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Non Technical Summary of Environmental Report

Strategic Environmental Assessment of the
Draft River Basin Management Plan for the Western
Wales river basin district

22nd December 2008

Non-Technical Summary

What is this document?

This is the non-technical summary of the environmental report that accompanies the consultation on the draft River Basin Management Plan for the Western Wales river basin district (the draft plan). **This consultation runs from 22 December 2008 until 22 June 2009.** You can access either the draft plan or its environmental report by logging on to www.environment-agency.gov.uk/wfd, or contacting us on 08708 506 506.

The first River Basin Management Plan for the Western Wales river basin district will be adopted in December 2009. This plan is a requirement of the Water Framework Directive. It will review the current health of our water environment, and set out a plan for the improvements we believe should be made. It will also set out what we and others need to do to make this happen. The plan will focus on the period from 2009 to 2015.

We encourage everyone with an interest in water and those keen to protect and improve it for the benefit of people now and in the future to get involved. We would like you to play a part in river basin management planning and welcome your views on the documents we are developing and the approaches we are proposing.

River basin management planning

The draft plan proposes actions that can be taken in this river basin district (Figure 1) to achieve the objectives set through river basin management planning. We present three alternative approaches (Scenarios) for managing the water environment in the Western Wales river basin district in the future in the draft plan:

Scenario A: What is already happening and what will happen.

Scenario B: Additional actions that will happen if this plan is approved.

Scenario C: Actions that could happen if we had more certainty they would be proportionate and feasible.

Environmental assessment

Any new actions proposed to manage the water environment could have significant positive or negative effects on the wider environment. The process used to identify, assess and consider these effects is called Strategic Environmental Assessment (SEA). SEA identifies the potential

environmental consequences of the choices available to plan-makers before a plan is approved. This process is documented in full in the environmental report, the structure of which is presented in Box 1 below.

Box 1: Structure of the environmental report

1. Introduction

An introduction to SEA and river basin management planning.

2. Environmental background

A background to the environmental issues in the Western Wales river basin district, including a summary of relevant policies and plans and existing environmental issues.

3: Assessment methods

An explanation of how we aligned the SEA process with river basin management planning, including a description of assessment methods and criteria.

4. Significant environmental effects of the draft plan

A description of the significant environmental effects identified when developing the draft plan.

5. SEA's role in finalising the River Basin Management Plan

A summary of enhancement and mitigation opportunities related to the draft plan's significant environmental effects; an outline of the SEA monitoring programme and future steps in the SEA process.

Work we've done so far

To determine how the draft plan could affect the wider environment in the river basin district, we produced a scoping report setting out the environmental information that was relevant to the draft plan. The scoping report was open to public consultation from 12 October 2007 until 24 January 2008¹.

The assessment process took place at the same time as developing the new actions proposed in the draft plan. The majority of this work took place between February and June 2008.

¹ Within this period the formal five week scoping consultation with the statutory consultation bodies, required by law, took place between 12 October and 16 November 2007.



Figure i: Map of the Western Wales river basin district

Environmental background

We have developed an understanding of the Western Wales river basin district and its water environment by undertaking the river planning process (Box 2 below). The environmental report, whilst including a concise summary of the water environment, focuses on wider environmental issues, trends and problems relevant to river basin management planning.

Reviewing other plans and policies helped us to understand how the draft plan could influence, or be influenced by, these documents. This review also helped us understand environmental issues within the river basin district better and how existing plans are trying to address these issues. Table i summarises the plans and environmental protection objectives relevant to the draft plan.

Wider environmental issues and trends

We carried out further work to understand the main environmental problems and trends in the Western Wales river basin district. We reviewed and interpreted existing environmental data and information to make sure it was relevant to the river basin management planning process. A summary of these main issues and trends is presented below:

Population and health

- Population pressures are a significant pressure on water resources, transport infrastructure and utilities.
- Proximity and access to water resources creates recreation opportunities and encourages healthier lifestyles.

Material assets (national industry, transport and infrastructure)

- Infrastructure is important across the region and assets must be maintained.
- Waste and landfill pressures are a significant issue in the region.

Landscape and the built environment

- The landscape value of the area is important to the Welsh economy as it is a factor in attracting visitors to the area
- Relationship between the surface water environment and land is important.
- There are links between impacts on landscape and visual amenity, recreational amenity and also human health.

Natural environment – biodiversity and soil

- Biodiversity is linked to water quality
- Designated sites have conservation objectives which must be taken into consideration.
- Large areas of Wales are vulnerable to acidification
- Mineral extraction in the river basin district is key to the economy

Historic environment, archaeology and cultural heritage

- The historic environment is sensitive to changes in water quality, water levels, pollution and chemical land use practices.

Climate change

- Carbon dioxide emissions in the river basin district contribute significantly to the UK total.
- Climate predictions suggest a trend towards wetter winters and drier summers across the catchment, which is likely to increase fluvial flood risk

Box 2: Environmental outcomes we aim to achieve in the Western Wales river basin district

The draft plan proposes new actions to manage the water environment in the Western Wales river basin district. We have grouped the environmental outcomes we expect to achieve as a result of the planned actions under the following headings:

- Reducing impacts from rural land management
- Achieving low impact transport and built environments
- Securing sustainable amounts of water
- Restoring wildlife habitats
- Addressing localised pollution sources

Table i: Relevant plans and main themes

Topic	Types of plans reviewed	Main Themes
Population and health	Wales Transport Strategy; Better Homes for People in Wales; Wales Spatial Plan 2008 update; Planning Policy Wales, TAN, Wales Rural Development Plan	Aims to promote recreation and enjoyment of the water environment. Promote reducing water use and greater water efficiency; pressure on water resources from development and tourism (may conflict); preparation of unitary development plans and local development frameworks should take water related issues into account.
Material assets	Above plus: Wise About Waste: The National Waste Strategy for Wales; Minerals Planning Policy Wales; Marine Aggregates Dredging Policy; Regional Waste Management, Strategies, Regional Mineral Strategies, Minerals TAN, Planning Policy Guidance England.	Objective to promote sustainable development; promote sustainable management of flood risk including limiting development on the floodplain; promotion of sustainable transport; policies aim to minimise road transport of minerals.
Landscape	Above plus: plus: The Welsh Historic Environment Report; Register of Welsh Historic Landscapes.	Aim to conserve and enhance valuable landscapes; opportunities for land use or land management to benefit landscape.
Biodiversity	Above plus: Wales Environment Strategy; Regional Biodiversity Strategies; Regional Environment Strategies, UK Biodiversity Strategy.	General aims to conserve, and enhance the biodiversity and the quality of wider the environment; this should help to achieve good ecological water status (Some development objectives may lead to conflict).
Historic environment	As above plus: The Welsh Historic Environment Report; Register of Welsh Historic Landscapes;	Promote a better understanding and protection of historic assets.
Soil	Agri-environment schemes; Rural Development Plan Wales; Welsh Agri Food Strategy; Woodlands for Wales; Catchment Sensitive Farming (Wales).	Encourage farming methods that deliver environmental benefits and encourage local production and markets.
Climate change	Starting To Live Differently – The Sustainable Development Scheme of the National Assembly for Wales;	Many plans support adaptation to climate change including the development of renewable energy.

Options appraisal

We have developed the draft plan through a number of options appraisal activities. We used SEA to identify and evaluate significant environmental effects that could result from:

- individual new actions and
- the wider environmental effects of the draft plan scenarios.

We have used assessment criteria (Box 3) to identify the positive and negative effects of new actions proposed in the draft plan and the wider environmental effects of the draft plan scenarios.

We evaluated the significance of each environmental effect based on both the nature of the effect and the environment affected. Due to the regional nature of the draft plan, we did not consider the effects on local environmental issues limited to a small number of watercourses to be significant. We will carry out a more detailed environmental assessment on a number of the actions proposed in the draft plan at a later stage

Assessment results and mitigation/enhancement opportunities

Table ii provides a summary of the significant environmental effects of the draft plan's scenarios. Scenario A represents the future baseline for the water environment if the draft plan were not approved. The assessment process has used this scenario alongside wider environmental background information to assess scenarios B and C.

Table iii identifies plans and policies arising from other plans that may interact with the draft plan (scenario B) and other plans and strategies. Where the assessment process found significant environmental effects, it also identified opportunities to improve positive consequences of the draft plan's new actions and reduce negative effects. We have incorporated a number of these opportunities directly within the proposed new actions.

A summary of the main remaining opportunities to reduce negative and improve positive effects generated by the draft plan are presented in Table ii. Where practicable, these opportunities will be taken up when the River Basin Management Plan is implemented.

Box 3: SEA assessment criteria

The SEA assessment criteria used in the Western Wales river basin district cover population, human health, biodiversity, flora, fauna, landscape, climatic factors, historic environment, soil and material assets:

Population and human health

- Reduce human pressure on water resources and promote improved water efficiency?
- Promote sustainable forms of development and regeneration?
- Promote recreational and access opportunities?
- Reduce risk of flooding?

Material assets

- Promote improved methods of waste treatment/disposal & reduce waste disposal to landfill?
- Reduce the environmental impact of industry and other commercial activities?
- Reduce the environmental impact of transport infrastructure and diffuse urban pollution?
- Improve existing assets and influence new assets (including safeguarding of valuable agricultural land, transport and power infrastructure)

Landscape

- Improve/maintain landscape character?

Biodiversity

- Promote development that is not detrimental and seeks improvements to biodiversity?
- Prevent habitat degradation and fragmentation and promote habitat creation opportunities?
- Improve the condition of designated sites?
- Reduce the impacts of coastal squeeze?
- Promote appropriate agricultural management?
- Control the spread of alien invasive species?
- Manage water abstraction in a sustainable manner and manage the impacts of drought?

Cultural heritage and archaeology

- Improve or maintain historic structures associated with the water environment?
- Improve/ maintain the historic landscape character?

Soil

- Promote development that is not detrimental to soils?
- Promote remediation of former industrial sites?
- Promote appropriate soil management?
- Move away from reliance on pesticides/fertilisers?
- Prevent loss of nutrients from agricultural sources?
- Promote agricultural land management as a way of reducing flood risk?
- Promote awareness/action on impacts of agricultural on climate change?
- Reduce environmental impact of mineral extraction?
- Reduce the impact of acidification in a sustainable manner?

Climatic factors

- Enable adaptation due to the effects of climate change?

Table ii Summary of the wider environmental effects of scenarios B and C of the draft plan

Topic	Scenario B: scenario A plus additional actions that will happen if this plan is approved	Scenario C: scenario B plus additional actions that could happen if we had more certainty they would be proportionate and feasible
Population and health	✓ Positive impact: reduction of pressure on water resources/promotion of improved water efficiency through educational campaigns. This will help to promote sustainable forms of development and regeneration. Benefits of reducing flood risk through actions to retreat defences and encourage natural processes. Positive impacts for recreation with changes to land use management resulting in new recreational opportunities.	✓ Positive actions to promote the principles of sustainable development by encouraging water efficiency/reuse. Positive impacts associated with the reduction of flood risk through actions to improve urban drainage, allow natural processes and the removal of redundant flood defence structures. Positive impacts linked to conserving water through winter storage reservoirs coupled with countryside liaison work. The development of conservation schemes by Dwr Cymru Welsh Water (DCWW) and the Wildlife Trusts in abstracted catchments will reduce human pressure on the environment and will help to promote improved water efficiency.
	x No Significant Effects Identified.	x No Significant Effects Identified.
Material assets	✓ Improve waste treatment through education campaigns and good codes of agricultural practice. Awareness campaigns to influence the behaviour regarding surface run-off, Sustainable Drainage Systems and rainwater harvesting will help to reduce the environmental effects of businesses.	✓ Positive impact: the environmental impact of industry and other commercial activities is reduced via actions to improve efficiency of water use, disposal and treatment across a range of sectors. This includes considering conservation in new developments that incorporate Sustainable Drainage Systems. Water company's existing and future assets will be improved by developing conservation schemes on water company land in abstracted water catchments.
	x No Significant Effects Identified.	x No Significant Effects Identified.
Landscape	✓ Significant landscape benefits can result from the numerous actions which encourage good land management practices and habitat restoration. Mine remediation could lead to improved visual amenity of watercourses.	✓ Significant landscape benefits delivered via actions to encourage good land management practices and habitat restoration. Potential to work together to deliver significant landscape benefits.
	x No Significant Effects Identified.	x No Significant Effects Identified.
Biodiversity	✓ Positive biodiversity impacts including reduction in habitat loss/fragmentation through introduction of codes of good agricultural practice, education and land management guidance, targeted enhancement, restoration and habitat creation schemes. In the longer term actions should encourage the development of wildlife corridors. Opportunity to link Regional Biodiversity Forums and Wildlife Trusts. Wider biodiversity benefits from actions to promote awareness as well as the implementation of management plans to control non-native invasive species.	✓ Positive actions of the Wildlife Trust working with DCWW to encourage conservation schemes on their land will promote development that is not detrimental to biodiversity and will help to prevent habitat degradation. Guidance on the consideration of species conservation when removing redundant flood defence structures will prevent unnecessary disturbance of protected species and may promote extended habitats and wildlife corridors. Promoting a Catchment Sensitive Farming (CSF) initiative may provide opportunities to prevent habitat degradation and
	x No Significant Effects Identified.	x No Significant Effects Identified.

Topic	Scenario B: scenario A plus additional actions that will happen if this plan is approved	Scenario C: scenario B plus additional actions that could happen if we had more certainty they would be proportionate and feasible
	<p>Awareness campaigns to influence behaviour towards surface run-off may have a positive impact on watercourses susceptible to drought and flooding.</p> <p>Mine restoration should allow habitats to be restored through improvements to water quality.</p> <p>Positive benefits from achieving objectives on Natura 2000 protected sites.</p>	<p>fragmentation and encourage wildlife corridors</p>
Historic environment	<p>x The creation of saltmarsh habitat by managed retreat may result in loss of other habitats.</p> <p>✓ Beneficial impacts for historic landscapes may result from actions influencing land management in rural areas in a positive manner. Improvements to water quality as a result of mine remediation could improve the setting and prevent deterioration of historic features.</p> <p>x Adverse effects on the historic environment: physical modifications which change the flow characteristics of the water environment could have adverse effects on heritage features subjecting them to increased erosion and in the case of buried remains, exposing them to oxidation.</p>	<p>x Removal of redundant flood defence structures may be detrimental to some species. In some cases it may allow invasive alien species to spread and colonise new areas.</p> <p>✓ No additional Significant Effects Identified.</p> <p>x No additional Significant Effects Identified.</p>
Soil	<p>✓ Positive impacts for soil quality: actions to improve land management practices, promote schemes similar to catchment sensitive farming initiatives, stewardship schemes or restoration will encourage practices that reduce degradation and erosion of soils and may also promote land management. Improved water quality resulting from mine restoration will reduce sediment contamination.</p> <p>x No Significant Effects Identified</p>	<p>✓ Developing/implementing catchment sensitive farming initiatives will have a positive impact on soils management practices; it may also encourage reduced use of pesticides and promote agricultural land management as a way of reducing flood risk.</p> <p>x No Significant Effects Identified.</p>
Climatic factors	<p>✓ Positive steps to address climate change: actions which influence planning and development (such as ensuring surface and dirty water systems are separate in new development) can work alongside awareness raising to reduce pressure on water resource supply and treatment, to reduce the impact of drought on the water environment. Habitat creation schemes have the potential to have a positive impact on climate change by creating open greenspace which can act as a sink for greenhouse gases. Awareness campaigns targeting diffuse pollution and good codes of agricultural practice will help raise awareness of climate change and help to identify actions to accommodate it.</p> <p>x No Significant Effects Identified.</p>	<p>✓ Positive actions to accommodate climate change. Increased uptake of Sustainable Drainage Systems, improved coordination of spatial and water resource asset planning and removal of redundant defences will maintain/create flood attenuation to allow adaptation to the effects of sea level rise and peak fluvial flows that are predicted as a result of climate. Adaptation to climate change by encouraging farmers to build storage reservoirs and encouraging water reuse if undertaken on a wide enough scale will make a positive contribution to managing the effects of climate change.</p> <p>x No Significant Effects Identified.</p>

Topic	Scenario B: scenario A plus additional actions that will happen if this plan is approved	Scenario C: scenario B plus additional actions that could happen if we had more certainty they would be proportionate and feasible
Water	The river basin management plan will assess in detail the effects of measures on the water environment, whilst the SEA report considers the wider environmental outcomes.	The river basin management plan will assess in detail the effects of measures on the water environment, whilst the SEA report considers the wider environmental outcomes.
Other	<p>✓ A code of practice for boat users may help to reduce erosion of the channel banks on navigable waterways.</p> <p>Allowing natural processes and the reintroduction of beavers will enable the watercourses to be re-naturalised.</p> <p>× No Significant Effects Identified.</p>	<p>✓ No additional Significant Effects Identified.</p> <p>× No Significant Effects Identified.</p>

Note: This is a summary of the SEA findings - full details of the assessment can be found in [Section 4 of the environmental report](#).

Table iii Summary of plans and policies with potentially significant interactions with the river basin district plans

Topic	Description of environmental consequences of interactions with the draft plan	Relevant plans and policies
Population and health	<p>✓</p> <ul style="list-style-type: none"> The Wales Spatial Plan (2004 and 2008) refers to the need to provide and improve infrastructure for recreation in particular around North East Wales and the Swansea Valleys, where it aspires to maximise tourism and recreation without causing environmental damage. Axis 2 of the Wales Rural Development Programme sets out policies which will increase environmental sustainability, in particular protecting and enhancing water resources. The Wales Rural Development Programme promotes reduction of flood risk through allowing the flooding of agricultural land. It also identifies incentives to manage semi-natural areas of flood mitigation to enhance biodiversity. Axis 2 of the Wales Rural Development Programme sets out a number of policies which will increase environmental sustainability. In particular maintaining and enhancing woodlands to ensure social, economic and environmental benefits. 	<p>Wales Spatial Plan 2004 and the 2008 update</p> <p>Wales Rural Development Programme 2007-13</p> <p>Wales Rural Development Programme</p> <p>Wales Rural Development Programme</p>
	<p>×</p> <ul style="list-style-type: none"> Objective 10 of the Wales Spatial Plan Update identifies initiatives to reduce environmental impact of population increase to protect and maintain water resources. The plan does however highlight that these resources will be under increased pressure as a result in increased visitor levels and housing development. 	<p>Wales Spatial Plan 2004 and the 2008 update</p>
Material assets	<p>✓</p> <ul style="list-style-type: none"> The Wales Spatial Plan (2004 and 2008) promotes developing an integrated network of facilities to improve sustainable waste management practices in the area. Wales a Vibrant Economy promotes strategic investments in the region's economic infrastructure to support waste management initiatives. This should link well with the RBMP. The Wales Rural Development Programme promotes land management incentives to improve fertiliser, manure and livestock management to reduce eutrophication and contamination of watercourses. It also identifies incentives to establish and manage buffer zones and reed beds to safeguard water quality and to enhance biodiversity. 	<p>Wales Spatial Plan 2004 and the 2008 update</p> <p>Wales a Vibrant Economy</p> <p>Wales Rural Development Programme</p>
	<p>×</p> <ul style="list-style-type: none"> No negative impacts identified. 	
Landscape	<p>✓</p> <ul style="list-style-type: none"> No positive impacts identified. 	

Topic	Description of environmental consequences of interactions with the draft plan	Relevant plans and policies
	<p>×</p> <ul style="list-style-type: none"> The Wales Spatial Plan (2004 and 2008) contains policies which identify that growth in tourism and agriculture, forestry and housing are dependant on a sensitive use of the natural resources and that the challenge is to maximise economic opportunities and enhance the areas environmental assets without negatively impacting on the Area's landscape. This is particularly the case for the western valleys region. The Strategy also has an objective to encourage appropriate use of derelict land. Policies are in place to try and protect and enhance the landscape, although new development and likely growth in renewables and transport links does have the potential for negative impact on landscape character within the region. 	Wales Spatial Plan 2004 and the 2008 update
Biodiversity	<p>✓</p> <ul style="list-style-type: none"> Axis 2 of the Wales Rural Development Programme sets out policies to increase environmental sustainability. It refers to promoting the protection of cultural landscapes, maintaining and enhancing woodlands and halting loss of biodiversity. Axis 1 and Axis 3, promote development and greater economic activity in agriculture and forestry. Better Woodlands for Wales is designed to assist in dealing with invasive species. The Wales Rural Development Programme promotes the possibility of flood prevention through allowing the flooding of agricultural land. It also identifies incentives to manage semi-natural areas of flood mitigation to enhance biodiversity. 	Wales Rural Development Programme Wales Rural Development Programme Wales Rural Development Programme
	<p>×</p> <ul style="list-style-type: none"> No negative impacts identified. 	
Historic environment	<ul style="list-style-type: none"> No positive impacts identified. 	
Soil	<p>✓</p> <ul style="list-style-type: none"> The Wales Spatial Plan (2004 and 2008) commits to good practice. It also identifies that forestry and agricultural sectors should become more sustainable in order to protect valuable habitats. Axis 2 states that soil structure and water quality should benefit from less intensive farm production promoted under the policy. 	Wales Spatial Plan 2004 and the 2008 update Wales Rural Development Programme
	<p>×</p> <ul style="list-style-type: none"> No negative impacts identified. 	
Water	<ul style="list-style-type: none"> The river basin management plan will assess in detail the effects of measures on the water environment, whilst the SEA report considers the wider environmental outcomes. 	
Climatic factors	<p>✓</p> <ul style="list-style-type: none"> Policies which will work towards a reduction in contribution towards climate change. The plan recognises a need to address climate change directly as well as a need to develop infrastructure to improve water, sewerage, waste and energy use. Policies to create additional public transport and communication links will allow long term benefits for climate change. 	Wales Spatial Plan 2004 and the 2008 update Wales a Vibrant Economy
	<p>×</p> <ul style="list-style-type: none"> Climate change adaptation measure and development of renewables may have high energy requirements or increase CO₂ emissions 	Wales Spatial Plan 2004 and the 2008 update/ Wales Environment Strategy
Other issues	<ul style="list-style-type: none"> No positive or negative impacts identified. 	

Table iv: Summary of opportunities for environmental enhancement and mitigation related to the draft River Basin Management Plan for the Western Wales river basin district

Environmental outcomes we expect to achieve:	Opportunities to improve environmental effects of the draft plan	
	Enhancement	Mitigation
Improve rural land management	In addition to existing agri-environment actions, additional educational and awareness campaigns offer opportunities for wider uptake of improved land management techniques leading to an improved environment and economic gain. Increased summer storage which supports summer irrigation could reduce human pressure on valuable water resources.	Ensure that flood risk management issues have been considered prior to implementing schemes to allow natural erosion processes along river reaches. This will help to avoid unexpected loss of agricultural land or the flooding of developments.
Achieve low impact transport built environments	Reduction in physical modification through the removal of flood defence structures offers opportunities for improved habitats and landscapes, improved soil / bank stability and enabling adaptation to climate change. Additional boat traffic guidance will ensure a reduction in bank erosion and sedimentation. Additional actions to raise awareness regarding the use of Sustainable Drainage Systems will help reduce the impacts of diffuse urban pollution and help to accommodate the impacts of climate change.	In general ensure that statutory consultees have all been consulted and are in agreement. Existing habitat use must be considered as well as potential habitat improvement or expansion. Consider implications of removal for recreation and tourism. To mitigate adverse effects on the historic environment from channel modifications an environmental assessment should be completed for each individual project.
Secure sustainable amounts of water	Water efficiency campaigns targeting high use sectors could contribute to water neutrality. Increased summer storage which supports summer irrigation could reduce human pressure on valuable water resources.	Ensure that implementation has regard for impacts on the historic and natural environment, with appropriate levels of survey, investigation and impact assessment. Work with consultees including Countryside Council for Wales, Cadw, local authorities and others to ensure that habitat restoration or creation does not adversely affect other interests.
Restore wildlife habitats	Locally targeted restoration schemes as well as strategic catchment based projects will have significant biodiversity impacts preventing habitat degradation and fragmentation that may contribute to landscape benefits. Measures to control the spread of non-natives have the opportunity to identify key issues and trigger appropriate action by responsible organisations. Reduction in physical modification offers opportunities for improved habitats and opening up of further lengths of wildlife corridors. Managed retreat actions provide opportunities to help sustain estuarine habitats as well as reducing flood risk.	When considering a project to create saltmarsh habitat by managed retreat, to remove redundant flood defence schemes or to improve habitat locally, the changes that will result from implementation need to be understood at a cumulative level as well as at a local level through an environmental assessment or other relevant assessment. Countryside Council for Wales must have approved the scheme. Consideration should be given to lost agricultural land since compensation may be required.
Address localised pollution sources	Improvements in the planning system, drainage networks, waste treatment, awareness campaigns and increased avoidance of misconnections will enhance water quality. Mine and minewater remediation schemes could result in improved water quality.	Ensure impacts across range of environmental receptors are identified and adequately assessed. For example specialised fauna and flora may have developed in response to unique water quality, particularly in relation to mining. The ecologic impacts of implementing neutralization schemes must be considered in terms of timescale because of species adaptation.

Q Do you agree with the enhancement and mitigation opportunities presented in Table iv of the non-technical summary to address the environmental effects identified?

Monitoring

We will monitor the significant effects of the River Basin Management Plan on the environment. To do this, we will use information from river basin management planning and existing environmental monitoring. We will identify and establish new monitoring needs as appropriate.

A summary of the existing monitoring we are likely to use to help monitor the significant environmental effects of implementing the draft plan is set out to the right.

List of existing environmental monitoring:

- Unemployment rates (WAG)
- Percentage of total length of footpaths and rights of way (NAW Performance Indicators)
- Quantity of municipal waste per person per annum sent to landfill (WAG)
- Quantity of industrial and commercial waste produced per annum /sent to landfill (WAG)

- Proportion of municipal waste recycled or composted (WAG)
- Land use – indicators measuring quality and diversity (to be taken from CCW landscape characterisation work when completed)
- Percentage of features on Natura 2000 sites in favourable or recovering condition (CCW)
- Trends in Biodiversity Action Plan species and habitats (WAG / UK Biodiversity Partnership)
- Number of historic assets deemed to be at risk (Cadw)
- Proportion of land which is under agri-environment agreement or is organic (WAG)
- Proportion of woodland that is certified (Forestry Commission)
- Annual emissions of greenhouse gases (WAG/AEA Energy and Environment)

Q Can you suggest any other environmental indicator(s) we should monitor in relation to the significant environmental effects identified?

Q Do you have any other comments on the Strategic Environmental Assessment process or its findings?



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Environmental Report

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Environmental Report

22nd December 2008

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1. Introduction

This section provides an introduction to strategic environmental assessment and river basin management planning in the Western Wales river basin district. It also explains how to comment on this report and the draft plan.

1.1 Purpose and contents of this report

This environmental report accompanies the consultation on the draft River Basin Management Plan for the Western Wales river basin district (draft plan). It sets out the findings of the strategic environmental assessment that was carried out during the development of the draft plan. The report is structured as follows:

Section 1: An introduction to strategic environmental assessment, river basin management planning, the assessment work undertaken so far and how to comment on this report/the draft River Basin Management Plan.

Section 2: A background to the environmental issues in the Western Wales river basin district, including a summary of relevant policies and plans and existing environmental issues.

Section 3: An explanation of how the strategic environmental assessment process was aligned with river basin management planning activities. It includes a description of the methods used and activities undertaken during the assessment.

Section 4: A description of the significant environmental effects identified during the development of the draft plan, including those related to the new actions it proposes, the plan scenarios considered, and the interaction between the draft plan and other relevant plans and policies.

Section 5: A summary of enhancement and mitigation opportunities related to the draft plan's significant environmental effects; and an outline of the strategic environmental assessment's monitoring programme and future steps.

1.2 River basin management planning and the River Basin Management Plan

The Water Framework Directive² sets a number of objectives for water management, which must be achieved through a process of River basin management planning. A key target of the Directive is the aim to achieve at least 'good status' in all waters. Status will be measured through a series of specific standards and targets developed by the UK administrations and supported by the Water Framework Directive UK Technical Advisory Group (www.wfduk.org).

The Environment Agency is responsible for submitting River Basin Management Plans to the Department for Environment, Food and Rural Affairs and/or the National Assembly for Wales, setting out the activities necessary to meet the requirements of the Directive.

There are 11 River Basin Districts in England and Wales. Figure 1 shows the location and extent of the Western Wales River Basin District. The draft River Basin Management Plan for the Western Wales river basin district proposes actions that can be taken in this District to achieve the objectives set by River basin management planning process

² Directive 2000/60/EC Establishing a Framework for Community Action in the Field of Water Policy. It was implemented in England and Wales by the Water Environment (Water Framework Directive) (England and Wales) Regulations (SI 2003 No. 3212).

Figure 1 - The Western Wales River Basin District



The draft Plan identifies significant issues affecting water management, namely:

- Phosphorus in rivers and standing waters
- Mines and minewaters
- Organic pollution (ammonia and biochemical oxygen demand)
- Pesticides
- Sediment (rivers and lakes)
- Other pollutants - Faecal indicator organisms
- Acidification
- Alien Species

The Plan identifies actions to tackle these issues, namely:

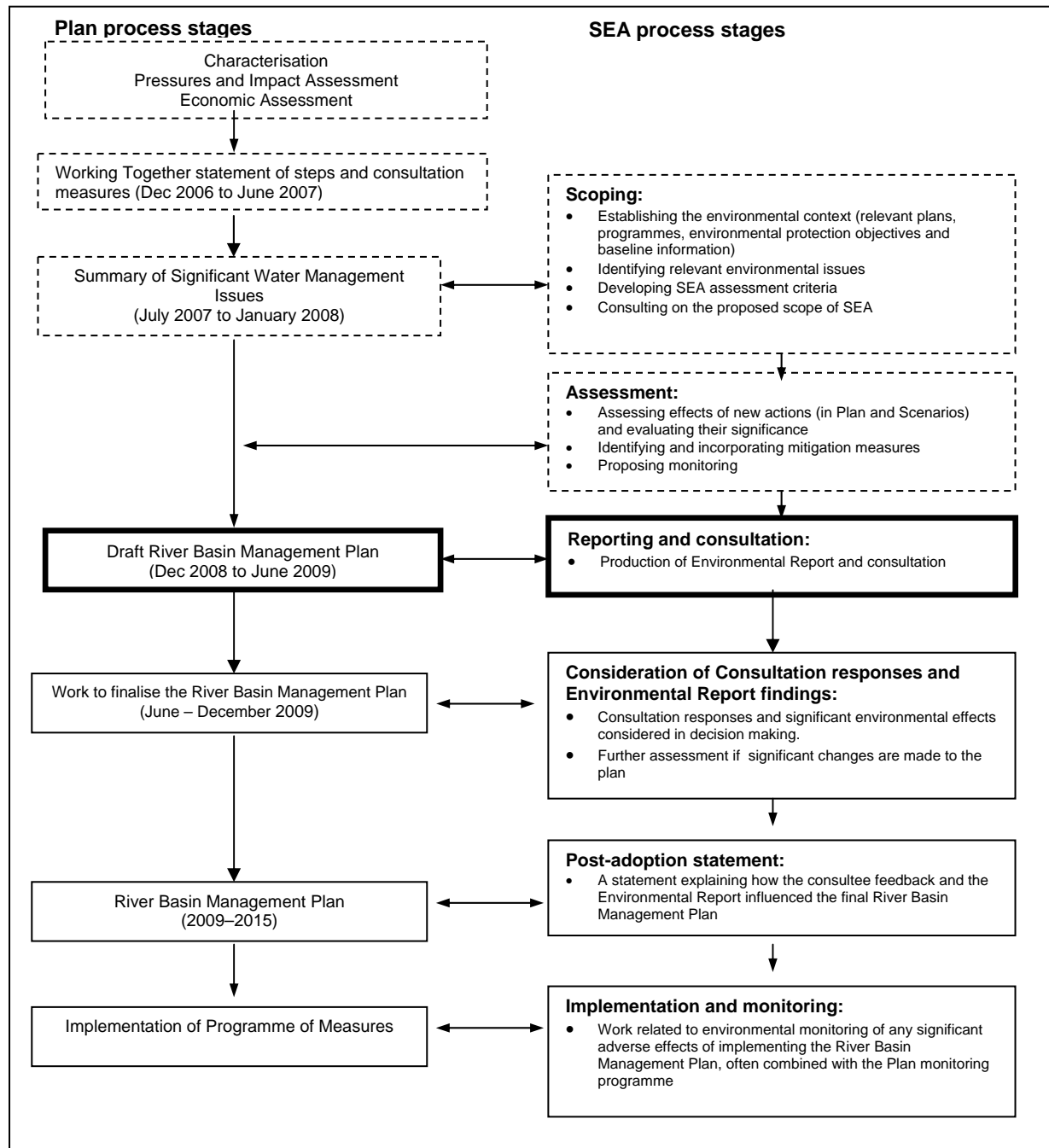
- Reducing impacts from rural land management
- Achieving low impact transport and built environments
- Securing sustainable amounts of water
- Restoring wildlife habitats
- Addressing localised pollution sources

Some of these actions are already happening or will happen, whilst others are proposed as new actions that could happen. Proposed new actions fall into two categories:

- (i) actions that rely on national decisions and legislation but can be implemented according to priorities identified at the river basin district level; and
- (ii) actions that are local and rely on initiatives proposed in the Western Wales River Basin District.

Where new actions are proposed to manage the water environment they have the potential to lead to significant impacts and benefits to the wider environment. The draft Plan's proposed new actions have therefore been assessed within the Strategic Environmental Assessment; this process is described in sections 1 and 3 below (section 1.3).

Figure 2 – Links between the river basin management planning and strategic environmental assessment processes



1.3 Strategic Environmental Assessment

The requirement for Strategic Environmental Assessment comes from a European Directive³, implemented in Wales through the Environmental Assessment of Plans and Programmes Regulations (WSI 1656, 2004).

The Regulations requires that certain plans and programmes likely to have significant environmental effects are subject to an environmental assessment. This is termed Strategic Environmental

³ Directive 2001/42/EC of the European Parliament and of the Council on the assessment of the effects of certain plans and programmes on the environment

Assessment (SEA). It is undertaken to ensure that wider environmental effects are considered during the development of a plan or programme alongside technical, economic or other considerations. The SEA process aims to contribute to a high level protection of the environment and through this work promote sustainable development.

Figure 2 provides a summary of the SEA process and how it aligns with the stages of the River basin management planning process.

To determine how the draft plan could affect the wider environment in the river basin district, we produced a scoping report setting out the environmental information that was relevant to the draft plan. The scoping report was open to public consultation from 12 October 2007 until 24 January 2008.

One of the main aims of the WFD is to improve inland and coastal waters and protect them. Given this overall aim there are likely to be implications for activities which impact on our water. The river basin management plan will assess in detail the effects of measures on the water environment, whilst the SEA report considers the wider environmental outcomes

1.4 How to comment on the Environmental Report and the draft Plan

You can contact us in any of these ways:

- email at david.revill@environment-agency.gov.uk
- phone on 08708 506506
- post to: David Revill
Environmental Assessment Officer
National Environmental Assessment Service (NEAS)
Environment Agency
Ty Cambria
29 Newport Road
Cardiff
CF24 0TP

We encourage you to respond to the draft Plan by using our online consultation on our website at www.environment-agency.gov.uk/wfd. From here, you will be able to see other people's responses, download the draft plan consultation document and annexes and find out more information about river basin management planning and the Water Framework Directive.

This consultation closes on 22 June 2009

2. Environmental Background

This section identifies the Western Wales river basin district and describes the key environmental issues and baseline environment relevant to the river basin district. It also summarises the review of other relevant plans, policies and strategies and their environmental protection objectives.

2.1 Identifying relevant environmental information in the Western Wales river basin district

The Western Wales River Basin District covers an area of 16,653 square kilometres. It extends across the entire western half of Wales from the Vale of Glamorgan in the south, to Denbighshire in the north. It is predominantly rural in nature; the main centres of population are restricted to the coastal strip and the westernmost of the South Wales valleys. The largest towns are mostly situated in the south, with Swansea by far the most populated. The river basin district includes the island of Anglesey off the north-west coast of North Wales. Further information on the Western Wales River Basin District is provided in section 2 of this document or Annex G of the draft plan.

We have developed an understanding of the Western Wales river basin district and its water environment by understanding the river basin management planning process. This information was used to develop the draft plan. As such information on the current and future state of the water environment is presented in the draft plan's main text and annexes. This environmental report includes a concise summary of the water environment and refers the reader to the draft plan as appropriate.

To determine how the wider (non-water) environment in the Western Wales river basin district could be affected by the draft River Basin Management Plan, an understanding of the relationship between the aims of the draft plan and existing environmental issues was developed. The scoping process (Figure 2) was used to identify environmental information relevant to the objectives and actions of the plan. Establishing relevance is subjective. Our analysis was based on whether river basin management planning objectives/potential new actions were likely to influence environmental issues in the river basin district and vice versa.

A scoping report was produced setting out the environmental information identified as relevant to the plan. The scoping report was open to public consultation from the 12th October 2007 until the 24th January 2008⁴. Responses received as a result of the scoping consultation have been used to help to refine and update the review of relevant policies, plans and programmes and the environmental baseline information (sections 2.2 and 2.3 of this document).

The scoping consultation identified the proposed assessment criteria. The final assessment criteria and the assessment methodology used in this strategic environmental assessment are presented in section 3 of this document.

2.2 Relevant plans and policies within the river basin district

The identification of other relevant plans and policies is important in strategic environmental assessment as it:

- identifies where the plan could influence existing plans and policies & vice versa;
- identifies potentially conflicting environmental issues, problems or protection objectives;
- and

⁴ Within this period the formal 5 week scoping consultation with the statutory consultation bodies took place between 12th October and 16th November 2007.

- helps to identify relevant environmental protection objectives and additional environmental baseline information.

By understanding these relationships the assessment and evaluation of significant environmental effects and the identification of cumulative effects is improved. This process can also help to identify where other plans and the organisations responsible for their production may be able to work with the river basin management planning process to implement environmental enhancement and mitigation opportunities.

An initial review of relevant policies, plans and programmes (PPP) was undertaken at the scoping stage for the Western Wales river basin district (Figure 2), and updated for this environmental report. Table 1 lists the main themes emerging from this review. A full list of the plans reviewed, including regional, national and international plans is presented in Appendix 2. Local plans were not included due to the regional scale of the draft River Basin Management Plan.

Table 1 Main themes from the review of policies, plans, programmes and environmental objectives of the WFD.

Environmental Topic	Common Themes
Maintain and restore habitats	The Water Framework Directive's objectives are consistent with PPP aims to protect, maintain and enhance the quality of the water environment. Terrestrial habitats need to be considered. The Water Framework Directive's objectives should contribute to protecting and enhancing biodiversity but the effects of achieving good ecological status will need to be compared with the conservation objectives of protected sites.
Improve status and diversity of species	The policy direction is to protect and enhance biodiversity; this should help the realisation of good ecological water status. However, plans to increase the angling will have repercussions in terms of increased tourism and impact upon fish stocks if not carefully managed.
Landscape	PPPs generally aim to conserve and enhance valuable landscapes; opportunities for land use or land management to benefit landscape.
Water resources / efficiency / water abstraction	The PPPs and Water Framework Directive aspire to protect natural resources. Some PPPs promote reducing water use and greater water efficiency, while others will put pressure on water resources and may conflict with Water Framework Directive objectives.
Water quality	PPPs generally aim to protect the water environment, but development may lead to greater pressures on water quality.
Flood risk	There is a move towards flood risk management (FRM) rather than direct flood defence. Links between flood risk management and the Water Framework Directive, particularly morphology.
Waste/ pollution	Reducing waste and pollution should further Water Framework Directive objectives, but increasing development pressures may counter them.
Sewerage infrastructure	Plans for increased sewage infrastructure could support Water Framework Directive objectives for water quality.
Transport	The Wales Transport Strategy stipulates the need to reduce water pollution from transport and highlights the impact of transport emissions contributing to eutrophication in water bodies. The PPP will aid the fulfilment of Water Framework Directive objectives.
Material assets	Policies aim to minimise road transport of minerals. Particular attention needs to be paid to sand and gravel workings in river floodplains because of the increased risks to surface water quality, river flow and floodplain hydraulics. Welsh Assembly policy on dredging the sea bed, will involve moving dredging further offshore over the next ten years.
Planning	Planning Policy Wales states preparation of unitary development plans and local development plans should take water related issues into account from an early stage in the process of identifying land for development or redevelopment.
Mitigation and adaptation to climate change	Activities to achieve Water Framework Directive objectives should comply with policies to reduce climate change, as well as mitigation and adaptation techniques.

Environmental Topic	Common Themes
Land Use	Farming practices are changing to ensure long-term sustainability of the industry, e.g., a move to organic farming, promotion of locally-based producers; agricultural practices increasingly seeking to protect and enhance the landscapes of Wales for the environmental benefits they offer, their cultural features and associated wildlife. Woodland management is aspiring to high-quality woodlands, with a diverse mixture of species and habitats that will provide, among other things, a better quality environment.
Water-based/waterside recreation	Opportunities to promote appropriate water-based recreation. Recreational activities may cause deterioration in water quality through pollution and bank erosion, but they could contribute to Water Framework Directive objectives if water and waterside areas are well managed to promote environmental benefits.

2.3 Environmental Baseline

An understanding of the current state of the environment (baseline information) helps to identify any trends and problems that may be affected by the draft River Basin Management Plan for the Western Wales river basin district. It also provides a basis for predicting and evaluating significant effects of the plan on the environment. This section summarises the relevant environmental issues and information we have identified for the draft plan (section 2.1 of this document) and sets the context for its assessment.

During the scoping process (Figure 2) we identified specific issues under each environmental topic, highlighted in the sub-sections below. These specific issues have been used to focus the strategic environmental assessment process in order to identify the significant environmental effects of the River Basin Management Plan.

The draft plan is not considered to have the potential to result in **significant air quality effects** at the river basin district scale. Our intention to remove air quality from further consideration within this assessment was open to public comment through the scoping report consultation. As a result of its removal baseline information on air quality is not included in this environmental report. Any localised air quality effects of specific new actions proposed by the draft plan are more appropriately considered during implementation (section 5.1 of this document). Impacts related to climatic factors are considered separately from air quality, and included in the assessment

A summary of the most relevant aspects of the current environment within the Western Wales river basin district is presented below. Further detail on the baseline gathered for this assessment can be found in Appendix 3. Section 2.1 of this document indicated that the river basin management planning process involved gathering considerable information on the existing state of the water environment within the plan area; links to this information are included, as appropriate, below. The main trends describing the likely future state of the environment if the plan were not implemented are presented in section 2.4 of this document and Table 2.

Population & Human Health

Key Issue 1: Population pressures are significant pressure on water resources, transport infrastructure and utilities. The health of the population in the Western Wales river basin district is variable

Key Issue 2: Proximity and access to water resources creates recreational opportunities and encourages healthier lifestyles.

The Western Wales river basin district is home to over 1.3 million people. The principal urban centres are Swansea (population 223,301), Bangor, Aberystwyth, Bridgend and Neath. The health of the population in the Western Wales river basin district is extremely variable with the Swansea Valleys

having amongst the highest percentages of populations with poor health in England and Wales. The natural environment can play a major role in the health of a population and water-related recreational activities are an important contributing factor

Material Assets

Key Issue 3: Infrastructure is important across the region and assets must be maintained.

Wales has a much larger manufacturing sector than the UK average, with a strong heavy industry component, so access to large quantities of affordable, reliable energy is important to the Welsh economy.

The largest commercial airport in the district is Cardiff International, on the Vale of Glamorgan. Both the rail and road networks follow a similar pattern, with principle routes along the north and south coasts. There is one motorway, crossing South Wales. Milford Haven is the largest port in Wales, handling mostly oil and gas products but with some ferry traffic to Ireland and leisure and fishing facilities. Also see Annex I - Designating candidate artificial and heavily modified waters bodies.

Key Issue 4: Waste and landfill pressures are a significant issue in the region.

Wales continues to be very dependent on landfill. 6 million tonnes of waste was treated or disposed of in Wales in 2004/5, up 12% since 2002/3. Wales has no commercially available landfill sites permitted to accept hazardous waste and, on 31 March 2005, had only an estimated 5 years of remaining tipping space at current rates of disposal.

Landscape

Key Issue 5: Relationship between the surface water environment and landscape is important.

Key issue 6: There are links between impacts on landscape and visual amenity, recreational amenity and also human health.

The Western Wales river basin district is characterised by a beautiful and rugged landscape demonstrated by the large areas designated, either wholly or in part, for their landscape quality. For example approximately 500kms of the coast of Wales is designated as Heritage Coast. The landscape value of the area is important to the Welsh economy as it is a factor in attracting visitors to the area. Actions in the plan could alter landscape character beneficially or detrimentally (for example through removing or building structures).

Biodiversity, Flora and Fauna

Key Issue 7: Biodiversity is linked to water quality and good ecological status should benefit many of the habitats and species in the river basin district.

Salmon and otter are Habitats Directive Annex II species and important indicator species for healthy rivers as they are sensitive not just to chemical water quality, but also to morphology, in terms of barriers to their migration.

Western Wales river basin district contains many salmonid rivers. Welsh rivers account for more than half the sea trout caught in England and Wales; in 2005 the Tywi and Teifi had the highest declared rod catch of sea trout in England and Wales. Rivers provide an important corridor for wildlife and protecting their naturalness should be an important part of the River Basin Management Planning process. The plan will generally improve water dependent biodiversity. See Annex G (Pressures and risks) of the draft plan.

Key Issue 8: Designated sites have conservation objectives which must be taken into consideration.

The Welsh Assembly Government has set a range of targets to improve the condition of SSSIs and Natura 2000 sites culminating in all sites to be in favourable condition by 2026⁵. Also see Annex D (Protected area objectives and Natura 2000 actions) of the draft plan for measures required to achieve the protected area objective in the Directive. The River Basin Management Plan is also subject to the Habitats Directive and has undergone a Habitats Regulations Assessment; see the draft plan for further details.

Historic Environment

Key Issue 9: The historic environment is sensitive to changes in water quality, water levels, pollution and chemical land use practices.

Actions in the plan, and development pressures, could affect historic landscape character and historic structures associated with the water environment and the historical context of their setting.

Soil

Key Issue 10: Large areas of Wales are vulnerable to acidification

This is found especially the uplands, as the bedrock is slow weathering and the soils have little or no acid neutralising capacity⁶. Efforts have been made to neutralise the acid waters in order to protect the aquatic ecology of rivers.

Key Issue 11: Mineral extraction in the river basin district is key to the economy.

The diverse geology of Wales provides a rich variety of minerals and aggregates. These are used in the construction industry, for various industrial processes and for energy production.

Water

A detailed baseline for the water environment is included in Section 2 and 3 of this document, and Annex G of the draft plan: Pressures and risks. This includes a summary of significant water management issues, the pressures these give rise to and the impact that human activity may have on the status of surface water and groundwater within the river basin district. This takes into account point and diffuse source pollution, quantitative status of water including abstraction, and other human activities. The annex considers the scale of the problem in the river basin district, the cause of any problems, any major trends, and significant risks of deterioration.

The annex further assesses the risks posed to the environment, in terms of failing to achieve Good Status either now or in 2015. Without this approach we would only be able to respond to pressures that are causing an impact now. Information on trends enables action to be taken to prevent water bodies being impacted in the future.

Climatic Factors

Key Issue 12: Carbon dioxide emissions in the river basin district contribute significantly to the UK total.

Carbon dioxide (CO₂) emissions in the Western Wales river basin district contributed approximately 6 per cent of the UK total in 2004⁷, with the energy supply industry contributing the highest proportion.

Key Issue 13: Important to consider both the effects of climate change on plan actions and how climate change will affect what the plan is seeking to achieve

⁵ Welsh Assembly Government (2006), Environment Strategy for Wales

⁶ Hornung, M., Le-Grice, S., Brown, N. and Norris, D. 1990. The role of geology and soils in controlling surface water acidity in Wales. In: Acid Waters in Wales (R.Edwards et al. (Eds.) Kluwer Academic Publishers, Dordrecht, Netherlands.

⁷ Local and Regional CO₂ Emissions Estimates for 2004, AEA Energy and Environment, 2006.

Climate predictions suggest a trend towards wetter winters and drier summers across the catchment, which is likely to increase fluvial flood risk. In addition, annual water levels are rising, thus increasing the frequency of tidal inundation during the wetter winter months in increasing the risk of coastal floods.

Current measures to reduce greenhouse gas emissions and combat climate change within the river basin district include seeking additional renewable energy sources including tidal and hydropower. These could involve building structures within watercourses or operating machinery with increased CO₂ emissions or high energy requirements. This may be in conflict with Water Framework Directive objectives.

Climate change information is included within Annex H (Adapting to climate change) of the draft plan.

2.4 Future state of the environment without the plan

The draft River Basin Management Plan for the Western Wales river basin district sets out actions for the period 2009 – 2015 and the ambitions for improvements in the water environment up to 2027. In order to be able to predict and evaluate the significant environmental effects of the plan over this period, an understanding of how the environment is likely to change in the future is needed. A summary of the likely future state of the environment, without the plan's implementation, is presented in Table 2. This is a key requirement of the SEA Regulations.

The draft plan proposes three scenarios for managing the water environment in the Western Wales river basin district (Table 3). Scenario A sets out actions that are already happening or will happen to improve the water environment even if the draft plan was not produced. Scenario A therefore sets out the future state of the water environment without the plan. A summary of changes in the water environment as a result of Scenario A is presented in Table 2 alongside the predicted future state of wider environmental issues. Further information on actions that are already being taken or will be taken to improve the water environment can be found in the draft plan.

Table 2: Key environmental trends affecting the future environment in the Western Wales river basin district

Environmental Issue	Key environmental trends
Population and human health	Population is forecast to continue to grow at 0.2 per cent per annum to 2015. This will put pressure on water provision. The proximity and access to water resources can contribute to urban regeneration, create recreational opportunities and encourage healthier lifestyles and increased tourism.
Material Assets	New developments will be built and there may be other land use changes for example in relation to agriculture and land management. Waste management pressures within the district will also increase. The extent of future mineral extraction is likely to continue to be a formative influence on the water environment.
Landscape	Changes to land use and management (especially new development) will have a major impact on the landscape character of the area. Amenities, conservation and biodiversity could also be affected.
Biodiversity, flora and fauna	Otter populations (an important indicator species) are currently increasing in Wales. The condition of protected sites should improve as a result of the Welsh Assembly Government targets culminating in all sites being in favourable condition by 2026 ⁸ .
Historic Environment	Development pressures could affect historic landscape character and historic structures associated with the water environment and the historical context of their setting. Coastal squeeze and increased flooding under

⁸ Welsh Assembly Government (2006), Environment Strategy for Wales

Environmental Issue	Key environmental trends
	climate change also have implications for features.
Soil	Environmental stewardship schemes will continue to promote good agricultural practices which protect soils and biodiversity; rising wheat prices and the WAG drive for Wales to become agriculturally self sufficient is likely to result in lower grades of land being bought into arable production. Expansion of biofuel production and windfarms is also likely to see significant changes in land use with implications for soils.
Water	Increased population growth and development in the plan area will continue to put pressure on the water environment (abstraction & sewage). However, improvements to the water environment will occur over the period. Also see Annex C (Actions to deliver objectives) of the draft plan.
Climatic Factors	Climate change will result in warmer temperatures, wetter winters and drier summers. By the 2020s, temperatures across the Western Wales river basin district could rise by up to 2°C, while summer rainfall may fall by up to 15 per cent and winter precipitation may increase by up to 15 per cent ⁹ . Information on the likely effects of Climate Change on the water environment can be found in Annex H (Adapting to climate change) of the draft plan. The effects of climate change may mean that some actions to mitigate pressures may be ineffective.
Other issues	None identified.

3. Assessment Methods

This section describes how assessment work was aligned with the river basin management planning process and how alternatives were identified for assessment. It goes on to describe: the methods used to identify and evaluate significant environmental effects and the assessment activities undertaken, including engagement with interested groups. Finally it sets out information on work undertaken to comply with the Habitats Directive.

3.1 Assessment stages

The Strategic Environmental Assessment Directive requires that the assessment process identifies, describes and evaluates “*the likely significant effects on the environment of implementing the Plan and reasonable alternatives taking into account the objectives and the geographical scope of the Plan*” (Article 5.1).

The draft River Basin Management Plan for the Western Wales river basin district has been developed through a number of activities; Table 3 indicates where the strategic environmental assessment process was applied to these activities. Strategic Environmental Assessment was used to identify, review and evaluate the significant environmental effects of alternative actions considered in the draft plan and of the different strategic approaches proposed for the draft plan (termed scenarios).

Table 3: Main stages in the river basin management planning process and related Strategic Environmental Assessment activities

⁹ Climate Change Scenarios for the United Kingdom, UKCIP, 2002.

River basin management planning Activities	Description	Strategic Environmental Assessment Activities (SEA)
Characterisation and identification of significant water management issues	Developed an understanding of the current state and problems in the river basin district's water environment.	This planning stage covered data gathering. The scoping work for the SEA was undertaken alongside this work (Figure 2).
Measures appraisal and Objective setting	Determining how water management activities in the form of existing and proposed new actions could be used to achieve improvements in the water environment.	This process was assessed as it identified potential new actions, which could be taken by the draft plan (section 3.3 of this document). The main stage of the SEA was undertaken alongside this work (Figure 2)
Scenarios -The river basin management planning process identifies three scenarios for the future management of the water environment in each river basin district.		
A – What is already happening and what will happen	Includes actions that are already happening or will happen to improve the water environment without the implementation of this River Basin Management Plan.	No assessment was required as it presents the future state of the water environment without the draft plan, (section 2.4 of this document).
B – Actions that will happen if this plan is approved	Presents the preferred approach to the River Basin Management Plan including proposed new actions for implementation.	Constitutes the draft plan being consulted upon and has been assessed (section 4.3 of this document).
C – Actions that could happen if we had more certainty they would be proportionate and feasible	Includes all actions in Scenario B plus actions we believe are probably worthwhile but where the case has not been made yet.	Constitutes an alternative approach to the draft plan, which would include additional new actions if it were implemented. It has been assessed (section 4.3 of this document).

This environmental report therefore includes assessment of the individual new actions proposed in the draft plan (section 4.1 of this document) and the wider environmental effects of the draft plan Scenarios (section 4.2 of this document). This included work at both the national and river basin district scale (see also Annex E Actions Appraisal).

National work

National work was required as some of the new actions proposed in the draft plan rely on national decisions and legislation. Strategic Environmental Assessment only formally applies to the draft plan at the river basin district scale. However, work was undertaken to ensure wider environmental effects were considered in river basin management planning activities undertaken nationally before potential new actions were considered for implementation in the river basin district.

Regional work

The main part of the strategic environmental assessment was undertaken alongside the actions appraisal process at the river basin district level. The appraisal process identified where new actions (reliant on either national decisions or local initiatives proposed in the river basin district) could be implemented through the draft plan.

The assessment process initially involved a strategic review of the potential new actions. This identified whether a new action had the potential to generate environmental effects that could be considered significant in the Western Wales river basin district. Actions were considered unlikely to have significant effects if they were limited in the extent to which they would be applied or related to investigation work. These actions were excluded from further assessment.

Proposed actions that were identified as likely to have significant effects were assessed further. The results of this work (section 4 and Appendix 5 of this document) were fed into the actions appraisal process in the Western Wales river basin district ensuring effects on the wider environment were considered during the selection of the draft plan's potential new actions.

The results of the actions appraisal identified new actions that were then included in either Scenario B or C (Table 3). The strategic environmental assessment process undertook further work to identify significant environmental effects resulting from interactions between the actions included in Scenario B and C (section 4.2 of this document). It also assessed how the wider environment could be significantly affected by the interaction of the draft plan with existing plans and policies (section 4.3 of this document). Information on engagement during the strategic environmental assessment process and how the views of consultees have been considered is presented in Appendix 4.

3.2 Defining significance in the assessment

The assessment process identifies the *significant environmental effects* of a plan or programme. Where wider environment effects were identified related to the draft River Basin Management Plan for the Western Wales river basin district, a consistent method was used to distinguish between significant and non-significant effects. Significance was evaluated based on both the nature of the effect and the receiving environment¹⁰, as follows:

- Nature of the environmental effect:
Likelihood - How likely is it that the environmental effect will occur as a result of the implementation of the draft plan?
Geographic Extent - How far reaching would the effect be?
Time bound Extent - Will the effect have short, medium or long-term environmental consequences?
Permanence – Is the effect reversible / irreversible?
- Nature of the receiving environment:
Sensitivity of the location – Is the area protected either internationally, nationally, or regionally? (i.e. designated sites)
Environmental protection objectives and targets – Are there agreed international, national or regional environmental protection objectives or targets related to the environmental affected? (i.e. greenhouse gas emission targets)

Due to the regional nature the draft plan, effects on local environmental issues, limited to a single / small number of watercourses, were not considered significant within this assessment (see 3.1 above). Such effects are more appropriately assessed locally where actions proposed by the draft plan are implemented.

3.3 Assessment Criteria

Assessment Criteria (or Assessment Objectives) are typically used in strategic environmental assessment to systematically identify the positive and negative effects a plan could have on individual environmental issues. By identifying and evaluating the significance of these environmental effects, strategic environmental assessment helps to understand the environmental consequences of a plan and its alternatives.

The assessment criteria used for the draft River Basin Management Plan for the Western Wales river basin district are presented in Table 4. They were first presented in the scoping report and have been refined as a result of responses to consultation on the report and subsequent work to finalise the assessment methodology. Assessment criteria in Table 4 are grouped by topics listed in the Strategic Environmental Assessment Directive, which were considered relevant through the scoping stage (section 2 of this document).

¹⁰ As recommended in the Government's – *A Practical Guide to the SEA Directive* (2005), Also see Schedule 1 of SI 1633/2004 (or SI 1656/2004 for Wales).

The assessment process considered whether the criteria in Table 4 were relevant when assessing new actions proposed in the draft River Basin Management Plan for the Western Wales river basin district. The criteria represent the environmental issues relevant to the plan and thus most likely to be affected by proposed actions in the draft plan. In some circumstances a new action was found to have effects on environmental issues not covered by the criteria. Where this was the case, the effect was recorded under the most relevant environmental topic. The assessment criteria were therefore used to guide the identification of the River Basin Management Plan's significant environmental effects, whilst not limiting the breadth of the assessment.

Table 4 Assessment criteria for the Western Wales river basin district

Environmental topic	Assessment criteria: <i>Does/is the proposed action...</i>
Population and human health	<ul style="list-style-type: none"> • Reduce the human pressure on water resources and promote improved water efficiency? • Promote sustainable forms of development and regeneration? • Promote recreational and public access opportunities? • Promote tourism? • Reduce risk of flooding (pluvial, fluvial and sewer)?
Material assets	<ul style="list-style-type: none"> • Promote improved methods of waste treatment and disposal and reduce volume of waste disposal to landfill? • Reduce the environmental impact of industry and other commercial activities? • Reduce the environmental impact of transport infrastructure and diffuse urban pollution? • Improve existing assets and influence new assets (including safeguarding of valuable agricultural land, transport and power infrastructure)
Landscape	<ul style="list-style-type: none"> • Improve or maintain the landscape character of the area?
Biodiversity, flora and fauna	<ul style="list-style-type: none"> • Promote development that is not detrimental and seeks improvements to biodiversity? • Prevent habitat degradation and fragmentation and promote habitat creation opportunities? • Improve the condition of designated sites? • Reduce the impacts of coastal squeeze? • Promote appropriate agricultural management? • Control the spread of non-native invasive species? • Manage water abstraction in a sustainable manner and manage the impacts of drought?
Historic Environment	<ul style="list-style-type: none"> • Improve or maintain historic structures associated with the water environment? • Improve or maintain the historic landscape character?
Soil	<ul style="list-style-type: none"> • Promote development that is not detrimental to soils? • Promote remediation of former waste or industrial sites? • Promote appropriate soil management practices to reduce erosion and degradation? • Move away from reliance on pesticide and fertiliser use? • Prevent loss of nutrients from agricultural sources? • Promote agricultural land management as a way of reducing flood risk? • Promote awareness and action on future impacts on agricultural practices from climate change? • Reduce the environmental impact of mineral extraction? • Reduce the impact of acidification in a sustainable manner, taking into account impacts on other environmental receptors?
Climatic factors	<ul style="list-style-type: none"> • Enable adaptation due to the effects of climate change?

4. Significant Environmental Effects of the draft River Basin Management Plan for the Western Wales river basin district

This section presents the significant environmental effects of individual new actions proposed in the draft River Basin Management Plan for the Western Wales river basin district and goes on to sets out the environmental effects of the interaction between these actions, in the form of the draft plan's scenarios. Finally it identifies the likely significant environmental consequences of interaction between the draft plan and existing plans and policies.

4.1 Summary of the significant environmental effects of new actions proposed in the draft plan

The draft River Basin Management Plan for the Western Wales river basin district proposes new actions to manage the water environment in the Western Wales river basin district. As detailed in section 1.2 of this document, the actions were identified to produce the following environmental outcomes:

- Reducing impacts from rural land management
- Achieving low impact transport and built environments
- Securing sustainable amounts of water
- Restoring wildlife habitats
- Addressing localised pollution sources

Further detail on the water management actions already occurring and proposed can be found in the River Basin Management Plan for the Western Wales river basin district. Descriptions of the significant environmental effects of the proposed new actions related to the above topics are presented below. Detailed assessments of actions in both Scenario B and Scenario C are included in Appendix 5. The assessment has also considered secondary impacts that may arise from the proposed new actions.

4.1.1 Significant environmental effects of reducing impacts from rural land management

The draft plan will lead to significant beneficial effects for the water environment, which are set out in the draft plan. The significant environmental effects of each of the proposed new actions that could be taken by the draft plan to improve rural land management are:

Partnerships/ education campaigns/Catchment Sensitive Farming initiatives to reduce diffuse pollution problems from agricultural sources

Advice alone is unlikely to result in significant impacts across the river basin district. If advice is implemented there is the potential for:

Positive effects to: landscape, biodiversity, soil, flood risk management and climate change.

Developing and implementing further schemes such as the Wildlife Trust Living Landscape Project, schemes similar to the Catchment Sensitive Farming initiatives, campaigns to reduce diffuse pollution and implement codes of good agricultural practice have the potential to deliver landscape, biodiversity and soil quality benefits. In addition large scale land management initiatives can reduce flood risk and help reduce the impacts of climate change.

Negative Effects: none identified.

Encouraging farmers to build storage to support summer irrigation

Positive effects to: population (increase water efficiency), climate change.

This will reduce human pressure on water resources and will promote improved water efficiency, as well as encouraging land managers to adapt to accommodate the effects of climate change. An assessment of the impacts of carbon and other greenhouse gas emissions should be completed prior to starting construction and appropriate mitigation adopted, to minimise future contributions to climate change.

Negative effects to: none identified. The assessment considered that the developments would be small scale, but if the storage facility was large in relation to its landscape negative environmental impacts could occur to receptors such as landscape, biodiversity and the historic environment. These however were not considered significant in the assessment.

4.1.2 Significant environmental effects of achieving low impact transport and built environments

The draft plan will lead to significant beneficial effects for the water environment, which are set out in the draft plan. The significant environmental effects of each of the proposed new actions that could be taken by the draft plan to achieve low impact transport built environments are:

Raise awareness of problems caused by waste disposal into the sewerage system

Positive Effects to: biodiversity.

This will raise public awareness of the problems such as sewer blockages and pollution caused by the disposing of nappies and cotton wool buds into the sewers. It will cause less pollution and so will help to prevent habitat degradation.

Negative Effects to: none identified.

Sustainable drainage systems for urban and rural areas

Positive Effects to: population in terms of sustainable development, flood risk management, landscape, biodiversity, soils, climate change (enabling adaptation).

Raising awareness campaigns of Sustainable Drainage Systems will start to initiate developments and improvements within this field. Installing Sustainable Drainage Systems will then help reduce the impacts of diffuse urban pollution and may help to accommodate the impacts of climate change. They may also have some biodiversity and landscape value in an urban context contributing to green corridors.

Negative Effects to: none identified.

Develop and Implement guidance to reduce the physical impacts of boat traffic

Positive Effects to: biodiversity and landscape.

This will help reduce bank erosion on navigable waterways and will help reduce habitat and landscape degradation through both direct erosion and sedimentation.

Negative Effects: none identified.

Ensure sensitive and appropriate development

Positive Effects to: population in terms of reduced risk of flooding and to biodiversity.

Actions to introduce guidance when considering the removal of obsolete defence structures will have a positive impact. It will allow a consideration of reducing flood risk to be weighed up against the structure being used as a place of refuge by protected species.

Negative Effects to: None identified. If inappropriately managed developments might have adverse effects on landscape, biodiversity and archaeology; also increased impacts associated with carbon consumption.

4.1.3 Significant environmental effects of securing sustainable amounts of water

The draft plan will lead to significant beneficial effects for the water environment. These are set out in the draft plan. The significant environmental effects of each of the proposed new actions that could be taken by the draft plan to secure sustainable amounts of water are:

More effective water efficiency devices, for example rainfall harvesting

Positive Effects to: population, climate change.

All these actions will reduce human pressures on water resources and promote improved water efficiency, as well as potentially allowing adaptation to some of the effects of climate change.

Negative Effects: none identified.

Encouraging farmers to build storage to support summer irrigation (see section 4.1.1 of this document)

4.1.4 Significant environmental effects of restoring wildlife habitats

The draft plan will lead to significant beneficial effects for the water environment which are set out in the draft plan. The significant environmental effects of each of the proposed new actions that could be taken by the draft plan to restore wildlife habitats are:

Habitat restoration and conservation schemes

Positive Effects to: biodiversity, population (recreational benefits), soils, landscape.

These actions (which include locally targeted restoration schemes as well as strategic catchment based projects) will have significant biodiversity impacts helping to prevent habitat degradation and fragmentation and promoting wildlife corridors. Increasing amount of available habitat will increase species numbers and diversity. Secondary benefits include maintenance or improvement of landscape character. It is also possible that restoration projects could enhance the setting or accessibility of historic environment assets, as well as serving to provide the means to accommodate runoff and flow related impacts of climate change.

Negative Effects to: historic environment.

Change of land use, in particular flooding or wetland restoration/creation could adversely affect historic structures/features.

Potential effects must be fully assessed prior to the scheme being implemented. This includes an assessment of historic sites in the surrounding area.

River basin district wide alien invasive species forum

Positive Effects to: potential future effects to biodiversity, landscape.

The forum alone is unlikely to have a direct significant impact unless it is empowered to undertake or enforce control measures. However, it could be instrumental in identifying key issues and trigger appropriate action by responsible organisations. The action to develop and implement a Non-Native Invasive Species Management Plan has the potential to help control alien species, especially if partnerships with Wildlife Trust Wales are formed and all involved work closely to national guidance.

Negative Effects to: none identified.

Allowing natural erosion processes within rivers (where appropriate)

Positive Effects to: morphology, biodiversity landscape, flood risk management and climate change adaptation.

This measure will, if managed correctly, reduce the risk of fluvial flooding and will allow natural geomorphological processes to operate with benefits for biodiversity, flooding and hydromorphology. The approach also promotes sustainable land use change and may encourage land management practices which take account of the effects of climate change.

Negative Effects to: None identified.

Develop and Implement codes of practice to reduce the physical impacts of boat traffic (See section 4.1.2)

Identifying priority areas for managed retreat in estuarine and coastal waters

Positive Effects to: biodiversity, flood risk management, climate change.

This will reduce the impacts of coastal squeeze, increase the saltmarsh and inter-tidal habitat and help sustain estuarine habitats in the long term with potential benefits for designated coastal sites. Managed retreat will enable adaptation to climate change and may reduce flood risk in coastal locations.

Negative Effects to: biodiversity and historic environment.

If inappropriately managed, there is the risk that some inter-tidal habitats for example coastal lagoons and shingle banks will be lost. In addition, retreating defences is likely to result in loss of freshwater terrestrial habitats. The small amount of high grade agricultural land present in the catchment is predominantly located in the lowlands and could potentially be lost due to managed retreat schemes. Managed retreat may also adversely affect heritage structures exposed to increased flooding/erosion.

Developing and implementing similar schemes to the catchment sensitive farming initiative in Wales (Also see section 4.1.1 Partnerships and education campaigns offering land management advice).

Positive effects to: biodiversity, soil.

Developing and implementing further Catchment Sensitive Farming initiatives in Wales has the potential to deliver more biodiversity and soil quality benefits. Actions will help prevent habitat degradation and fragmentation and will help to promote wildlife corridors. It may also improve water quality and promote sustainable agricultural land management to benefit wildlife. In addition, large scale land management initiatives can reduce flood risk and help reduce the impacts of climate change.

Negative effects: none identified.

Develop guidance to address implications of retention or removal of redundant flood defence structures on protected habitats and species (Also see section 4.1.2 for linked information on ensure sensitive and appropriate development).

Positive Effects to: flood risk management, biodiversity.

These actions may extend and integrate habitats and promote wildlife corridors. For example, fish passage could be extended upstream or the distribution of inter-tidal habitats could be increased which would reduce the impacts of coastal squeeze. In addition flood risk management benefits may result.

Negative Effects to: biodiversity.

If weir structures are removed there is a potential threat to habitats and species that prefer less turbulent flows or lagoon conditions. There may also be negative impacts to bank side habitats due to the change in flows of the river. If removal of defences is undertaken in coastal areas, terrestrial habitats and species may be adversely affected. There is a potential negative effect on biodiversity if works allow non-native invasive species to spread into new areas.

4.1.5 Significant environmental effects of addressing localised pollution sources

The draft plan will lead to significant beneficial effects for the water environment. These are set out in the draft plan. The significant environmental effects of each of the proposed new actions that could be taken by the draft plan to address localised pollution sources are:

Raise awareness of surface water runoff and sustainable drainage systems

Positive Effects to: population, biodiversity.

By promoting improved methods of drainage, the environmental impacts from businesses will be reduced. This includes reducing pollution levels as well as decreasing the flood risk from nearby drainage systems. A secondary impact would be the potential benefits to biodiversity in the nearby watercourses.

Negative Effects to: none identified.

Mine and minewater remediation

Positive Effects to: Landscape, biodiversity, historic environment and soil.

Ongoing investigations and active remediation of mine sites in Western Wales will result in improved water quality. Improved water quality will then also improve visual amenity, soil conditions and allow the restoration of habitats. Where relevant it may also allow improvements to the setting of historic features.

Negative Effects to: biodiversity.

In some cases rare floral communities may have developed in response to altered water quality and could be adversely affected by remediation.

4.2 Significant environmental effects of interactions within the draft plan scenarios

The Strategic Environmental Assessment Directive requires the cumulative and synergistic effects of a plan to be assessed. Cumulative and synergistic and secondary effects can be defined as effects on the environment that either build-upon each other or interact to generate a significant environmental effect. Such interactions can occur between different activities within the plan being assessed or between the plan's activities and those set out in other plans and policies.

The river basin management planning process identified three scenarios for managing the water environment within the Western Wales river basin district. These are set out in Table 3, and constitute the strategic alternatives in the river basin management planning process. Further information on the three scenarios is presented in section 5 of the draft plan and Annex C (Actions to deliver objectives).

Scenario A (Table 3) sets out how the water environment in the Western Wales River Basin District would evolve if the river basin management plan was not produced. This scenario represents the future baseline for the water environment. The strategic environmental assessment process used this scenario, together with information on wider environmental trends (section 2.4 of this document), to assess the significant effects of Scenarios B and C on the wider environment.

The strategic environmental assessment process identified the cumulative and synergistic effects of the actions included in the draft plan's Scenarios. The assessment considered how new actions proposed in Scenarios B and C interact with each other and with existing water management activities to generate significant environmental effects. A summary of the significant environmental effects of Scenarios B and C are presented in Tables 5 and 6. The tables also identify ways to reduce the adverse and enhance the positive cumulative and synergistic effects identified. The final column of each table presents the residual environmental effects that would occur in the Western Wales river basin district if the proposed mitigation / enhancement opportunities were implemented. The complete assessment is presented in Appendix 6.

Table 5 Summary of significant environmental effects of Scenario B *Additional actions that will happen if this plan is approved*

Topic	Summary of significant environmental effects
Population & human health	Positive impact: reduction of the human pressure on water resources by promotion of improved water efficiency through educational campaigns. This will help to promote sustainable forms of development and regeneration.
	Benefits of reducing flood risk through actions to retreat defences, restore catchments and encourage natural processes
	Positive impacts for recreation with changes to land use management resulting from a range of actions resulting in new recreational opportunities.
Material assets	Improve waste treatment through education campaigns and good codes of agricultural practice.
	Awareness campaigns to influence behaviour regarding surface water run-off, Sustainable Drainage Systems, rainwater harvesting will help to reduce the environmental impacts of businesses.
Landscape	Significant landscape benefits can result from the numerous actions which encourage good land management practices, remediation at priority mine sites, and habitat restoration.
Biodiversity, flora & fauna	Positive impacts for biodiversity including reduction in biodiversity loss and habitat fragmentation through introduction of codes of good agricultural practice, education and land management guidance along with targeted enhancement /restoration schemes (for example facilitating upstream fish passage or remediation work at mine sites). In the longer term actions should encourage the development wildlife corridors, particularly in rural areas where there is more land available to enable synergies to occur. Opportunity to link into Regional Biodiversity Forums and Wildlife Trust Living Landscape Work. There may also be benefits that will help to achieve the objectives on Natura 2000 protected sites.
	Wider biodiversity benefits will result from actions to promote awareness as well as the implementation of management plans to control non-native invasive species.
	Benefits for biodiversity arising from actions to recreate natural systems and habitats for example allowing natural erosion within rivers, removal of redundant flood defence structures and site specific restoration schemes; these actions will help reduce habitat loss and fragmentation and will also have flood defence benefits
	Awareness campaigns to influence behaviour towards surface water run-off may encourage actions to manage impacts of drought and flooding. This may have a positive impact on the watercourses in the RBD which are susceptible to flooding and drought.
	The creation of new saltmarsh habitats at candidate sites by managed retreat will have significant positive effects for species which live in the intertidal and estuarine habitats since coastal squeeze impacts will be reduced. Designated sites will also benefit. However, there may be significant negative impacts to the biodiversity due to loss of other habitats.
Historic environment	Adverse effects on the historic environment: physical modifications which change the flow characteristics of the water environment (for example retreated or removed defences, allowing natural retreat to occur and restoration schemes) could have adverse effects on heritage features subjecting them to increased erosion and in the case of buried remains, exposing them to oxidation.
	Beneficial impacts for historic landscapes may result from actions influencing land management in rural areas in a positive manner. An example of this would be the remediation of mine water sites.
Soil	Positive impacts for soil quality: actions to improve land management practices, promote schemes similar to catchment sensitive farming initiatives or restoration will encourage practices that reduce degradation and erosion of soils and may also promote land management as a way of reducing flood risk and accommodating the impacts of climate change.

Topic	Summary of significant environmental effects
Water	The river basin management plan will assess in detail the effects of measures on the water environment, whilst the SEA report considers the wider environmental outcomes.
Climatic factors	Positive steps to address climate change issues: actions which influence the planning system and development (such as ensuring surface and dirty water systems are separate in new development) can work alongside awareness raising regarding water consumption and reuse to help reduce pressure on water resource supply and treatment; this should in turn reduce the impact of drought on the water environment.
	Habitat creation schemes have the potential to have a positive impact on climate change by creating open greenspace which can act as a sink for greenhouse gases. Awareness campaigns to target diffuse pollution and campaigns to ensure effective implementation of codes of good agricultural practice will help raise awareness of climate change and help identify actions to accommodate it.
Other issues	A code of practice for boat users may help to reduce the erosion of the channel banks on navigable waterways.
	Allowing natural processes and the reintroduction of beavers will enable the watercourses to be re-naturalised.

Table 6 Summary of significant environmental effects of Scenario C Actions that could happen if we had more certainty they would be proportionate and feasible

Note – The significant environmental effects identified for Scenario B (Table 5) will also result from Scenario C. This table presents the significant effects likely to occur from interactions between the additional actions in Scenario C and actions already included in the plan.

Topic	Summary of significant environmental effects
Population & human health	The development of conservation schemes by Dwr Cymru Welsh Water and the Wildlife Trusts in catchments where abstraction is an issue will reduce human pressure on the water environment and may help to promote water efficiency.
	Positive actions to promote the principles of sustainable development by encouraging water efficiency/reuse.
	Positive impacts associated with the reduction of flood risk through actions to improve urban drainage, allowing natural processes and the removal of redundant flood defence structures.
Material assets	Positive impacts linked to conserving water through winter storage reservoirs coupled with countryside liaison work.
	Positive impact: the environmental impact of industry and other commercial activities is reduced via actions to improve efficiency of water use, disposal and treatment across a range of sectors. This includes conservation as part of new developments that incorporate Sustainable Drainage Systems.
Material assets	Water company existing and future assets will be improved by developing conservation schemes on water company land in abstracted water catchments.
	Significant landscape benefits delivered via numerous actions which encourage good land management practices and habitat restoration. These all have the potential to work together to deliver significant landscape benefits.
Landscape	Significant landscape benefits delivered via numerous actions which encourage good land management practices and habitat restoration. These all have the potential to work together to deliver significant landscape benefits.
	Positive actions of Wildlife Trust working with Dwr Cymru Welsh Water to encourage conservation schemes on their land will promote development that is not detrimental to biodiversity and will help to prevent habitat degradation.
	Guidance to the Environment Agency on considering species that have colonised redundant flood defence structures will have a positive impact as it will prevent unnecessary disturbance of protected species.
	The removal of redundant flood defence structures may extend habitats and promote wildlife corridors.
Biodiversity, flora & fauna	The removal of redundant flood defence structures may be detrimental to species that prefer quieter flow and lagoon habitats. It may also enable invasive species to colonise new areas more quickly.
	Promoting a Catchment Sensitive Farming (CSF) initiative may provide opportunities to prevent habitat degradation and fragmentation and encourage wildlife corridors
Historic environment	No Significant Effects Identified.
Soil	Developing and implementing a CSF in Wales and England will have a positive impact on soils management practices (to reduce erosion and degradation). It may also encourage reduced use of pesticides and promote agricultural land management as a way of reducing flood risk.
Water	The river basin management plan will assess in detail the effects of measures on the water environment; the SEA report considers the

Topic	Summary of significant environmental effects
	wider environmental outcomes.
Climatic factors	<p>Positive actions to accommodate impacts of climate change. Increased uptake of Sustainable Drainage Systems, improved coordination of spatial and water resource asset planning and removal of redundant defences will maintain/create additional flood attenuation/storage to allow some adaptation to the effects of sea level rise and peak fluvial flows that are predicted as a result of climate change.</p> <p>Encouraging farmers to build storage to support summer irrigation will enable adaptation to the effects of climate change. An assessment of the impacts of carbon and other greenhouse gas emissions should be completed prior to starting construction and appropriate mitigation incorporated into the scheme design. This should minimise future impacts on climate change.</p>
Other issues	No Significant Effects Identified.

4.3 Cumulative effects of the draft plan with other plans and programmes

This section presents the likely cumulative and synergistic effects on the environment of the interaction between the preferred approach to the draft River Basin Management Plan for the Western Wales river basin district (Scenario B) and other relevant plans and programmes. The identification of plans and programmes relevant to the draft plan was initially undertaken during the scoping stage of the assessment (section 2.2 of this document and Appendix 2) and updated during the assessment process.

Tables 7 and 8 summarise the findings of this assessment, the complete assessment is presented in Appendix 7. Table 7 identifies where the interaction between the draft plan and other plans and policies could have positive effects on the environment. Table 8 identifies where these interactions could lead to negative effects.

Table 7 Summary of positive environmental effects of interactions between the draft River Basin Management Plan for the Western Wales river basin district and other relevant plans and programmes

Topic	Description of significant positive interactions	Title of relevant document/s
Population & human health	The Wales Spatial Plan (2004 and 2008) shows synergy with the RBMP and refers to the need to provide and improve infrastructure for activity recreation in particular around North East Wales and the South Wales Valleys, where it aspires to maximise tourism and recreation without causing environmental damage.	Wales Spatial Plan 2004 and the 2008 update
	Axis 2 of the Wales Rural Development Programme, improving the Environment and the Countryside, sets out a number of policies which will increase environmental sustainability throughout Wales. In particular, it refers to protecting and enhancing water resources.	Wales Rural Development Programme
	The Wales Rural Development Programme promotes the possibility of flood prevention through allowing the flooding of agricultural land. It also identifies incentives to manage semi-natural areas of flood mitigation to enhance biodiversity.	Wales Rural Development Programme
	Axis 2 of the Wales Rural Development Programme sets out a number of policies which will increase environmental sustainability throughout Wales. In particular, it refers to maintaining and enhancing woodlands to ensure social, economic and environmental benefits. This should link well with promoting improved recreation the RBMP.	Wales Rural Development Programme
Material assets	The Wales Spatial Plan (2004 and 2008) promotes developing an integrated network of facilities to improve sustainable waste management practices in the area.	Wales Spatial Plan 2004 and the 2008 update
	Wales a Vibrant Economy promotes strategic investments in the region's economic infrastructure to support waste management initiatives. This should link well with the RBMP.	Wales a Vibrant Economy
	The Wales Rural Development Programme promotes land management incentives to improve fertiliser, manure and livestock management to reduce eutrophication and contamination of water courses. It also identifies incentives to establish and manage buffer zones and reed beds to safeguard water quality and to enhance biodiversity. Such action links well with the RBMP.	Wales Rural Development Programme
Landscape	No positive impacts identified.	
Biodiversity, flora & fauna	Axis 2 of the Wales Rural Development Programme sets out a number of policies which will increase environmental sustainability throughout Wales. In particular, it refers to promoting the protection of cultural landscapes, maintaining and enhancing woodlands and halting loss of biodiversity.	Wales Rural Development Programme
	Axis 1 and Axis 3, however promote development of infrastructure and greater economic activity in agriculture and forestry. There is therefore potential for negative effects on biodiversity at a local level from these if more land is required for economic activity, however it should be possible to avoid or mitigate for losses.	
	The Wales Rural Development Programme highlights one agri-environment scheme, Better Woodlands for Wales which is designed to assist in dealing with invasive species.	Wales Rural Development Programme
	The Wales Rural Development Programme promotes the possibility of flood prevention through allowing the flooding of agricultural land.	Wales Rural Development Programme

Topic	Description of significant positive interactions	Title of relevant document/s
	It also identifies incentives to manage semi-natural areas of flood mitigation to enhance biodiversity.	
Historic environment	No positive impacts identified.	
Soil	The Wales Spatial Plan (2004 and 2008) commits to rolling out good practice where possible. It also identifies that forestry and agricultural sectors should be facilitated to becoming more sustainable in order to protect valuable habitats.	Wales Spatial Plan 2004 and the 2008 update
	The Wales Rural Development Programme sets out under Axis 2 that soil structure and water quality should benefit from less intensive farm production promoted under the policy.	Wales Rural Development Programme
Water	Policies relating to Sustainable Drainage Systems, green infrastructure and flood risk will contribute towards reduced flooding.	Wales Spatial Plan 2004 and the 2008 update
Climatic factors	The Wales Spatial Plan (2004 and 2008) identifies a number of policies which will work towards a reduction in Wales' contribution towards climate change. The plan recognises a need to address climate change directly as well as a need to develop infrastructure to improve water, sewerage, waste and energy use.	Wales Spatial Plan 2004 and the 2008 update
	Policies to create additional public transport and communication links will allow long term benefits for climate change.	Wales a Vibrant Economy
Other issues	No positive impacts identified.	

Table 8 Summary of negative environmental effects of interactions between the draft River Basin Management Plan for the Western Wales river basin district and other relevant plans and programmes

Topic	Description of significant negative interactions	Title of relevant document/s
Population & human health	Objective 10 of the Wales Spatial Plan (2004 and 2008) identifies some initiatives to reduce environmental impact of population increase in Wales such as to protect and maintain water resources. The plan does however highlight that these resources will be under increased pressure as a result in increased visitor levels and housing development. In particular, central Wales's natural resources are likely to be under particular pressure owing to increased economic and housing development.	Wales Spatial Plan 2004 and the 2008 update
Material assets	No negative impacts identified.	
Landscape	The Wales Spatial Plan (2004 and 2008) contains policies which identify that growth in tourism and agriculture, forestry and housing are dependant on a sensitive use of the natural resources and that the challenge is to maximise economic opportunities and enhance the areas environmental assets without negatively impacting on the Area's landscape. This is particularly the case for the Swansea Bay waterfront and western valleys region. The Strategy also has a specific objective to encourage appropriate use of derelict land. Therefore policies are in place to try and protect and enhance the landscape. A requirement for 6,500 new homes and likely growth in renewables and transport links does however have the potential to have a negative impact on landscape character within the region.	Wales Spatial Plan 2004 and the 2008 update
Biodiversity, flora & fauna	No negative impacts identified.	
Historic environment	The Wales Rural Development Plan promotes the possibility of flood prevention through allowing the flooding of agricultural land. This could have an adverse impact on historic features within areas flooded.	Wales Rural Development Plan
Soil	No negative impacts identified.	
Water	The river basin management plan will assess in detail the effects of measures on the water environment; the SEA report considers the wider environmental outcomes.	
Climatic factors	Climate change adaptation measures or development of renewables may have high energy requirements or increase CO ₂ emissions.	Wales Spatial Plan 2004 and the 2008 update/ Wales Environment Strategy
Other issues	No negative impacts identified.	

5. Strategic Environmental Assessment's role in finalising the River Basin Management Plan

This section summarises the environmental mitigation and enhancement opportunities that could be adopted to enhance the environmental performance of the Western Wales River Basin Management Plan for the river basin district. It also outlines proposals to monitor significant environmental effects identified by the assessment and sets out future strategic environmental assessment activities that will be undertaken during finalisation of the plan.

5.1 Summary of environmental mitigation and enhancement opportunities

This assessment has identified the significant effects on the wider environment likely to occur as a result of implementation of the Western Wales River Basin Management Plan for the Western Wales river basin district (section 4 of this document). The assessment process also identified opportunities to enhance the positive and mitigate the negative significant environmental effects of new actions proposed in the draft plan (Appendix 5).

A number of these opportunities were incorporated directly within the proposed new actions during the river basin management planning process. Additionally many of the new actions proposed in the draft plan will pass through further approval processes before being implemented. The assessment process has identified where these further approval processes include existing environmental protection mechanisms (Table 9) that will also help to ensure the draft plan's positive effects are enhanced whilst negative effects are minimised.

Table 9. Existing environmental protection mechanisms related to the implementation of new actions proposed in the draft plan

Existing Environmental Protection Mechanisms	Responsible organisation	Influence on the Plan's significant environmental effects
Sustainability Appraisal (SA) in regional and local plan making	WAG, and Local Authorities	SAs will help ensure that pollution reduction and environmental enhancement measures are incorporated into regional / local plans (and subsequently into development control), helping to support the delivery of the plan's objectives, and to mitigate potential residual negative effects.
Strategic Environmental Assessment (SEA) of wider plan-making processes (e.g. Water Resource Management Plans, Catchment Flood Management Plans, etc.)	Government Departments and Agencies, Water Companies	SEAs of other plans and programmes will need to take into account their cumulative effects with the plan (and the statutory nature of the Water Framework Directive objectives) and propose their own enhancement and mitigation measures where interactions may give rise to significant environmental effects. SEA will therefore provide further safeguard at a number of different geographical scales.
Environmental Impact Assessment (EIA) of projects	Developer and Local Planning Authority	Project EIA aims to integrate environmental concerns into project planning and, decision-making. Significant effects of projects arising from the plan, particularly on biodiversity, water quality and the wider environment, will be enhanced / mitigated through detailed consideration at project EIA level. Other projects will need to address interactions with plan actions.

Existing Environmental Protection Mechanisms	Responsible organisation	Influence on the Plan's significant environmental effects
Planning and development control activities for projects requiring planning permission	Local Planning Authority	Development projects will be subject to specific physical, environmental and social conditions, enabling local authorities to enhance significant positive and mitigate significant negative effects of the Plan particularly in relation to development.
Technical Advice Notes	Local Planning Authority and Statutory Consultees	TANs create statutory provisions and provide high level guidance on planning policy and the planning system to local authorities. Requirements in a number of TANs will directly support plan objectives and help enhance and mitigate residual effects of the plan.
Abstraction licensing and discharge consents for water	Environment Agency	Abstraction licenses and discharge consents seek to protect water resources from unsustainable abstraction and pollution by imposing limits, monitoring implementation and enforcement of licensing. This will help support the plan in delivering its objectives, enhancing positive and mitigating negative environmental effects of the plan, especially in relation to water supply and quality.
Habitats Regulation Assessment (HRA)	Proponent of the project / plan and the Country side Council for Wales	Actions, including specific projects, arising from the Plan likely to affect Natura 2000 sites will be subject to HRA, ensuring that potentially significant negative effects are avoided. This provides a further safeguard, enhancing positive and avoiding negative effects of the plan on habitats/biodiversity.

Tables 10a and 10b summarise the remaining opportunities to enhance positive and mitigate negative consequences available to the draft River Basin Management Plan for the Western Wales river basin district before it is finalised. By incorporating the opportunities in Tables 10a and 10b the plan will help to promote sustainable development in the Western Wales river basin district.

Table 10a. A summary of environmental enhancement opportunities related to the proposed new actions of the draft River Basin Management Plan for the Western Wales river basin district

Plan Actions	Key environmental enhancement opportunities
Improving rural land management	In addition to existing agri-environment actions, additional educational and awareness campaigns offer opportunities for wider uptake of improved land management techniques leading to an improved environment and economic gain. Increased summer storage which supports summer irrigation could reduce human pressure on valuable water resources.
Achieving low impact transport built environments	Reduction in physical modification through the removal of flood defence structures offers opportunities for improved habitats and landscapes, improved soil / bank stability and enabling adaption to climate change. Additional boat traffic guidance will ensure a reduction in bank erosion and sedimentation. Additional actions to raise awareness regarding the use of Sustainable Drainage Systems will help reduce the impacts of diffuse urban pollution and help to accommodate the impacts of climate change.
Securing sustainable amounts of water	Water efficiency campaigns targeting high use sectors could contribute to water neutrality. Increased summer storage which supports summer irrigation could reduce human pressure on valuable water resources.
Restoring wildlife habitats	Locally targeted restoration schemes as well as strategic catchment based projects) will have significant biodiversity impacts preventing habitat degradation and fragmentation. Measures to control the spread of non-natives have the opportunity to identify key issues and trigger appropriate action by responsible organisations. Reduction in physical modification offers opportunities for improved habitats and opening up of further lengths of wildlife corridors. Managed retreat actions provide opportunities to help sustain estuarine habitats as well as reducing flood risk.
Addressing localised pollution sources	Improvements in the planning system, drainage networks, awareness campaigns and increased avoidance of misconnections will enhance water quality. Mine and minewater remediation schemes could result in improved water quality.

Table 10b. A summary of environmental mitigation opportunities related to the proposed new actions of the draft River Basin Management Plan for the Western Wales river basin district

Plan Actions	Key environmental avoidance / mitigation opportunities
Improving rural land management	Ensure that flood risk management issues have been considered prior to implementing schemes to allow natural erosion processes along river reaches. This will help to avoid unexpected loss of agricultural land or the flooding of developments.
Achieving low impact transport built environments	.Ensure that when removing redundant flood defence structures from the catchment that Cadw and Local Authorities have all been consulted and are in agreement. The existing habitat use must be considered as well as potential habitat improvement or expansion. The implications of its removal for recreation and tourism must also be thought about. To mitigate adverse effects on the historic environment from channel modifications an environmental assessment should be completed for each individual project.
Securing sustainable amounts of water	Ensure that implementation has regard for potential impacts on the historic and natural environment, with appropriate levels of survey, investigation and impact assessment. Work with consultees including Countryside Council for Wales, Cadw, local authorities and other consultees to ensure that wetland / habitat restoration or creation does not adversely affect other interests. Ensure that soils are protected and there is minimal disturbance. Have

Plan Actions	Key environmental avoidance / mitigation opportunities
	regard to designations, whether for landscape, conservation or historic environment. Work in partnership with water companies to maximise environmental benefits across a range of receptors
Restoring wildlife habitats	<p>Ensure that in implementing changes to barriers to fish movement the impact of changing flows, river energy and water temperature are fully understood at a cumulative level as well as at a local level through Environmental Impact Assessment or other relevant assessment. This includes understanding the potential for adverse impact to biodiversity including the spread of non native species, public safety and the maintenance regime of structures in the river such as bridges, impact on historic environment, impact on recreational enjoyment, impact on soil erosion and landscape change.</p> <p>Ensure that when creating saltmarsh habitat by managed retreat the changes that will result from implementation need to be understood at a cumulative level as well as at a local level through an environmental assessment. This includes understanding the potential for adverse impact to biodiversity and historic environment. CCW approval is required.</p> <p>Ensure that in implementing restoration schemes or managed retreat the potential impacts (in terms of existing biodiversity and habitats) are fully assessed and the Countryside Council for Wales have approved the scheme. Consideration must also be given to lost agricultural land.</p>
Addressing localised pollution sources	<p>Ensure impacts across range of environmental receptors are identified and adequately assessed. For example specialised fauna and flora may have developed in response to prevailing water quality areas, particularly in relation to mining. Acidification is especially predominant in the upland areas. The potential impacts on the aquatic ecology of implementing neutralization schemes across the catchment must be considered in terms of timescale because of species adaptation. If programmes suddenly stop due to lack of funding then this could have a detrimental impact to the ecology.</p>

5.2 Outline of proposed monitoring for significant environmental effects

Once the draft River Basin Management Plan for the Western Wales river basin district adopted, Article 10 (1) of the Strategic Environmental Assessment Directive requires its significant environmental effects to be monitored. This section presents an outline of the actions we expect to undertake in relation to monitoring the significant environmental effects of the draft plan.

The river basin management planning process requires considerable amounts of monitoring of the water environment; see Annex A (Current state of waters in the Western Wales river basin district) of the draft plan. A number of environmental and sustainability monitoring activities are also regularly undertaken across the Western Wales river basin district. The Environment Agency will utilise established networks where appropriate and develop new actions if required to address the environmental monitoring requirements of the strategic environmental assessment process. Table 11 sets out the existing monitoring networks we anticipate using to monitor the effects of the draft River Basin Management Plan for the Western Wales river basin district, and identifies where new monitoring may need to be established.

Table 11 Outline programme for monitoring significant adverse effects on the environment

Topic	Proposed Monitoring	Organisation responsible for monitoring
Population & human health	Percentage of total length of footpaths and other rights of way which were easy to use by the public, from National Assembly for Wales Performance Indicators (NAWPIs)*	NAW
	Unemployment rates	WAG

Topic	Proposed Monitoring	Organisation responsible for monitoring
Material assets	Quantity of municipal waste per person per annum/sent to landfill*	Waste Management surveys (Welsh Assembly Government and Department for Environment, Food and Rural Affairs), the Commercial and Industrial Waste surveys (Environment Agency Wales) and Construction and Demolition Waste surveys (Office of the Deputy Prime Minister and Smiths Gore data).
	Quantity of industrial & commercial waste produced per annum/sent to landfill*	Waste Management surveys (Welsh Assembly Government and Department for Environment, Food and Rural Affairs), the Commercial and Industrial Waste surveys (Environment Agency Wales) and Construction and Demolition Waste surveys (Office of the Deputy Prime Minister and Smiths Gore data).
	Proportion of municipal waste recycled or composted	Waste Management surveys (Welsh Assembly Government and Department for Environment, Food and Rural Affairs)
Landscape	Indicators, measuring quality and diversity, to be selected on completion of CCW landscape characterisation work (to be developed)*	CCW
Biodiversity, flora & fauna	Percentage of features on Natura 2000 sites in favourable or recovering condition*	CCW
	Trends in Biodiversity Action Plan species and habitats*	WAG/UK Biodiversity Partnership
Historic environment	The number of historic assets deemed to be at risk*	Cadw
Soil	Proportion of land under agri-environment agreement (by scheme), or which is organic or which is in conversion to organic*	WAG
	Proportion of woodland that is certified*	Forestry Commission, Forest Service and Forest Stewardship Council)
Water	One of the main aims of the WFD is to improve inland and coastal waters and protect them. Given this overall aim there are likely to be implications for activities which impact on our water. The river basin management plan will assess in detail the effects of measures on the water environment, and monitoring requirements whilst the SEA report considers the wider environmental outcomes	
Climatic factors	Annual emissions of basket of greenhouse gases (by sector)	WAG/AEA Energy and Environment
Other issues	None identified.	

* Taken from WAG State of the Environment report which presents data on the indicators that monitor progress against the Welsh Assembly Government's Environment Strategy. <http://www.statswales.wales.gov.uk/>

5.3 Future Strategic Environmental Assessment activities

This report concludes the main stage of the river basin management planning strategic environmental assessment process. Further assessment may be required if substantial changes to the draft plan subsequent to consultation are considered likely to alter the likely significant environmental effects described in this report. This work will be reported in an Addendum to the environmental report.

Finally a Statement will be published alongside the adopted plan, explaining how consultation responses and the findings of the SEA influenced the plan making process and how monitoring requirements have been finalised. This is a requirement of the SEA Directive.

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