is managed in Wales. Wider use of these systems amongst other RMAs was envisaged, with LAs especially expected to make use of the new technology to manage the assets that they were responsible for. However, due to the very specific hardware and software configuration requirements, there has been limited take-up of the systems outside of NRW.

## RMA asset data management questionnaire

The first section of the questionnaire focussed on asset data management within RMAs. The questions were aimed at gathering key, high level information on:

- The flood risk asset data that is stored.
- The means of storing the data e.g. paper, asset management IT.
- The number of flood risk assets maintained.
- Future development plans for asset management IT.

The main findings of the survey and the review of NRW coastal asset data were:

- All RMAs store information on their assets in some format.
- On the whole the key fundamental asset datasets are in place. This includes asset data fields such as the owner, asset type, location and National Grid Reference (NGR).
- Over 60% of the respondents showed interest in using the AMX system in the future. This could be through flood risk teams purchasing the system themselves or utilising the AMX system currently being used in other team's e.g. street lighting.
- The information stored on asset maintenance work and inspection varies between RMAs.
- There is little evidence of asset data being used for long term investment planning.
- There is limited information on the benefits that those flood risk assets provide, e.g. number of properties protected.
- There is very limited information kept by LAs on third party assets on Ordinary Watercourses.
- The questionnaire returns suggest a wide variation in the numbers of staff in flood risk management teams across RMAs in Wales. This may impact on their ability to populate and maintain flood risk asset data in the future. The skills and capacity required for RMAs to carry out this area of flood risk management work will be addressed through Project 7 of the Wales Coastal Review Delivery Plan. The findings of this section of the questionnaire have been supplied to the Project 7 lead for consideration.

## Asset data management options

From analysis of the survey responses, the following potential options in addressing the requirements of Recommendation 31 have been identified. The inherent benefits and drawbacks of each option are also listed.

| Option   | Benefits   | Drawbacks  |
|--|--|--|
| <b>1. Do nothing option</b>  | <ul style="list-style-type: none"> <li>Familiarity amongst all RMAs with the current systems that are in place.</li> <li>No additional costs in terms of time and money in creating a consistent asset database.</li> </ul>  | <ul style="list-style-type: none"> <li>There will be no consistent asset dataset in place on the coast or inland.</li> <li>Different asset data formats across all RMAs.</li> <li>Unable to make longer term investment decisions as part of the Flood and Coastal Investment Programme (FaCIP)<sup>1</sup> due to different data formats.</li> <li>It will take longer to find out who owns and maintain specific assets.</li> <li>It will be a lengthy and drawn-out process to understand the wider ownership and condition of the asset stock across Wales.</li> <li>Access to key asset data, pre, during and post flood event, will be difficult.</li> </ul> |
| <b>2. All RMAs purchase their own individual AMX asset management package with agreement to have consistent core asset dataset fields and 'pick lists'</b> | <ul style="list-style-type: none"> <li>Consistency in using the same software provider.</li> <li>Allows greater freedom and flexibility for RMAs to create and manage their own asset data outside of core fields.</li> <li>Potentially greater purchasing power with suppliers if buying in bulk.</li> <li>Access to asset management system for all RMAs – 'live management tool' allowing immediate access and updating.</li> </ul> | <ul style="list-style-type: none"> <li>Concerns over the ability of the software providers to be able to deal with high volume of work.</li> <li>Many RMAs taking up the AMX system individually could be very expensive.</li> <li>Possible procurement rule issues.</li> <li>Some LAs have established and well developed asset management systems in place already.</li> <li>Availability of resources to keep the database maintained.</li> <li>Would require co-ordination of RMAs to get an all Wales picture of asset performance.</li> </ul>  |
| <b>3. LAs gain access to the NRW version of AMX and store their assets on the NRW system</b>   | <ul style="list-style-type: none"> <li>A full 'live management tool' with consistent asset datasets across all RMAs.</li> <li>Potentially cheaper since only one system is being used.</li> <li>Consistent format for all assets whether on the coast, Main River or Ordinary Watercourse.</li> </ul>  | <ul style="list-style-type: none"> <li>Concerns over the speed of the system with many remote users accessing it at the same time.</li> <li>Lack of control for RMAs in developing the system for their own local requirements.</li> <li>Possible security concerns regarding integrity of asset information.</li> </ul>   |

<sup>1</sup> The Welsh Government is the primary funder of flood and coastal erosion risk management in Wales and the Flood and Coastal Investment Programme is the proposed new way to prioritise funding nationally according to risk.

|  |   |  |
|--|---|--|
| <p><b>4. NRW AMX database is used to store data on other RMA assets, particularly LA assets on Ordinary Watercourses. Local authorities supply NRW with information on their assets.</b></p> | <ul style="list-style-type: none"> <li>• A consistent national asset dataset would be achieved.</li> <li>• Uses NRW data fields for the coast, Main River and Ordinary Watercourses.</li> <li>• Recognised asset fields and inspection process for all assets.</li> <li>• Could be used for future investment planning (FaCIP) in comparing asset condition for all assets.</li> <li>• Relatively few key assets to input and inspect.</li> </ul> | <ul style="list-style-type: none"> <li>• Increased workloads particularly in the short term for NRW in gathering and inputting other RMA data.</li> <li>• LAs can't manage the data on a regular basis.</li> </ul> |
|--|---|--|

## ***Rec 32: Review and identify options to achieve a more consistent approach to the inspection of the network of coastal defence systems.***

### **Flood risk asset inspection**

Asset inspection is a key component of flood risk asset management. The inspection process provides valuable information on the condition of assets both individually and collectively in monitoring the overall state of the asset stock an organisation manages.

All flood risk assets are subject to deterioration over time, especially those exposed to coastal and tidal processes. Some flood risk assets experience sudden, rapid failure while others deteriorate over a longer timeframe. A robust and consistent inspection process is vital in identifying flood risk assets that require an urgent repair or those where an initial visual inspection may trigger further investigation. Having a series of inspections over time also provides a useful input into prioritisation for asset investment planning.

The need for a consistent, risk based asset inspection regime was highlighted in the Bye Report (1998) following the Easter 1998 flood event. The post event investigation found key flood defences and structures were either missing or in a poor condition. Of particular concern was the lack of information on the condition of third party assets which, although not constructed as such, act as a flood defence in protecting people and property.

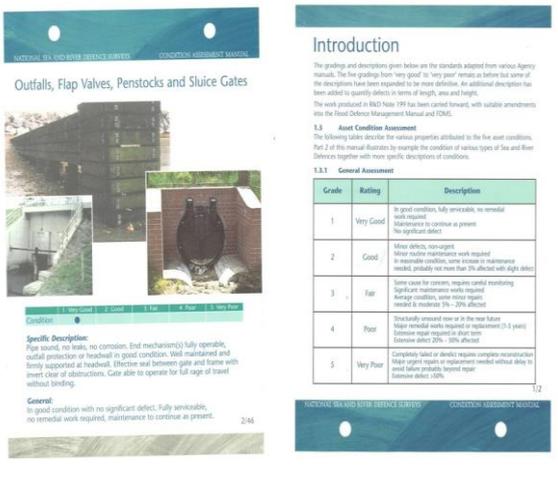
Alongside the creation of the NFCDD asset database, a consistent, risk based asset inspection regime was implemented. This involved the condition assessment of all flood risk assets on the coast and on Main River watercourses. The asset inspection process has remained fundamentally unchanged since its inception, and continues to be used by the EA in England and by NRW today.

## Flood risk asset inspection in Natural Resources Wales

NRW has a well-established visual asset inspection process that has been in place since the early 2000s. On average, around 14,000 inspections are carried out in Wales by NRW each year by a dedicated team of accredited asset inspectors. While some amendments and improvements have been made, the core elements of the process have remained unchanged since its development.

The key elements of the NRW asset inspection process are:

- A full time, dedicated team of eight asset inspectors in Wales.
- Consists of a visual asset inspection process with a scoring system between 1 (Very Good) and 5 (Very Poor).
- All assets on Main River and the coast are inspected including LA and third party maintained assets.
- The programme of asset inspections is risk based. Inspections are carried out on a frequency between 6 months and 5 years dependent on the degree of flood risk.
- Inspectors have to attain and maintain a formal accreditation called T98 to carry out asset inspection. Inspectors are re-assessed every five years to keep the accreditation.
- The Condition Assessment Manual (CAM) is used to drive consistency in the grading of flood risk assets.



A section of the CAM Manual and NRW asset inspectors in the field

## Flood risk asset inspection questionnaire

The asset inspection section of the questionnaire focussed on how flood risk assets are currently being inspected by RMAs. The questions covered a range of issues, the main being:

- If an inspection process is in place.
- The method of inspection e.g. visual, structural.
- The people who carry out the inspections and their qualifications.
- The frequency of inspection.

The key findings of the asset inspection element of the survey and AMX coastal data review were:

- There is inspection of assets being undertaken in all RMAs of some description.
- The majority of assets are visited at least annually.
- While the majority of assets are being checked on a regular basis, the purpose tends to be for operational reasons and not to assess the overall condition of the asset itself. A typical inspection may be following receipt of a heavy rainfall warning where culvert screens are checked to make sure they are clear of debris prior to the event.
- While inspection of key LA assets is carried out, there is very little in the way of inspection of third party assets on Ordinary Watercourses.
- There is no standard methodology used in condition grading flood risk assets amongst RMAs. Methods range from scoring systems through to written reports.
- Relatively few RMAs (25%) have a dedicated asset inspection team. The majority of inspections are carried out by field team operatives who carry out routine maintenance e.g. screen clearance.
- There are inconsistencies and gaps in the inspection frequency on the coast. Several NRW maintained coastal structures do not have an inspection frequency displayed or are not programmed to be inspected at appropriate intervals.

## Flood risk asset inspection options

Following analysis of the survey responses the following potential options in addressing Recommendation 32 have been identified. The inherent benefits and drawbacks of each option are also listed.

| Option  | Benefits  | Drawbacks   |
|---|---|---|
| <b>1. Do nothing option</b>   | <ul style="list-style-type: none"> <li>Familiarity amongst all RMAs with their current inspection processes.</li> <li>No additional costs in terms of time and money for start- up training.</li> <li>No increased costs in creating a dedicated asset inspection regime.</li> </ul>  | <ul style="list-style-type: none"> <li>No like-for-like comparison of the condition of assets amongst RMAs in Wales.</li> <li>Other asset management authorities using the EA/NRW model e.g. Network Rail. Lack of consistency.</li> </ul>  |
| <b>2. NRW asset inspectors carry out all inspections on the coast, Main River and key assets on Ordinary Watercourses.</b>        | <ul style="list-style-type: none"> <li>Consistency in asset inspection for all assets, consistent methodology.</li> <li>The ability to have a whole Wales picture of flood risk asset condition for Welsh Government.</li> <li>More flood risk focussed inspection regime in Wales.</li> <li>New challenge for NRW asset inspectors.</li> <li>Improved understanding of the wider flood risk issues, not just Main River.</li> <li>No additional costs to train other inspectors in T98.</li> </ul> | <ul style="list-style-type: none"> <li>Not a 'live' management tool from an asset inspection standpoint.</li> <li>Increased workloads for NRW asset inspectors.</li> </ul>  |
| <b>3. Staff from LAs are trained in T98 and carry out their own inspections and supply information to NRW for input onto AMX.</b> | <ul style="list-style-type: none"> <li>All RMAs take ownership and embed a consistent asset inspection process.</li> <li>New mentoring role for NRW Inspectors in assisting RMA inspectors.</li> <li>Wider pool of trained inspectors to carry out the task and cover during heavy workloads, e.g. gathering post flood event information.</li> </ul>   | <ul style="list-style-type: none"> <li>Expensive to train the candidate inspectors and to supply equipment in the short term.</li> <li>NRW have to forward on inspection reports and issues which takes time.</li> <li>Additional work for NRW to input inspections on the NRW AMX system.</li> </ul> |
| <b>4. Staff from LAs are trained in T98 and input inspection data onto local asset management system, preferably AMX.</b>         | <ul style="list-style-type: none"> <li>As above but RMAs have immediate access to the condition of their assets.</li> <li>Consistent asset inspection process used amongst all RMAs.</li> <li>Wider pool of trained inspectors to carry out the task and cover during heavy workloads, e.g. gathering post flood event information.</li> </ul>  | <ul style="list-style-type: none"> <li>Any reports for asset condition information has to be requested and co-ordinated.</li> <li>Costs to get staff trained and to supply the Condition Assessment Manual (CAM).</li> </ul>  |

## Project 6 Recommendations

An appraisal of the options, acknowledging their relative benefits and drawbacks, was carried out to address the requirements of Project 6. The proposals on how asset data management and inspection are taken forward in the future are listed below.

### Asset data management Recommendations (Rec 31)

- The NRW AMX asset management system should be used to store the flood risk asset information for all RMAs in Wales. Other RMAs to supply NRW with asset data in a suitable format for placement on the NRW AMX system. (*Asset data management - Option 4*).
- Where AMX is being purchased by other RMAs, the same AMX system architecture currently used in NRW should be used. This will ensure that all key asset data fields are consistent across RMAs in Wales.
- NRW Area flood risk teams to review their respective coastal asset datasets on AMX. This is to ensure that all flood risk assets have been captured and have the correct inspection frequency assigned to it.

### Flood risk asset inspection Recommendations (Rec 32)

- The current inspection methodology used in NRW should be adopted across all RMAs in assessing the condition of flood risk assets in Wales. This would include the 5 point asset condition grading system.
- T98 accreditation courses in asset inspection to be arranged to train other RMA representatives to carry out flood risk asset inspections for their respective areas.
- In the short term, NRW asset inspectors to carry out inspection of the key flood risk assets identified by the other RMAs. It is proposed that inspections in low flood risk areas on Main Rivers will be temporarily stopped or reduced. This will be until representatives of the other RMAs achieve the T98 accreditation in asset inspection and can carry out inspections themselves. (*Asset inspection - Option 2, moving to Option 4*)
- A rebranded version of the EA Condition Assessment Manual to be developed for use across all RMAs in Wales.

## Conclusion

It is envisaged that the recommendations given in the preceding section will help to provide improved access to flood risk data and greater consistency in the way it is stored across all RMAs in Wales. They will also provide benefits in the day-to-day management of flood risk assets and will help to inform decisions on flood risk asset investment in the longer term. The recommendations will also encourage RMAs to work in closer partnership especially in the area of flood risk asset inspection.

Asset data management and inspection are key elements of good flood risk management. It is hoped that the recommendations put forward in this report will improve the delivery of these two vital components in the future, and so take forward the intended outcomes that lie behind Recommendations 31 and 32 of the Wales Coastal Flooding Review.

## Appendices

### Appendix 1 – Wales Coastal Flooding Review Recommendations

**Rec 31: Produce a complete national dataset of coastal protection and defence assets including details of areas benefitting.**

**It is essential that this dataset becomes a ‘live management tool’ and not merely a representative picture of a snapshot in time. This dataset must therefore be associated with a process for ensuring the information is maintained.**

**Lead:** Natural Resources Wales      **Partners:** Risk Management Authorities, Asset Owners

#### **Current Status: Ongoing**

- Natural Resources Wales are replacing their existing Flood and Coastal Risk Asset Management system called AIMS. This system was brought over from the Environment Agency, one of their legacy bodies.
- Development and Implementation work by an appointed contractor starts in November 2014. The first phase of the solution is expected to go live in March 2015.
- Risk Management Authorities have their own approaches to collection and storage of coastal data.
- Other partners have their own approaches to collection and storage of coastal data.

#### **Methodology type: Task and Finish**

- Link with Recommendation 32.
- Establish a task and finish group to identify and evaluate options, with consideration given to opportunities risks and constraints.
- Review and evaluate existing datasets and approaches.
- Identify the national requirements.
- From the above identify gaps, risks and opportunities.
- Identify and evaluate options.
- Produce a report evaluating options and generating recommend way forward.
- Delivery of this Recommendation should include consideration of Recommendations from the ‘Welsh Coastal Storms, December 2013 & January 2014 – an assessment of environmental change’ report delivered under Recommendation 36.

**Rec 32: Review and identify options to achieve a more consistent approach to the inspection of the network of coastal defence systems. This must include recommendations to improve the efficiency and effectiveness of the asset inspection process.**

**Lead:** Natural Resources Wales      **Partners:** Risk Management Authorities, Asset Owners

**Current Status: Ongoing**

- Early scoping of implications and need to incorporate into consideration of Recommendation 31.

**Methodology type: Task and Finish**

- Align and incorporate this Recommendation into Recommendation 31.
- Establish a task and finish group to identify and evaluate options, with consideration given to opportunities, risks and constraints.
- Consider and evaluate a common approach to asset inspection and assessment methodology.
- Review and evaluate current inspection methodologies and consider opportunity to implement a common, consistent approach.
- Consider and evaluate opportunities to improve efficiency and effectiveness of the asset inspection process, both at a local and national scale.
- Consider practical implications of implementing any changes.
- Produce a report evaluating options and generating recommendations.
- Delivery of this Recommendation should include consideration of Recommendations from the 'Welsh Coastal Storms, December 2013 & January 2014 – an assessment of environmental change' report delivered under Recommendation 36.

## Appendix 2 – Risk Management Authorities who took part in the exercise

| <b>Risk Management Authorities (RMAs) consulted</b> | <b>Coastal element or landlocked</b> |
|---|--------------------------------------|
| The City of Cardiff Council                         | Coastal and inland                   |
| Monmouthshire County Council                        | Coastal and inland                   |
| Newport City Council                                | Coastal and inland                   |
| Vale of Glamorgan Council                           | Coastal and inland                   |
| Bridgend County Borough Council                     | Coastal and inland                   |
| Neath Port Talbot County Borough Council            | Coastal and inland                   |
| City and County of Swansea Council                  | Coastal and inland                   |
| Carmarthenshire County Council                      | Coastal and inland                   |
| Pembrokeshire County Council                        | Coastal and inland                   |
| Ceredigion County Council                           | Coastal and inland                   |
| Gwynedd Council                                     | Coastal and inland                   |
| Conwy County Borough Council                        | Coastal and inland                   |
| Denbighshire County Council                         | Coastal and inland                   |
| Isle of Anglesey County Council                     | Coastal and inland                   |
| Flintshire County Council                           | Coastal and inland                   |
| Wrexham County Borough Council                      | Non-coastal (landlocked)             |
| Powys County Council                                | Non-coastal (landlocked)             |
| Rhondda Cynon Taff County Borough Council           | Non-coastal (landlocked)             |
| Merthyr County Borough Council                      | Non-coastal (landlocked)             |
| Torfaen County Borough Council                      | Non-coastal (landlocked)             |
| Blaenau Gwent County Borough Council                | Non-coastal (landlocked)             |
| Caerphilly County Borough Council                   | Non-coastal (landlocked)             |
|   |                                      |
| Dwr Cymru/Welsh Water                               | Coastal and inland                   |
| <b>Non RMA's consulted in the exercise</b>          |                                      |
| North Wales Trunk Roads Agency (NWTRA)              | Coastal and inland                   |
| South Wales Trunk Roads Agency (SWTRA)              | Coastal and inland                   |
| Network Rail  | Coastal and inland                   |

## References

*The Bye Report - Independent Review of the Easter Floods 1998 (1998)*

*The Pitt Review – Learning lessons from the 2007 floods (2008)*



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