Flintshire Local Flood Risk Management Strategy

Strategic Environmental Assessment – Environmental Report

February 2013

Flintshire County Council

CYNGOR Sir y Fflint Flintshire COUNTY COUNCIL

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Issue and revision record

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001	22 November 2012	N Levy C Probert K Burton	S Wasik	N Parry	Draft for Comment
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Content

Abbreviations

AD	Anno Domini
AQMA	Air Quality Management Areas
ANOB	Area of Outstanding Natural Beauty
CFMP	Catchment Flood Management Plan
FCC	Flintshire County Council
CO_2	Carbon Dioxide
CCW	Countryside Council for Wales
BC	Before Christ
DCLG	Department for Communities and Local Government
DEFRA	Department for Environment, Food and Rural Affairs
DCWW	Dwr Cymru Welsh Water
EA	Environment Agency
EAW	Environment Agency Wales
EC	European Community
EU	European Union
FFS	Flood Feasibility Study
FWMA	Flood Water Management Act
GHG	Green House Gases
GP	Ground Protection
GSPZ	Ground Source Protection Zone
HRA	Habitat Regulations Assessment
IMDs	Indices of Multiple Depravation
FCC	Flintshire County Council
LANDMAP	Landscape Assessment and Decision Making Process
LLFA	Lead Local Flood Authority
LBAP	Local Biodiversity Action Plan
LDP	Local Development Plan
LFRMS	Local Flood Risk Management Strategy
LNR's	Local Nature Reserves
LSOA	Local Super Output Area
ODPM	Office of Deputy Prime Minister
ONS	Office of National Statistics
MMO	Marine Management Organisation
NAQS	National Air Quality Standards
NEC	Natural Environment and Communities
NNR	National Nature Reserves
PPP	Policy Plans and Programmes

PFRA	Preliminary Flood Risk Assessment
RIGS	Regionally Important Geological Sites
SAM	Scheduled Ancient Monument
SMP	Shoreline Management Plan
SSSI	Site of Special Scientific Interest
SPZ	Source Protection Zone
SAC	Special Area of Conservation
SPA	Special Protect Area
SAMAP's	Specific Area Management Action Plans
SEA	Strategic Environmental Assessment
SOA	Super Output Area
SuDs	Sustainable Urban Drainage System
SAB	SuDs Approval Body
TAN	Technical Advice Note
UK	United Kingdom
UKCCP09	United Kingdom Climate Change Projections 2009
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UDP	Urban Development Plan
WFD	Water Framework Directive
WG	Welsh Government
WAG	Welsh Assembly Government
WHS	World Heritage Site

Glossary

Act	A Bill approved by both the House of Commons and the House of Lords and formally agreed to by the reigning monarch (known as Royal Assent).
Aquifer	A layer of porous substrate that contains and transmits groundwater.
Baseline	A description of the present and future state of an area, in the absence of any development, taking into account changes resulting from natural events and from other human activities
Cadw	The Welsh Government historic environment service.
Catchment	An area that serves a river with rainwater; that is, every part of land where the rainfall drains to a single watercourse is in the same catchment.
CCW	Countryside Council for Wales – is the Government's statutory advisor on sustaining natural beauty, wildlife and the opportunity for outdoor enjoyment on Wales and its inshore waters.
Coastal Erosion	The wearing away of coastline, usually by wind and/or wave action.
Coastal Erosion Risk	Measures the significance of potential coastal erosion in terms of likelihood and impact.
Coastal Erosion Risk Management	Anything done for the purpose of analysing, assessing and reducing a risk of the wearing away of coastline.
Coastal Flooding	Occurs when coastal defences are unable to contain the normal predicted high tides that can cause flooding, possibly when a high tide combines with a storm surge (created by high winds or very low atmospheric pressure).
Consultation Body	An authority which because of its environmental responsibilities is likely to be concerned by the effects of implementing plans and programmes and must be consulted under the SEA Directive. The Consultation Bodies designated in the SEA Regulations are Natural England, English Heritage and the Environment Agency
Climate Change Adaptation	Involves adjustments to natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities
Climate Change Mitigation	Involves taking action to reduce the impact of human activity on the climate system, primarily through reducing greenhouse gas emissions
Indicator	A measure of variables over time, often used to measure achievement of objectives
Culvert	A covered structure under road, embankment etc, to direct the flow of water.

Defences	A structure that is used to reduce the probability of floodwater or coastal erosion affecting a particular area.
EA / EAW	Environment Agency and Environment Agency Wales - Executive Non-departmental Public Body responsible to the Secretary of State for Environment, Food and Rural Affairs and a Welsh Government sponsored Public Body responsible to the Welsh Ministers.
Flood	Any case where land not normally covered with water becomes covered by water.
Flood Risk	Product of the probability of flooding occurring and the consequences when flooding happens.
Flood Risk Management	The activity of understanding the probability and consequences of flooding, and seeking to modify these factors to reduce flood risk to people, property and the environment. This should take account of other water level management and environmental requirements, and opportunities and constraints.
Flood Risk Management Measures	The way in which flood risks are to be managed.
Fluvial Flooding	Flooding from rivers including ordinary watercourses and main rivers
Groundwater	Water held underground in the soil or in pores and crevices in rock.
Groundwater Flooding	Occurs when water levels in the ground rise above the natural surface. Low lying areas underlain by permeable strata are particularly susceptible.
Local Development Framework (LDF)	Sets out, in the form of a 'portfolio', the Local Development Documents which collectively deliver the spatial planning strategy for the area in question. The LDF also includes the Statement of Community Involvement, the Local Development Scheme and the Annual Monitoring Report.
Local Flood Risk	Defined within the Flood and Water Management Act 2010 as including surface runoff, groundwater and ordinary watercourses.
LFRMS	Local Flood Risk Management Strategy - Required in relation to Wales by Section 10 of the Flood and Water Management Act 2010 Local Flood Risk Strategies are to be prepared by Lead Local Flood Authorities and must set out how they will manage local flood risks within their areas.
LLFA	Lead Local Flood Authority - the County Council or the County Borough Council for the area (Local Authority).
Mitigation Measures	Refers to measures to avoid, reduce or offset significant adverse effects

Objective	A statement of what is intended, specifying the desired direction of change in trends
Ordinary Watercourse	All watercourses that are not designated Main River, and which are the responsibility of riparian landowners.
River flooding	Occurs when water levels in a channel overwhelms the capacity of the channel.
Scoping	The process of deciding the scope and level of detail of an SA, including the sustainability effects and options which need to be considered, the assessment methods to be used, and the structure and contents of the SA Report
SEA Directive	European Directive 2001/42/EC 'on the assessment of the effects of certain plans and programmes on the environment'. Transposed into UK law via The Environmental Assessment of Plans and Programmes Regulations 2004
Strategic Environmental Assessment	Generic term used internationally to describe environmental assessment as applied to policies, plans and programmes. In this report, 'SEA' is used to refer to the type of environmental assessment required under the SEA Directive
SuDS	Sustainable Drainage Systems - Approach to surface water management which helps to deal with excesses of water by mimicking natural drainage processes and patterns.
Surface Water Flooding	In the urban context, usually means that surface water runoff rates exceed the capacity of drainage systems to remove it. In the rural context, it is where surface water runoff floods something or someone.
Surface Water Runoff	This occurs when the rate of rainfall exceeds the rate that water can infiltrate the round or soil and flows over ground.
Sustainability Appraisal	Generic term used in this report to describe the form of assessment that considers environmental, social and economic effects. However, for this report it is not the formal process associated with the Planning and Compulsory Purchase Act 2004
Sustainability Appraisal Framework	This is the objectives and criteria developed for the project
Sustainability Objectives	These are specific objectives that have been developed for this project. They are also part of the SA Framework, against which the project objectives and design have been tested for the purposes of this SA

Non-Technical Summary

Local Flood Risk Management Strategy

Under Section 10 of the Flood and Water Management Act (2010) Flintshire County Council (FCC) is defined as a Lead Local Flood Authority (LLFA) and is required to 'develop, maintain, apply and monitor a strategy for local flood risk management in its area'. The Local Flood Risk Management Strategy (LFRMS) is designed to help everyone understand and manage the risk of flooding in the county. The Draft LFRMS contains 10 outcomes which form the basis for preparing actions to reduce the risk of flooding. It highlights the steps that are to be taken to improve knowledge of flood risk in the county, to work better with organisations and the public towards reducing those risks whilst aiming to balance the need of communities, the economy and the environment

Strategic Environmental Assessment

A Strategic Environmental Assessment (SEA) is required by law and is undertaken to identify possible effects that plans, programmes and strategies may have on the existing environment, and therefore increase the consideration of environmental issues in the decision making process. This Environmental Report shows the results of Stages A to C of the SEA process that has been undertaken in support of the development of this Local Strategy. The SEA evaluates the predicted impacts of the Local Strategy against environmental objectives that have been identified following consideration of the environmental issues affecting Flintshire.

The likely effects of the LFRMS

The anticipated environmental impacts were presented within the SEA Scoping Report that was issued for consultation in July 2012. The principle topics identified were pressures upon water, climatic factors, soil, biodiversity, fauna and flora, landscape, cultural heritage, population and human health and material assets. The only topic where it was considered that there would be limited impacts on the baseline was air quality and as such this was not assessed in further detail. The Environmental issues were used to develop 9 SEA objectives that the strategic outcomes of the Local Strategy were appraised against to test the potential environmental effects of implementation.

In considering the 10 strategic outcomes of the Local Strategy, when compared to the 9 objectives of the SEA, it has been concluded that the Flintshire Local Flood Risk Management Strategy will either lead to positive impacts upon environmental assets and interests within the county of Flintshire or will have neutral impacts. Opportunities to maximise positive effects have also been considered. The SEA process has not identified any significant negative impacts upon the environment upon implementation of the Local Flood Risk Management Strategy.

The main positive effects identified were flood risk reduction resulting in protection of people, property, infrastructure, businesses, water quality, historic assets, and biodiversity from flood damage. The only potential negative effects identified during the assessment stage were where measures may lead to future structural flood defence works/schemes. These effects are likely to be temporary and mitigated through best site practices, legislation, and the planning process.

Monitoring of the LFRMS

Due to the high level nature of the LFRMS and the positive results of the assessment, requirements and feasibility of monitoring is limited. However, although perceived negative effects were not identified, it is

considered that the LFRMS should still undergo monitoring to ensure that the implementation of the strategy is as predicted in this SEA. Monitoring helps ensure that the identified SEA objectives are being achieved. This will allow early identification of unforeseen adverse effects and this appropriate remedial action can be taken to mitigate against an negative impacts. Monitoring will be an important requirement to measure performance and ensure the LFRMS is being successfully implemented.

The next stage

The next stage of the process is Stage D which involves this Environmental Report and the LFRMS subject to a 6-week public consultation period with statutory consultees, stakeholders and the public, and making any necessary amendments and updates to the documents. The results of the consultation will be presented in the Final Environmental Report. Stage E 'Monitoring' will be carried out annually by FCC following adoption of the LFRMS.

1. Introduction

1.1 Introduction

Flintshire County Council (FCC) is required under Section 10 of the Flood and Water Management Act (FWMA) 2010[1] to develop, maintain, apply and monitor a Local Flood Risk Management Strategy (LFRMS). The LFRMS must address potential flood risk arising from local sources within the boundaries of the local authority area. These are defined in the Act as: surface water run-off, groundwater and ordinary water courses (including lakes and ponds). Flood risk arising from the sea, main rivers and reservoirs is outside the scope of the strategy and is managed by the Environmental Agency (EA) and other organisations. Flood risk arising from sewers is also outside the scope of the strategy and is managed by water companies (further details about the Flintshire LFRMS[2] are presented in Section 3). Although omitted from the act, flooding associate with these sources need to be considered due to their potential interaction and cumulative effects to ensure that risks of flooding at local levels are addressed and to accord with the National Flood and Coastal Erosion Management Strategy[3].

Under the European Directive 2001/42/EC[4], on the assessment of the effects of certain plans and programmes on the environment (also known as the 'Strategic Environmental Assessment (SEA) Directive'), and the resulting Environmental Assessment of Plans and Programmes Regulations 2004[5], a SEA is required to ensure that the environmental effects of LFRMS are considered. This Environmental Report follows on from the first stage of the SEA process, following issue of the Scoping Report to the statutory consultees. The Environmental Report will be subject to a 6-week public consultation period the results of which will presented in the Final Environmental Report.

1.2 Purpose of the Assessment Stage and Environmental Report

The purpose of the assessment stage and Environmental Report is to review the strategic options for the Flintshire LFRMS and the subsequent preferred Flintshire LFRMS and identify any potential impacts (positive and negative). This will be achieved through undertaking the following:

- Review of the Flintshire LFRMS SEA Scoping Report[6];
- Review of the proposed options and draft Flintshire LFRMS;
- Assessment of the strategic options proposed for the Flintshire LFRMS;
- Identify and evaluate predicted effects of the draft LFRMS though appraisal against the SEA Framework and assess cumulative effects;
- Identify mitigation measures;
- Develop monitoring proposals to be implemented by FCC during the LFRMS period; and
- Prepare an Environmental Report for public consultation.

[1] Her Majesty's (HM) Government (2010) Flood and Water Management Act

[2] Flintshire County Council (November 2012) Local Flood Risk Management Strategy

[3] Welsh Government (November 2011) National Strategy for Flood and Coastal Erosion Risk Management in Wales

[4] Directive 2001/42/EC of the European Parliament and of the Council (June 2001) on the Assessment of the Effects of Certain Plans and Programmes on the Environment

[5] Her Majesty's Government (2004) Environmental Protection, Wales – The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004

[6] Flintshire County Council (July 2012) Local Flood Risk Management Strategy: Strategic Environmental Assessment – Scoping Report Flintshire

1.3 Compliance with the SEA Directive

This Environmental Report has been prepared in accordance with the requirements of the SEA Directive. Table 1.1 indicates where the specific requirements in SEA Directive relating to the Environmental Report (SEA Directive Annex I) can be found within this report.

Table 1.1: SEA Directive Requirements Signposting Table

SEA Directive Environmental Report Requirements		Section of Environmental Report where Requirements is found
a)	An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes;	Chapter 3, Chapter 4, Appendix B
b)	The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme;	Chapter 4, Appendix B
c)	The environmental characteristics of areas likely to be significantly affected;	Chapter 4
d)	Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC	Chapter 4
e)	The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation;	Chapter 4, Appendix B
f)	The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors;	Chapter 5, Chapter 6, Appendix D
g)	The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme;	Chapter 7
h)	An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;	Chapter 5, Chapter 6
i)	A description of the measures envisaged concerning monitoring in accordance with Article 10; and	Chapter 7
j)	A non-technical summary of the information provided under the above headings.	At the start of this report before Chapter 1

1.4 Links with Wider Studies

Habitat Regulations Assessment

Under the European Directive 92/43/EEC[7] on the Conservation of Natural Habitats and Wild Fauna and Flora (also known as the 'Habitats Directive'), and the resulting Conservation of Habitats and Species Regulations 2012[8] (as amended), a Habitat Regulations Assessment (HRA) is required where a plan may give rise to significant effects on European designated sites, known as Natura 2000 sites.

[7] Directive 92/43/EEC of the European Parliament and of the Council (May1992) on the Conservation of Natural Habitats and Wild Fauna and Flora

[8] The Conservation of Habitats and Species (Amendment) Regulations 2012

Natura 2000 sites consist of Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites, and also include potential SPA (pSPA) and candidate SAC (cSAC). Within and around the county and coast of Flintshire there are SPA's and SAC's, and therefore a HRA may be required. A HRA Stage 1 'Test of Likely Significant'[9] (screening) has been undertaken for the LFRMS. The results indicate that it is unlikely that there will be any significant impacts relating to the implementation of the strategy and hence a full assessment is not required. However, should schemes need to be implemented it is advised that each scheme is assessed in its own merit under the appropriate legislation.

Water Framework Directive Assessment

The Water Framework Directive (WFD)[10] aims to provide a better water environment in Europe for surface waters, including rivers, estuaries and coastal waters and also groundwater.

The WFD requires that good status is achieved in all water bodies by 2015. For surface waters, good status is made up of good environmental status (or potential in artificial or heavily modified water bodies) and good chemical status. Ecological status consists of biological, hydromorphological and physico-chemical elements. For groundwater, good status consists of quantitative and qualitative status. Improvement measures have been planned for water bodies in order that they meet good status. The Directive also requires that there is no deterioration in water body status. WFD objectives are shown in Table 1.2.

Table 1.2: WFD Environmental Objectives

Objectives (from Article 4 of WFD)	Reference and Description
4.1(a)(i)	Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water;
4.1(a)(ii)	Member States shall protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status by 2015;
4.1(a)(iii)	Member States shall protect and enhance all artificial and heavily modified bodies of water, with the aim of achieving good ecological potential and good surface water chemical status by 2015;
4.1(a)(iv)	Progressively reduce pollution from priority substances and cease or phasing out emissions, discharges and losses of priority hazardous substances; and
Ground Water 4.1(b)(i)	Prevent Deterioration in status and prevent or limit input of pollutants to groundwater.

Source: Water Framework Directive

A separate WFD assessment has not been carried out as part of the LFRMS. Instead this has been captured in the SEA with the assessment of the SEA objective for water quality. This ensures the objectives, requirements and targets of the WFD have been considered and complied within the LFRMS.

[9] Flintshire County Council (November 2012) Local Flood Risk Management Strategy: Habitat Regulations Assessment – Stage 1 Test of Likely Significance

[10] European Parliament (October 2000) Council Directive Establishing a Framework for the Community Action in the Field of Water Quality (2000/60/EC)

1.5 Limitations of the SEA

During the production of this Environmental Report, FCC has relied on published data and information provided internally by FCC and from third party organisations.

The baseline data used as part of this assessment was correct up until July 2012. However, it is possible that the baseline may have changed during the production of the Environmental Report. As such the compiled baseline data has been used to provide a snapshot of the current conditions in the county.

This report is regarded as a live document and as such shall be updated throughout the SEA process, as new information becomes available or other information presents itself. The proposed consultation process aims to address and minimise any gaps in information to ensure all potential environmental effects have been considered with regard to the LFRMS.

2. SEA Process and Methodology

2.1 SEA Legislative Requirements and Purpose

An SEA is required for the Flintshire LFRMS under the European Union Directive 2001/42/EC, more commonly known as the SEA Directive. The Directive was transposed into United Kingdom (UK) law via the Environmental Assessment of Plans and Programmes Regulations 2004, which requires an assessment of the effects of certain plans and programmes on the environment.

Article 3 of the SEA Directive defines the scope of when a SEA is required for plans and programmes. Article 3 (2b) states that a SEA is required for plans and programmes which are prepared for water management, and set the framework for development consents, and/or are likely to have a significant environmental effect. The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 also state that a SEA is required for plans and programmes which are required by legislative, regulatory or administrative provision and are either subject to preparation and/or adoption at national, regional, or local level or prepared by an authority for adoption through a legislative procedure (e.g. The Flood and Water Management Act).

Some of the key objectives of the SEA process are to afford a high level of protection to the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans. The SEA also works to inform the decision-making process through the identification and assessment of the significant and cumulative effects that a plan or programme may have on the environment. This is conducted at a strategic level and enables consultation on the potential environmental effects of a plan with a wide range of stakeholders.

2.2 SEA Process and Stages

The Flintshire LFRMS SEA was carried out in accordance with the Office of Deputy Prime Minister (ODPM) (now the Department for Communities and Local Government (DCLG)) Guidance 'A Practical Guide to the Strategic Environmental Assessment Directive' (September 2005)[11], and meets the requirements of the SEA Directive (and resulting SEA Regulations). Figure 2.1 shows the different stages in the SEA process, and Table 2.1 breaks the stages down into the individual tasks involved.

[11] Department for Communities and Local Government (September 2005) A Practical Guide to the Strategic Environmental Assessment Directive

Figure 2.1: SEA Process Stages

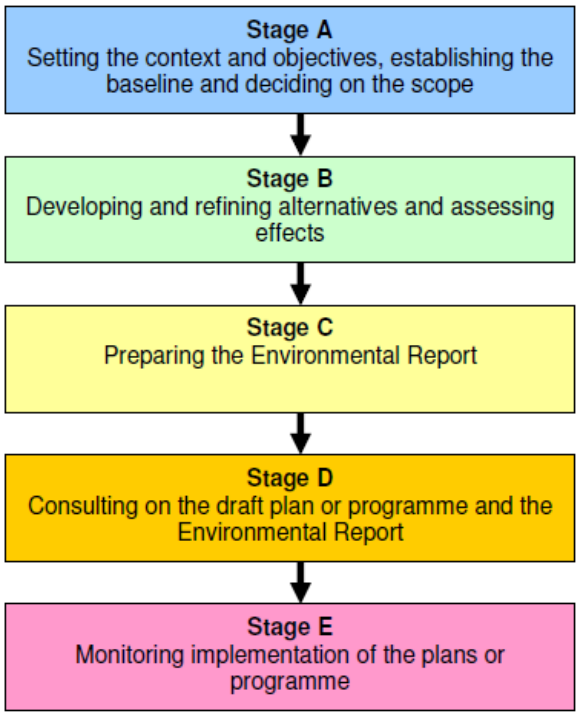


Table 2.1: Description of SEA Stages and Tasks

SEA Stage	SEA Task	Task Purpose
Stage A Setting the context and objectives, establishing the baseline and deciding on the scope	A1: Identifying other relevant plans, programmes, and environmental protection objectives	To establish how the plan or programme is affected by outside factors, to suggest ideas for how any constraints can be addressed, and to help to identify SEA objectives
	A2: Collecting baseline information	To provide an evidence base for environmental problems, prediction of effects, and monitoring; to help in the development of SEA objectives
	A3: Identifying environmental problems	To help focus the SEA and streamline the subsequent stages, including baseline information analysis, setting of the SEA objectives, prediction of effects and monitoring
	A4: Developing SEA objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed
	A5: Consulting on the scope of SEA	To ensure that the SEA covers the likely significant environmental effects of the plan or programme
Stage B Developing and refining alternatives and assessing effects	B1: Testing the plan or programme objectives against the SEA objectives	To identify potential synergies or inconsistencies between the objectives of the plan or programme and the SEA objectives and help in developing alternatives
	B2: Developing strategic alternatives	To develop and refine strategic alternatives
	B3: Predicting the effects of the draft plan or programme, including alternatives	To predict the significant environmental effects of the plan or programme and alternatives
	B4: Evaluating the effects of the draft plan or programme, including alternatives	To evaluate the predicted effects of the plan or programme and its alternatives and assist in the refinement of the plan or programme
	B5: Considering ways of mitigating adverse effects	To ensure that adverse effects are identified and potential mitigation measures are considered

SEA Stage	SEA Task	Task Purpose
	B6: Proposing measures to monitor the environmental effects of plan or programme implementation	To details the means by which the environmental performance for the plan or programme can be assessed
Stage C Preparing the Environmental Report	C1: Preparing the Environmental Report	To present the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision-makers
Stage D Consulting on the draft plan or programme and the Environmental Report	D1: Consulting on the draft plan or programme and Environmental Report	To give the public and the Consultation Bodies an opportunity to express their opinions on the findings of the Environmental Report and to use it as a reference point in commenting on the plan or programme. To gather more information through the opinions and concerns of the public
	D2: Assessing significant changes	To ensure that the environmental implications of any significant changes to the draft plan or programme at this stage are assessed and taken into account
	D3: Decision making and providing information	To provide information on how the Environmental Report and consultees' opinions were taken into account in deciding the final form of the plan or programme to be adopted
Stage E Monitoring implementation of the plans or programme	E1: Developing aims and methods for monitoring	To track the environmental effects of the plan or programme to show whether they are as predicted; to help identify adverse effects
	E2: Responding to adverse effects	To prepare for appropriate responses where adverse effects are identified

Source: Adapted from 'A Practical Guide to the Strategic Environmental Assessment Directive' (ODPM, September 2005)

2.3 SEA Scoping Consultation Results

The SEA Scoping Report was subject to a 5-week consultation period during which the three statutory consultees (Environment Agency Wales (EAW), Countryside Council for Wales (CCW), and Cadw) had the opportunity to comment on the scope, content and level of detail of the Scoping Report. Feedback was received from the statutory consultees and is provided in Appendix A along with how the feedback has been considered in the SEA process.

3. Description and Context of the Flintshire Local Flood Risk Management Strategy

3.1 Flintshire Local Flood Risk Management Strategy

Under the Flood and Water Management Act 2010, all Lead Local Flood Authorities (LLFA) are required to develop, maintain (which includes updating and reviewing), apply, and monitor the application of a strategy for local flood risk management in their area. This strategy is known as a Local Flood Risk Management Strategy (LFRMS).

A 'local flood risk' is defined within the Act as being a flood risk from:

- Surface run-off;
- Groundwater; and
- Ordinary watercourses.

The reference to ordinary watercourses includes a reference to a reservoir, lake, pond or other areas of water which flows into an ordinary watercourse.

Flintshire County Council is a LLFA, and as such has prepared a LFRMS. The LFRMS is a high level strategy document that sets out management policies for flood risk management. The Strategy does not provide details on management for specific flood risk areas. Specific Area Management Action Plans (SAMAP's) may be produced in the future, and will cascade down from the Strategy.

The Welsh Government (WG) has produced a National Strategy for Flood and Coastal Erosion Risk Management in Wales[12]. This is the overarching document for all LFRMS in Wales. The LFRMS must be consistent with this document. The WG has also produced a guidance document for LLFA 'Local Flood Risk Management Strategies: Local Strategy' (November 2011)[13].

The WG guidance states that LFRMS should be developed in keeping with the four overarching objectives for flood and coastal erosion risk management in Wales as set out in the National Strategy. The four objectives are:

- **Reducing the consequences** for individuals, communities, businesses and the environment from flooding and coastal erosion;
- **Raising awareness of and engaging people in the response** to flood and coastal erosion risk;
- **Providing an effective and sustained response** to flood and coastal erosion events; and
- **Prioritising investment** in the most at risk communities.

Section 10(4) of the Act, specifies what must be included within a LFRMS:

- The Risk Management Authorities in the Local Authority's area;
- The flood and coastal erosion risk management functions that may be exercised by those Authorities in relation to the area;

[12] Welsh Government (November 2011) Local Flood Risk Management Strategies – Local Strategy

[13] Her Majesty's Government (2009) The Flood Risk Regulations 2009

- The objectives for managing local flood risk (including, when available, any objectives included in an LLFA flood risk management plan prepared in accordance with the Flood Risk Regulations 2009**Error! Reference source not found.**);
- The measures proposed to achieve those objectives;
- How and when the measures are expected to be implemented;
- The costs and benefits of those measures, and how they are to be paid for;
- The assessment of local flood risk for the purpose of the strategy;
- How and when the strategy is to be reviewed; and
- How the strategy contributes to the achievement of wider environmental objectives.

3.2 Flintshire LFRMS Objectives and Strategic Options

3.2.1 Introduction

The consultation version of the FLFRMS contains ten overarching objectives which follow the guiding principles for flood risk management in Flintshire. These objectives are identified in the Flintshire LFRMS as strategic outcomes.

The measures set out in later sections of the FLFRMS seek to support these objectives. Further to these is a set of environmental objectives which aim to achieve wider environmental benefits as required by the Flood and Water Management Act.

The LFRMS will be supplemented by annual action plans in order to give a more detailed overview of what FCC want to achieve that year and how it will be undertaken.

3.2.2 Strategy Objectives

The ten overarching objectives are:

1. To improve the understanding of local flood (surface water, groundwater and ordinary watercourses) and coastal risks;

2. Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk;

3. To collaborate with FRMA's, stakeholders and the public to reduce flood and coastal risks, and share data and resources to the greatest benefit;

4. To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;

5. To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments;

6. Improve and/or maintain the capacity of existing drainage systems by targeted maintenance;

7. Take a sustainable approach to flood risks management balancing economic, environmental and social benefits;

8. Increase approaches that utilise the natural environment;

9. Ensure the development of skills required to implement effective and innovative flood risk management tasks; and

10. Identify projects and programmes which are affordable, maximising capital funding from internal and external sources.

3.2.3 Strategy Options

1	To improve the understanding of local flood (surface water, groundwater and ordinary watercourses) and coastal risks
1.1	Record all flooding incidents and where appropriate carry out flooding investigations;
1.2	Record all appropriate structures/assets on watercourses so that ownership and responsibility can be identified in the event of a problem with flooding;
1.3	Develop a consistent approach to designation of flooding/drainage structures;
1.4	Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment;
1.5	Develop a county wide map based record of flood risk assets, Flood Investigation Reports, historical flooding and areas at risk of flooding to allow a proactive risk management approach to be taken by the flood authority; and
1.6	Digitise all relevant paper reports and information to protect historical knowledge and make it accessible for future flood investigations.

2	Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk
2.1	Raise public awareness of the impacts of climate change on flooding and (failure of) coastal defences;
2.2	Publish a public awareness strategy (Workshops, public awareness events, publish information on the Council Website, adverts in local press) and communicate it;
2.3	Develop a capacity to deal effectively and appropriately with non-emergency flood incidents;
2.4	To collaborate with statutory bodies to promote the existing flood warning service (EAW) and their proposed flooding campaigns;
2.5	Collaborate with other FRA's to create an integrated county wide real time hydraulic and flood alert map (long term);
2.6	Make the public aware of available flood prevention and mitigation measures (resistance and resilience) to protect their property and assets; and
2.7	Target areas of historical flooding (or at high probability of flooding) to increase awareness of emergency procedures in the event of a flood.

3	To collaborate with FRMA's, stakeholders and the public to reduce flood and coastal risks, and share data and resources to the greatest benefit
3.1	Identify responsibilities of the riparian owners of managing their assets, through public engagement;
3.2	Continue to meet with the North Wales LFRMA's and Coordination Group to share knowledge, data and lessons learnt;
3.3	Develop an effective communication plan to ensure collaborative working and data sharing; and

3.4	Undertake stakeholder engagement, to identify responsibilities of flood risk partners.

4	**To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion**
4.1	Identify vulnerable groups within the community, and prepare action plans in the event of flooding;
4.2	Identify areas at greatest risk of flooding, and develop a capital cost investment programme to alleviate flooding;
4.3	Educate general public on options for protecting their properties through flood prevention options and resistance and resilience measures; and
4.4	Assist and provide support following a flood event.

5	**To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments**
5.1	Develop clear guidance for the Planning Department when assessing planning applications;
5.2	Develop a process with the Planning Department to create clear advise and direction to developers on FRMS and drainage (including incorporation of SuDS into new developments);
5.3	Establish a SuDS Approval Body (SAB);
5.4	Keep the Planning Department informed and up-to-date with flood areas in the County; and
5.5	Develop policies for effective land use management and enhance development control procedures where appropriate.

6	**Improve and/or maintain the capacity of existing drainage systems by targeted maintenance**
6.1	Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment;
6.2	Develop a risk based proactive and cyclical maintenance regime; and
6.3	Develop a risk based programme for improving existing infrastructure.

7	**Take a sustainable approach to flood risk management balancing economic, environmental and social benefits**
7.1	Ensure the environmental consequences of implementing the LFRMS are considered against the technical, economic and social benefits;
7.2	Consider the use of attenuation through wetlands to increase the length of flow durations, store flood water, and provide amenity and ecological benefits; and
7.3	Consider the use of bioretention areas to remove sediment and pollutants from ordinary watercourses.

8	**Increase approaches that utilise the natural environment**
8.1	Adopt natural flood-risk management techniques including SuDS;
8.2	Explore new and innovative technologies for flood defence and flood management;

8.3	Where possible incorporate multiple benefits such as water quality, biodiversity and amenity benefits; and
8.4	Develop and implement a culverting policy.

9	**Ensure the development of skills required to implement effective and innovative flood risk management measures**
9.1	Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the act;
9.2	Invest in appropriate software and hardware;
9.3	Outsource specialist skills to deliver specific projects, and
9.4	Collaborate and provide support, training and network of staff across the region.

10	**Identify projects and programmes which are affordable, maximising capital funding from internal and external sources**
10.1	Identify potential funding sources which may include communities and local business's;
10.2	Undertake full lifecycle cost benefit analysis for projects including social, and environmental benefits; and
10.3	Investigate opportunities for match funding and grants.

4. Stage A Scoping Summary

4.1 Plans and Programmes Summary

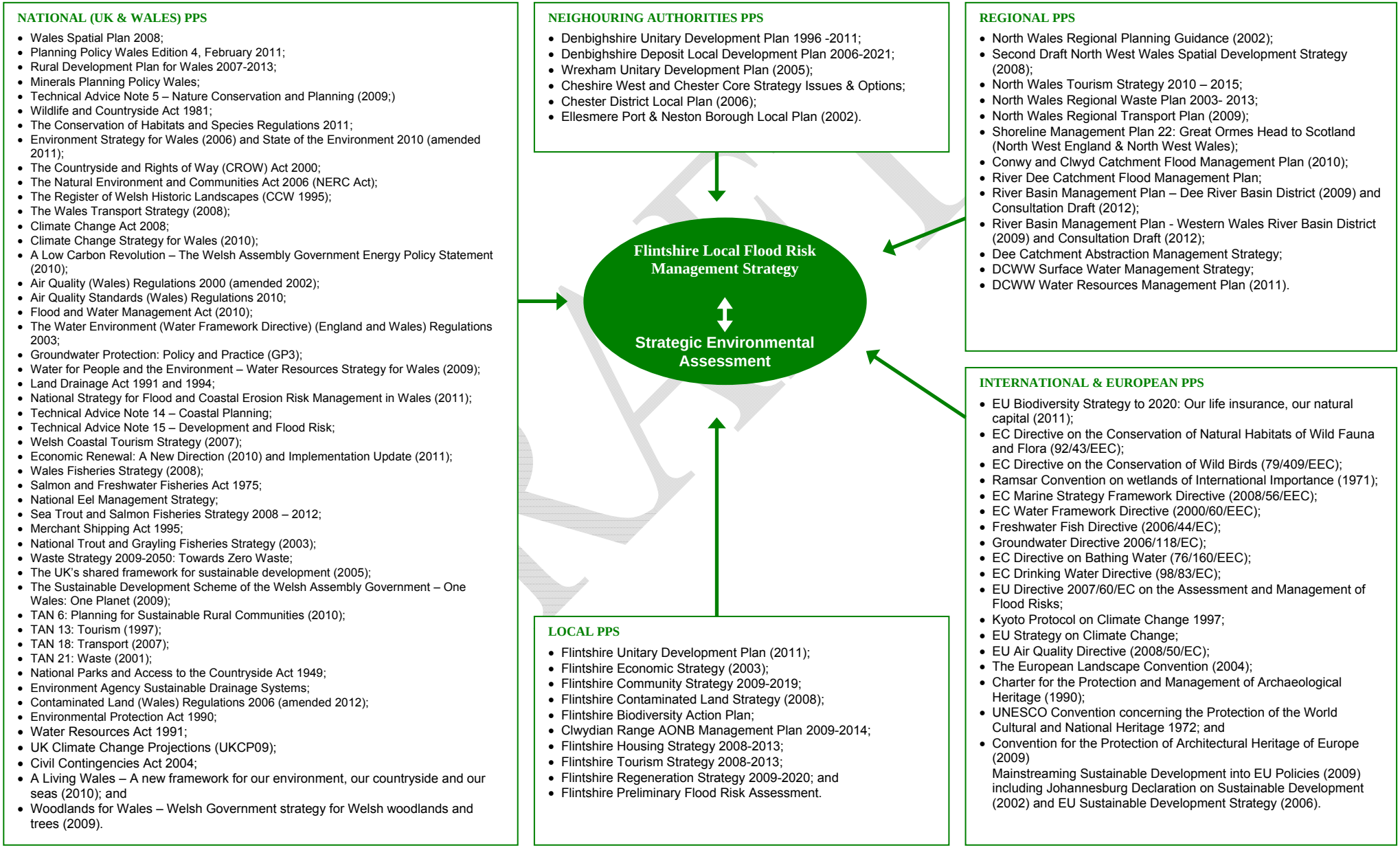
The LFRMS must comply with all current relevant policies, plans, programmes (PPPs) and environmental protection legislation at international, national and local levels.

The SEA Directive requires "an outline of the plan or programme's relationship with other relevant plans and programmes"; Annex 1(a) and

"the environmental protection objectives, established at international, Community or Member State level, which are relevant to the plans or programme and the way those objectives and any environmental considerations have been taken into account during tits preparation." Annex 1(e)

The LFRMS must support and where possible strengthen the objectives of other local plans and strategies within Flintshire County. A review of these documents is required in order to identify any potential inconsistencies or constraints between these documents and the LFRMS. Any inconsistencies and constraints identified can then be addressed. Figure 4.1 below lists the current and relevant PPPs, which were considered during the Scoping stage. Appendix B presents the PPP review and a description on how these objectives or requirements were integrated into the LFRMS.

Figure 4.1: Relevant Policies, Plans, Programmes and Environmental Protection Legislation



4.2 Baseline Scoping Summary

Current baseline information for the environment and socio-economics was collected and examined for Flintshire County during the scoping exercise. The baseline information collected during the scoping stage of the process forms an evidence base against which environmental effects (either positive or negative) resulting from the LFRMS can be predicted and assessed.

SEA Directive requires: 'The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.' Annex I(b);

'The environmental characteristics of areas likely to be significantly affected' Annex I(c);

'Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and the Habitats Directive.' Annex 1(d)

The baseline information collected is presented under the topics outlined in Annex 1(f) of the 'SEA Directive' and is contained within Appendix C. The topics which were reviewed during the scoping exercise are detailed below:

- Air;
- Water;
- Climatic Factors;
- Soil;
- Biodiversity, Fauna and Flora;
- Landscape;
- Cultural Heritage (architectural and archaeological heritage);
- Population and Human Health; and
- Material Assets.

4.2.1 Future Baseline

The SEA Directive requires the following to be identified:

'The relevant aspects of the current state of the environment (i.e. the current baseline) and the likely evolution thereof without implementation of the Plan or Programme'.

Prediction of future trends is difficult because they depend on a wide range of global, national, and regional factors and decision-making which can change without prior warning.

Assuming that the proposed LFRMS is not implemented and based on the information currently available to date it is believed that the following trends and statements that were identified in the scoping exercise stand.

This is under the assumption that no actions or developments (above and beyond the programmed works) are undertaken relating to flooding and flood protection as defined in the Act:

- Air quality – new development, regeneration and tourism may lead to increased car journeys within the County and may increase traffic on the A55 leading to localised air quality effects. Public transport improvements, national air quality targets and European emissions standards for new vehicles should contribute to reducing future air quality impacts from motor vehicles;
- Water – water quality is likely to continue to be maintained and improved through legislation such as the Water Framework Directive. New development could increase surface water run-off and exacerbate flooding issues. Future flooding may cause pollution of watercourses and groundwater;
- Climatic Factors – future climate change effects are likely to include sea level rise, higher temperatures and more severe weather conditions (higher intensity and duration) including flash floods;
- Biodiversity – habitats and species are likely to continue to be protected through European and UK legislation. However, future development may put pressure on these ecological areas. Future climate change effects and flooding may affect ecosystems, habitats and species;
- Population – the population of the County is predicted to increase. This may put development pressure on the land and development may have to be located in flood risk areas. Future severe flood events may affect the population in term of damage to houses, local infrastructure and services that communities rely on. Future flood events may also affect the economy through damage to businesses and tourism;
- Human Health – future flood events may impact on human health through injury or death, emotion stress of flooding, and pollution leading to health issues;
- Material Assets – regeneration and future investment and demand are likely to increase the number and quality of material assets such as housing, transport infrastructure, waste facilities, power stations and community facilities;
- Landscape – future flood events and future development may affect the quality and character of landscapes;
- Soil – future flood events may cause damage to agricultural land which could have consequences for the rural economy. Future flooding in contaminated areas could also increase pollution; and
- Cultural Heritage – historic assets are likely to continue to be protected through European and UK legislation. Future flooding may damage historic assets and their character.

4.3 Key Environmental Issues and Opportunities

A key stage in the scoping process was to decide what topics were relevant for the Flintshire LFRMS SEA and what topics (if any) should be scoped out. Table 4.1 below presents those topics that have been scoped in and out. It also presents the key issues and opportunities relevant to each topic that were identified during the scoping exercise. Topics were scoped in based on the likelihood of flood risk and the LFRMS potentially impacting them. This was assessed using professional judgement to review baseline conditions and current environmental issues for Flintshire and to determine the likelihood of this potential impact.

Table 4.1: Key Issues and Opportunities

SEA Topic	Scoped In	Scoped Out	Evidence	Key Issues and Opportunities
Air Quality		✓	In general air quality in the County is good, meeting National Air Quality Standards. Air pollution is primarily from road transport.	Air quality is unlikely to be effected by the Flintshire LFRMS. However, if the LFRMS proposes active intervention such as capital works in certain areas there may be minor temporary effects during construction from plant machinery and construction transportation, but this should be mitigated by use of best environmental site practices. Due to the fact that FCC has no declared AQMAs and the LFRMS is unlikely to have effects on air quality it is

SEA Topic	Scoped In	Scoped Out	Evidence	Key Issues and Opportunities
				proposed to scope out air quality from the SEA.
Water	✓		The majority of watercourses and water bodies in the County are classed by the EAW as good to moderate quality in terms of both ecological and chemical parameters. Only the River Alyn and Wheeler were described as of poor status. Groundwater vulnerability which indicates the susceptibility of the underlying aquifer to pollution varies across the County. The areas of Kinnerton Sandstone and Carboniferous Limestone are highly permeable. There are 2 groundwater source protection zones. Surface water flooding is a common source of flooding in the County.	Flooding can have a potential negative impact on water quality. Flooding of contaminated land, sewerage networks, agricultural land and urban land can result in the spread of pollutants from their sources into watercourses. The LFRMS may have effects for water quality by: • Implementation of SuDS: should reduce pressure on the sewerage network, reducing the likelihood of floods arising from it and preventing the spread of pollutants both into watercourses and the sea impacting the quality of the water bodies. To fulfil the local authority's role as a SuDS Approval Body (SAB), the LFRMS will describe how the implementation of SuDS will be managed across the local authority; • Proper management of flood risk: will attempt to avoid the flooding of contaminated land and the subsequent spread of pollutants into watercourses; • Releasing pollutants into watercourses, which have been produced by the construction undertaken for flood alleviation schemes, may diminish water quality. However, this is likely to be avoided via the flood defence/land drainage consent process and pollution control guidelines; and • Careful management of water in terms of flood risk will allow for better water resources management through adaption to climate change and other water related pressures.
Climatic Factors	✓		The County is predicted to have warmer, drier summers and wetter, warmer winters Sea level is projected to rise as a result of climate change.	Climate change can increase flood risk through heavy rainfall leading to flash floods. The LFRMS will need to take climate change effects into consideration when planning flood management. Although the LFRMS is not directly concerned with tidal flooding, tidal flooding (storm surge) may have cumulative effects with surface water flooding. Since the coastal strip is heavily populated this could have significant effects. The LFRMS may have effects for climate change by: • Managing and mitigating the future effects of climate change with regard to flooding; • Increasing sustainability across the Flintshire County with regard to flood risk management, as it will incorporate more sustainable flood management techniques (SuDS), which are more beneficial compared to current techniques; • Opportunity to Use 'greener' solutions for flood defences including using material which are sustainable and locally sourced, use of natural defences and use of SuDS; and • Potential increase in carbon emissions from flood management activities such as the construction of concrete-made flood defences or the creation of methane producing habitats (i.e. wetlands).
Soil	✓		Generally Flintshire does not have a history of heavy (or polluting) industries, with the main employment associated with agriculture and forestry.	Flooding can cause damage of agricultural land making it unusable for farming, and can ruin crops and injure or kill livestock. Flooding can also wash away soils leading to siltation or rivers and streams. Flooding of contaminated areas can cause pollution of

SEA Topic	Scoped In	Scoped Out	Evidence	Key Issues and Opportunities
			However, a number of potentially polluting industries have occurred in the county including: lead mining; coalfields; WWI explosive factory; WWII ordinance factory; steelworks.	watercourses and groundwater, and can affect human health. The LFRMS may have effects on soil by: • Implementing an efficient flood risk management plan to reduce the occurrence and level of severity of floods in Flintshire. This in turn may make land available for agriculture which was previously deemed as unsuitable due to flood risk, and should reduce the incidents of pollution relating to flooding.
Biodiversity, Fauna, and Flora	✓		The County is rich in flora and fauna. It contains several SPA, SAC, SSSI, NNR, LNR and RIGS. These are also important for tourism.	Natural flooding plays an integral role in creation and maintenance of wetland habitats, upon which many species rely on. However, flooding events could potentially lead to the destruction of habitats sensitive to flooding. The LFRMS may have effects for biodiversity, including: • May alter natural flooding regimes which could potentially negatively impact ecosystem that rely on flooding to maintain their habitats and soil fertility; • The discharge of floodwater into water bodies can also have a detrimental effect on biodiversity in terms of direct physical damage and impact on water quality; • May benefit biodiversity by reducing the number of severity of flood events that could threaten habitats and species; • Physical flood defences (e.g. embankments/levees, walls, weirs, sluices and pumping stations) used in flood management may negatively impact the habitats of certain species in turn affecting those species, e.g. white clawed crayfish, otters, water voles and fish species; • Natural flood alleviation schemes have the potential to increase biodiversity through the creation of new habitats; and • Flood defence works need to timed appropriately to avoid fish spawning season, and bird breeding season.
Landscape	✓		Flintshire falls partly within the Clwydian Range AONB, and also contains landscapes of historic importance. These areas are important for tourism.	Flood events could potentially result in the damage/destruction of important landscape features. The LFRMS may have effects for landscape through: • There may be opportunities for synergy between a reduction in the flood potential of some areas and the protection of historic features, for example historic monuments are vulnerable to damage from water erosion so actions which reduce the rate of water flow can be beneficial; • Alteration of the landscape character both positive and negative. A natural flood alleviation method may enhance the character of the landscape. However, man-made structural defences may detract from the quality of the landscape; and • May benefit the landscape quality by reducing the occurrence and severity of floods, which could in turn damage important landscape features.

SEA Topic	Scoped In	Scoped Out	Evidence	Key Issues and Opportunities
Cultural Heritage	✓		The County has a rich heritage and contains many listed buildings, scheduled ancient monuments, conservation areas, and historic parks and gardens. These areas are also important for tourism.	Flooding may cause damage to the fabric of historic assets and/or their setting. The LFRMS may have effects for cultural heritage through: • There may be opportunities for synergy between a reduction in the flood potential of some areas and the protection of historic features, for example historic monuments are vulnerable to damage from water erosion so actions which reduce the rate of water flow can be beneficial; • Implementing an efficient flood risk management plan to reduce the occurrence and level of severity of floods in the County which may threaten historic assets; and • Flood defence structures and construction activities may result in damage to historic assets or affect their setting. However, this is likely to be avoided through best practice site method and the planning approvals process.
Population	✓		Current population is 152,500 and this is expected to increase. Population density is highest across the coastal fringes of the county and along major transport routes. There are significant rural areas with low population density. Some of the key economic indicators suggest that Flintshire's economy is currently strong and performing well: unemployment is relatively low, GDP and economic activity are relatively high. However there are still weaknesses in the County economy such as pockets of high unemployment and deprivation in both rural and urban parts of Flintshire.	Flooding events can severely impact local population. Flooding can cause damage to houses, local infrastructure and services that communities rely on. Flooding can also affect people's livelihoods and the economy through damage to business premises and lost revenue due to stock damage or transportation delays. Flooding can also damage tourism assets and put visitors off coming to an area. Population increase will led to new development which increase flood risk and assets at risk from flooding The LFRMS may have effects for population through: • Benefiting the local population by reducing flood risk and its impacts for communities, businesses and tourism; • Reducing flood risk may make land available for development which was previously deemed as unsuitable due to flood risk; • Costs associated with implementation of the LFRMS; and • Opportunity to work with planners to reduce new development in high flood risk areas; work with businesses to raise awareness of flood risk and how to deal with a flood event; work with developers to design SuDS into new developments.
Human Health	✓		Life expectancy is above the Wales average. Flintshire has 3 LSOA with the most deprived in the Country. In general the more deprived areas in Flintshire tend to be located along the eastern side of the county	Flooding events can impact human health through a number of factors including injury and death; emotional stress of flooding to a home and loss/damage to personal items; pollution and contamination. It is anticipated that the impacts of climate change may be felt disproportionately by the most vulnerable society. As such, the most deprived areas may be more vulnerable to flood risk. The LFRMS may affect human health though: • Implementing an efficient flood risk management plan to reduce the occurrence and level of severity of floods in Flintshire, and consequently the number of people at risk; and

SEA Topic	Scoped In	Scoped Out	Evidence	Key Issues and Opportunities
				• Opportunity to raise awareness of flooding, what to do in the event of a flooding incident and who to contact for help and advice. This may also help reduce perceived fear associated with flooding as residents will be equipped with the knowledge of how to deal with a flood event.
Material Assets	✓		Projected demand for new dwellings is 7,400 over the life of the UDP. There are 3 main power stations within Flintshire. Additional land is required for future waste arisings	Flooding can damage and destroy key assets and infrastructure including: • Damage to houses by making them uninhabitable; • Damage to waste management infrastructure, resulting in spread of contaminants; • Damage to transport infrastructure, reducing accessibility to essential services; • Damage to power stations and supplies, affecting energy supplies; and • Damage to community facilities making them unfit and unsafe for use. The LFRMS may have effects for material assets by: • Implementing an efficient flood risk management plan to reduce the occurrence and level of severity of floods in the County, reducing assets and infrastructure at risk of flooding; • Reducing flood risk may make land available for development which was previously deemed as unsuitable due to flood risk; and • Opportunity to work with developers to design SuDS into new housing developments, new waste facilities etc, and encourage use of grey water recycling; work with planners to ensure new development, key assets and infrastructure are not located in high flood risk areas.

4.4 SEA Framework

The SEA Framework was developed during the scoping stage and includes the SEA objectives, assessment criteria and indicators (see Table 4.2). The SEA objectives were developed based on the SEA Directive topics, baseline information, and key issues for the County. The indicators will be used as the basis for monitoring proposals to monitor the implementation of the LFRMS (Section 7).

* It should be noted that the objective on population and human health has been changed from the scoping stage because it was felt that the objective should be broadened to include human health effects from a reduction in flooding in general, not just through flood risk awareness raising and emergency planning.

Table 4.2: SEA Framework

Topic	Flintshire Strategy SEA Objectives	Assessment Criteria	Indicators
Water	Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	• Will it affect the ecological status/potential of water bodies? • Will it affect the chemical status/potential of water bodies? • Will it affect overall water quality of water bodies? • Will it affect the water quality on the beaches?	• Ecological status of water bodies; • Chemical status of water bodies; • Closures on beaches due to water quality failure; and • Number of pollution incidents following flood events.
Flood risk	Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within Flintshire County.	• Will it reduce the risk of flooding from ordinary watercourses? • Will it reduce the risk of flooding from surface water run-off? • Will it reduce the risk of flooding from groundwater? • Will it reduce the risk of flooding from artificial water bodies? • Will it help provide a better understanding of flood risk?	• Number of residential and non-residential properties at risk of flooding; • Number of new developments permitted in areas of flood risk; • Number of flood defences schemes implemented; • Number of SuDS implemented; and • Number and severity of flooding incidents in Flintshire and their source.
Population, Human Health	Enhance human health and wellbeing through reducing flooding effects*.	• Will it increase awareness of flood risk? • Will it prescribe procedures for emergency planning for flood risk? • Will it help communities be more resilient and prepare better for flooding events? • Will it help reduce the perceived fear of flooding? • Will it help to maintain accessibility to key services and goods? • Will it reduce flood risk for businesses and reduce revenue lost through flooding? • Will it protect tourism assets and reduce tourism	• Number of flood related injuries and fatalities; • Number of residential and non-residential properties at risk from flooding; • Number of flood events leading to transport disruption; • Number of awareness raising activities and events undertaken; and • Number of flood related public enquires.

Topic	Flintshire Strategy SEA Objectives	Assessment Criteria	Indicators
		revenue lost through flooding?	
Biodiversity	Protect and enhance biodiversity and geo-diversity across the Flintshire County.	• Will it encourage habitat creation through SuDS and flood defence works? • Will it involve loss or damage to habitats as a result flood defence works? • Will flood management proposals affect habitats that rely on localised flooding e.g. wetlands? • Will it affect ecological areas that are benefited by flood cycles? • Will it help protect ecological sites and species from flood risk?	• Negative impacts on statutory and non-statutory ecological sites as a result of flooding; • Number of flood incidents that have resulted in loss of protected or LBAP species; • Area of protected or LBAP habitat damaged or brought into less favourable condition though flooding; • Area of habitat created (type, and area) or lost as a result of SuDS and flood defence works; and • Populations of priority species lost or increased through flood defence works.
Landscape	Protect and enhance landscape quality and character across the county.	• Will it protect landscape quality and character from flood risk? • Will it enhance landscape quality?	• Area of landscape at risk from flooding; • No significant adverse landscape effects from flooding related development in sensitive landscape; and • Positive (or negative) visual impact of flood defence schemes located within outstanding areas of landscape quality or significance.
Cultural Heritage	Protect historic assets and their landscapes.	• Will it affect the fabric of an historic asset • Will it affect the setting of a historic asset • Will it help protect historic assets from flood risk?	• Number of historic assets at risk of flooding; and • Number of listed buildings on the 'at risk' register at risk from flooding.
Climate Factors	Educate, manage, plan and adapt for the effects of climate change.	• Will it assist in educating people about the impacts of climate change on flood risk? • Will it help the County to adapt to climate change effects? • Will it encourage implementation of SuDS?	• Number of SuDS schemes implemented; • Predicted future flood risk with climate change; and • Number of educational activities (exhibitions, workshops, leaflets, questionnaires, advertising) undertaken.

Topic	Flintshire Strategy SEA Objectives	Assessment Criteria	Indicators
Material Assets	Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	• Will it help protect key transport infrastructure? • Will it help protect energy, power and telecommunication assets? • Will it help protect community facilities including schools, libraries, hospitals etc? • Will it help protect waste facilities? • Will it help reduce the number of properties at risk of flooding?	• Number and severity of incidents leading to disruption or damage to transport infrastructure; • Number and severity of incidents leading to disruption or damage to service provision; • Number of residential and non-residential properties at risk of flooding across Flintshire; • Number of power, waste and telecommunication assets at risk of flooding; • Number of critical services at risk of flooding; and • Transport infrastructure at risk from flooding.
Soil	Protect best quality soil and agricultural land and minimise the potential for pollution.	• Will it help protect soils and agricultural land? • Will it help minimise the potential for pollution from flooding?	• Area of agricultural land at risk of flooding; • Area of agricultural land lost due to the need for flood defence; and • Number of pollution incidents arising from flooding.

4.5 Compatibility of SEA Objectives

When developing objectives based on environmental, social and economic issues, it is likely that not all of these objectives will relate or be compatible. For example, objectives which are economic issues may sometimes conflict with environmental objectives, and vice versa. A compatibility assessment of the SEA objectives is presented in Figure 4.2, and demonstrates any potential conflicts and uncertainties between objectives.

The following key has been used to illustrate the SEA objectives compatibility:

+	Objectives are compatible
-	Objectives are potentially incompatible
0	Objectives are not related
/	Uncertainty over relationship

Figure 4.2: SEA Objectives Compatibility Matrix

SEA Objectives	1	2	3	4	5	6	7	8	9
1									
2	+								
3	+	+							
4	+	/	+						
5	+	/	+	+					
6	0	/	+	0	+				
7	+	+	+	+	+	+			
8	0	+	+	0	0	0	+		
9	+	+	+	+	+	0	+	0	

SEA Objectives

Table 4.3: SEA Objectives

Ref	Flintshire LFRMS SEA Objectives
1	Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.
2	Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within Flintshire County.
3	Enhance human health and wellbeing through flood risk awareness raising and emergency planning.
4	Protect and enhance biodiversity and geo-diversity across the Flintshire County.
5	Protect and enhance landscape quality and character across the county.
6	Protect historic assets and their settings..
7	Educate, manage, plan and adapt for the effects of climate change.
8	Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.
9	Protect best quality soil and agricultural land and minimise the potential for pollution.

Instances of uncertainty between objectives are explained below:

Objective 2 with Objective 4: Some habitats rely on localised flooding events or inundation by water. Seeking to minimise the impacts of flooding in a particular locality may lead to a starvation of water for habitats in close proximity. There is also the potential that waters channelled away from one locality will result in too much water in other localities. There is also potential that flood defence works may result in detraction of ecological sites and affect habitats and species.

Objective 2 with Objective 5: There is the potential that flood defence works to reduce and manage flood risk may detract from the landscape character.

Objective 2 with Objective 6: There is the potential that flood defence works to reduce and manage flood risk may detract from historic assets.

5. Strategic Options Development and Assessment

5.1 Compatibility of LFRMS Objectives and SEA Objectives

Testing the compatibility of the LFRMS objectives against the SEA objectives is the first task in Stage B of the SEA process. It helps to identify any potential synergies or inconsistencies between the LFRMS and SEA objectives and contributes to the development of the proposed options. A compatibility matrix (see Figure 5.1) was completed between the SEA and the LFRMS objectives.

The following key has been used to illustrate the LFRMS and SEA objectives compatibility:

+	Objectives are compatible
-	Objectives are potentially incompatible
0	Objectives are not related
/	Uncertainty over relationship

5.2 Summary of Compatibility

The LFRMS objectives and SEA objectives are all compatible. The LFRMS objectives aim to reduce the risks, impacts and consequences of flooding for people, business, property, infrastructure and the environment. These objectives support the SEA objectives on protecting communities, biodiversity, landscape, heritage, water, soils etc. Adopting a sustainable approach to flood risk management will help ensure that flood management schemes do not adversely effect the environment.

Figure 5.1: LFRMS and SEA Objectives Compatibility Matrix

		Strategic Environmental Assessment Objectives								
		1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	3. Enhance human health and wellbeing through reducing flooding effects.	4. Protect and enhance biodiversity and geo-diversity across the County.	5. Protect and enhance landscape quality and character across the County.	6. Protect historic assets and their settings.	7. Educate, manage, plan and adapt for the effects of climate change.	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	9. Protect best quality soil and agricultural land and minimise the potential for pollution.
Flintshire Local Flood Risk Management Strategy Objectives	**Objective 1**	+	+	+	+	+	+	+	+	+
	Objective 2	+	+	+	+	+	+	+	+	+
	Objective 3	+	+	+	+	+	+	+	+	+
	Objective 4	+	+	+	+	+	+	+	+	+
	Objective 5	+	+	+	+	+	+	+	+	+
	Objective 6	+	+	+	+	+	+	+	+	+
	Objective 7	+	+	+	+	+	+	+	+	+
	Objective 8	+	+	+	+	+	+	+	+	+
	Objective 9	+	+	+	+	+	+	+	+	+
	Objective 10	+	+	+	+	+	+	+	+	+

Flintshire LFRMS Objectives

Objective 1. To improve the understanding of flooding (surface water, groundwater and ordinary watercourses) and coastal risks;
Objective 2. Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk;
Objective 3. To work together (both FRMA's, stakeholders and public) to reduce flood and coastal risks, sharing data and resources to the greatest benefit;
Objective 4. To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion;
Objective 5. To ensure that Flood Risk Management issues are considered when planning decisions regarding development are made;
Objective 6. Improve and/or maintain the capacity of existing drainage systems by targeted maintenance;
Objective 7. Take a sustainable approach to flood risk management balancing economic, environmental and social benefits;
Objective 8. Increasing approaches that utilise the natural environment;
Objective 9. Ensure the development of skills required to implement effective and innovative flood risk management measures; and
Objective 10. Identify projects and programmes which are affordable, maximising capital funding from internal and external sources.

5.3 Assessment of Strategic Options

A variety of options or 'measures' were developed under each of the LFRMS objectives (see 6.1). The aim of the measures was to help FCC to deliver the LFRMS objectives by providing more detailed approaches and tasks to be undertaken. Each of the measure was assessed against the SEA Framework (Table 4.2). A 'Do Nothing' option and a 'Business as Usual' option were also assessed. A definition of these options is presented below:

- Do Nothing – the flood risk management team at FCC is disbanded and no further work on flood risk management is undertaken; and
- Business as Usual – the existing flood risk management team at FCC is retained and current flood risk management activities continue but the LFRMS is not implemented.

The measures were appraised against the SEA Framework by determining the level of environmental performance of the measure against each of the SEA Framework objectives. It should be noted that the assessment was a high level, strategic evaluation of implementing policy.

The assessment criteria and key used were as follows:

+++	Significant positive effect
++	Moderate positive effect
+	Minor positive effect
0	Neutral or no effect
-	Minor negative effect
- -	Moderate negative effect
- - -	Significant negative effect
?	Uncertainty over effect or multiple effects which are both positive and negative
D	Effect depends on implementation

Duration of Effect	
LT	Long Term
MT	Medium term
ST	Short Term
Perm	Permanent
Temp	Temporary

Cumulative Effect	
D	Direct
I	Indirect
SE	Secondary
SY	Synergistic

Definitions of scoring key:

Duration of effect:

- Long Term – effects that will occur between 50 and 100 years after implementation of the plan;
- Medium Term – effects that will occur between 20 and 50 years after implementation of the plan;
- Short Term – effects that will occur between 0 and 20 years after implementation of the plan;
- Permanent – are effects of the plan that are permanent e.g. loss of trees for a development; and
- Temporary – are effects of the plan that are temporary in nature, usually these would be temporary construction impacts.

The duration of short, medium and long term has been taken from the time periods set out in the Local Flood Risk Management Strategies guidance (Welsh Government, November 2011).

Cumulative Effect:

- Direct – are effects that are a direct result of the plan. For example, the plan or development would create jobs;
- Secondary or indirect - are effects that are not a direct result of the plan, but occur away from the original effect or as a result of a complex pathway. Examples of secondary effects are a development that changes a water table and thus affects the ecology of a nearby wetland; and construction of one project that facilitates or attracts other developments; and

Synergistic effects - interact to produce a total effect greater than the sum of the individual effects. Synergistic effects often happen as habitats, resources or human communities get close to capacity. For instance a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.

5.4 Summary of Options Assessment

The full assessment tables and commentary are presented in Appendix D. Below is a written summary of the assessment results.

5.4.1 Initial Draft LFRMS Objective 1

Measure 1 – Do nothing
If the FCC flood management team, Risk Authorities and the public do not understand flood risks and issues then the risks cannot be effectively managed and flooding will continue to be a problem and furthermore is likely to get worse as climate change affects cause more frequent and severe weather events. This is likely to have significant negative effects on flood risk reduction, human health, infrastructure, property and businesses, historic assets and soils. In addition, the measure would not allow for climate change planning and adaptation. There are also likely to be moderate negative effects on biodiversity, water quality and landscape from flood damage.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
The flood management team keep up-to-date with current flood risk knowledge and flood management techniques and communicate these to the public so that all have an understanding of current flood risk issues. As more data is recorded and built up over time the understanding of risks and risk areas will increase and more efficient and effective management can be implemented to reduce flood risk. This will have benefits in terms of protecting humans, property and businesses, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage. Business as Usual also involves keeping abreast of climate change effects and projectors and taking these into consideration in planning flood management.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is felt that more measure would also be required.

Measure 3 – Record all flooding incidents and where appropriate carry out flooding investigations
This measure would ensure that the process for recording flood incidents and carrying out flood investigation was consistent and transparent, allowing data to be used for future flood management. This is likely to result in more effective flood management, identifying responsibility, bringing all useful information together in one place, providing an understanding of the incident, outlining possible causes of flooding and potential long-term solutions to protect people and their homes from flooding. This is likely to have benefits

in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage in the future. It will also help plan for future climate change effects.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 4 – Record all appropriate structures/assets on watercourses so that ownership and responsibility can be identified in the event of a problem with flooding
This measure would ensure a consistent and complete database was kept up-to-date of flood and drainage assets in the County. This would help plan maintenance and upgrading of assets and identify where issues may occur. This measure would also help ensure that everyone knew who owned which assets and what their responsibilities are regarding those assets. This would help reduce flood risk as people are more likely to take ownership and responsibility of looking after their own assets, and also if a flood event occurs there will be no disagreement over whose responsibility it is to take action. However, just because people know they have responsibilities doesn't mean they will carry them out. The measure is likely to have benefits in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage. It will also help plan for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Develop a consistent approach to the designation of flooding/drainage structures
This measure is similar to measure 4 and will therefore have similar effects. It would ensure a consistent and complete database was kept up-to-date of flood and drainage assets in the County. This would help plan maintenance and upgrading of assets and identify where issues may occur. This is likely to have benefits in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage. It will also help plan for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 6 – Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment
This option would provide a more proactive active looking at the condition of drainage assets to identify what and when assets will need upgrading to prioritise investment. This is likely to have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses. It is likely to have minor positive effects on biodiversity, water quality, historic assets and climate change adaptation and planning.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, this is the same as Measure 3, Objective 6. Therefore, only one or the other needs to be included in the LFRMS.

Measure 7 – Develop a county wide map based record of flood risk assets, flood investigation reports, historical flooding and areas at risks of flooding to allow a proactive risk management approach to be taken by the flood authority
This measure is likely to have significant positive effects in terms of better understanding and reducing flood risk and will have a positive impact in terms of protecting human health, infrastructure, property and businesses. Larger benefits are likely to be felt in the medium and long term as more data is recorded and fed into the model making it more accurate. Reduced flood risk will have moderate positive effects for biodiversity, water quality, historic assets and soils. The model should also help manage and plan for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 8 – Digitalise all relevant paper reports and information to protect historical knowledge and make it accessible for future flood investigations
This measure is unlikely to have significant effects but is important for preserving past knowledge on flood risk and flooding incidents which may help in the future. Effects are likely to be short term as once all the

paper reports and information are digitalised is likely that a move will be made to digital and all subsequent reports will automatically be digital. There will be minor positive effects in terms of flood risk reduction and protection of humans, property, infrastructure, businesses, historic assets and water quality.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

5.4.2 Initial Draft LFRMS Objective 2

Measure 1 – Do nothing
Doing nothing will have significant negative effects in terms flood risk, human health and impacts on property, infrastructure, businesses and historic assets because individuals and communities will not be aware of the risk and what measure they should put in place to reduce flood risk and flooding consequences. In the medium and long term as frequency and severity of flooding events increase with climate change effects, doing nothing to prepare for this will have negative impacts on water quality, biodiversity, landscape and soils.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
Currently FCC carry out some awareness raising campaigns and events, especially in high flood risk areas. This helps increase public awareness of flood risks and what to do to prepare for a flood. Therefore, this measure is likely to have positive effects on reducing the impact and consequences of flooding for human health, infrastructure, property, businesses and historic assets. As understanding and awareness increases there may be beneficial effects for biodiversity, landscape and soils from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 3 – Raise public awareness of the impacts of climate change on flooding and coastal erosion including possible failure of coastal defences
Climate change will have significant impacts on coastal erosion and flooding in the future. It is important that people are aware of this so that they can plan for the future and prepare and adapt their homes for future flood risk. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting historic assets, property and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Publish a public awareness strategy (Workshops, public awareness events, publish information on the Council Website, adverts in local press) and communicate it widely
Implementing a public awareness strategy through a range of media should engage with a wide variety and geographical distribution of people. The more people that are aware of flood risk and how to deal with it the more benefits will be gained in terms of flood protection. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting historic assets, property, assets and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Develop a capacity to deal effectively and appropriately with non-emergency flood incidents
This measure will help ensure that flood support is provided to people in non-emergency situations. The team can provide advice on what to do to prepare and protect assets and property from flooding. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting

historic assets, property and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 6 – To collaborate with statutory bodies to promote the existing flood warning service (EAW) and their proposed flooding awareness campaigns
Awareness of flood warning services and flooding campaigns are important to allow people to prepare for a flood event and understand what to do in a flood event. This will have benefits on human health and reducing the impacts and consequences of flooding. It may also have minor positive effects on biodiversity, water quality, landscape and soils. By collaborating, FCC can utilise staff and expertise from other authorities and help reduce costs to the Council.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 7 – Collaborate with other FRA's to create an integrated county wide real time hydraulic and flood alert map (long term)
This measure is likely to have significant positive effects in terms of understanding and raising awareness of flood risk and reducing flood risk and associated impacts on human health, infrastructure, property and businesses. Larger benefits are likely to be felt in the medium and long term as more data is recorded and fed into the model creating a more accurate reflection of flood risk in the County. Reduced flood risk will have positive effects for biodiversity, water quality, historic assets and soils. The model should also help manage and plan for future climate change effects.

SEA Recommendation – This measure would provide significant positive effects in terms of flood risk understanding and awareness, and flood reduction and could be included in the LFRMS.

Measure 8 – Make public aware of available flood prevention and mitigation measures (resistance and resilience) to protect their property and assets
If the public are aware of the flood prevention options and mitigation measures available to them to reduce flooding and alleviate the effects of flooding then they are more likely to use these to protect themselves, their properties and businesses. This is likely to have positive effects in terms of reducing the impacts and consequences of flooding on human health, property and businesses. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution. Owners of historic assets and farmers can also implement these measures to protect their assets from flood damage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, this measure is the same as Measure 5 under Objective 4 and therefore only one or the other should be included in the LFRMS.

Measure 9 – Target areas of historical flooding (or at high probability of flooding) to increase awareness of emergency procedures in the event of a flood
This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on human health, property, businesses, infrastructure and historic assets. The measure is more focused on increasing awareness of what the public can do to stay safe in a flood and in clearing up afterwards than biodiversity and landscape. However, there may be some long term minor positive effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

5.4.3 Initial Draft LFRMS Objective 3

Measure 1 – Do nothing
Not working together and sharing data and knowledge on flood risk is likely to have negative, transboundary effects and flooding issues in other catchments that can not be fully understood and

collaboratively tackled. This will lead to flood risk issues resulting in negative effects on water quality, human health, biodiversity, historic assets, soils, infrastructure, property and businesses.

SEA Recommendation – This measure is not realistic and will have negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
Currently there is a certain amount of data sharing and collaboration with FRMA's, stakeholders and the public. This provides positive effects in terms of reducing flood risk which will have resulting benefits in protecting humans, property, infrastructure, businesses, soils, water quality and historic assets from flood damage. There will be minor benefits for biodiversity and landscape.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 3 – Identify responsibilities of the riparian owners for managing their assets through public engagement
This measure would ensure that riparian owners understood their responsibilities of managing their assets. This would slightly help to reduce flood risk as owners should fully understand what they are required to do. However, just because people know they have responsibilities doesn't mean they will carry them out. Therefore, there are likely to be minor positive effects in terms of reducing flood risk and impacts on humans, infrastructure, property, businesses, historic assets and soils. There are unlikely to be effects on biodiversity and landscape.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Continue to meet with the North Wales LFRMA's and Coordination Group to share knowledge, data and resources to develop best practice
This measure will ensure that FCC continue to participate in sharing knowledge, data and lessons learnt. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Develop an effective communication plan to ensure collaborative working and data sharing
This measure will help ensure continued and effective communication to share data and work together to address flood issues. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. For clarity it is recommended that the measure is reworded to 'Develop and implement an effective communication plan to ensure collaborative working and data sharing'.

Measure 6 – Undertake stakeholder engagement to identify responsibilities of flood risk partners
Ensuring flood risk partners are aware of, and understand, their responsibilities is important for effective and collaborative flood management. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

5.4.4 Initial Draft LFRMS Objective 4

Measure 1 – Do nothing
Under the do nothing option, flood risk and the associated consequences would not be addressed and the situation would continue to get worse as flood events increase due to climate change. This would have significant negative effects on human health, infrastructure, property, businesses and historic assets from flood damage. It is also likely to have minor and moderate negative effects on water quality, biodiversity, landscape and soils.

SEA Recommendation – This measure is not realistic and will have negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
FCC currently manage and reduce flood risk using the resources available but not every area of the County can be protected. In the future as the impacts of climate change results in more frequent and severe flooding events FCC will not have the capacity to deal with all flooding issues. This is likely to result in negative effects in terms of increased flood risk and flood damage for humans, infrastructure, property, businesses, historic assets, and soils.

SEA Recommendation – This measure will have negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 3 – Identify vulnerable groups within the community, and prepare action plans to be implemented in the event of flooding
This measure is aimed at the protection of vulnerable groups within the community from flooding. Therefore, there will be positive effects in terms of human health and flood reduction but only for certain groups and areas. It is unlikely that there would be any effects on biodiversity, water quality, landscape, historic assets or soils.

SEA Recommendation – Although this measure only provides limited positive effects. The positive effects are considered important in protecting vulnerable groups from the effects of flooding, and could be included in the LFRMS.

Measure 4 – Identify areas at greatest risk of flooding, and develop a capital cost investment programme to develop schemes to alleviate flooding
Identifying high flood risk areas will allow investment to be prioritised and targeted at the most appropriate areas. A capital cost investment programme is likely to result in construction of flood alleviation schemes. This will have positive effects in terms of reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features. Effects on water quality will depend on the type or flood defence scheme implemented. For example, creation of a wetland or reedbed will have positive effect on water quality. However, other defence works could affect water flows or could have potential for spillages and contamination during construction.

SEA Recommendation – The positive effects associated with this measure are likely to outweigh the negative effects and could be included in the LFRMS. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes.

Measure 5 – Educate the general public on options for protecting their properties through flood prevention options and resistance and resilience measures
If the public are aware of the flood prevention options and resilience measures available to them to reduce flooding effects then they are more likely to use these to protect themselves and their properties and

businesses. This is likely to have positive effects in terms of reducing the impacts and consequences of flooding on human health, property and businesses. Measure such as storing fuels and oils out of the way of flood water will help protect water quality from pollution. Owners of historic assets and farmers can also implement these measures to protect their assets from flood damage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, this measure is the same as Measure 8 under Objective 2 and therefore only one or the other should be included in the LFRMS.

Measure 6 –Assist and provide support and advice following a flood event
Although this measure is likely to have limited benefits it is important for people's peace of mind to know that there is someone they can call to get advice and support following a flood incident. The support team may also be able to advise people what do to next time there is a flood. This could help reduce impacts and consequences for property and businesses. It may also help protect water quality as advice could be provided on where to store fuels, oils etc so they don't pollute the water during a flooding incident.

SEA Recommendation – Although this measure only provides limited positive effects. The positive effects are considered important in providing peace of mind and support to people following a flood event, and could be included in the LFRMS.

5.4.5 Initial Draft LFRMS Objective 5

Measure 1 – Do nothing
If the planning department are not aware of flood risk areas and issues then they may allow development in inappropriate places such as floodplains and high flood risk areas. This will increase flood risk and the number of people and properties at risk. This will have significant effects in terms of increased flood risk negatively affecting humans, infrastructure, property, businesses, water quality, biodiversity, landscape, historic assets and soils. It may also exacerbate future climate change effects.

SEA Recommendation – This measure is not realistic and will have negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
Currently the FCC flood management team and planning department do have some communications on development policies in flood risk areas. This provides minor benefits in terms of flood reduction through appropriate location of new developments in relation to flood risk areas. This is likely to have minor positive effects in terms of protection of biodiversity, water quality, landscape, human health, historic assets and soils from flood damage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 3 – Develop clear guidance for the Planning Department when assessing planning applications
This measure would provide clear guidance to the Planning Department on how to deal with planning applications in flood risk areas and what standards should be set. This should help ensure development is not permitted in inappropriate locations such as floodplains or areas at high risk of flooding. It would also provide a consistent approach for determining all planning applications. The measure is likely to have positive effects in terms of reducing flood risk and assets at risk of flooding. Thus, having positive effects through protection of humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from flood damage. It will also help plan and adapt for future climate change effects through discouraging building in appropriate places such as floodplains which may be needed in the future for flood water storage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Develop a process with the Planning Department to create clear advice and direction to developers on FRMS and drainage (including incorporation of SuDS into new developments)
This measure would help ensure that developers design new developments with appropriate drainage and with consideration of flood risk issues. It would also encourage developers to incorporate appropriate SuDS into designs and plan for future climate change effects. The measure is likely to have positive effects in terms of preventing further areas of the County becoming at risk from flooding and lead to the protection of humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from flood damage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Establish a SuDS Approval Body (SAB)
Establishing a SuDS Approval Body (SAB) should move SuDS higher up the agenda and encourage more implementation of SuDS in developments as flood management techniques. SuDS are likely to provide more environmental benefits for water quality, biodiversity, soils and landscape. They will also help to reduce flood risk having minor positive effects for humans, property, infrastructure, businesses and historic assets. Implementation of SuDS will also assist in planning and adapting for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 6 – Keep the Planning Department informed and up-to-date with information relating to flood risk areas in the County
This measure will help the planning department determine where new development should be appropriately placed to avoid flood risk areas. This should help reduce the numbers of development on floodplains or in high flood risk areas. This is likely to have positive effects in terms of flood reduction, human health and protection of infrastructure, property, businesses and water quality. It will also help contribute to future climate change planning and adaptation. The measure is concerned with development in relation to flood risk and is unlikely to have impacts on biodiversity, landscape, historic assets and soils.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 7 – Develop policies, development management and procedures which take account of flooding issues
This measure would provide a clear and consistent approach to land use management and development control procedures in relation to development and flood risk. This would help planners to effectively plan new developments away from high flood risk areas and incorporate spatial development policies. This is likely to have positive effects in terms of flood risk reduction and benefits for humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from protection from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

5.4.6 Initial Draft LFRMS Objective 6

Measure 1 – Do nothing
If drainage systems were not maintained then they would block up causing flooding and potential sewage overflows. These effects are likely to get worse with time as more drains become blocked increasing flooding. Both flooding and sewage will have health implications for humans, significant negative effects on water quality, and moderate negative effects on biodiversity and climate change adaptation. It will also have minor negative effects on landscape, cultural heritage and soils.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
Currently drainage maintenance is largely reactive. The maintenance team are usually called to unblock or mend/upgrade a drainage asset which prevents it from flooding. However, sometimes the drainage system floods before the team can remove the obstruction or upgrade the asset. Continued maintenance will provide minor benefits through a small reduction in flood risk. This is likely to have benefits in terms of human health, reduction of impact and consequences of flood, planning for climate change, protection of biodiversity and historic assets.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is felt that more measure would also be required.

Measure 3 – Identify and assess condition of existing drainage assets within the County, to prioritise capital investment
This option would provide a more proactive active looking at the condition of drainage assets to identify what and when assets will need upgrading to prioritise investment. This is likely to have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses. It is likely to have minor positive effects on biodiversity, water quality, historic assets and climate change adaptation and planning.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is the same as Measure 6, Objective 1. Therefore, only one or the other needs to be included in the LFRMS.

Measure 4 – Develop a risk based proactive and cyclical maintenance regime
This measure builds on Measure 2 by ensuring a prescribed and regular maintenance regime was in place. This would have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses, and water quality . It is likely to have minor positive effects on biodiversity and historic assets as a result of decreased flood risk.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Develop a risk based programme for improving existing infrastructure assets
This measure builds on Measures 3 and 4 by using a proactive risk-based approach to improve existing drainage infrastructure. Improving drainage infrastructure will include upgrading assets that are failing and upgrading assets to deal with larger future flows from climate change. This will have significant effects in reducing future flood risk and impacts and consequences for human health, infrastructure, property and businesses. It will also have benefits in terms of protecting biodiversity, historic assts and water quality from the effects of flooding. Long term as more assets are improved the benefits will increase.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

5.4.7 Initial Draft LFRMS Objective 7

Measure 1 – Do nothing
It has been assumed that in the do nothing option economic and social benefits would be prioritised over environmental issues when making flood management decisions. Therefore, flood risk may be reduced in the short and medium term using unsustainable methods but at climate change increases frequency and severity of flood events unsustainable methods will not be as effective as reducing and managing flood risk. Also unsustainable flood management could cause long term environmental impacts that could worsen flood risk in the future. There will be positive and negative effects on biodiversity, landscape and cultural heritage. Positive effects are likely from reduced flood risk and negative effects are likely from prioritisation of social and economic issues over environmental issues, resulting in negative environmental effects.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual

Currently environmental issues are given consideration as well as economic and social issues. This is likely to have a minor positive effect on water quality biodiversity, landscape and soils as flood management decision will take environmental effects into consideration. Currently historic assets are not given as significant priority as other environmental issues, social and economic issues. Therefore, a score of neutral has been determined. The current approach will help reduce flood risk for humans, properties, infrastructure and businesses.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is felt that more measure would also be required.

Measure 3 – Consider the use of attenuation through wetlands or retention basins to increase the length of flow durations, store flood water, and provide amenity and ecological benefits

This measure is likely to have moderate positive effects for biodiversity through habitat creation such as wetlands. This will also have moderate and significant positive effects on water quality from reduced pollutants entering water bodies. Creation of wetlands areas may also have minor positive effects on improving the landscape character and quality. Increasing length of flow durations and creating flood water storage will also help to reduce flood risk and the impacts on consequences on humans, property, businesses, infrastructure and historic assets.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Consider the use of bio-retention areas to reduce sediments and pollutants from entering ordinary watercourses

This measure is likely to have moderate positive effects for biodiversity through creation of bio-retention areas that enhance or create habitat. This will also have moderate and significant positive effects on water quality from reduced pollutants and sediment entering water bodies. Creation of bio-retention areas may also have minor positive effects on improving the landscape character and quality, and will help to reduce flood risk and the impacts on consequences on humans, property, businesses, infrastructure and historic assets.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 - Ensure the environmental consequences of implementing the LFRMS are properly balanced against the technical, economic and social benefits

Consideration of environmental issues as well as economic and social issues is likely to have a minor positive effect on water quality biodiversity, landscape and soils as flood management decision will take environmental effects into consideration. It is assumed that historic assets would be given equal weight with other environmental issues. This approach will help reduce flood risk for humans, properties, infrastructure and businesses.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Embed policies from other local basin management plans, catchment flood management plans, local environmental policies and European protected sites into flood risk management procedures and programmes

This measure is unlikely to affect biodiversity, landscape, historic assets, soils and human health. Taking other plans into account may have minor benefits in terms in a clearer understanding of the wider picture of flood risk and cross-boundary effects. This will help plan flood management strategies for the local area.

SEA Recommendation – This measure will produce some minor positive effects and could be included in the LFRMS. However, other measures may provide greater benefits.

5.4.8 Initial Draft LFRMS Objective 8

Measure 1 – Use traditional approaches to drainage
Traditional drainage approaches are likely to become out-dated in the future and less efficient and effective than other solutions. Using only traditional approaches is likely to lead to increased future flood risk resulting in negative effects on humans, property, infrastructure, businesses, water quality, biodiversity, landscape, historic assets and soils.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Adopt soft engineering including SuDS
Implementing soft engineering approaches including SuDS can have benefits over just using traditional solutions in the majority of cases. SuDS are likely to provide more environmental benefits for water quality, biodiversity, soils and landscape. They will also help to reduce flood risk having minor positive effects for humans, property, infrastructure, businesses and historic assets. Implementation of SuDS will also help plan and adapt for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 3 – Explore new and innovative technologies for flood defence and flood management
The assessment has assumed that this measure is to explore and implement where appropriate new and innovative technologies. New and innovative technologies are being continuously developed. However, it is likely that significant new and innovative technologies will not be developed until some time into the future. Therefore, larger benefits are likely to be realised in the medium and long term. It is likely that new and innovative technologies will make flood defences more efficient and effective, reducing flood risk and adapting to climate change. This would have benefits for human health, property, infrastructure, businesses, water quality, biodiversity, landscape, historic assets and soils.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 4 – Where possible incorporate multiple benefits such as water quality, biodiversity and amenity benefits
This measure is about incorporating multiple benefits into flood management schemes. Incorporation of new or enhanced habitat, landscaping, use of local materials, creation of amenity area will have benefits for biodiversity, water quality, landscape, climate change and human health. Creation of new wetland, for example, will help reduce flood risk and benefit the environment and society.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 5 – Develop and implement a non-culverting policy
The culverting policy will have a presumption against culverting. This is likely to have positive effects as culverts can get blocked or collapse causing flooding. A reduction in culverting will reduce this risk and have minor positive effects in terms of reduced flood risk and effects for humans, water quality and historic assets. It will also allow waterways to be open having positive effects for biodiversity and landscape.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

5.4.9 Initial Draft LFRMS Objective 9

Measure 1 – Do Nothing
If staff don't have the skills, knowledge and equipment to provide effective flood management then flood risk is likely to increase. The most significant effects are likely to be seen in the medium and long term when an accumulation of increased frequency and severity of flood events from climate change together with a lack of understanding and knowledge in how to deal with this will result in significant negative effects

on humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as Usual
Currently the flood risk management team keep abreast of the latest news, legislation and techniques in the industry, and employ new staff members where a shortage is identified. This current situation is likely to have short, medium and long terms benefits for on humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets because the team will understand the current issues relating to flood risk and how to deal with them. However, there are barriers that hinder the team such as funding for additional staff, bureaucracy, and severe flood events requiring a large amount of resources which take staff aware from other work.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is felt that larger benefits could be achieved through inclusion of other measures with more positive effects.

Measure 3 – Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the Act
The Act places additional duties on the LLFA and in order that the quality of flood protection and response does not decrease with the extra workload additional members of staff will be required. Having additional staff will ensure that all the requirements of the Act are implemented effectively, allow staff to develop flood risk mapping and asset management systems to increase the efficiency and effectiveness of responses, and allow staff time to read up on new innovations and attend conferences. This is likely to have positive effects for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 4 – Invest in appropriate software and hardware
Having the appropriate software and hardware for a task is essential for effective flood management. Often there are financial barriers to achieving this. This measure would ensure that appropriate software and hardware was available to the flood management team. This would allow them to conduct their work more efficiently and effectively, provide a consistent method and recording system, and manage data and interpretation to better understand flood risk. This is likely to have positive effects for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 5 – Outsource specialist skills to deliver specific projects
Some skills are very specialist and the flood management team may not have the technical knowledge and expertise in these areas. Employing a specialist to provide support, advice and delivery of specific projects is important to ensure projects are designed and implemented successfully. Using a specialist during project design and development can have significant future benefits in terms of innovation, operational life and reliability, success of the project in protecting people and assets from flooding, and minimisation of negative environmental effects.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 6 – Collaborate and provide support, training and networking of staff across the region
This measure will help ensure that knowledge is shared between the risk management authorities to help better understand flood risk. Appropriate training is important so that staff can do their job effectively. This in turn should help understanding and reduction of flood risk which will have benefits for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

5.4.10 Initial Draft LFRMS Objective 10

Measure 1 – Do Nothing
If funding is not obtained then flood protection projects cannot be implemented. In the short term this is likely to have minor negative effects on water quality, biodiversity, landscapes, historic assets and soils as flood events will go unmanaged. In the future, as the frequency and severity of flood events increases due to climate change the effects of flood damage will worsen. If flood management programmes and projects are not implemented, then flood risk and severity of flooding will increase. This is likely to have significant medium and long term negative effects on human health, key assets, infrastructure, properties and businesses.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as Usual
Currently funding is obtained from internal and external sources and projects are implemented based on risk, priority and costs. There is a limit to current funding and so many flood management programmes and projects are not implemented. In the short term a few new flood management projects are likely to be implemented having minor positive effects in terms of protecting humans, assets, infrastructure, property, business , biodiversity, landscape, soils water quality and historic assets from flooding. However, there can also be temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. In the medium and long terms more projects are likely to be implemented resulting in larger cumulative positive and negative effects.

SEA Recommendation –The positive effects associated with this measure are likely to outweigh the negative effects. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes. However, some of the other measures are likely to have larger positive effects and should be taken forward first.

Measure 3 – Identify potential funding sources which may include communities and local businesses
Identifying new funding sources should increase the funds available for flood management projects resulting in more programmes and schemes being implemented. The most significant benefits are likely to be seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features.

SEA Recommendation – The positive effects associated with this measure are likely to outweigh the negative effects and could be included in the LFRMS. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes.

Measure 4 – Undertake a full lifecycle cost benefit analysis for projects including social and environmental benefits
Undertaking lifecycle benefit analysis is likely to help prioritise projects and ensure that the most cost effective and beneficial project is taken forward. This should help reduce wasting money on projects with few benefits that could be better spent on alternative projects. The most significant benefits are likely to be

seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features. Consideration of social and environmental benefits as part of the lifecycle analysis is also likely to reduce negative effects associated with a project and maximise positive effects.

SEA Recommendation – The positive effects associated with this measure are likely to outweigh the negative effects and could be included in the LFRMS. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes.

Measure 5 – Investigate opportunities for match funding and grants
Investigating opportunities for match funding and grants should increase the funds available for flood management projects resulting in more programmes and schemes being implemented. The most significant benefits are likely to be seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features.

SEA Recommendation – The positive effects associated with this measure are likely to outweigh the negative effects and could be included in the LFRMS. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes.

6. Flintshire LFRMS Development and Assessment

6.1 Development of LFRMS

The Flintshire LFRMS contains ten overarching objectives which follow the guiding principles for flood risk management in Flintshire. The measures which seek to support these objectives have been provided below. The reference number applies to which objective the measure is seeking to support.

Only a very small number of amendments were made to the LFRMS measures between the early internal draft and the Draft LFRMS for public consultation (December 2012). These changes related to recommendations coming out of SEA Assessment and from internal consultation within FCC. The amendments have been explained below:

Initial Draft Objective 1: To improve the understanding of local flood (surface water, groundwater and ordinary watercourses) and coastal risks

1.1	Do Nothing;
1.2	Business as usual;
1.3	Record all flooding incidents and where appropriate carry out flooding investigations;
1.4	Record all appropriate structures/assets on watercourses so that ownership and responsibility can be identified in the event of a problem with flooding;
1.5	Develop a consistent approach to designation of flooding/drainage structures;
1.6	Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment;
1.7	Develop a county wide map based record of flood risk assets, Flood Investigation Reports, historical flooding and areas at risk of flooding to allow a proactive risk management approach to be taken by the flood authority; and
1.8	Digitise all relevant paper reports and information to protect historical knowledge and make it accessible for future flood investigations.

The option of Do Nothing is predicted to have generally negative environmental effects increasing the risk of flooding and erosion over time and therefore was not considered a viable option.

Under the Business as usual option, the general environmental effects tend to be similar to the Do Nothing option, but the effects are delayed over time, therefore it was also removed.

Measures to support Objective 1 have been refined to the following:

Objective 1: To improve the understanding of local flood (surface water, groundwater and ordinary watercourses) and coastal risks

1.1	Record all flooding incidents and where appropriate carry out flooding investigations;
1.2	Record all appropriate structures/assets on watercourses so that ownership and responsibility can be identified in the event of a problem with flooding;
1.3	Develop a consistent approach to designation of flooding/drainage structures;
1.4	Identify and assess the condition of existing drainage assets within the County, to prioritise capital

	investment;
1.5	Develop a county wide map based record of flood risk assets, Flood Investigation Reports, historical flooding and areas at risk of flooding to allow a proactive risk management approach to be taken by the flood authority; and
1.6	Digitise all relevant paper reports and information to protect historical knowledge and make it accessible for future flood investigations.

Initial Draft Objective 2: Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk

2.1	Do nothing;
2.2	Business as usual;
2.3	Raise public awareness of the impacts of climate change on flooding and coastal erosion including possible failure of coastal defences;
2.4	Publish a public awareness strategy (Workshops, public awareness events, publish information on the Council Website, adverts in local press) and communicate it widely;
2.5	Develop a capacity to deal effectively and appropriately with non-emergency flood incidents;
2.6	To collaborate with statutory bodies to promote the existing flood warning service (EAW) and their proposed flooding awareness campaigns;
2.7	Collaborate with other FRA's to create an integrated county wide real time hydraulic and flood alert map (long term);
2.8	Make the public aware of available flood prevention and mitigation measures (resistance and resilience) to protect their property and assets; and
2.9	Target areas of historical flooding (or at high probability of flooding) to increase awareness of emergency procedures in the event of a flood.

The option of Do Nothing and Business as usual were removed for the reasons already provided.

Measures to support Objective 2 have been refined to the following:

Objective 2: Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk

2.1	Raise public awareness of the impacts of climate change on flooding and coastal erosion including possible failure of coastal defences;
2.2	Publish a public awareness strategy (Workshops, public awareness events, publish information on the Council Website, adverts in local press) and communicate it;
2.3	Develop a capacity to deal effectively and appropriately with non-emergency flood incidents;
2.4	To collaborate with statutory bodies to promote the existing flood warning service (EAW) and their proposed flooding awareness campaigns;
2.5	Collaborate with other FRA's to create an integrated county wide real time hydraulic and flood alert map (long term);

2.6	Make the public aware of available flood prevention and mitigation measures (resistance and resilience) to protect their property and assets; and
2.7	Target areas of historical flooding (or at high probability of flooding) to increase awareness of emergency procedures in the event of a flood.

Initial Draft Objective 3: To work together (both FRMA, stakeholders and public) to reduce flood and coastal risks, sharing data and resources to the greatest benefit

3.1	Do nothing;
3.2	Business as usual;
3.3	Identify the responsibilities of the riparian owners for managing their assets, through public engagement;
3.4	Continue to meet with the North Wales LFRMA's and Coordination Group to share knowledge, data and resources to develop best practice;
3.5	Develop an effective communication plan to ensure collaborative working and data sharing; and
3.6	Undertake stakeholder engagement, to identify responsibilities of flood risk partners.

The option of Do Nothing and Business as usual were removed for the reasons already provided.

Measures to support Objective 3 have been refined to the following:

Objective 3: To collaborate with FRMA's, stakeholders and the public to reduce flood and coastal risks, and share data and resources to the greatest benefit

3.1	Identify responsibilities of the riparian owners for managing their assets, through public engagement;
3.2	Continue to meet with the North Wales LFRMA's and Coordination Group to share knowledge, data and resources to develop best practice;
3.3	Develop an effective communication plan to ensure collaborative working and data sharing; and
3.4	Undertake stakeholder engagement, to identify responsibilities of flood risk partners.

Initial Draft Objective 4: To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion

4.1	Do nothing;
4.2	Business as usual;
4.3	Identify vulnerable groups within the community, and prepare action plans in the event of flooding;
4.4	Identify areas at greatest risk of flooding, and develop a capital cost investment programme to develop schemes to alleviate flooding;
4.5	Educate the general public on options for protecting their properties through flood prevention options and resistance and resilience measures; and

4.6	Assist and provide support and advice following a flood event.

The option of Do Nothing and Business as usual were removed for the reasons already provided.

Measures to support Objective 4 have been refined to the following:

Objective 4: To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion

4.1	Identify vulnerable groups within the community, and prepare action plans in the event of flooding;
4.2	Identify areas at greatest risk of flooding, and develop a capital cost investment programme to develop schemes to alleviate flooding;
4.3	Educate the general public on options for protecting their properties through flood prevention options and resistance and resilience measures; and
4.4	Assist and provide support and advice following a flood event.

Initial Draft Objective 5: To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments

5.1	Do nothing;
5.2	Business as usual;
5.3	Develop clear guidance for the Planning Department when assessing planning applications;
5.4	Develop a process with the Planning Department to create clear advise and direction to developers on FRMS and drainage (including incorporation of SuDS into new developments);
5.5	Establish a SuDS Approval Body (SAB);
5.6	Keep the Planning Department informed and up-to-date with information relating to flood risk areas in the County; and
5.7	Develop policies, development management and procedures which take into account of flooding issues.

Objective 5 and its supporting measures were not changed apart from removing the Do Nothing and Business as usual options for the reasons already provided.

The final Measures to support Objective 5 are as follows:

Objective 5: To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments

5.1	Develop clear guidance for the Planning Department when assessing planning applications;
5.2	Develop a process with the Planning Department to create clear advise and direction to developers on FRMS and drainage (including incorporation of SuDS into new developments);
5.3	Establish a SuDS Approval Body (SAB);
5.4	Keep the Planning Department informed and up-to-date with information relating to flood risk

areas in the County; and

5.5 Develop policies, development management and procedures which take into account of flooding issues.

Initial Draft Objective 6: Improve and/or maintain the capacity of existing drainage systems by targeted maintenance

6.1 Do nothing;

6.2 Business as usual;

6.3 Identify and assess condition of existing drainage assets within the County, to prioritise capital investment;

6.4 Develop a risk based proactive and cyclical maintenance regime; and

6.5 Develop a risk based programme for improving existing infrastructure assets.

Measures Do Nothing and Business as usual were removed for reasons already provided.

Following internal consultation with different council department's measure 6.4 above was slightly amended to change the risk based 'proactive' regime to a risk based 'reactive' regime in measure 6.2 below.

The final Measures to support Objective 6 are as follows:

Objective 6: Improve and/or maintain the capacity of existing drainage systems by targeted maintenance

6.1 Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment;

6.2 Develop a risk based reactive and cyclical maintenance regime; and

6.3 Develop a risk based programme for improving existing infrastructure assets.

Initial Draft Objective 7: Take a sustainable and holistic approach to flood and coastal management, seeking to deliver wider environmental, economic and social benefits, climate change mitigation and improvements under the Water Framework Directive

7.1 Do nothing;

7.2 Business as usual;

7.3 Consider the use of attenuation through wetlands or retention basins to increase the length of flow durations, store flood water, and provide amenity and ecological benefits;

7.4 Consider the use of bioretention areas to reduce sediments and pollutants from entering ordinary watercourses;

7.5 Ensure the environmental consequences of implementing the LFRMS are properly balanced against the technical, economic and social benefits; and

7.6 Consider policies from other local basin management plans, catchment flood management plans,

local environmental policies and European protected sites and integrate with flood risk management procedures and programmes.

The option of Do Nothing and Maintain Status Quo were removed for the reasons already provided.

Following internal consultation with different council department's measure 7.6 above was removed as it was highlighted that FCC does not have a catchment flood management plan nor an environment policy for the county.

The final Measures to support Objective 7 are as follows:

Objective 7: Take a sustainable approach to flood risks management balancing economic, environmental and social benefits

7.1	Ensure the environmental consequences of implementing the LFRMS are properly balanced against the technical, economic and social benefits;
7.2	Consider the use of attenuation through wetlands or retention basins to increase the length of flow durations, store flood water, and provide amenity and ecological benefits; and
7.3	Consider the use of bioretention areas to reduce sediments and pollutants from entering ordinary watercourses.

Initial Draft Objective 8: Increasing approaches that utilise the natural environment in place of traditional solutions

8.1	Use traditional approaches to drainage;
8.2	Adopt soft engineering solutions including SuDS;
8.3	Explore new and innovative technologies for flood defence and flood management;
8.4	Where possible incorporate multiple benefits such as water quality, biodiversity and amenity benefits; and
8.5	Develop and implement a non-culverting policy.

Measure 8.1 above was identified to have the equivalent meaning as Business as usual and was therefore removed.

Following internal consultation with different council department's measure 8.1 below was introduced which has incorporated measure 8.2 above.

The objective has been amended to remove 'in place of traditional solutions' as during internal consultation it was decided that in some circumstances it will be appropriate to use traditional solutions.

Measures to support Objective 8 have been refined to the following:

Objective 8: Increase approaches that utilise the natural environment

8.1	Adopt natural flood-risk management techniques including SuDS;
8.2	Explore new and innovative technologies for flood defence and flood management;

8.3	Where possible incorporate multiple benefits such as water quality, biodiversity and amenity benefits; and
8.4	Develop and implement a non-culverting policy.

Initial Draft Objective 9: Ensure the development of skills required to implement effective and innovative flood risk management measures

9.1	Do nothing;
9.2	Business as usual;
9.3	Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the act;
9.4	Invest in appropriate software and hardware;
9.5	Outsource specialist skills to deliver specific projects; and
9.6	Collaborate and provide support, training and networking of staff across the region.

The option of Do Nothing and Business as usual were removed for the reasons already provided.

The final Measures to support Objective 9 are as follows:

Objective 9: Ensure the development of skills required to implement effective and innovative flood risk management measures

9.1	Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the act;
9.2	Invest in appropriate software and hardware;
9.3	Outsource specialist skills to deliver specific projects, and
9.4	Collaborate and provide support, training and networking of staff across the region.

Initial Draft Objective 10: Identify projects and programmes which are affordable, maximising capital funding from internal and external sources

10.1	Do nothing;
10.2	Business as usual;
10.3	Identify potential funding sources;
10.4	Undertake a full lifecycle cost benefit analysis for projects including social, and environmental benefits; and
10.5	Investigate opportunities for match funding and grants.

The option of Do Nothing and Business as usual were removed for the reasons already provided.

Measure 10.3 above was amended to 10.1 below to include ‘communities and local business’s’ as potential funding sources.

The final Measures to support Objective 10 are as follows:

Objective 10: Identify projects and programmes which are affordable, maximising capital funding from internal and external sources

10.1	Identify potential funding sources which may include communities and local business's;
10.2	Undertake a full lifecycle cost benefit analysis for projects including social, and environmental benefits; and
10.3	Investigate opportunities for match funding and grants.

6.2 Assessment of Flintshire LFRMS

The methodology for assessing the environmental effects of the LFRMS followed the same assessment methodology as described in Section 5.3. The full assessment results are presented below.

6.2.1 LFRMS Objective 1 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 1: To improve the understanding of local flood (surface water, groundwater and ordinary watercourses) and coastal risks					
	Measure 1.1	Measure 1.2	Measure 1.3	Measure 1.4	Measure 1.5	Measure 1.6
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT 0
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT 0
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST + (T)	ST + (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT 0
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT 0
3. Enhance human health and wellbeing through reducing flooding effects	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST ++ (T)	ST ++ (T)	ST + (T)
	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T)	MT +++ (T)	MT 0
	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T)	LT +++ (T)	LT 0
4. Protect and enhance biodiversity and geo-diversity across the County.	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST 0	ST 0
	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT + (T)	MT + (T)	MT 0
	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT + (T)	LT + (T)	LT 0
5. Protect and enhance landscape quality and character across the County.	ST + (T)	ST + (T)	ST + (T)	ST 0	ST 0	ST 0
	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT 0	MT 0	MT 0
	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT + (T)	LT + (T)	LT 0
6. Protect historic assets and their settings.	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT + (T)	MT ++ (T)	MT 0
	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT + (T)	LT ++ (T)	LT 0
7. Educate, manage, plan and adapt for the effects of climate change.	ST + (T)	ST + (T)	ST + (T)	ST ++ (T)	ST + (T)	ST 0
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT 0
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT 0
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST + (T)	ST + (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT 0
	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T)	LT +++ (T)	LT 0
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST + (T)	ST + (T)	ST + (T)	ST 0	ST + (T)	ST 0
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT 0	MT ++ (P)	MT 0
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (P)	LT 0

Measure 1.1 – Record all flooding incidents and where appropriate carry out flooding investigations;

This measure would ensure that the process for recording flood incidents and carrying out flood investigation was consistent and transparent, allowing data to be used for future flood management. This is likely to result in more effective flood management, identifying responsibility, bringing all useful information together in one place, providing an understanding of the incident, outlining possible causes of flooding and potential long-term solutions to protect people and their homes from flooding. This is likely to have benefits in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage in the future. It will also help plan for future climate change effects.

Measure 1.2 – Record all appropriate structures/assets on watercourses so that ownership and responsibility can be identified in the event of a problem with flooding

This measure would ensure a consistent and complete database was kept up-to-date of flood and drainage assets in the County. This would help plan maintenance and upgrading of assets and identify where issues may occur. This measure would also help ensure that everyone knew who owned which assets and what their responsibilities are regarding those assets. This would help reduce flood risk as people are more likely to take ownership and responsibility of looking after their own assets, and also if a flood event occurs there will be no disagreement over whose responsibility it is to take action. However, just because people know they have responsibilities doesn't mean they will carry them out. The measure is likely to have benefits in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage. It will also help plan for future climate change effects

Measure 1.3 – Develop a consistent approach to designation of flooding/drainage structures

This measure would ensure a consistent and complete database was kept up-to-date of flood and drainage assets in the County. This would help plan maintenance and upgrading of assets and identify where issues may occur. This is likely to have benefits in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage. It will also help plan for future climate change effects.

Measure 1.4 – Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment

This option would provide a more proactive active looking at the condition of drainage assets to identify what and when assets will need upgrading to prioritise investment. This is likely to have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses. It is likely to have minor positive effects on biodiversity, water quality, historic assets and climate change adaptation and planning

Measure 1.5 –Develop a county wide map based record of flood risk assets, Flood Investigation Reports, historical flooding and areas at risk of flooding to allow a proactive risk management approach to be taken by the flood authority

This measure is likely to have significant positive effects in terms of better understanding and reducing flood risk and will have a positive impact in terms of protecting human health, infrastructure, property and businesses. Larger benefits are likely to be felt in the medium and long term as more data is recorded and fed into the model making it more accurate. Reduced flood risk will have moderate positive effects for biodiversity, water quality, historic assets and soils. The model should also help manage and plan for future climate change effects.

Measure 1.6 – Digitalise all relevant paper reports and information to protect historical knowledge and make it accessible for future flood investigations

It is important to digitalise paper records and information so that past knowledge does not get lost and so it can be used in the future to inform flood management decisions. In the short terms this measure is likely to have a minor positive effect on flood risk reduction, human health and protection of property, assets and businesses. However, once all paper copies are digitalised the system is likely to switch to automatic digital copies.

6.2.2 LFRMS Objective 2 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 2: Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk						
	Measure 2.1	Measure 2.2	Measure 2.3	Measure 2.4	Measure 2.5	Measure 2.6	Measure 2.7
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT ++ (T)	MT + (T)	MT + (T)
	LT + (T)	LT + (T)	LT + (T)	LT + (T)	LT ++ (T)	LT + (T)	LT + (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST ++ (T)	ST ++ (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)	LT ++ (T)
3. Enhance human health and wellbeing through reducing flooding effects	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)	LT ++ (T)
4. Protect and enhance biodiversity and geo-diversity across the County.	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0
	MT 0	MT 0	MT 0	MT 0	MT + (T)	MT 0	MT 0
	LT + (T)	LT + (T)	LT 0	LT + (T)	LT + (T)	LT + (T)	LT + (T)
5. Protect and enhance landscape quality and character across the County.	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0
	MT 0	MT 0	MT 0	MT 0	MT 0	MT 0	MT 0
	LT + (T/P)	LT + (T/P)	LT 0	LT + (T/P)	LT + (T)	LT + (T/P)	LT + (T/P)
6. Protect historic assets and their settings.	ST + (T/P)	ST + (T/P)	ST + (T)	ST + (T/P)	ST + (T)	ST + (T/P)	ST + (T/P)
	MT + (T/P)	MT + (T/P)	MT + (T)	MT + (T/P)	MT ++ (T)	MT + (T/P)	MT + (T/P)
	LT + (T/P)	LT + (T/P)	LT + (T)	LT + (T/P)	LT ++ (T)	LT + (T/P)	LT + (T/P)
7. Educate, manage, plan and adapt for the effects of climate change.	ST 0	ST 0	ST 0	ST 0	ST + (T)	ST 0	ST 0
	MT + (T)	MT + (T)	MT 0	MT + (T)	MT +++ (T)	MT + (T)	MT + (T)
	LT + (T)	LT + (T)	LT 0	LT + (T)	LT +++ (T)	LT + (T)	LT + (T)
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST ++ (T)	ST ++ (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)	LT ++ (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST 0	ST 0	ST + (T)	ST 0	ST + (T)	ST 0	ST 0
	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT ++ (P)	MT + (T)	MT + (T)
	LT + (T)	LT + (T)	LT + (T)	LT + (T)	LT ++ (P)	LT + (T)	LT + (T)

Measure 2.1 – Raise public awareness of the impacts of climate change on flooding and (failure of) coastal defences

Climate change will have significant impacts on coastal erosion and flooding in the future. It is important that people are aware of this so that they can plan for the future and prepare and adapt their homes for future flood risk. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting historic assets, property and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

Measure 2.2 – Publish a public awareness strategy (Workshops, public awareness events, update and improve the Council Website, adverts in local press) and communicate it

Implementing a public awareness strategy through a range of media should engage with a wide variety and geographical distribution of people. The more people that are aware of flood risk and how to deal with it the more benefits will be gained in terms of flood protection. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting historic assets, property, assets and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

Measure 2.3 – Develop a capacity to deal effectively and appropriately with non-emergency flood incidents

This measure will help ensure that flood support is provided to people in non-emergency situations. The team can provide advice on what to do to prepare and protect assets and property from flooding. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting historic assets, property and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

Measure 2.4 – To collaborate with statutory bodies to promote the existing flood warning service (EAW) and their proposed flooding campaigns

Awareness of flood warning services and flooding campaigns are important to allow people to prepare for a flood event and understand what to do in a flood event. This will have benefits on human health and reducing the impacts and consequences of flooding. It may also have minor positive effects on biodiversity, water quality, landscape and soils. By collaborating, FCC can utilise staff and expertise from other authorities and help reduce costs to the Council.

Measure 2.5 – Collaborate with other FRA's to create an integrated county wide real time hydraulic and flood alert map

This measure is likely to have significant positive effects in terms of understanding and raising awareness of flood risk and reducing flood risk and associated impacts on human health, infrastructure, property and businesses. Larger benefits are likely to be felt in the medium and long term as more data is recorded and fed into the model creating a more accurate reflection of flood risk in the County. Reduced flood risk will have positive effects for biodiversity, water quality, historic assets and soils. The model should also help manage and plan for future climate change effects.

Measure 2.6 – Make the public aware of available flood prevention and mitigation measures (resistance and resilience) to protect their property and assets

If the public are aware of the flood prevention options and mitigation measures available to them to reduce flooding and alleviate the effects of flooding then they are more likely to use these to protect themselves, their properties and businesses. This is likely to have positive effects in

terms of reducing the impacts and consequences of flooding on human health, property and businesses. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution. Owners of historic assets and farmers can also implement these measures to protect their assets from flood damage.

Measure 2.7 – Target areas of historical flooding (or at high probability of flooding) to increase awareness of emergency procedures in the event of a flood

This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on human health, property, businesses, infrastructure and historic assets. The measure is more focused on increasing awareness of what the public can do to stay safe in a flood and in clearing up afterwards than biodiversity and landscape. However, there may be some long term minor positive effects.

6.2.3 LFRMS Objective 3 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 3: To collaborate with FRMA's, stakeholders and the public to reduce flood and coastal risks, and share data and resources to the greatest benefit			
	Measure 3.1	Measure 3.2	Measure 3.3	Measure 3.4
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT + (T)	MT + (T)	MT + (T)	MT + (T)
	LT + (T)	LT + (T)	LT + (T)	LT + (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
3. Enhance human health and wellbeing through reducing flooding effects	ST + (T)	ST ++ (T)	ST ++ (T)	ST + (T)
	MT + (T)	MT ++ (T)	MT ++ (T)	MT + (T)
	LT + (T)	LT ++ (T)	LT ++ (T)	LT + (T)
4. Protect and enhance biodiversity and geo-diversity across the County.	ST 0	ST 0	ST 0	ST + (T)
	MT 0	MT 0	MT 0	MT + (T)
	LT 0	LT + (T)	LT + (T)	LT + (T)
5. Protect and enhance landscape quality and character across the county.	ST 0	ST 0	ST 0	ST 0
	MT 0	MT 0	MT 0	MT 0
	LT 0	LT + (T/P)	LT + (T/P)	LT + (T/P)
6. Protect historic assets and their settings.	ST + (T)	ST + (T/P)	ST + (T/P)	ST + (T/P)
	MT + (T)	MT + (T/P)	MT + (T/P)	MT + (T/P)
	LT + (T)	LT + (T/P)	LT + (T/P)	LT + (T/P)
7. Educate, manage, plan and adapt for the effects of climate change.	ST 0	ST 0	ST 0	ST + (T)
	MT 0	MT + (T)	MT + (T)	MT ++ (T)
	LT 0	LT + (T)	LT + (T)	LT ++ (T)
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST + (T)	ST 0	ST 0	ST + (T)
	MT + (T)	MT + (T)	MT + (T)	MT + (T)
	LT ++ (T)	LT + (T)	LT + (T)	LT + (T)

Measure 3.1 – Identify responsibilities of the riparian owners of managing their assets, through public engagement

This measure would ensure that riparian owners understood their responsibilities of managing their assets. This would slightly help to reduce flood risk as owners should fully understand what they are required to do. However, just because people know they have responsibilities doesn't mean they will carry them out. Therefore, there are likely to be minor positive effects in terms of reducing flood risk and impacts on humans, infrastructure, property, businesses, historic assets and soils. There are unlikely to be effects on biodiversity and landscape.

Measure 3.2 – Continue to meet with the North Wales LFRMA's and Coordination Group to share knowledge, data and lessons learnt

This measure will ensure that FCC continues to participate in sharing knowledge, data and lessons learnt. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

Measure 3.3 – Develop an effective communication plan to ensure collaborative working and data sharing

This measure will help ensure continued and effective communication to share data and work together to address flood issues. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

Measure 3.4 – Undertake stakeholder engagement, to identify responsibilities of flood risk partners

Ensuring flood risk partners are aware of, and understand, their responsibilities is important for effective and collaborative flood management. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

6.2.4 LFRMS Objective 4 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 4: To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion			
	Measure 4.1	Measure 4.2	Measure 4.3	Measure 4.4
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST 0 MT 0 LT 0	ST 0 MT D LT D	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within Conwy County.	ST + (T) MT + (T) LT + (T)	ST + (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST 0 MT 0 LT 0
3. Enhance human health and wellbeing through flood risk awareness raising and emergency planning.	ST ++ (T) MT ++ (T) LT ++ (T)	ST + (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)
4. Protect and enhance biodiversity and geo-diversity across the Conwy County.	ST 0 MT 0 LT 0	ST (P/T) - + MT (P/T) - + LT (P/T) - +	ST 0 MT 0 LT + (T)	ST 0 MT 0 LT 0
5. Protect and enhance landscape quality and character across the county.	ST 0 MT 0 LT 0	ST (P/T) - + MT (P/T) - + LT (P/T) - +	ST 0 MT 0 LT + (T)	ST 0 MT 0 LT 0
6. Protect historic assets and their landscapes.	ST 0 MT 0 LT 0	ST (P/T) - + MT (P/T) - + LT (P/T) - +	ST + (T) MT + (T) LT + (T)	ST 0 MT 0 LT 0
7. Educate, manage, plan and adapt for the effects of climate change.	ST + (T) MT + (T) LT + (T)	ST + (T) MT ++ (T) LT ++ (T)	ST 0 MT + (T) LT + (T)	ST 0 MT 0 LT 0
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST + (T) MT + (T) LT + (T)	ST + (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST + (T) MT + (T) LT + (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST 0 MT 0 LT 0	ST (P/T) - + MT (P/T) - + LT (P/T) - +	ST 0 MT + (T) LT + (T)	ST 0 MT 0 LT 0

Measure 4.1 – Identify vulnerable groups within the community, and prepare action plans in the event of flooding

This measure is aimed at the protection of vulnerable groups within the community from flooding. Therefore, there will be positive effects in terms of human health and flood reduction but only for certain groups and areas. It is unlikely that there would be any effects on biodiversity, water quality, landscape, historic assets or soils.

Measure 4.2 – Identify areas at greatest risk of flooding, and develop a capital cost investment programme to alleviate flooding

Identifying high flood risk areas will allow investment to be prioritised and targeted at the most appropriate areas. A capital cost investment programme is likely to result in construction of flood alleviation schemes. This will have positive effects in terms of reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features. Effects on water quality will depend on the type or flood defence scheme implemented. For example, creation of a wetland or reedbed will have positive effect on water quality. However, other defence works could affect water flows or could have potential for spillages and contamination during construction.

Measure 4.3 – Educate the general public on options for protecting their properties through flood prevention options and resistance and resilience measures

If the public are aware of the flood prevention options and resilience measures available to them to reduce flooding effects then they are more likely to use these to protect themselves and their properties and businesses. This is likely to have positive effects in terms of reducing the impacts and consequences of flooding on human health, property and businesses. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution. Owners of historic assets and farmers can also implement these measures to protect their assets from flood damage.

Measure 4.4 – Assist and provide support following a flood event

Although this measure is likely to have limited benefits it is important for people's peace of mind to know that there is someone they can call to get advice and support following a flood incident. The support team may also be able to advise people what do to next time there is a flood. This could help reduce impacts and consequences for property and businesses. It may also help protect water quality as advice could be provided on where to store fuels, oils etc so they don't pollute the water during a flooding incident.

6.2.5 LFRMS Objective 5 Assessment

		LFRMS Objective 5: To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments				
		Measure 5.1	Measure 5.2	Measure 5.3	Measure 5.4	Measure 5.5
Strategic Environmental Assessment Objectives	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT ++ (T)	MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (T)
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
		MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
	3. Enhance human health and wellbeing through reducing flooding effects	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT +(T)	LT ++ (T)	LT ++ (T)
	4. Protect and enhance biodiversity and geo-diversity across the County.	ST + (T)	ST + (T)	ST ++ (T)	ST 0	ST + (T)
		MT ++ (T)	MT ++ (T)	MT ++ (T)	MT 0	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT ++ (T)	LT 0	LT ++ (T)
	5. Protect and enhance landscape quality and character across the County.	ST + (T)	ST + (T)	ST + (T)	ST 0	ST + (T)
		MT + (T)	MT + (T)	MT + (T)	MT 0	MT + (T)
		LT ++ (T)	LT ++ (T)	LT + (T)	LT 0	LT ++ (T)
	6. Protect historic assets and their settings.	ST + (T)	ST + (T)	ST + (T)	ST 0	ST + (T)
		MT + (T)	MT + (T)	MT + (T)	MT 0	MT + (T)
		LT ++ (T)	LT ++ (T)	LT + (T)	LT 0	LT ++ (T)
	7. Educate, manage, plan and adapt for the effects of climate change.	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT ++ (T)	MT ++ (T)	MT + (T)	MT + (T)	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT + (T)	LT + (T)	LT ++ (T)
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST ++ (T)	ST ++ (T)	ST + (T)	ST + (T)	ST ++ (T)
		MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT ++ (T)
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST 0	ST + (T/P)
		MT + (T/P)	MT + (T/P)	MT + (T/P)	MT 0	MT + (T/P)
		LT++(T/P)	LT++(T/P)	LT+ (T/P)	LT 0	LT++(T/P)

Measure 5.1 – Develop clear guidance for the Planning Department when assessing planning applications

This measure would provide clear guidance to the Planning Department on how to deal with planning applications in flood risk areas and what standards should be set. This should help ensure development is not permitted in inappropriate locations such as floodplains or areas at high risk of flooding. It would also provide a consistent approach for determining all planning applications. The measure is likely to have positive effects in terms of reducing flood risk and assets at risk of flooding. Thus, having positive effects through protection of humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from flood damage. It will also help plan and adapt for future climate change effects through discouraging building in appropriate places such as floodplains which may be needed in the future for flood water storage.

Measure 5.2 – Develop a process with the Planning Department to create clear advise and direction to developers on FRMS and drainage (including incorporation of SuDS into new developments)

This measure would help ensure that developers design new developments with appropriate drainage and with consideration of flood risk issues. It would also encourage developers to incorporate appropriate SuDS into designs and plan for future climate change effects. The measure is likely to have positive effects in terms of preventing further areas of the County becoming at risk from flooding and lead to the protection of humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from flood damage.

Measure 5.3 – Establish a SuDS Approval Body (SAB)

Establishing a SuDS Approval Body (SAB) should move SuDS higher up the agenda and encourage more implementation of SuDS in developments as flood management techniques. SuDS are likely to provide more environmental benefits for water quality, biodiversity, soils and landscape. They will also help to reduce flood risk having minor positive effects for humans, property, infrastructure, businesses and historic assets. Implementation of SuDS will also assist in planning and adapting for future climate change effects.

Measure 5.4 – Keep the Planning Department informed and up-to-date with flood areas in the County

This measure will help the planning department determine where new development should be appropriately placed to avoid flood risk areas. This should help reduce the numbers of development on floodplains or in high flood risk areas. This is likely to have positive effects in terms of flood reduction, human health and protection of infrastructure, property, businesses and water quality. It will also help contribute to future climate change planning and adaptation. The measure is concerned with development in relation to flood risk and is unlikely to have impacts on biodiversity, landscape, historic assets and soils.

Measure 5.5 – Develop policies for effective land use management and enhance development control procedures where appropriate

This measure would provide a clear and consistent approach to land use management and development control procedures in relation to development and flood risk. This would help planners to effectively plan new developments away from high flood risk areas and incorporate spatial development policies. This is likely to have positive effects in terms of flood risk reduction and benefits for humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from protection from flooding effects

6.2.6 LFRMS Objective 6 Assessment

Strategic Environmental Assessment Objectives		LFRMS Objective 6: Improve and/or maintain the capacity of existing drainage systems by targeted maintenance		
		Measure 6.1	Measure 6.2	Measure 6.3
	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST + (T)	ST ++ (T)	ST ++ (T)
		MT ++ (T)	MT ++ (T)	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT ++ (T)
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST ++ (T)	ST ++ (T)	ST ++ (T)
		MT ++ (T)	MT ++ (T)	MT +++(T)
		LT ++ (T)	LT ++ (T)	LT +++ (T)
	3. Enhance human health and wellbeing through reducing flooding effects	ST ++ (T)	ST ++ (T)	ST ++ (T)
		MT ++ (T)	MT ++ (T)	MT +++(T)
		LT ++ (T)	LT ++ (T)	LT +++ (T)
	4. Protect and enhance biodiversity and geo-diversity across the County.	ST + (T)	ST + (T)	ST + (T)
		MT + (T)	MT + (T)	MT + (T)
		LT + (T)	LT + (T)	LT + (T)
	5. Protect and enhance landscape quality and character across the County.	ST 0	ST 0	ST 0
		MT 0	MT 0	MT 0
		LT + (T)	LT + (T)	LT + (T)
	6. Protect historic assets and their settings.	ST + (T)	ST + (T)	ST + (T)
		MT + (T)	MT + (T)	MT + (T)
		LT + (T)	LT + (T)	LT + (T)
	7. Educate, manage, plan and adapt for the effects of climate change.	ST ++ (T)	ST ++ (T)	ST ++ (T)
		MT ++ (T)	MT ++ (T)	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT ++ (T)
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST ++ (T)	ST ++ (T)	ST ++ (T)
		MT ++ (T)	MT ++ (T)	MT +++(T)
		LT ++ (T)	LT ++ (T)	LT +++ (T)
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST 0	ST 0	ST 0
		MT 0	MT 0	MT 0
		LT + (T)	LT + (T)	LT + (T)

Measure 6.1 – Identify and assess the condition of existing drainage assets within the County, to prioritise capital investment

This option would provide a more proactive active looking at the condition of drainage assets to identify what and when assets will need upgrading to prioritise investment. This is likely to have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses. It is likely to have minor positive effects on biodiversity, water quality, historic assets and climate change adaptation and planning.

Measure 6.2 – Develop a risk based reactive and cyclical maintenance regime

This measure builds on Measure 2 by ensuring a prescribed and regular maintenance regime was in place. This would have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses, and water quality. It is likely to have minor positive effects on biodiversity and historic assets as a result of decreased flood risk.

Measure 6.3 – Develop a risk based programme for improving existing infrastructure

This measure builds on Measures 3 and 4 by using a proactive risk-based approach to improve existing drainage infrastructure. Improving drainage infrastructure will include upgrading assets that are failing and upgrading assets to deal with larger future flows from climate change. This will have significant effects in reducing future flood risk and impacts and consequences for human health, infrastructure, property and businesses. It will also have benefits in terms of protecting biodiversity, historic assts and water quality from the effects of flooding. Long term as more assets are improved the benefits will increase.

6.2.7 LFRMS Objective 7 Assessment

		LFRMS Objective 7: Take a sustainable approach to flood risk management balancing economic, environmental and social benefits		
		Measure 7.1	Measure 7.2	Measure 7.3
Strategic Environmental Assessment Objectives	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST + (T)	ST ++ (T)	ST ++ (T)
		MT + (T)	MT ++ (T)	MT ++ (T)
		LT + (T)	LT +++ (T)	LT +++ (T)
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within Conwy County.	ST + (T)	ST ++ (T)	ST ++ (T)
		MT + (T)	MT ++ (T)	MT ++ (T)
		LT + (T)	LT ++ (T)	LT ++ (T)
	3. Enhance human health and wellbeing through flood risk awareness raising and emergency planning.	ST 0	ST ++ (T)	ST ++ (T)
		MT 0	MT ++ (T)	MT ++ (T)
		LT 0	LT ++ (T)	LT ++ (T)
	4. Protect and enhance biodiversity and geo-diversity across the Conwy County.	ST 0	ST + (T)	ST + (T)
		MT 0	MT ++ (T)	MT ++ (T)
		LT 0	LT ++ (T)	LT ++ (T)
	5. Protect and enhance landscape quality and character across the county.	ST 0	ST + (T)	ST + (T)
		MT 0	MT + (T)	MT + (T)
		LT 0	LT + (T)	LT + (T)
	6. Protect historic assets and their landscapes.	ST 0	ST + (T)	ST + (T)
		MT 0	MT + (T)	MT + (T)
		LT 0	LT + (T)	LT + (T)
	7. Educate, manage, plan and adapt for the effects of climate change.	ST + (T)	ST + (T)	ST + (T)
		MT + (T)	MT + (T)	MT + (T)
		LT + (T)	LT + (T)	LT + (T)
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST + (T)	ST ++ (T)	ST ++ (T)
		MT + (T)	MT ++ (T)	MT ++ (T)
		LT + (T)	LT ++ (T)	LT ++ (T)
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST 0	ST ++ (T/P)	ST ++ (T/P)
		MT 0	MT ++ (T/P)	MT ++ (T/P)
		LT 0	LT +++ (T/P)	LT +++ (T/P)

Measure 7.1 – Ensure the environmental consequences of implementing the LFRMS are considered against the technical, economic and social benefits

Consideration of environmental issues as well as economic and social issues is likely to have a minor positive effect on water quality biodiversity, landscape and soils as flood management decision will take environmental effects into consideration. It is assumed that historic assets would be given equal weight with other environmental issues. This approach will help reduce flood risk for humans, properties, infrastructure and businesses.

Measure 7.2 – Consider the use of attenuation through wetlands to increase the length of flow durations, store flood water, and provide amenity and ecological benefits

This measure is likely to have moderate positive effects for biodiversity through habitat creation such as wetlands. This will also have moderate and significant positive effects on water quality from reduced pollutants entering water bodies. Creation of wetlands areas may also have minor positive effects on improving the landscape character and quality. Increasing length of flow durations and creating flood water storage will also help to reduce flood risk and the impacts on consequences on humans, property, businesses, infrastructure and historic assets.

Measure 7.3 – Consider the use of bio-retention areas to remove sediment and pollutants

This measure is likely to have moderate positive effects for biodiversity through creation of bio-retention areas that enhance or create habitat. This will also have moderate and significant positive effects on water quality from reduced pollutants and sediment entering water bodies. Creation of bio-retention areas may also have minor positive effects on improving the landscape character and quality, and will help to reduce flood risk and the impacts on consequences on humans, property, businesses, infrastructure and historic assets.

6.2.8 LFRMS Objective 8 Assessment

Strategic Environmental Assessment Objectives		LFRMS 8: Increase approaches that utilise the natural environment			
		Measure 8.1	Measure 8.2	Measure 8.3	Measure 8.4
	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT ++ (T)	MT + (T)	MT + (T)	MT + (T)
		LT ++ (T)	LT ++ (T)	LT + (T)	LT + (T)
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST ++ (T)	ST + (T)	ST + (T)	ST + (T)
		MT ++ (T)	MT ++ (T)	MT + (T)	MT + (T)
		LT ++ (T)	LT ++ (T)	LT + (T)	LT + (T)
	3. Enhance human health and wellbeing through reducing flooding effects	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT + (T)	MT ++ (T)	MT + (T)	MT + (T)
		LT +(T)	LT ++ (T)	LT + (T)	LT + (T)
	4. Protect and enhance biodiversity and geo-diversity across the County.	ST ++ (T)	ST + (T)	ST + (T)	ST + (T)
		MT ++ (T)	MT + (T)	MT + (T)	MT + (T)
		LT ++ (T)	LT ++ (T)	LT + (T)	LT + (T)
	5. Protect and enhance landscape quality and character across the County.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT + (T)	MT + (T)	MT + (T)	MT + (T)
		LT + (T)	LT ++ (T)	LT + (T)	LT + (T)
	6. Protect historic assets and their settings.	ST + (T)	ST + (T)	ST 0	ST + (T)
		MT + (T)	MT + (T)	MT 0	MT + (T)
		LT + (T)	LT ++ (T)	LT 0	LT + (T)
	7. Educate, manage, plan and adapt for the effects of climate change.	ST + (T)	ST 0	ST + (T)	ST 0
		MT + (T)	MT + (T)	MT + (T)	MT + (T)
		LT + (T)	LT ++ (T)	LT + (T)	LT + (T)
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT + (T)	MT ++ (T)	MT + (T)	MT + (T)
		LT + (T)	LT ++ (T)	LT + (T)	LT + (T)
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST + (T/P)
		MT + (T/P)	MT + (T/P)	MT + (T/P)	MT + (T/P)
		LT + (T/P)	LT ++ (T/P)	LT + (T/P)	LT + (T/P)

Measure 8.1 – Adopt natural flood-risk management techniques including SuDS

Implementing natural flood risk management techniques such as SuDS can have benefits over just using traditional solutions in the majority of cases. SuDS are likely to provide more environmental benefits for water quality, biodiversity, soils and landscape. They will also help to reduce flood risk having minor positive effects for humans, property, infrastructure, businesses and historic assets. Implementation of SuDS will also help plan and adapt for future climate change effects.

Measure 8.2 – Explore new and innovative technologies for flood defence and flood management

The assessment has assumed that this measure is to keep up-to-date and implement where appropriate new and innovative technologies. New and innovative technologies are being continuously developed. However, it is likely that significant new and innovative technologies will not be developed until some time into the future. Therefore, larger benefits are likely to be realised in the medium and long term. It is likely that new and innovative technologies will make flood defences more efficient and effective, reducing flood risk and adapting to climate change. This would have benefits for human health, property, infrastructure, businesses, water quality, biodiversity, landscape, historic assets and soils.

Measure 8.3 – Where possible incorporate multiple benefits such as water quality, biodiversity and amenity benefits

This measure is about incorporating multiple benefits into flood management schemes. Incorporation of new or enhanced habitat, landscaping, use of local materials, creation of amenity area will have benefits for biodiversity, water quality, landscape, climate change and human health. Creation of new wetland, for example, will help reduce flood risk and benefit the environment and society.

Measure 8.4 – Develop and implement a culverting policy

The culverting policy will have a presumption against culverting. This is likely to have positive effects as culverts can get blocked or collapse causing flooding. A reduction in culverting will reduce this risk and have minor positive effects in terms of reduced flood risk and effects for humans, water quality and historic assets. It will also allow waterways to be open having positive effects for biodiversity and landscape.

6.2.9 LFRMS Objective 9 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 9: Ensure the development of skills required to implement effective and innovative flood risk management measures			
	Measure 9.1	Measure 9.2	Measure 9.3	Measure 9.4
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST + (T)	ST + (T)	ST ++ (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)
3. Enhance human health and wellbeing through reducing flooding effects	ST + (T)	ST + (T)	ST ++ (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)
4. Protect and enhance biodiversity and geo-diversity across the County.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
5. Protect and enhance landscape quality and character across the County.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT ++ (T)	MT ++	MT ++	MT ++
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
6. Protect historic assets and their settings.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
7. Educate, manage, plan and adapt for the effects of climate change.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT ++	MT ++	MT +++	MT ++
	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST + (T)	ST + (T)	ST ++ (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)
	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++
	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)

Measure 9.1 – Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the Act

The Act places additional duties on the LLFA and in order that the quality of flood protection and response does not decrease with the extra workload additional members of staff will be required. Having additional staff will ensure that all the requirements of the Act are implemented effectively, allow staff to develop flood risk mapping and asset management systems to increase the efficiency and effectiveness of responses, and allow staff time to read up on new innovations and attend conferences. This is likely to have positive effects for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

Measure 9.2 – Invest in appropriate software and hardware

Having the appropriate software and hardware for a task is essential for effective flood management. Often there are financial barriers to achieving this. This measure would ensure that appropriate software and hardware was available to the flood management team. This would allow them to conduct their work more efficiently and effectively, provide a consistent method and recording system, and manage data and interpretation to better understand flood risk. This is likely to have positive effects for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

Measure 9.3 – Outsource specialist skills to deliver specific projects

Some skills are very specialist and the flood management team may not have the technical knowledge and expertise in these areas. Employing a specialist to provide support, advice and delivery of specific projects is important to ensure projects are designed and implemented successfully. Using a specialist during project design and development can have significant future benefits in terms of innovation, operational life and reliability, success of the project in protecting people and assets from flooding, and minimisation of negative environmental effects.

Measure 9.4 – Collaborate and provide support, training and network of staff across the region

This measure will help ensure that knowledge is shared between the risk management authorities to help better understand flood risk. Appropriate training is important so that staff can do their job effectively. This in turn should help understanding and reduction of flood risk which will have benefits for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

6.2.10 LFRMS Objective 10 Assessment

		LFRMS Objective 10: Identify projects and programmes which are affordable, maximising capital funding from internal and external sources		
		Measure 10.1	Measure 10.2	Measure 10.3
Strategic Environmental Assessment Objectives	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST +	ST +	ST +
		MT +++ (T)	MT +++ (T)	MT +++ (T)
		LT +++ (T)	LT +++ (T)	LT +++ (T)
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within Conwy County.	ST + (T)	ST + (T)	ST + (T)
		MT +++ (T)	MT +++ (T)	MT +++ (T)
		LT +++ (T)	LT +++ (T)	LT +++ (T)
	3. Enhance human health and wellbeing through flood risk awareness raising and emergency planning.	ST + (T)	ST + (T)	ST + (T)
		MT +++ (T)	MT +++ (T)	MT +++ (T)
		LT +++ (T)	LT +++ (T)	LT +++ (T)
	4. Protect and enhance biodiversity and geo-diversity across the Conwy County.	ST (T/P)	ST (T/P)	ST (T/P)
		- +	- +	- +
		MT (T/P)	MT (T/P)	MT (T/P)
		- - ++	- ++	- - ++
		LT (T/P)	LT (T/P)	LT (T/P)
		- - +++	- +++	- - +++
	5. Protect and enhance landscape quality and character across the county.	ST (T/P)	ST (T/P)	ST (T/P)
		- +	- +	- +
		MT (T/P)	MT (T/P)	MT (T/P)
		- - ++	- ++	- - ++
		LT (T/P)	LT (T/P)	LT (T/P)
		- - +++	- +++	- - +++
	6. Protect historic assets and their landscapes.	ST (T/P)	ST (T/P)	ST (T/P)
		- +	- +	- +
		MT (T/P)	MT (T/P)	MT (T/P)
		- - ++	- ++	- - ++
		LT (T/P)	LT (T/P)	LT (T/P)
		- - +++	- +++	- - +++
	7. Educate, manage, plan and adapt for the effects of climate change.	ST + (T)	ST + (T)	ST + (T)
		MT ++ (T)	MT ++ (T)	MT ++ (T)
		LT ++ (T)	LT ++ (T)	LT ++ (T)
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST + (T)	ST + (T)	ST + (T)
		MT +++ (T)	MT +++ (T)	MT +++ (T)
		LT +++ (T)	LT +++ (T)	LT +++ (T)
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST (T/P)	ST (T/P)	ST (T/P)
		- +	- +	- +
		MT (T/P)	MT (T/P)	MT (T/P)
		- - ++	- ++	- - ++
		LT (T/P)	LT (T/P)	LT (T/P)
		- - +++	- +++	- - +++

Measure 10.1 – Identify potential funding sources which may include communities and local businesses

Identifying new funding sources should increase the funds available for flood management projects resulting in more programmes and schemes being implemented. The most significant benefits are likely to be seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features.

Measure 10.2 – Undertake full lifecycle cost benefit analysis for projects including social, and environmental benefits

Undertaking lifecycle benefit analysis is likely to help prioritise projects and ensure that the most cost effective and beneficial project is taken forward. This should help reduce wasting money on projects with few benefits that could be better spent on alternative projects. The most significant benefits are likely to be seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features. Consideration of social and environmental benefits as part of the lifecycle analysis is also likely to reduce negative effects associated with a project and maximise positive effects.

Measure 10.3 – Investigate opportunities for match funding and grants

Investigating opportunities for match funding and grants should increase the funds available for flood management projects resulting in more programmes and schemes being implemented. The most significant benefits are likely to be seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features.

6.3 Cumulative Assessment

The SEA Directive required that a cumulative assessment of the effects of the Flintshire LFRMS is undertaken. The cumulative effect of the combination of measures under each LFRMS objective has been assessed against the SEA objectives. Cumulative effects of the LFRMS are mainly positive as the measure all contribute to achieving the objective and providing benefits in terms of flood risk reduction.

Figure 6.1: Cumulative Assessment

LFRMS Objectives and Measures	SEA Objectives									Commentary
	1	2	3	4	5	6	7	8	9	
LFRMS Objective 1 – Measures 1.1-1.6	++	+++	+++	++	+	++	+++	+++	++	All the measures will contribute to increasing understanding of local flood and coastal risks. This will have cumulative benefits, making flood management more effective and efficient resulting in flood reduction benefits for biodiversity, water quality, human health, property, infrastructure, businesses, historic assets, soils and landscape. Understanding will also aid climate change planning and adaptation.
LFRMS Objective 2 – Measures 2.1-2.7	+	+++	+++	+	+	++	+	+++	++	All the measures will contribute to increasing individual and community awareness and preparedness for flood and coastal erosion events and have cumulative positive effects, especially in terms of reducing consequences and impacts for human health, property, infrastructure and business..
LFRMS Objective 3 – Measures 3.1-3.4	+	++	++	++	+	+	+	++	+	The measures will allow collaboration with FRMA's, stakeholders and the public. The cumulative effect of the measures will improve collaboration.
LFRMS Objective 4 – Measures 4.1-4.4	++	++	+++	- ++	- +	- ++	++	+++	- +	Cumulative effects of the measures will be mainly positive through flood reduction. However, there will be cumulative negative effects which are likely to be temporary in nature during construction of schemes.
LFRMS Objective 5 – Measures 5.1-5.5	++	++	++	++	++	++	++	++	++	All the measures will contribute to ensuring planning decision are properly informed by flood risk issues.
LFRMS Objective 6 – Measures 6.1-6.3	++	+++	+++	+	+	+	++	+++	+	The cumulative effects of the measures will result in positive effects especially in terms of improving water quality and reducing flooding from drains.
LFRMS Objective 7 – Measures 7.1-7.3	+++	++	++	++	+	+	+	++	+++	The measure will have positive cumulative effects on the SEA objectives.
LFRMS Objective 8 – Measures 8.1-8.4	+	++	++	++	+	+	+	++	+	The measures will contribute to providing the necessary skills for implementing flood risk management tasks effectively.
LFRMS Objective 9 – Measures 9.1-9.4	++	+++	+++	++	++	++	+++	+++	++	The cumulative effects of the measure will result in positive effects.
LFRMS Objective 10 – Measures 10.1-10.3	+++	+++	+++	- - +++	- - +++	- - +++	++	+++	- - +++	The measure will have significant positive cumulative effects in terms of flood reduction and resulting benefits for human health, assets, property and businesses. However, there will be cumulative negative effects which are likely to be temporary in nature during construction of schemes.

7. Mitigation and Monitoring

7.1 Mitigation and Enhancement Measures

The options/measures assessment provided SEA Recommendations for taking options/measures forward into the LFRMS, and refining options to maximise positive effects such as amalgamating measures and suggesting additional or change or wording to measures. These recommendation are presented in Section 5.4 and were taken into consideration (with other factors) when determining the preferred LFRMS.

Due to the nature of the LFRMS and the recommendations made during the options assessment the majority of the LFRMS measures were assessed as having positive effects. Therefore, identification of mitigation measures is limited. Opportunities to maximise positive effects have also been considered. Table 7.1 sets out mitigation and enhancement measures that have been developed for LFRMS.

Table 7.1: Mitigation and Enhancement Measures

LFRMS Objective and Measure	Issue / Potential Effect	Suggested Mitigation and Enhancement Measures
Objective 4, Measure 4.2	A capital cost investment programme is likely to result in construction of flood alleviation schemes. As well as positive effects in terms of reducing flood risk there is potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works.	Negative effects are likely to be minimised through the planning process and legislation and therefore specific mitigation measures are not required in the LFRMS. Future scheme mitigation could include: • Undertake a feasibility study for the scheme looking at the most appropriate location and scheme type that balances social, economic and environmental factors; • Undertake an appropriate environmental assessment of the scheme (e.g. EIA or similar) to look in details at the environmental effects and specific mitigation; • Undertake WRAP (Waste Resources Action Programme) workshop during design of the scheme to help design out waste; • Develop a Construction Environmental Management Plan (CEMP) to minimise effects on the environment during construction; and • Develop a Site Waste Management Plan (SWMP) to encourage re-use and recycling of materials.
Objective 10, Measure 10.1, 10.2, 10.3	Identifying new funding sources is likely to result in more programmes and schemes being implemented. As well as positive effects in terms of reducing flood risk there is potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works.	

7.2 Monitoring Proposals

Monitoring the negative effects of implementing the LFRMS is an essential ongoing element of the SEA process. Monitoring helps ensure that the identified SEA objectives are being achieved, allows early identification of unforeseen adverse effects and this appropriate remedial action can be taken. Monitoring will be an important requirement to measure performance and ensure the LFRMS is being successfully implemented. The DCLG guidance states that it is inappropriate to monitor everything and monitoring proposals should be focused on the following areas:

- indicate a likely breach of international, national or local legislation, recognised guidelines or standards;
- may give rise to irreversible damage, with a view to identifying trends before such damage occurs; and

- were subject to uncertainty in the SEA and where monitoring would enable prevention or mitigation measures to be taken.

Due to the high level nature of the LFRMS and the positive results of the assessment, requirements and feasibility of monitoring is limited. However, although negative effects were not identified it is considered that the LFRMS should still undergo monitoring to ensure that the implementation of the strategy is as predicted in this SEA. Therefore, a range of indicators have been suggested below for monitoring the effects of the LFRMS (see Table 7.2). This monitoring will be incorporated within the annual action plans that will supplement the LFRMS. It should be noted that not all indicators will be feasible to monitor straight away due to resources and baseline gaps. However, these indicators should be considered for future monitoring.

Table 7.2: Monitoring Proposals

Monitoring Proposal - Indicators
• Number of residential and non-residential properties at risk of flooding;
• Number of new developments permitted in areas of flood risk;
• Number of flood defences schemes implemented;
• Number of SuDS implemented;
• Number and severity of flooding incidents in Flintshire and their source.
• Number of flood events leading to transport disruption;
• Number of awareness raising activities and events undertaken;
• Number of flood related public enquiries
• Area of habitat created (type, and area) or lost as a result of SuDS and flood defence works;
• Populations of priority species lost or increased through flood defence works
• Area of important landscape at risk from flooding;
• No significant adverse landscape effects from flooding related development in sensitive landscape;
• Positive (or negative) visual impact of flood defence schemes located within outstanding areas of landscape quality or significance
• Number of historic assets at risk of flooding;
• Number of listed buildings on the ‘at risk’ register at risk from flooding.
• Number of educational activities (exhibitions, workshops, leaflets, questionnaires, advertising) undertaken.
• Number and severity of incidents leading to disruption or damage to service provision;
• Number of residential and non-residential properties at risk of flooding across Flintshire;
• Number of power, waste and telecommunication assets at risk of flooding;
• Number of critical services at risk of flooding; and
• Transport infrastructure at risk from flooding.
• Area of agricultural land at risk of flooding;
• Area of agricultural land lost due to the need for flood defence;

Monitoring Proposal - Indicators
• Number of pollution incidents arising from flooding

7.2.1 Links to Other Tiers of Plans, Programmes and the Project Level

The Flintshire LFRMS supports several local, regional and national plans and programmes. The LFRMS will have a direct link to flood risk management strategies but will also have indirect links to plans relating health and well-being, housing, economy, transport and the environment.

The Flintshire LFRMS has been assessed at a high strategic policy level. Any specific schemes that are proposed and implemented as a result of LFRMS will be subject to the formal planning process and may require an Environmental Impact Assessment under the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2011 (as amended)[14]. Requirements for EIA will be determined on a scheme by scheme basis once the scheme is at the stage to be taken forward.

[14] Her Majesty's Government (2011) Town and Country Planning – The Town and Country Planning (Environmental Impact Assessment) Regulations 2011

8. Conclusions of the SEA

8.1 Conclusions and Difference the SEA Process has made to the LFRMS

The SEA undertaken for the Flintshire LFRMS has helped ensure that those options/measures with significant negative effects that could not be mitigated were rejected at the options selection stage and not taken forward into the LFRMS. The process also helped to refine options/measures to maximise beneficial effects. Due to the nature of the LFRMS most of the options/measures and the preferred strategy itself have positive effects. The main positive effects identified were flood risk reduction resulting is protection of people, property, infrastructure, businesses, water quality, historic assets, and biodiversity from flood damage. The only potential negative effects identified during the assessment stage were where measures may lead to future structural flood defence works/schemes. These effects are likely to be temporary and mitigated through best site practices, legislation, and the planning process.

8.2 Next Steps in the SEA Process

8.2.1 Remaining Stages of the SEA Process

This Environmental Report shows the results of Stages A to C of the SEA process. The next stage of the process is Stage D which involves consulting upon the draft LFRMS and draft Environmental Report with statutory consultees, stakeholders and the public and making any necessary amendments and updates to the documents. Following adoption of the LFRMS an SEA Statement is produced. Stage E 'Monitoring' will be carried out annually by FCC following adoption of the LFRMS.

8.2.2 Stage D: Consulting on the draft Strategy and the Environmental Report

Task D1: Consulting on the draft Strategy and Environmental Report

As required by the SEA Regulations, consultation and participation by key stakeholders including the public will take place to ensure a robust Strategy consultation. The SEA Regulations do not state a specific time period for consultation but states that 'authorities shall be given an early and effective opportunity within appropriate time frames to express their opinion'. It is proposed that the consultation period is six weeks. It is proposed that relevant authorities/stakeholders are provided with the draft Strategy and Environmental Report. The findings of the consultation responses will be taken into account in the decision-making process and documented.

Task D2: Assessment of significant changes

Any significant alterations to the Strategy as a result of the consultation in Stage D1 will be assessed in terms of their environmental implications and influence on the revision of the Strategy. The final Environmental Report will need to be amended as necessary to reflect any changes.

Task D3: Decision making and providing information

Information in the Environmental Report and responses to consultation will be taken into account during the preparation of the Strategy before it is adopted. Following adoption, a short statement will be produced which outlines how the SEA process has influenced the development of the Anglesey LFRMS, how consultation comments were taken into consideration and how the Strategy will be monitored. This

summary will provide enough information to make it clear how the Strategy was changed (if at all) as a result of the SEA process and consultation.

8.2.3 Completion of Stage E

Stage E 'Monitoring implementation of the plan' of the SEA process will be carried out by FCC. It is likely that monitoring of the Strategy will be incorporated with the Council's annual monitoring process.

Appendices

Appendix A. Scoping Consultation Results

Consultees and Comments	FCC Response
Cadw Comments:	
In general, barring specific comments below, the scoping report appears to be reasonably comprehensive and lays out an appropriate strategy for evaluation.	No action required
The scoping report notes the need to consider impact on Cultural Heritage (architectural and archaeological heritage) and provides a summary of baseline information in section 5.8. In general this is satisfactory although section 5.8 should include reference and explanation of non-statutory registered historic landscapes of historic interest (in part indirectly referred to in 5.7). All historic landscapes have been subject to detailed characterisation work - available in hard copy and electronic format from Clwyd Powys Archaeological Trust.	To avoid duplication of information landscapes of historic interest will be covered in the Landscape section. A further sentence has been added about the Register of Landscapes of Historic Interest in Wales. The historic landscape characterisation work undertaken by Clwyd Powys Archaeological Trust and Gwynedd Archaeological Trust have been reviewed. It is considered too much detail to conclude in the baseline but will be taken into consideration when assessing the potential effects of the LFRMS and options
It is also important to recognise that in addition to designated historic assets, there are substantial numbers of undesignated historic assets within the study area with regional and local importance. Some categories of monuments can be particularly vulnerable to flood/flood management actions including bridges, harbours, WWII defensive structures and coastal/river-side monuments. There is a need to develop strategies which will enable sites at risk to be identified and protected through appropriate mitigation.	A section on undesignated historic assets and archaeology has been added to the Cultural Heritage baseline. The LFRMS is a high level policy document that will not identify flood risk areas and sites. However, it will help ensure that flood risk is reduced and that the natural and built environment is protected. In the future area specific management plans may be developed which will consider heritage assets.
A general comment is that the document focuses less on opportunities than on issues/risks. There may be opportunities for synergy between a reduction in the flood potential of some areas and the protection of historic features, for example historic monuments are vulnerable to damage from water erosion so actions which reduce the rate of water flow can be beneficial.	Opportunities have been developed under each of topic headings and these are considered sufficient. The opportunity under cultural heritage has been re-worded in a more positive way and the example given has been included
5.8.1 Scheduled ancient monuments are monuments of national importance - designated by Cadw, the historic environment service of the Welsh Government in accordance with the Ancient Monuments and Archaeological Areas Act, 1979. As noted, they can be diverse in form and nature and many include areas of buried (sub-surface) archaeological remains. Cadw undertakes a process of regular condition surveys of all scheduled ancient monuments on a 10-year rotation.	Noted. No action required
5.8.2 Change "Welsh Assembly" to Welsh Government - and refer to Cadw as the historic environment service of the Welsh Government rather than as an Agency.	Welsh Assembly has been changed to Welsh Government, and the reference to Cadw has been changed
Environment Agency Wales (EAW) Comments:	
Are there any additional plans or programmes at the international, national, regional or local level which have been excluded from Appendix A, which your organisation thinks are relevant to the Flintshire LFRMS SEA? No	No action required
Do you agree with the review of the current key sustainability issues in the Flintshire County area? Yes	No action required
Do you thin the environment, social and economics baseline date collected for Flintshire is appropriate and relevant? Yes, however, recommend that our updated Local Evidence Packs are utilised for future assessments.	Noted and these will be considered for future assessments

Consultees and Comments	FCC Response
Http://www.informbasecymru.net	
Is any environmental, social and economic baseline information currently missing? No	No action required
Is there any inaccurate environmental, social and economic baseline information? No	No action required
Are the SEA objectives and associated assessment criteria and indiat0rs suitable for the Flintshire LFRMS? Yes	No action required
Does the wording of any existing objectives need to be changed, added or removed? No	No action required
Do the draft SEA indicators provide a relevant measure of the objective? If not can you suggest appropriate alternatives? Yes	No action required
Do you have any other comments on the Scoping Report? We are satisfied that the most relevant documents have been referred to, and look forward to the submission of the SEA	No action required
Countryside Council for Wales (CCW) Comments:	
Section 1.2 As well as the aims listed in section 2.1, the aim of a scoping report is to present information about the relationship of the plan or programme with other relevant plans and programmes.	Agreed. The Scoping Report is not being updated, scoping consultation comments have been addressed in the Environmental Report. This task was undertaken as part of the plans and programme review in the scoping report and will also be presented in the Environmental Report
It may also be relevant to point out that the scope seeks to establish the environmental protection objectives at international, European, national and local levels which are relevant to the plan or programme and how those objectives and any environmental concerns should be taken into account during its' preparation.	Agreed. The Scoping Report is not being updated, scoping consultation comments have been addressed in the Environmental Report. This task was undertaken as part of the plans and programme review in the scoping report and will also be presented in the Environmental Report
As well as establishing the baseline environmental information for Flintshire, the scope should also outline the likely evolution of Flintshire's environment without implementation of the LFRMS (the 'no-action' alternative or business as usual alternative).	Agreed. The Scoping Report is not being updated, scoping consultation comments have been addressed in the Environmental Report. This task was presented in the scoping report and will also be presented in the Environmental Report. The assessment appraises a Do Nothing option and a Business as Usual option and the results will be presented in the Environmental Report.
Section 1.3 Habitat Regulations Assessment As the Conservation of Habitats and Species Regulations 2010 have recently been amended reference to them should be altered to 'Conservation of Habitats and Species Regulations 2012 (as amended)'.	The Conservation of Habitats and Species Regulations has been updated
Reference should also be made to pSPAs and cSACs.	Reference has been that Natura 2000 sites also cover pSPAs and cSACs
As a matter of government policy, Ramsar sites are afforded the same degree of protection as European Sites and should be included within the HRA process given the potential effects of the Flintshire LFRMS on the Dee Estuary Ramsar, this is of relevance.	Ramsar sites will be covered in the HRA and are referred to in the scoping report under Natura 2000 sites
Given the nature of the strategy and the likely potential for significant adverse effects on the integrity of European Sites, it is suggested that Habitats Regulation Assessment	The strategy is a high level policy document that will not detail specific flood risk areas or flood management schemes. Therefore, until the HRA screening has been undertaken it

Consultees and Comments	FCC Response
will be required rather than "maybe" required, as stated in the text.	cannot be determined whether a HRA will be required or not.
When drawing up the Habitat Regulations Assessment (HRA) for this strategy it may be of assistance to refer to the current guidance produced by the CCW in relation to HRA's which is available at: http://www.ccgc.gov.uk/landscape--wildlife/managing-land-and-sea/environmental-assessment/habitatsregulations-assessment.aspx The guidance document entitled Guidance for Plan Making Authorities in Wales: The Appraisal of Plans under the Habitats Directive found in the resource section of this page is likely to be of particular relevance to the SEA process	Noted and will be considered during the HRA and SEA processes
Section 1.4 Limitations of the Scoping Exercise CCW welcomes the intention for FCC to up-date the baseline dataset throughout the assessment process and to minimise any gaps in information.	No action required
Section 2.2 SEA Process and Stages In addition to the guidance published by the Office of the Deputy Prime Minister relating to the Strategic Environmental Assessment Directive it is recommended that you also refer to the SEA guidance published by the Countryside Council for Wales which is available on the Countryside council for Wales's (CCW) website at: http://www.ccgc.gov.uk/landscape--wildlife/managing-land-and-sea/environmental-assessment/strategicenvironmental-assess.aspx	Noted and guidance taken into account during the preparation of the Environmental Report
The SEA process identifies a number of environmental topics that must be considered within the assessment process and CCW have published a series of guidance notes for SEA topics to help plan makers and SEA practitioners. The topics covered include: SEA Topic: Air SEA Topic: Biodiversity SEA Topic: Climate Change SEA Topic: Cultural Heritage SEA Topic: Landscape SEA Topic: Material Assets SEA Topic: Soil SEA Topic: Water	Noted and guidance taken into account during the preparation of the Environmental Report
It should also be noted that additional guidance on SEA topics has been produced by the Environment Agency and links to it and other useful sources of information about the SEA process are available at the web address referred to above.	Noted and guidance taken into account during the preparation of the Environmental Report
Please also refer to the SEA annexes within TAN 5.	This has been reviewed and will be taken into consideration
Section 2.3 SEA Stage A- Scoping While CCW understand that the monitoring outlined in Stage 3 will be carried out as part of the LFRMS annual monitoring, preparations for monitoring will need to be considered in the course of preparing the LFRMS.	Monitoring will be considered as part of the LFRMS and SEA process. Stage B6 of the SEA process will develop an outline monitoring programme for the LFRMS. Monitoring will based on the outcomes of the assessment where uncertainties and adverse effects are identified
Section 3.1 Need to consider whether coastal/marine flooding issues will be included within this LFRMS.	Noted and this will be included in the Strategy document.
Section 4.1 Please see comments relating to Appendix A below which are also relevant to Figure 4.1.	We have reviewed the relevant plans and programmes.
Figure 4.1: The following PPPs (some still in development), need to be considered within this Review	The three national plans have been reviewed and added to Figure 4.1 and Appendix A. It has not been possible to review

Consultees and Comments	FCC Response
process.Neighbouring Authorities PPS:Denbighshire Local Flood Risk Management PlanCheshire Local Flood Risk Management Plan and relevant Water Cycle Studies for CheshireCheshire West and Chester LDF (in development)Ellesmere and Neston LDF (in development)National (UK and Wales):Better Woodlands for Wales (Forestry Commission, 2009)Natural Environment Framework 'A Living Wales' (2011)Civil Contingencies Act (2004)	the those plans that are still in development
Section 5.1 Baseline Information Please see comments above in relation to Section 2.2, which refer to CCW's Guidance Topic papers. This series of guidance notes for SEA topics include information about identifying sources of baseline data and examples of how to present this data.	Noted and guidance taken into account during the preparation of the Environmental Report
Annex 1(f) should also present information which shows that the interrelationships between environmental topics have been considered.	Noted and guidance taken into account during the preparation of the Environmental Report
The baseline information presented in this section does not demonstrate a clear understanding of the particular nature/types of flood hazard within Flintshire and also does not consider risk/probability of those hazards manifesting themselves. The baseline section should show a clear understanding of the environmental issues that are being considered writing the plan under scrutiny	The information presented is based upon the PFRA which is the most up to date flood risk information available for Flintshire
Section 5.2 Air Quality CCW agrees that the impact of the LFRMP is unlikely to impact on air quality and the decision to scope air quality out of the SEA. However this section should have given some reference to the likely impact that air quality in Flintshire has on protected sites (i.e. SAC, SSSI etc) as the air quality targets for some of these sites are considerably more precautionary than those highlighted in this section. Please see the APIS website which provides the most up to date information about air quality (www.apis.ac.uk) and its impact on protected sites.	Comment will be added to identify impacts of air quality on protected sites
More details about diffuse air pollution issues/impacts on habitats especially potential indirect effects on water quality would have been of interest. It may also be helpful to have presented any information available on air pollution/water quality causal pathways (intensive agriculture, industrial/domestic discharge etc) and also consider further the potential air quality effects derived along A55 and along the industrialised areas of the Dee Estuary identified in section 5.2.	Agreed, further information will be added
Are there any AQMA in close proximity to Flintshire i.e. Wirral/Liverpool which could be affected	There are likely to be AQMA in close proximity however it is unlikely that these will not impacted due to the policy nature of the strategy
Section 5.3 Water A lot of information presented in this section is generic and in places, of marginal relevance to the plan under scrutiny. In sections 5.3.1, 5.3.2 and 5.3.3 in which the water courses/rivers/estuaries and the coast of Flintshire are discussed it would be helpful to provide further information e.g. from TAN 15 maps/EA flood maps etc in regards to flood hazard. It may also be helpful to include further information about ordinary water courses.	TAN 15 plans relate to combined flooding hazards but do not differentiate between the types of flooding. In addition the plans are often inaccurate and do not provide sufficient local detail. The PFRA for Flintshire provides a better indication of local flood risk from ordinary watercourses, groundwater and surface runoff and as such this has been used the baseline data source.
What does the key on figure 5.2 illustrate, please clarify	
There are set conditions that need to be in place for the	This information is available on the EAW website and

Consultees and Comments	FCC Response
areas of Flintshire to flood and these should be described. It would be useful if the baseline indicated rivers/tributaries and estuaries where flood issue (including tidal back up) were particular issues especially in respect of developed areas/non-permeable surfaces.	referenced in the document
Reference should be made to the Dee Estuary's status as SAC/SPA/Ramsar/SSSI. It is not clear how relevant Colwyn Bay will be to this LFRMS. Information should be presented on any shellfish fisheries and coastal water quality issues.	Additional information will be added to the document to reflect the comment.
Section 5.3.5 The LFRMS has the potential to cause issues with water quality by not adequately dealing with flood risk issues in areas such as waste water treatment works and also at industrial site where harmful chemicals/ fuel etc are stored and could be released if these areas were to flood. A consideration of this in relation to the current flood risk within Flintshire should be included (it may be helpful to present this in a map). It should be noted that different water bodies will have differing resilience to pollution and this should be considered further within the scope.	We agree in context however we do not feel that this is appropriate due to the high level nature of the document.
A consideration of this in relation to the current flood risk within Flintshire should be included (it may be helpful to present this in a map).	We agree in context however we do not feel that this is appropriate due to the high level nature of the document.
There should be reference to River Dee's SAC/SPA/Ramsar status and to relevant issues associated with water supply/discharge of treated waste water etc (see section 5.3.6)	Agreed an this will be incorporated into the Environmental Report
It should be noted that there is very little monitoring of water quality in the estuary in relation to nutrient levels.	Noted
Damaged septic tanks may contribute to water quality issues but also those that are malfunctioning due to damage, poor manage lack of maintenance or inadequate size for the discharge. While septic tanks should be registered there are many historic unregulated domestic discharges within the catchment.	Agreed and the comments will be integrated into the Environmental Report
Section 5.3.7 The information included in this section is generic and does not convey understanding of the particular issues affecting Flintshire. There is no reference to the role of tidal influence on discharge of waste water/backup.	Agreed and the comments will be integrated into the Environmental Report
There also does not appear to be any consideration of role of non-permeable surfaces/developed areas in exacerbating surface water run off.	Agreed and the comments will be integrated into the Environmental Report
The text refers to 18 areas identified as being at flood risk but no identification as to where these areas might be or the factors that contribute to the flood risk.	This data is available in the PFRA. More detailed information on the factors was considered to be too detailed for the high level nature of the document.
It would have been helpful if a flood risk map had been included in this section.	Data was not available
The scope should consider that flood alleviation measures may impact on natural functions and biodiversity and are likely to require EIA (at project level) in their own right, also HRA (project level) where there is the potential to adversely affect European Sites (alone and in combination).	Agreed flood alleviation schemes may have an impact on biodiversity however as stated these will be identified through the planning procedures (HRA and EIA).

Consultees and Comments	FCC Response
Flooding It may be helpful to examine the positive impact that flooding could have on biodiversity and protected sites though existing flooding, controlled flooding of area and the creation of flood defences both in terms of protecting areas but also the creation of flood defence measures which could benefit biodiversity (such as planting woodland or creation of wetlands etc).	Comment will be added to reflect the opportunities.
The text needs to show a greater understanding of the difference between hazard and risk and an awareness that in reducing the risk of floods occurring there may be a potential to increase the magnitude/severity of flooding (albeit at a reduced frequency).	This will be clarified
Water Quality and Water Resources See comment in relation to water quality in Section 5.3.5 above. The installation of some flood defence measures have the capacity to affect the flow of rivers and this may in turn affect the ecological functionality of a water course, also it could act in combination with existing water quality issues.	We agree in context however we do not feel that this is appropriate due to the high level nature of the document and specific schemes and locations will not be identified in the strategy
Climate Change Climate change may adversely affect some species and habitat and this should be examined in this section. Measures which may improve this situation in terms of the impact on biodiversity include improving connectivity and permeability of the landscape in ecological terms. Flood defence measures could potentially contribute to or may detract from this connectivity and it is recommended that some consideration of this be included in this section.	Agreed but this is a high level document and the information is too detailed
The potential for increased frequency/magnitude of storm surges should be discussed.	A comment will be added to further explain this
It is also recommended that further consideration of climatic factors in terms of resilience of infrastructure/transport etc to withstand climate changes should be included.	A comment will be added to further explain this
Section 5.5 Soils It would be helpful if this section considered the wider function of soil in terms of flood alleviation, carbon storage and soil's ecological functions. There is also little consideration of the link between soil and general water quality issues including loss of N and P from agricultural soil, turbidity, suspended sediment.	Information on foot and mouth and the implications of buried animal on groundwater flooding will be added. A comment will be added to further explain this
CCW do not agree that Flintshire does not have a history of heavy or polluting industries. Reference needed to existing industrial areas and consideration of their resilience to flooding.	The text will be changed to reflect the level of contamination
Section 5.6 Biodiversity, Flora, Fauna CCW welcomes the inclusion of maps showing the distribution of the protected sites.	No action required
Need to consider the potential effects of flood defences on foraging habitats for mobile species	This will added to the report and will also be further considered in the HRA
Section 5.7 Landscape A figure should be included that indicates the location of landscapes on the Register of Landscapes of Historic Importance and the Clwydian Range AONB..	Text in the baseline information covers landscapes on the Register of Landscapes of Historic Importance. A map showing the AONB will be included
Section 5.10 Material Assets This section would be improved if it also presented	Flood hazard maps have not yet been produced by FCC and the document is high level so not go into specific of areas and

Consultees and Comments	FCC Response
information about the potential vulnerability of material assets to flood hazard and/or climate change effects (e.g. how much housing/transport etc lies within TAN 15/EA Flood Risk areas).	assets at risk
It would be useful for information to be provided regarding percentage/areas of housing at 'risk' from flooding.	It is not possible to differentiate between different types of flooding and hence the data would not be representative of the flood risk from local sources
It would be useful for information to be provided regarding percentage/areas of community assets at 'risk' from flooding	Flood hazard maps have not yet been produced by FCC and the document is high level so not go into specific of areas and assets at risk
It would be useful for information to be provided regarding percentage/areas of energy and power assets at 'risk' from flooding including the provision/existence of flood defence structures/contingency plans.	Flood hazard maps have not yet been produced by FCC and the document is high level so not go into specific of areas and assets at risk
It would be useful for information to be provided regarding percentage/areas of transport assets at 'risk' from flooding including the provision/existence of flood defence structures/contingency plans	Flood hazard maps have not yet been produced by FCC and the document is high level so not go into specific of areas and assets at risk
It would be useful for information to be provided regarding percentage/areas of existing and historic waste assets at 'risk' from flooding including the provision/existence of flood defence structures/contingency plans.	Flood hazard maps have not yet been produced by FCC and the document is high level so not go into specific of areas and assets at risk
Section 5.10.5 In terms of critical infrastructure some consideration of the impact on telecommunications and energy transmission needs to be included	This has been included in the material assets section.
Section 5.11 In reference to air quality one of the major contributions to reducing air quality issues in the UK in recent years has been the tighter regulation of large oil/gas/coal fired power stations and oil refineries as they are major contributors to background levels of NOx and SOx.	Comment to be added to reflect contribution from power stations
Section 6 Key Environmental Issues Table 6.1:Air Quality: Please refer to previous comments relating to air quality above. CCW agree with the decision to scope out air quality however it would have been helpful have included further information regarding any potential issues relating to diffuse air pollution and habitat/water quality	We do not consider this to be appropriate due to the high level nature of the document.
Water: This section mainly focuses on water quality with little reference to water resources, it is recommended that the final bullet point in this row be reworded to clarify what is meant by "better water resources" and that this point is elaborated upon.	Agreed and the comments will be integrated into the Environmental Report
Need to add potential effects on water quality of bathing waters/beaches as a result of run off from combined drainage systems as surface water flooding and the associated water quality issues caused by it will not be confined to terrestrial water courses.	This will be added to the Environmental Report
Climatic Factors: Please include some consideration of storm surges and the potential coastal flooding events which could act in combination with the flooding dealt with by the LFRMS. Further consideration of the need to climate proof/increase climate change resilience of essential infrastructure should be included.	The existing comments will be expanded to include the points made.
Soil: Please see previous comments in relation to soil it is recommended that this section include further consideration of potential effects on soils' wider functions or potential for	Agreed and the comments will be integrated into the Environmental Report

Consultees and Comments	FCC Response
soils to be used as flood amelioration. There is no consideration of function of Flintshire Flood Plain.	
Biodiversity/Flora/Fauna: Further consideration of the effects of flooding on quality of coastal and estuary habitats/species should be included both in terms of direct physical damage and impact on water quality.	Agreed and the comments will be integrated into the Environmental Report
There is a typo please amend sporning to spawning.	Typo amended
Section 7.1 Indicators in general: In order for indicators to be effective the current baseline needs to be established and the information needs to be readily available. The aim of indicators is to test the performance of the plan/strategy. In order to do that, the baseline needs to relate to and be capable of reacting to the plan. Therefore some revision of them so that they are more focused on flooding and flood measures needs to be undertaken. For example the use of the chemical status of water bodies is relevant to the effectiveness of the LFRMS however general information may not tell you how effective the LFRMS is as the monitoring may not be effective as it is unlikely to be undertaken during flood events and therefore drops in water quality caused during flood events may not be identified. Also general monitoring of water quality may not be looking at the chemical parameters you may be interested in. If there is a decrease in water quality this may be due to other factors, how would you isolate flooding or try and correlate flood events with drops in water quality data?	Noted. Indicators will be taken forward into the monitoring programme following the results of the assessments as only uncertain and negative effects need to be monitored, indicators taken forward will be reviewed and revised if necessary
Water: An additional objective is needed in respect of ecological function of water courses and water bodies including consideration of water goods/services.	We feel that this is already covered under the assessment criteria
There is a strong emphasis on water quality but need to consider water quality in a wider context (for example the need to consider water quality in relation to recreation).	An additional assessment criteria will be added to the Population and Human Health Objective
There should be assessment criteria that relates to the potential impact on water resources.	An additional assessment criteria will be added to the Material Assets Objective. We feel that this issue is important and will be added to the key issues table.
The ecological status and chemical status of water bodies can be used to assess the impact of the LFRMS however they need to be linked to flooding or the installation of flood control measures otherwise they will not be relevant.	As the strategy is high level, no schemes will be identified. Any schemes that will be constructed will be subject to appropriate monitoring pre, during and post construction and hence both the chemical and ecological impacts of the construction will be monitored
Flood Risk: An additional objective is required in respect of coastal flooding e.g. from storm surges.	Additional assessment criteria to be added under the flood risk objective, relating to the combination of local and other flooding sources
The number of SuDs implemented or the number of flood defence schemes implemented may not adequately measure the impact of the LFRMS. It may be better to also measure the number of properties, infrastructure or the area of land that were at risk from flood against the area/number of land/properties/infrastructure that have a reduced risk of flooding once these measures have been implemented.	It is not currently feasible to monitor this suggested indicator but it may be in future cycles of the strategy
It is recommended that the criteria include some consideration of the potential for marine flooding and/or potential need to climate proof infrastructure against increased frequency of flood events (marine and terrestrial).	Please refer to the flood risk comment above.

Consultees and Comments	FCC Response
Biodiversity: The indicator, "Area and number of statutory and non-statutory ecological sites at risk from flooding" needs further clarification as some areas of the sites may benefit from a certain degree of flooding. In this context you need to be clear which protected sites or areas of protected sites you are referring to in this criteria.	Agree and further clarification will be provided.
It is not clear how the second indicator in this row will be measured as it is not clear if monitoring of this kind takes place. This indicator would only be useful when measured against a baseline (i.e. before the LFRMS) and it is not clear where this data would come from. It is recommended that you revise this criteria to something that can be measured or explain where the data is going to come from. It is important that this data would be robust enough to use as an indicator.	If the indicator is taken forward into the monitoring programme (following the results of the assessment) it will be reviewed and revised if necessary
The fourth indicator is the "number of SuDs and flood defence works that have lead to habitat creation. In this case it may also be helpful to quantify the area of habitat created, the type of habitat created and how this relates to ecological targets	Text to be amended to include area and type of habitat.
It should be noted that in some situations the aim may not be to 'protect ecological sites from flooding'.	An assessment criteria will be added to address the positive effects of flooding on ecological sites e.g. wetlands
It may be helpful to cross ref the Shoreline Management Plans and consider coastal squeeze and possible marine flooding issues.	Information on coastal squeeze is not available for the area. The SMP has been reviewed as part of the plans and programme review and is included in the report. Marine flooding issues are now covered in the new assessment criteria under flood risk
Landscape: Please define what is meant by an "area of important landscape".	A definition will be provided.
Further consideration of the impact that flood alleviation/protection measures may have in terms of Shoreline Management Plans. Rather than just the number of schemes located within areas of outstanding areas of landscape it is necessary to quantify the impact in some way as flood alleviation measures could benefit as well as detract from the quality of landscape in these areas.	Limited relevance in terms of the SMP. The following indicator will be added; No significant adverse landscape effects from flooding-related development in sensitive landscape.
Soil: Please refer to previous comments relating to soil, it is recommended that the criteria and indicators be revised to reflect the broader function of soil.	It is not feasible to currently monitor this issue due to resources and lack of baseline. This will be reviewed in the next cycle of the strategy if required
Section 7.2 Table 7.2 It is recommended that an SEA objective relating to water resources as well as water quality be included.	An additional objective will not be added. However, impacts on water resources will be considered through addition of an assessment criteria under material assets
Also it is recommended that the objective relating to soil better reflect its broader function.	See previous comments on soil
Section 9 The outline of the approach to the SEA process is in line with current guidance and CCW welcomes this.	No action required
Appendix A Plans and Programme Review Please refer to the CCW Topic Guidance Notes outlined above which provide lists of relevant plans and policies which may need to be considered in addition to the ones listed in Appendix A.	Noted and guidance taken into account during the preparation of the Environmental Report
Below is a list of additional plans polices or programmes which CCW recommend are included, this is not an exhaustive list and it is recommended that further consideration is given to the wider effect of implementing the LFRMS. Neighbouring Authorities PPS:	The three national plans have been reviewed and added to Figure 4.1 and Appendix A. It has not been possible to review the Gwynedd LFRMS and Denbighshire LFRMS as these are still in development

Consultees and Comments	FCC Response
Cheshire Local Flood Risk Management Plan and relevant Water Cycle Studies for Cheshire Cheshire West and Chester LDF (in development) Ellesmere and Neston LDF (in development) National (UK and Wales): Better Woodlands for Wales (Forestry Commission, 2009) Natural Environment Framework 'A Living Wales' (2011) Civil Contingencies Act (2004)	

Appendix B. Plans and Programmes Review

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
	INTERNATIONAL & EUROPEAN	
EU Biodiversity Strategy to 2020: Our life insurance, our natural capital (2011)	Strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020. There are six main targets, and 20 actions to help Europe reach its goal. The six targets cover: • Full implementation of EU nature legislation to protect biodiversity; • Better protection for ecosystems, and more use of green infrastructure; • More sustainable agriculture and forestry; • Better management of fish stocks; • Tighter controls on invasive alien species; and • A bigger EU contribution to averting global biodiversity loss. The strategy is in line with two commitments made by EU leaders in March 2010. The first is the 2020 headline target: *"Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss"*; the second is the 2050 vision: *"By 2050, European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided."*	There are several European, national and local designated sites of nature conservation in Flintshire. Flooding and construction of defence structures can affect these sites. The LFRMS should aim to protect these areas and where possible contribute to biodiversity. The LFRMS should promote biodiversity where possible by including policies which promote natural flood defences which may benefit biodiversity.
EC Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC)	The main aim of this Directive is to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. While the Directive makes a contribution to the general objective of sustainable development; it ensures the conservation of a wide range of rare, threatened or endemic species, including around 450 animals and 500 plants. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right. The Directive provides for a ban on the downgrading of breeding and resting places for certain strictly protected animal species. Exceptions to the strict protection rules can be granted under very specific conditions. The Habitats Directive also establishes the EU wide Natura 2000 ecological network of protected areas. For these areas it provides a high level of safeguards against potentially damaging developments. Together with the Birds Directive, the Habitats Directive forms the backbone of EU nature protection legislation.	There are several Natura 2000 sites in Flintshire. The LFRMS should aim to protect these areas and where possible contribute to their biodiversity.
EC Directive on the Conservation of Wild Birds (2009/147/EC)	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (this is the codified version of Directive 79/409/EEC as amended). This Directive ensures far-reaching protection for all of Europe's wild birds, identifying 194 species and sub-species among them as particularly threatened and in need of special conservation measures. There are a number of components to this scheme: • Member States are required to designate Special Protection Areas (SPAs) for 194 particularly threatened species and all migratory bird species. SPAs are scientifically identified areas critical for the survival of the targeted species, such as wetlands. They are part of the Natura 2000 ecological network set up under the Habitats Directive 92/43/EEC; • A second component bans activities that directly threaten birds, such as the deliberate killing or capture of birds, the destruction of their nests and taking of their eggs, and associated activities such as trading in live or dead birds (with a few exceptions); and • A third component establishes rules that limit the number of bird species that can be hunted (82 species and sub-species) and the periods during which they can be hunted. It also defines hunting methods which are permitted (e.g. non-selective hunting is banned).	There are several SPAs within Flintshire and other areas that are important for birds. The LFRMS should aim to protect these areas, and flood defence projects should not threaten bird species.
Ramsar Convention on wetlands of	Provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The aim is *"the conservation and wise use of all wetlands through local and national actions and*	There is a Ramsar site and wetland habitat within Flintshire. The LFRMS

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International Importance (1971)	*international cooperation, as a contribution towards achieving sustainable development throughout the world".* The Convention uses a broad definition of the types of wetlands covered, including lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans.	should aim to protect these areas.
EC Marine Strategy Framework Directive (2008/56/EEC)	The aim of the Marine Strategy Framework Directive is to protect more effectively the marine environment across Europe. It aims to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. The Directive enshrines in a legislative framework the ecosystem approach to the management of human activities having an impact on the marine environment, integrating the concepts of environmental protection and sustainable use.	The LFRMS isn't directly concerned with flooding from marine waters. However, flood management activities inland can have knock-on effects for marine water but in terms of ecology and pollution. The LFRMS should take holistic approach and consider wider effects.
EC Water Framework Directive (2000/60/EEC)	The WFD has the following key aim: • Expanding the scope of water protection to all waters, surface waters and groundwater; • Achieving "good status" for all waters by a set deadline; • Water management based on river basins; • "Combined approach" of emission limit values and quality standards; • Getting the prices right; • Getting the citizen involved more closely; and • Streamlining legislation. There are a number of objectives in respect of which the quality of water is protected. The key ones at European level are general protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water. Member States must aim to reach good chemical and ecological status in inland and coastal waters by 2015.	The LFRMS will aim to enhance rather than diminish the status of aquatic environments (e.g. Sustainable urban Drainage Systems – SuDS). Through its SEA, the LFRMS will consider potential effects arising from its implementation on surface waters and ground waters across Flintshire and will avoid/mitigate where appropriate. A separate WFD compliance assessment will not be carried out as part of the LFRMS. Instead this will be captured in the SEA with the assessment of the SEA objective for water quality and resources. This should ensure the objectives, requirements and targets of the WFD have been considered and complied within the LFRMS.
Freshwater Fish Directive (2006/44/EC)	The Freshwater Fish Directive is to be repealed in 2013 by the EC Water Framework Directive. The EC Freshwater Fish Directive (2006/44/EC) was originally adopted on 18 July 1978 but consolidated in 2006. The Directive seeks to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. For those waters it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters.	The LFRMS should ensure that flood risk management does not adversely affect fish habitats and stocks.
Groundwater Directive (2006/118/EC)	This new directive establishes a regime which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater. The directive establishes quality criteria that takes account local characteristics and allows for further improvements to be made based on monitoring data and new scientific knowledge. The directive thus represents a proportionate and scientifically sound response to the requirements of the Water Framework	One of the primary aims of the LFRMS is to reduce and manage flood risk from groundwater. This should contribute to improving

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	Directive (WFD) as it relates to assessments on chemical status of groundwater and the identification and reversal of significant and sustained upward trends in pollutant concentrations. Member States will have to establish the standards at the most appropriate level and take into account local or regional conditions. The groundwater directive complements the Water Framework Directive. It requires: • Groundwater quality standards to be established by the end of 2008; • Pollution trend studies to be carried out by using existing data and data which is mandatory by the Water Framework Directive (referred to as "baseline level" data obtained in 2007-2008); • Pollution trends to be reversed so that environmental objectives are achieved by 2015 by using the measures set out in the WFD; • Measures to prevent or limit inputs of pollutants into groundwater to be operational so that WFD environmental objectives can be achieved by 2015; • Reviews of technical provisions of the directive to be carried out in 2013 and every six years thereafter; and • Compliance with good chemical status criteria (based on EU standards of nitrates and pesticides and on threshold values established by Member States).	groundwater quality.
EC Directive on Bathing Water (76/160/EEC)	The overall objective of the Directive remains the protection of public health whilst bathing, but the revised Directive (into force 2006) also offers an opportunity to improve management practices at bathing waters and to standardise the information provided to bathers across Europe and aims to set more stringent water quality standards and also puts a stronger emphasis on beach management and public information.	The LFRMS isn't directly concerned with bathing waters. However, flood management activities inland can have knock-on effects for bathing water quality. The LFRMS should take holistic approach and consider wider effects.
EC Drinking Water Directive (98/83/EC)	The Drinking Water Directive sets out the following objectives: • Sets quality standards for drinking water quality at the tap (microbiological, chemical and organoleptic parameters) and the general obligation that drinking water must be wholesome and clean; • Obliges Member States to regular monitoring of drinking water quality and to provide to consumers adequate and up-to-date information on their drinking water quality; and • Member States may exempt water supplies serving less than 50 persons or providing less than 10 m3 of drinking water per day as an average and water in food-processing undertakings where the quality of water cannot affect the wholesomeness of the foodstuff in its finished form.	The LFRMS should take into account the requirements of the directive and help ensure flooding does not impact on drinking water supply or quality.
EU Directive 2007/60/EC on the Assessment and Management of Flood Risks	Its aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive requires Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.	The LFRMS will complement the aims and requirements of the directive. It will aim to reduce and manage flood risk in Flintshire.
Kyoto Protocol on Climate Change 1997	The protocol was ratified in 2004. The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. The Kyoto Protocol requires the EU to cut its greenhouse gas emissions to 8% below 1990 levels by 2008-2012.	The LFRMS will plan for potential future flooding impacts caused by climate change across Flintshire. It will contain policies for raising public awareness of flood risk.

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EU Strategy on Climate Change	This document sets out concrete steps to limit the effects of climate change and to reduce the risk of massive and irreversible disruptions to the planet. The EU and its Member States have confirmed their target to limit the global average temperature increase to 2° Celsius compared with pre-industrial levels, the point beyond which the impact of climatic change is believed to increase dramatically.	The LFRMS will plan for potential future flooding impacts caused by climate change across Flintshire. It will contain policies for raising public awareness of flood risk.
EU Air Quality Directive (2008/50/EC)	It establishes ambitious, cost-effective targets for improving human health and environmental quality up to 2020. The EU objective on air quality is *"to achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment."*	The LFRMS is unlikely to affect air quality. However, large scale defence works could have temporary effects. Therefore, the LFRMS should take the requirements of the directive into consideration.
The European Landscape Convention (2004)	Also known as the Florence Convention, - promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues.	Flintshire contains landscapes categories as outstanding. Through its SEA, the LFRMS will consider potential effects arising from its implementation on the character and special features of these areas.
Charter for the Protection and Management of Archaeological Heritage (1990)	The charter lays down principles relating to the different aspects of archaeological heritage management. These include the responsibilities of public authorities and legislators, principles relating to the professional performance of the processes of inventorisation, survey, excavation, documentation, research, maintenance, conservation, preservation, reconstruction, information, presentation, public access and use of the heritage, and the qualification of professionals involved in the protection of the archaeological heritage. The Charter states that policies for the protection of archaeological heritage should constitute an integral component of policies relating to land use, development, and planning as well as of cultural, environmental and educational policies.	Flintshire has rich heritage. The LFRMS should aim to help protect this heritage, both from flooding, and from defence works which affect the fabric or setting of an archaeological asset. Through its SEA, the LFRMS will consider potential effects arising from its implementation on archaeological assets and their setting.
UNESCO Convention concerning the Protection of the World Cultural and National Heritage 1972	The Convention defines the kind of natural or cultural sites which can be considered for inscription on the World Heritage List. The Convention sets out the duties of States Parties in identifying potential sites and their role in protecting and preserving them. By signing the Convention, each country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage. The States Parties are encouraged to integrate the protection of the cultural and natural heritage into regional planning programmes, set up staff and services at their sites, undertake scientific and technical conservation research and adopt measures which give this heritage a function in the day-to-day life of the community.	Flintshire has rich heritage. The LFRMS should aim to help protect this heritage, both from flooding, and from defence works which affect the fabric or setting of a heritage asset. Through its SEA, the LFRMS will consider potential effects arising from its implementation on heritage assets and their setting.
Convention for the Protection of Architectural Heritage	The aim of this Convention is to protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study. Sources are considered to be elements of the archaeological heritage all remains and objects and any other traces of mankind from past epochs, the preservation and study of which help to retrace	Flintshire has rich heritage. The LFRMS should aim to help protect this heritage, both from flooding, and

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of Europe (2009)	the history of mankind and its relation with the natural environment, for which excavations or discoveries and other methods of research into mankind and the related environment are the main sources of information, and which are located in any area within the jurisdiction of the Parties. The archaeological heritage shall include structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or under water.	from defence works which affect the fabric or setting of a heritage asset. Through its SEA, the LFRMS will consider potential effects arising from its implementation on heritage assets and their setting.
Mainstreaming Sustainable Development into EU Policies (2009) including Johannesburg Declaration on Sustainable Development (2002) and EU Sustainable Development Strategy (2006)	The Renewed EU Sustainable Development Strategy (2006) deals in an integrated way with economic, environmental and social issues and lists the following seven key challenges: 1. Climate change and clean energy; 2. Sustainable transport; 3. Sustainable consumption and production; 4. Conservation and management of natural resources; 5. Public health; 6. Social inclusion, demography and migration; 7. Global poverty.	The principles of sustainable development will be embedded into the LFRMS through consideration of SuDS, climate change, public health and biodiversity. The SEA will ensure that all aspects of sustainability (environmental, social and economic) are considered within the LFRMS.
NATIONAL (UK & WALES)		
Wales Spatial Plan 2008	The broad 20 year agenda and overall role, purpose and principles of the Wales Spatial Plan are: • Making sure that decisions are taken with regard to their impact beyond the immediate sectoral or administrative boundaries and that the core values of sustainable development govern everything we do; • Setting the context for local and community planning; • Influencing where money is spent by the Welsh Assembly Government through an understanding of the roles of and interactions between places; and • Providing a clear evidence base for the public, private and third sectors to develop policy and action. It is a principle of the Wales Spatial Plan that development should be sustainable. Sustainable development is about improving wellbeing and quality of life by integrating social, economic and environmental objectives in the context of more efficient use of natural resources.	The LFRMS will promote a more sustainable approach to managing flood risk, by describing how the implementation of SuDS will be managed across the local authority and providing a holistic approach to flood risk management.
Planning Policy Wales (Edition 4, February 2011)	This document contains current land use planning policy for Wales. It provides the policy framework for the effective preparation of local planning authorities' development plans. This is supplemented by 21 topic based Technical Advice Notes (TANs). Chapter 13.2 contains guidance on flood risk and climate change, Chapter 13.3 on development plans and flood risk, and chapter 13.4 on development control and flood risk. Planning Policy for Wales recognises that all development on land within the flood plain of a watercourse, or drained via a culvert, or on low lying land adjacent to tidal waters, is at some risk of flooding and whilst flood risk can be reduced by using mitigation measures it can never be completely eliminated. It also states that rapid flows due to failure of defences pose a greater risk to life than a steady rise in water level, and land protected by tidal defences is extremely vulnerable in the event of a breach due to the speed and depth of flooding. Flooding as a hazard therefore involves the consideration of the potential consequences of flooding, as well as the likelihood of an event occurring.	LFRMS will promote the planning principles in Planning Policy Wales where applicable - especially in relation to flood risk and development. LFRMS will encourage appropriate development in flood risk areas across Flintshire by ensuring that (a) planning decisions are properly informed of flood risk issues; and (b) future impact of planning on flood risk is considered across Flintshire.

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	Meeting the Assembly Government's objectives for sustainable development requires action through the planning system to move away from flood defence and the mitigation of the consequences of new development in areas of flood hazard towards a more positive avoidance of development in areas defined as being of flood hazard. Local planning authorities should take a strategic approach to flood risk and consider the catchment as a whole. Planning Policy Wales states that Local Authorities should bear in mind that the continued construction of hard engineered flood defences to protect development in defined areas of flood hazard is unlikely to be sustainable in the long term. A sustainable approach to flooding will therefore involve the avoidance of development in flood hazard areas and, where possible or practical, the encouragement of managed retreat, the creation of wash-lands and flood plain restoration.	Through its SEA, the LFRMS will also consider potential impacts arising from its implementation on human health, environment, cultural heritage, climate change, economic activity and accessibility and will avoid/mitigate where appropriate.
Rural Development Plan for Wales 2007-2013	The Rural Development Plan covers four areas of activity. These are: • Agriculture and forestry; • Environment and countryside; • Quality of life in rural areas; and • Locally based approaches to rural development. A key measure is to tackle overgrazing that can result in soil erosion, soil compaction and contributes to increased risk of flooding. One of the objectives is to: Reduce Wales' contribution to climate change by protecting and enhancing carbon sinks, managing flood risks and water resources, reducing consumption of non-renewable resources and encouraging use of renewable energy. Top tier scheme and separated targeted measures could include: the possibility of flood prevention through allowing the flooding of agricultural land where this would also be beneficial to particular species –for example curlew or lapwing.	The LFRMS will compliment the objective of the Rural Development Plan to manage flood risk. Through its SEA, the LFRMS will also consider potential impacts arising from its implementation on human health, environment, cultural heritage, climate change, economic activity and accessibility and will avoid/mitigate where appropriate
Minerals Planning Policy Wales	Minerals Planning Policy Wales sets out the land use planning policy guidance of the National Assembly for Wales in relation to mineral extraction and related development in Wales, which includes all minerals and substances in, on or under land extracted either by underground or surface working. The overriding objective is to provide a sustainable pattern of mineral extraction by adhering to 5 key principles: • Provide mineral resources to meet society's needs and to safeguard resources from sterilisation; • Protect areas of importance to natural or built heritage; • Limit the environmental impact of mineral extraction; • Achieve high standard restoration and beneficial after-use; and • Encourage efficient and appropriate use of minerals and the re-use and recycling of suitable materials.	The LFRMS should take the Minerals Planning Policy into consideration when developing flood management options.
Technical Advice Note 5 – Nature Conservation and Planning (2009)	This Technical Advice Note provides advice about how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. Key principles of positive planning for nature conservation include (amongst others): • Integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time; • Ensure that the UK's international and national obligations for site, species and habitat protection are fully met in all planning decisions; • Look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally; and • Help to ensure that development does not damage, or restrict access to, or the study of, geological sites and features or impede the evolution of natural processes and systems especially on rivers and the coast.	Flintshire contains many protected habitats and species. The LFRMS should comply with policies outlined in this TAN. The LFRMS should promote biodiversity where possible by including policies which promote natural flood defences which may benefit biodiversity, and protecting ecological areas from flooding.
Wildlife and Countryside Act 1981	The Act makes it an offence (subject to exceptions) to intentionally kill, injure, or take, possess, or trade in any wild animal listed in Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals	The LFRMS should promote biodiversity where possible by

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	occupying such places. The Act also prohibits certain methods of killing, injuring, or taking wild animals. The Act requires surveying authorities to maintain up to date definitive maps and statements, for the purpose of clarifying public rights of way.	including policies which promote natural flood defences which may benefit biodiversity, and protecting ecological areas from flooding.
The Conservation of Habitats and Species Regulations (2010) (amended 2011)	The Conservation of Habitats and Species Regulations 2010 apply in the terrestrial environment and in territorial waters out to 12 nautical miles. The EU Habitats and Wild Birds Directives are transposed in UK offshore waters by separate regulations. The new regulations do not make any substantive changes to existing policies and procedures other than the establishment of the Marine Management Organisation (MMO). The MMO takes on certain licensing functions from Natural England to ensure consistency with the approach in the Marine and Coastal Access Act 2009. The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Directive lays down rules for the protection, management and exploitation of such habitats and species.	Flintshire contains many protected habitats and species. The LFRMS should comply with the Regulations. The LFRMS should promote biodiversity where possible by including policies which promote natural flood defences which may benefit biodiversity, and protecting ecological areas from flooding.
Environment Strategy for Wales (2006) and State of the Environment (2011)	Environment Strategy for Wales is the Welsh Assembly Government's long term strategy for the environment of Wales, setting the strategic direction for the next 20 years. It is supported by a series of regularly updated action plans and a policy map setting out the key actions that will be taken to deliver the outcomes in the Strategy. The purpose of the Strategy is to provide the framework within which to achieve an environment which is clean, healthy, biologically diverse and valued by the people of Wales. By 2026, the aim is to see the distinctive Welsh environment thriving and contributing to the economic and social wellbeing and health of all of the people of Wales. The Strategy contains a chapter on flood and coastal erosion risk management. The Strategy recognises that flood and coastal erosion risk poses a significant threat to quality of life. It states that given the expected increase in flood risk due to climate change impacts, we recognise that we need to move away from our traditional flood defence approach and focus on managing the risks and consequences of flooding and coastal erosion. The State of the Environment report provides an annual summary of the latest information on the indicators monitoring progress against the Environment Strategy. Indicators being measured and their status in relation to flood risk include: • 31a: Annual cost of damage due to flooding – trend shows a clear improvement from 2005-2011; • 31b: Probability of flooding of assets at risk – baseline only began in 2010, no trends available; • 31c: Percentage of new development permitted in the floodplain – stable/no clear trend from 2003-2011; • 32a: Level of us of Floodline – baseline only began in 2011, no trends available; • 32b: Households registered for flood warnings as a percentage of total number of households at risk of flooding – trend shows a clear improvement from 2005-2011; and • 32c: Percentage of people aware of flood risk – stable/no clear trend from 2006-2011.	The LFRMS should promote biodiversity where possible by including policies which promote natural flood defences which may benefit biodiversity, and protecting ecological areas from flooding.
The Countryside and Rights of Way (CROW) Act 2000	The Act was introduced in 2000 with the intention to give greater freedom for people to explore open countryside and contains provisions to introduce a new statutory right of access for open-air recreation to mountain, moor, heath, down and registered common land. It also includes a power to extend the right to coastal land by order, and enables landowners voluntarily to dedicate irrevocably any land to public access.	The LFRMS should compliment the Act though reduce and managing flood risk which may affect access.
The Natural Environment and Communities Act 2006 (NERC Act)	The Natural Environment and Rural Communities Act is designed to help achieve a rich and diverse natural environment and thriving rural communities through modernised and simplified arrangements for delivering Government policy. It is about conserving and enhancing places and nature and helping people to enjoy them – taking a wider view, pursuing environmental management which encompasses access and recreation, and aiming where possible to achieve economic	The LFRMS will compliment the NERC Act by reducing and managing flood risk which could damage places and nature, and hinder access and

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	and social outcomes alongside conservation goals.	recreation.
The Register of Welsh Historic Landscapes (CCW 1995)	In partnership with Cadw and the International Council of Monuments and Sites (ICOMOS UK) CCW has compiled a Register of Landscapes of Historic Interest in Wales. The Register comes in two volumes and describes 58 landscapes in Wales that are of outstanding or special historic interest. Flintshire contains a few landscapes classified as outstanding including: lowland wetland; upland moorland.	Flintshire a few outstanding landscapes. The LFRMS should aim to protect these landscapes and their special character and features from flood damage and inappropriate defence works.
The Wales Transport Strategy (2008)	The Strategy states that transport accounts for around 14 per cent of greenhouse gas emissions in Wales. Of this, road transport is the greatest contributor, with more than 90 per cent of emissions. Overall, road traffic growth appears to be slowing down, but is expected to continue to grow for the foreseeable future. The Strategy's main focus is about ensuring access to areas, services, employments and goods through the transport network and also about ensuring an efficient, reliable and sustainable transport network	Ensuring access for residents and visitors to key services and goods, and ensuring the transport network is efficient and reliable are key priorities that could be hindered by flood risk. Flooding of key transport infrastructure can also result in lost revenue. Transport is a significant contributor to climate change and resulting increased flood risk. The LFRMS should consider policies to protect key transport infrastructure.
Climate Change Act 2008	In 2008 the UK Government passed the Climate Change Act. It was the first legislation in the world to create a legally binding framework to tackle climate change. The Act sets the legally binding target of an 80% cut in greenhouse gas emissions by 2050, and sets a carbon budgeting system that caps emissions over five year periods. It also provides UK governments with powers regarding preparing for climate change impacts. The two key aims of the Act are to: • Improve carbon management, helping the transition towards a low-carbon economy in the UK; and • Demonstrate UK leadership internationally, signalling commitment to taking our share of responsibility for reducing global emissions in the context of developing international negotiations.	Climate change effects can increase flood risk. The LFRMS should take into account future climate change projectors in its analysis of flood risk.
Climate Change Strategy for Wales (2010)	The Climate Change Strategy and associated Delivery Plans sets out Wales' commitments and the areas where action will be taken, and partnership working, to reduce greenhouse gas emissions and enable effective adaptation in Wales. The targets for Wales as outlined in the Strategy are: • Reduce greenhouse gas emissions by 3% per year from 2011 in areas of devolved competence, against a baseline of average emissions between 2006-10; • Achieve at least a 40% reduction in greenhouse gas emissions in Wales by 2020 against a 1990 baseline; • The 3% target will include all 'direct' greenhouse gas emissions in Wales except those from heavy industry and power generation, but including emissions from electricity use in Wales by end-user; and • We have set target ranges for sectoral emissions reduction.	Climate change effects can increase flood risk. The LFRMS should take into account future climate change projectors in its analysis of flood risk.
A Low Carbon Revolution – The Welsh Assembly Government Energy Policy Statement	Some of the main aims outlined in the strategy include: • A significant proportion of energy to be generated locally or domestically; • To promote the optimum use of offshore wind around the coast of Wales in order to deliver a further 15 kWh/d/p of capacity by 2015/16; • To capture at least 10% (8 kWh/d/p) of the potential tidal stream and wave energy off the Welsh coastline by	Climate change effects can increase flood risk. The LFRMS should take into account future climate change projectors in its analysis of flood risk.

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(2010)	2025; • To have 4.5 kWh/d/p of installed onshore wind generation capacity by 2015/2017; • To support small scale hydro and geothermal schemes where they are environmentally acceptable in order to generate at least 1 kWh/d/p; • To deliver by 2020 up to 6 kWh/d/p in Wales of electricity from biomass – 50% indigenous/50% imported – and a heat potential of 2-2.5 kWh/d/p in Wales; • That any new fossil fuel plants should be carbon capture ready with fully developed plans for carbon capture and storage; and that these plants maximise efficiency through use of waste heat and co-firing where appropriate; and • To maximise the short and long-term benefits for Wales' economy and society of the move to a low carbon energy system.	
Air Quality (Wales) Regulations 2000 and Air Quality (amendment) (Wales) Regulations 2002	The Air Quality (Wales) Regulations 2000 ("the 2000 Regulations") set the air quality objectives for Wales and prescribe the periods within which they must be achieved. The 2002 Regulations amend the 2000 Regulations. They introduce a second air quality objective for benzene and alter the air quality objective for carbon monoxide.	The LFRMS is unlikely to affect air quality. However, large scale defence works could have temporary effects. Therefore, the LFRMS should take the requirements of the Regulations into consideration.
Air Quality Standards (Wales) Regulations 2010	The 2010 Regulations brought into force the requirements of the European Directive 2008/50/EC on ambient air quality and cleaner air for Europe.	The LFRMS is unlikely to affect air quality. However, large scale defence works could have temporary effects. Therefore, the LFRMS should take the requirements of the Regulations into consideration.
Flood and Water Management Act (2010)	The Flood and Water Management Act 2010 requires flood and coastal erosion risk management authorities (Environment Agency, local authorities, internal drainage boards, sewerage companies and highways authorities (that did not previously have such a duty) to aim to contribute towards the achievement of sustainable development when exercising their flood and coastal erosion risk management functions. The Act also requires the Secretary of State to issue guidance on how those authorities are to discharge their duty, including guidance about the meaning of sustainable development.	Primary reason for LFRMS is to adhere to Flood and Water Management Act. To fulfil the local authority's role as a Lead Local Flood Authority the LFRMS will set out how FCC will implement their duties under the Act, whilst contributing towards the achievement of sustainable development.
Flood Risk Regulations 2009	The purpose of the Regulations is to transpose the EC Floods Directive (Directive 2007/60/EC on the assessment and management of flood risks) into UK law and to implement its provisions. In particular, it places duties on the Environment Agency and local authorities to prepare flood risk assessments, flood risk maps and flood risk management plans.	Provisions resulting from the Regulations such as PFRA, flood risk maps etc will be used as the basis for the LRMS.
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003	The Regulations transpose the EC WFD in UK law. They will help implement the WFD requirement in England and Wales. They aim to protect and enhance the quality of: • Surface freshwater (including lakes, streams and rivers); • Groundwaters; • Groundwater dependant ecosystems; • Estuaries; and	The LFRMS will aim to enhance rather than diminish the status of aquatic environments. Through its SEA, the LFRMS will consider potential effects arising from

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	• Coastal waters out to one mile from low-water.	its implementation on surface waters and ground waters across Flintshire and will avoid/mitigate where appropriate. A separate WFD compliance assessment will not be carried out as part of the LFRMS. Instead this will be captured in the SEA with the assessment of the SEA objective for water quality and resources. This should ensure the objectives, requirements and targets of the WFD have been considered and complied within the LFRMS.
Groundwater Protection: Policy and Practice (GP3)	Groundwater is important. It supplies about one third of mains drinking water in England and around three per cent in Wales. It also supports numerous private supplies. But pollution and demands for water puts the resource under pressure. GP3 describes how the EA manage and protect groundwater now and for the future. GP3 identifies that in most Welsh aquifers, recharge is thought to greatly exceed abstraction, but in some areas (such as the sandstone in the Vale of Clwyd) groundwater appears to be at or near its abstraction limit. The Environment Agency's core groundwater policy is: *"To protect and manage groundwater resources for present and future generations in ways that are appropriate for the risks that we identify*". Nine themes support this policy, with number four being: reducing flood risk. GP3 states that groundwater flooding is a significant but localised issue and in recent years, there has been considerable concern about the risk of flooding from groundwater. Groundwater flooding is a problem partly because it happens very infrequently. Memories or information about previous floods may have been lost. Developments may have taken place in areas susceptible to the break-out of new springs or the appearance of lakes fed by groundwater. These 'new' groundwater features can flood property and land for many weeks because of the large storage potential of groundwater. Rising groundwater can also inundate sewers. This can cause serious problems for sewage treatment works, overloading their flow capacity and polluting surface water. The EA use a series of guiding principles to ensure a consistent approach to the assessment and management of groundwater. These are: • To secure the proper use of water resources for all purposes, including environmental need; • To protect the environment by: o Identifying a minimum flow or groundwater level below which abstraction may be curtailed or flows augmented, o Protecting flow and water-level variability across the full range of seasonal regimes, o From low to high water flow/level conditions, o Protecting the critical aspects of the water environment including, where relevant, habitats that are dependent upon river flows or water levels' o Recognising that some watercourses or wetlands are more sensitive than others to the impact of flow or level changes' • To ensure no reduction in existing protected rights; • To protect the interests of other legitimate water users;	One of the primary aims of the LFRMS is to reduce and manage flood risk from groundwater. This should contribute to improving groundwater quality

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	• To take account of existing and future local requirements that are currently not considered. These could be protecting or changing flows from rivers into estuaries in order to provide protection for the estuarine environment; and • To take account of water quality considerations throughout the catchment in both surface waters and groundwater.	
Water for People and the Environment – Water Resources Strategy for England and Wales (2009)	The vision set out in the Strategy is - Enough water for people and the environment, "*Management and use of water that is environmentally, socially and economically sustainable, providing the right amount of water for people, agriculture, commerce and industry, and an improved water-related environment*." Key themes and aims of the strategy are: • Adapting to and mitigating climate change – The EA is able to manage water resources and protect the water environment in the face of climate change; • A better water environment – species and habitat that depend on water are restored, protected, improved and valued; • Sustainable planning and management of water resources – good water management contributes to sustainable development by supporting people and the economy in an improved environment; and • Water and the water environment are valued – people value water and enjoy their water environment and how it contributes to their quality of life.	The LFRMS will support the Strategy by helping to reduce and manage flood risk for communities and taking into account climate change effects.
Land Drainage Act 1991 and 1994	The Land Drainage Act 1991 requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded. The riparian owner must accept the natural flow from upstream but need not carry out work to cater for increased flows resulting from some types of works carried out upstream, for example a new housing development. If a riparian owner fails to carry out his responsibilities under the Land Drainage Act, or if anyone else causes a watercourse to become blocked or obstructed, the County and District Councils have powers of enforcement by serving a notice under the Act. If this is ignored, the Council concerned may carry out the necessary itself and then recharge the person responsible for the full cost incurred. The District Council normally implements these powers but the County Council will deal with problems that affect the highway. The person responsible may also be prosecuted for nuisance under the Public Health Act 1936. The 1994 Act amends the Land Drainage Act of 1991 in relation to the functions of internal drainage boards and local authorities.	The LFRMS will comply with the duties and powers resulting from this Act.
National Strategy for Flood and Coastal Erosion Risk Management in Wales (2011)	Prepared under the terms of the Flood and Water Management Act 2010 the National Strategy sets four overarching objectives for the management of flood and coastal erosion risk in Wales: • Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion; • Raising awareness of and engaging people in the response to flood and coastal erosion risk; • Providing an effective and sustained response to flood and coastal erosion events; and • Prioritising investment in the most at risk communities. The Strategy states that currently around 357,000 properties in Wales, or one in six properties, are at risk of flooding from rivers, the sea and surface water. There are however other sources of flood risk including: the failure of dams; the failure of defence structures; canal breaches; groundwater and other water sources; and sewer flooding.	This is the National Strategy that all LFRMS will be based on. The objectives in the national strategy should be reflected in the LFRMS.
Technical Advice Note 14 – Coastal Planning (1998)	Specific issues in relation to the coastal zone can that should be addressed include: • Proposals for Development; o The nature of the ground conditions and physical processes, and the potential need for remedial and defence works, o Likely effects on physical and biological processes along the coast,	Although the LFRMS will not directly cover coastal flood risk, it will take it into account when developing flood management policy.

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	o The potential effects on mineral, water and conservation resources, as well as high quality agricultural land, o Any potential visual; impact from both land sea, • Nature and Landscape Conservation; o The role of physical and biological processes in creating, maintaining and altering features of nature and landscape conservation value, o The effects of statutory and other nature and landscape conservation policies in the coastal zone, with may not always be contiguous with the low water mark, o The importance of the integrity and special features of Marine Nature Reserves, candidate marine SACs and coastal SACs, Special Protection Areas and Ramsar sites, • Recreation; o The primary role of physical processes in creating, maintaining and altering recreation resources such as beaches and sand dunes, o The effects of recreational facilities on the stability of coastal geomorphology, • On shore; o The risks to nay form of development associated with the physical processes and problem ground conditions, o The likely impact of any development on the geomorphological processes and features, and on the important features of the littoral and sub-littoral zones, o Off-shore, in the intertidal zone, and the maritime fringe, the sediment budget of the physical system, and o The sensitivity of the overall coastal environment to natural change or human influences.	Flood management activities inland can have knock-on effects for coastal flooding. There is also potential for in-combination effects from a combination of flood sources. The LFRMS should take holistic approach and consider wider effects
Technical Advice Note 15 – Development and Flood Risk (2004)	This TAN provides technical guidance which supplements the policy set out in Planning Policy Wales in relation to development and flooding. It advises on development and flood risk as this relates to sustainability principles, and provides a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed. The general approach of PPW, supported by the TAN, is to advise caution in respect of new development in areas at high risk of flooding by setting out a precautionary framework to guide planning decisions.	The LFRMS should support the principles set out in the TAN by helping to reduce and manage flood risk.
Welsh Coastal Tourism Strategy (Draft Final Report 2007)	The purpose of the Coastal Tourism Strategy is to identify a clear way forward for the development of Coastal Tourism, which realises and builds on the economic potential of the coastline of Wales whilst respecting its environmental quality and recognising the importance of achieving community benefits. Strategic aims: • To encourage economic, social and environmental benefits for coastal communities; • To improve the quality of the visitor experience; • To achieve an integrated approach to the development and management if coastal tourism; and • Coastal tourism is a year round industry.	Tourism is extremely important to Flintshire's economy. Incidents of flooding can affect tourism. The LFRMS will compliment the Tourism Action Plan by helping to reduce and manage flood risk.
Economic Renewal: A New Direction (2010) and Implementation Update (2011)	The vision for economic renewal is of a Welsh economy built upon the strengths and skills of its people and natural environment; recognised at home and abroad as confident, creative and ambitious; a great place to live and work. There are five priorities: 1. Investing in high quality and sustainable infrastructure; 2. Making Wales a more attractive place to do business; 3. Broadening and deepening the skills base; 4. Encouraging innovation; 5. Targeting the business support we offer.	Flooding can affect the economy in many ways. The LFRMS will support the economic renewal plan by reducing and managing flood risk which may cause economic implications.
Wales Fisheries	The Wales Fisheries Strategy is the Welsh Assembly Government's long term strategy for the management and	Flooding and flood defences can

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Strategy (2008)	development of fisheries in Wales across all sectors of aquaculture, commercial fisheries, and recreational fisheries for 2020. The vision of the Wales Fisheries Strategy is to: *'Support the development of viable and sustainable fisheries in Wales as an integral part of coherent policies for safeguarding the environment'* In achieving this vision a number of goals have been identified applicable to all fisheries sectors to be achieved by 2020, as indicators of the success of the Strategy: • **Environment** – fisheries developed and managed in a sustainable way contributing positively to environmental policies of Wales; • **Healthy fish stocks** – development and management of fisheries at sustainable levels as a part of healthy and productive ecosystems; • **Positive community role** – recognition of fisheries as a positive contribution to the communities of Wales; • **Economic contribution** – maximising the economic importance and contribution of fisheries to the development of the 'Wales' brand on a Wales/UK/EU/International level; and • **Partnership working** – to further the partnership working already established between policy makers, stakeholders, and delivery agents for fisheries and establish this joint role as custodians for the future. The Strategy recognises the impacts that flooding can have on the well-being and habitats of fisheries.	effects harbours and marinas, impacting on commercial and recreational fishing. Certain defences may also affect the habitat and population of fish species. In developing flood management policy, the LFRMS should have regard to potential effects on fish species and populations.
Salmon and Freshwater Fisheries Act 1975	Both recreational and commercial fishermen must follow this law in catching salmon and other freshwater fish. The act encompasses fishing regulation, as well as illegal obstruction of migratory pathways and prohibited modes of destroying fish. The act allows the salmon to maintain an environmentally stable population and support the fishing industry.	In developing flood management policy, the LFRMS should have regard to potential effects on fish species and populations.
National Eel Management Strategy	The eel fishery is the most valuable commercial inland fishery in England and Wales, providing significant benefits to the rural economy. Eels have been exploited for thousands of years, initially through subsistence fisheries, and now by commercial fisheries supplying a wider market. They are used at all life stages, from glass eel and elver to yellow and silver eel. The fisheries are seasonal and most participants supplement their income from other sources. Catch returns are unreliable and better information is obtained from export records. Elver catches in England and Wales are believed to be about ten tonnes and those of yellow and silver eels to be a few hundred tonnes. Glass eel and elver fishing in England and Wales occurs in tidal reaches. Fishing effort varies according to market-led demand, and the number of dip net licences issued varied between about 1,000 during the 1980s, reaching a peak of 2,500 in 1998 and dropping to 1,900 in 1999. Sales in 2000 onwards indicate that this downward trend is continuing. Catches of glass eel in the UK, or at least the quantities exported from England and Wales, have remained relatively stable. Prices can fluctuate widely, with annual average values exhibiting a three- to four-fold difference during the 1990s. Licenses to fish for eels are issued on demand and, although some controls on the use and type of instruments are available through byelaws, there is no power to restrict the number of fishing units. In England and Wales, legislation and regulations are inadequate to give proper protection to stock and fishery. The eel has never attracted the recreational interest enjoyed by salmonids or coarse fish, although large eels are valued by specimen angling interests. As a consequence, there is limited awareness and understanding of the eel, despite the fact that the elver fishery is probably the most valuable commercial freshwater fishery in England and Wales.	Flood management may have effects upon eel habitats and populations. In developing flood management policy, the LFRMS should have regard to potential effects on eel species and populations.
Sea Trout and Salmon Fisheries Strategy 2008 – 2012	The Strategy sets outs key results for achievement by 2021. These are: • Self-sustaining sea trout and salmon in abundance in more rivers; • Economic and social benefits optimised for sea trout and salmon fisheries; and	In developing flood management policy, the LFRMS should have regard to potential effects on fish

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	• Widespread and positive partnerships, producing benefits. To achieve these results the Strategy sets out 16 specific aims. Aim 1 is to improve environmental conditions and increase the availability of good habitat. A set of measures and targets are also presented in the Strategy. One of the targets is: 76% of rivers outside the 'at risk' category for 2013.	species and populations.
National Trout and Grayling Fisheries Strategy (2003)	The strategy is founded on the Agency's duty to maintain, improve and develop fisheries within the overall aim of contributing to sustainable development. The aim of the strategy is to conserve and improve wild stocks of trout, sea trout, char and grayling, while enhancing the environment for all types of fisheries for these species in England and Wales. It also aims to enhance the social and economic benefits derived from these fisheries. Policies are included to help ensure the conservation of wild stocks of trout and grayling. These relate to three main areas: • Exploitation; • Stocking; and • Habitat. Policy 22: We will work with others to monitor, protect and improve the physical, chemical and biological quality of trout, char and grayling habitat, including work with Government to ensure that impacts on fisheries are fully considered in the development of new policies and grant schemes relating to land use. Policy 24: Obstructions - For any new structures, where the Agency's consent is required, these must be designed to enable fish migration. Policy 26: We will work with others to monitor, protect and improve the appearance of fisheries, consistent with our duties in relation to flood defence, conservation, recreation and other functions.	In developing flood management policy, the LFRMS should have regard to potential effects on fish species and populations.
Merchant Shipping Act 1995	The Act establishes requirements and procedures of merchant shipping. The Merchant Shipping (Pollution) Act 2006 amended section 178(1) of the Act. It restricts claims to being enforced within three years of the damage occurring.	The LFRMS should have regards for the provision of the Act.
Waste Strategy 2009 – 2050: Towards Zero Waste	The aim of the Strategy is to move towards a 'zero waste' approach. Two key milestones are proposed: • By 2025: A high recycling society of a least 70% recycling across all sectors, and diverting waste from landfill sites; and • By 2050: Zero waste, so products and services are designed with waste prevention in mind. This will help the economy and create jobs.	Flooding of waste facilities has the potential to cause pollution and human health issues. Through the SEA, the LFRMS will consider potential effects arising from its implementation on human health from pollution issues.
The UK's shared framework for sustainable development (2005)	As a result of the consultation, the priority areas for immediate action, shared across the UK are: • **Sustainable Consumption and Production** – Sustainable consumption and production is about achieving more with less. This means not only looking at how goods and services are produced, but also the impacts of products and materials across their whole lifecycle and building on people's awareness of social and environmental concerns. This includes reducing the inefficient use of resources, which is a drag on the economy, so helping boost business competitiveness and to break the link between economic growth and environmental degradation; • **Climate Change and Energy** –The effects of a changing climate can already be seen. Temperatures and sea levels are rising, ice and snow cover are declining, and the consequences could be catastrophic for the natural world and society. Scientific evidence points to the release of greenhouse gases – such as carbon dioxide and methane – into the atmosphere by human activity as the primary cause of climatic change. We will seek to secure a profound change in the way we generate and use energy, and in other activities that release these gases. We must set a good example and will encourage others to follow it; • **Natural Resource Protection and Environmental Enhancement** – Natural resources are vital to our existence	The principles of sustainable development will be embedded into the LFRMS through consideration of SuDS, climate change, public health and biodiversity. The SEA will ensure that all aspects of sustainability (environmental, social and economic) are considered within the LFRMS.

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	and that of communities throughout the world. We need a better understanding of environmental limits, environmental enhancement and recovery where the environment is most degraded to ensure a decent environment for everyone, and a more integrated policy framework; and • **Sustainable Communities** – Our aim is to create sustainable communities that embody the principles of sustainable development at the local level. This will involve working to give communities more power and say in the decisions that affect them; and working in partnership at the right level to get things done. The UK uses the same principles of engagement, partnership, and programmes of aid in order to tackle poverty and environmental degradation and to ensure good governance in overseas communities.	
The Sustainable Development Scheme of the Welsh Assembly Government – One Wales: One Planet (2009)	The Scheme is set out into five key themes, each with a vision and headline indicator: • **Sustainable Resource Use** – Within the lifetime of a generation we want to see Wales using only it fair share of the earth's resources. Headline indicators: Wales' Ecological Footprint; • **Sustaining the Environment** – Wales has health, functioning ecosystems that are biologically diverse and productive and managed sustainably. Headline indicator: % of Biodiversity Action Plan habitats and species recorded as stable or increasing; • **A Sustainable Economy** – A resilient and sustainable economy for Wales that is able to develop whilst establishing, then reducing, its use of natural resources and reducing its contribution to climate change. Headline indicator: Gross Value Added (GVA) and GVA per head; • **A Sustainable Society** – Safe, sustainable, attractive communities in which people live and work, have access to services, and enjoy good health and can play their full roles as citizens. Headline indicator: % of the population in low income households; and • **The Wellbeing of Wales** – A fair, just and bilingual Wales, in which citizens of all ages and backgrounds are empowered to determine their own lives, shape their communities and achieve their full potential. Headline indicator: Wellbeing Wales. In order to achieve these visions some of the targets set out include: • Reduce by 80-90% use of carbon-based energy, resulting in a similar reduction in greenhouse gas emissions; • All new buildings to be zero carbon buildings; • Produce as much electricity from renewable sources by 2025 as we consume; • Moving towards becoming a zero waste nation; • Achieving 70% recycling across all sectors and diverting waste from landfill by 2025; • Organise the way we live and work so we can travel less by car wherever possible; and • Source more of our food locally and in season.	The principles of sustainable development will be embedded into the LFRMS through consideration of SuDS, climate change, public health and biodiversity. The SEA will ensure that all aspects of sustainability (environmental, social and economic) are considered within the LFRMS.
TAN 6: Planning for Sustainable Rural Communities (2010)	The TAN provides guidance on how the planning system can contribute to: • **Sustainable rural economies** - the TAN states that the diversification of the rural economy should be supported both traditional rural industries and new enterprises. There should be identification of a range of suitable sites for future employment use and where possible these should be located within or adjacent to settlements • Sustainable rural housing – the TAN states that should be sufficient land to meet market and affordable housing needs across the authority's area. In rural areas where there constraints consideration should be given to prioritising affordable housing, especially in smaller villages; • **Sustainable rural services** – the TAN states that to ensure communities are sustainable in the long term rural residents need to have reasonable access to essential local services. Development should consider the availability of services. A positive approach should be adopted for proposals designed to improve the viability, accessibility or community value of existing services and facilities; and • **Sustainable agriculture** – The TAN states that the Welsh Assembly Government's objective is a sustainable and	Flooding of agricultural land can have significant implications for the livelihoods of rural residents. The LFRMS should support the TAN by helping reduce and manage flood risk. Through its SEA, the LFRMS will consider potential effects arising from its implementation on human health, environment, cultural heritage and economic activity and will

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	profitable future for farming families and businesses through the production and processing of farm products while safeguarding the environment, animal health and welfare, adapting to climate change and mitigating its impacts, while contributing to the vitality and prosperity of our rural communities. Development should consider the quality of agricultural land, the best and most versatile land falls into grades 1, 2 and 3a.	avoid/mitigate where appropriate.
TAN 13: Tourism (1997)	The Wales Tourist Board has responsibility for promoting and developing tourism in Wales. It makes a major contribution to the Welsh economy, provides employment in a wide variety of occupations and can bring benefits to local economies and communities in urban and rural areas. The TAN recognises that the demand for holiday and touring caravan sites has concentrated on the most popular holiday areas, particularly the coast, although there is increasing demand inland. The TAN states that as a rule sites should not be allowed immediately by the sea but should be set back a short distance inland.	Tourism is extremely important to Flintshire's economy. Incidents of flooding can affect tourism. The LFRMS will compliment the Tourism TAN by helping to reduce and manage flood risk.
TAN 18: Transport (2007)	TAN 18 recognises the link between land use planning and the transport network. It also recognises that transport contributes significantly to climate change, and encourages reducing the need to travel and providing greater choice of means of transport other than the private car. The TAN also states that relative accessibility should be maximised rather than ensuring everyone can travel everywhere.	Ensuring access for residents and visitors to key services and goods, and ensuring the transport network is efficient and reliable are key priorities that could be hindered by flood risk. Flooding of key transport infrastructure can also result in lost revenue. Transport is a significant contributor to climate change and resulting increased flood risk. The LFRMS should consider policies to protect key transport infrastructure
TAN 21: Waste (2001)	TAN 21 is intended to facilitate the introduction of a comprehensive, integrated and sustainable land use planning framework for waste management in Wales. It sets out principles for sustainable waste management: • Proximity principle and self-sufficiency; and • Waste hierarchy of reduction, re-use, recovery (composting & recycling), recovery (energy from waste), disposal.	Flooding of waste facilities has the potential to cause pollution and human health issues. Through the SEA, the LFRMS will consider potential effects arising from its implementation on human health from pollution issues.
National Parks and Access to the Countryside Act 1949	The Act provided the framework for the creation of National Parks and Areas of Outstanding Natural Beauty in England and Wales, and also addressed public rights of way and access to open land.	Through its SEA, the LFRMS will consider potential effects arising from its implementation on the character and special features of landscape areas.
Environment Agency Sustainable Drainage Systems	The document recognises that many existing drainage systems are damaging the environment and are not sustainable in the long term. Techniques to reduce these effects have been developed and are collectively referred to as Sustainable Drainage Systems. The document states that natural drainage patterns are disrupted as land is developed. In most cases, the amount of impermeable cover will increase as a result of development. Traditional drainage systems are designed to remove rainfall from these impervious surfaces as quickly as possible. This causes higher flow rates for shorter periods and	The LFRMS should support the EA document. Measures to reduce and manage flood risk may include policies on implementation of SuDS.

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	can result in flooding further downstream. Balancing ponds, underground storage tanks or similar measures are often required to compensate for this. SUDS offer a combination of benefits that conventional drainage systems do not provide, for instance, in relation to flood risk, SUDS may protect people and property from flooding, now and in the future. Examples of SUDS include: green roofs, permeable pavements, rainwater harvesting, infiltration trenches, infiltration basins, filter drains, swales, filter strips, detention basins, retention ponds, wetlands etc.	
Contaminated Land (Wales) Regulations 2006 and amended 2012	The regulations sets out provisions relating to the identification and remediation of contaminated land, identifies sites requiring regulation as 'special sites' and adds land contaminated by radioactive substances to this classification.	Through its SEA, the LFRMS will consider potential effects arising from its implementation on human health, and ecological harm from pollution issues.
Environmental Protection Act 1990	The Environmental Protection Act 1990 establishes in England, Scotland and Wales businesses' legal responsibilities for the duty of care for waste, contaminated land and statutory nuisance. It introduced important new controls aimed at limiting and preventing pollution from a wide range of industries in the UK.	Through its SEA, the LFRMS will consider potential effects arising from its implementation on human health, and ecological harm from pollution issues.
Woodlands for Wales – Welsh Government strategy for Welsh woodlands and trees (2009)	The Welsh Government Woodlands for Wales strategy sets out a 50 year plan for developing and using Welsh woodlands and trees to bring maximum benefit to the people of Wales. Woodlands for Wales outlines: • How we could increase the woodland cover in Welsh towns and cities; and, • How we could make our woodlands much more diverse by planting a wider range of tree species that are more resilient to the changing climate. The Woodlands for Wales strategy has four key themes. These are: **Responding to climate change** - The effects of climate change can be eased by woodlands and trees. The strategy sets out ambitious plans to help Wales reduce its greenhouse gas emissions. **Woodlands for people** - Wales' woodlands provide a wide range of opportunities for people from all walks of life to enjoy their woodlands as places of recreation and learning out of doors. Woodlands are excellent places to become more active and healthier. They can be ideal locations to develop community projects. **A competitive and integrated forest sector** - The strategy sets out how we can develop innovative and skilled industries and maintain levels of timber production in line with the Welsh Governments efforts to promote and increase demand for this renewable resource. **Environmental quality** - The development of our woodlands and trees will also help us to make a positive contribution to biodiversity, landscapes and heritage. It will assist us in reducing other environmental pressures. The Woodlands for Wales Action Plan was published in March 2010. It sets out what needs to happen over the next five years to make progress towards achieving the outcomes of Woodlands for Wales.	Through its SEA, the LFRMS will consider the potential effects of additional planting of woodlands and how this could be incorporated into future designs.
A Living Wales – A new framework for our environment, our countryside and our seas (2010)	The principles of the new framework are: • To secure sustainable and integrated management of land and water by making the long-term health of ecosystems and the services they provide central to decision making; and, by doing this; and • To make optimum use of our finite land and water resources and ensure Wales' natural and cultural capital assets are maintained and enhanced.	The principles of sustainable development will be embedded into the LFRMS through consideration of SuDS, climate change, public health and biodiversity.

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	In order for this to be turned into action on the ground, it will need to be expressed in national, regional and local priorities and tools. We following next key steps have been identified: • Developing a stronger evidence base for our ecosystems so that we have a better basis for decisions that fully reflect risks, opportunities and limits. • Ensuring that our dependence on the natural environment and the value of ecosystems, and their services, are fully reflected in the decisions that we make as government and society. • Updating our regulatory and management approaches to deliver the new approach. • Redesigning our partnership mechanisms around the new approach. • Refreshing our institutional arrangements for regulating the environment and delivering improvements to ensure that they support an integrated, sustainable approach.	The SEA will ensure that all aspects of sustainability (environmental, social and economic) are considered within the LFRMS.
Civil Contingencies Act (2004)	The Civil Contingencies Act 2004 establishes a coherent framework for emergency planning and response ranging from local to national level. The Act repeals the Civil Defence Act 1948 and the Civil Defence Act (Northern Ireland) 1950. Part 1 of the Act creates a new concept of an "emergency". This term is broadly defined. It includes events which would have engaged the existing civil defence legislation (war or attack by a foreign power). It also includes terrorism which poses a threat of serious damage to the security of the United Kingdom and events which threaten serious damage to human welfare in a place in the United Kingdom or to the environment of a place in the United Kingdom (this can include major flooding events). The Act imposes a series of duties on local bodies in England and Wales, Scotland and Northern Ireland (to be known as "Category 1 responders"). These duties include the duty to assess the risk of an emergency occurring and to maintain plans for the purposes of responding to an emergency. The Act repeals the Emergency Powers Act 1920 and the Emergency Powers Act (Northern Ireland) 1926. It confers a power on Her Majesty (or in certain very limited circumstances, a senior Minister of the Crown) to make regulations if an "emergency" has occurred or is about to occur.	The SEA will ensure that there is a holistic and integrated approach to responses to emergency planning which will be embedded into the LFRMS.
REGIONAL		
North Wales Regional Planning Guidance 2002	Key guidance set out includes: • Policies and proposals in Unitary Development Plans should aim to enhance the economic prospects of the coastal area whilst protecting and enhancing its biodiversity, natural character and quality of the landscape and built environment. In this way the true value of the coast to the people who live, work and enjoy it can be realised; and • As a guiding principle only development which requires a coastal location should be so located. Development on the coast should be considered in the context of the capacity of the coast and maritime waters to absorb change and any risks which may arise from erosion, flooding or pollution. The document also provides high level guidance on increasing tourism and associated facilities, employment and retail sites and facilities and housing sites.	The LFRMS will promote a more sustainable and holistic approach to managing flood risk. Through its SEA, the LFRMS will consider potential effects arising from its implementation on human health, environment, cultural heritage and economic activity and will avoid/mitigate where appropriate.
West Cheshire/North East Wales Sub-Regional Spatial Strategy 2006 - 2021	The West Cheshire \ North East Wales Sub Regional Spatial Strategy provides a non-statutory framework for greater cross-border co-operation and development between North East Wales and West Cheshire over the next 15 years. The Sub-Regional Spatial Strategy supports the sustainable growth of the four strategic centres. Of these one, the Deeside conurbation, is within Flintshire. Supporting strategic centres means that the focus for new investment and development within the sub-region would, in the short-term at least, be on this area. A second strand of the Sub-Regional Spatial	Flood management described in the LFRMS should support the policies outlined in the Sub-Regional Spatial Strategy. The LFRMS will encourage

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	Strategy is for a focus on the Regeneration Areas identified within the sub-region. Within Flintshire these include Flint, Holywell, Mold, Shotton, Mostyn, Ffynnongroyw and Gronant. **Deeside** • Promotion of strategic sites within the Deeside area, such as the Northern Gateway - which will accommodate a wide range of land uses to promote sustainable development including housing, employment land (predominantly for B8 uses, supported by B1 and B2 uses) community, education health and leisure facilities; • Reinforcement of the role of Deeside as a key location for manufacturing industry and related service activities; • Review of environmental implications of future development in this area, notably in connection with flood-risk and implications for international environmental designations; and • Enhancement of transport links between Deeside and other strategic settlements and centres within and close to the sub-region, including Wrexham via the Wrexham-Bidston line, Chester and the Flintshire coastal towns and westwards to the coastal settlements of Denbighshire. **Flintshire Coastal Towns** • Consideration of potential of the coastal towns for accommodating future housing development; • Reinforcement of the sub-regional role of Mostyn Docks, although any further expansion of the Docks area should recognise the environmental constraints of its surrounds and be subject to environmental appraisal to avoid significant adverse impacts being incurred upon the Dee Estuary Special Protection Area, Ramsar site and possible Special Area of Conservation; • Identification of strategic sites along the North Wales coastal corridor for the location of employment and mixed-use development; and • Enhancement of principal links between the coastal towns and strategic settlements, including public transport accessibility.	appropriate development across Flintshire. It will inform planning decisions about potential flood risk issues as such ensure that spatial planning supports flood risk management policies and plans. The LFRMS will promote a more sustainable and holistic approach to managing flood risk. Through its SEA, the LFRMS will consider potential effects arising from its implementation on human health, environment, cultural heritage and economic activity and will avoid/mitigate where appropriate.
North Wales Tourism Strategy 2010 - 2015	The Strategy states that tourism is vitally important to the North Wales economy. Tourism generates £1.8bn for the North Wales economy each year, supports an estimated 37,500 jobs and is a lifeline for numerous small businesses. There is potential for further growth. This strategy sets out how North Wales can achieve its potential and is a blueprint to guide action over the next five years. The strategic objectives and key priorities outlined in the Strategy are as follows. **1. Projecting our distinctive strengths** - Key priorities are becoming more market driven, creating a stronger impact and providing inspiring information. **2. Investing in product excellence** - Key priorities are providing quality accommodation, diverse attractions and excellent activities. **3. Providing an outstanding experience** - Key priorities are creating well-managed places, enriching experiences, efficient transport and skilled people **4. Working together in partnership** - Key priorities are getting better recognition for tourism, establishing effective organisation and relying on sound evidence	Tourism is extremely important to Flintshire's economy. Incidents of flooding can affect tourism. The LFRMS will compliment the Tourism Strategy by helping to reduce and manage flood risk.
North Wales Regional Waste Plan First Review 2003- 2013	Using 1995 as a base year the statutory targets set by the EU Landfill Directive include: • By 2012 no more than 50% of the biodegradable municipal waste BMW generated can be landfilled; and • By 2020 no more than 35% of the BMW generated can be landfilled. The Plan shows the future capacity requirements for waste facilities. In Flintshire these are: • Material recovery facility for primary source segregation = 95,771 m^3; • Open windrow composting plant = 13,286 m^3;	Flooding of waste facilities has the potential to cause pollution and human health issues. Through the SEA, the LFRMS will consider potential effects arising from

<table>
<tr><th>Plan Title</th><th>Plan Description and Key Relevant Objectives/Targets</th><th>Implications of the LFRMS SEA</th></tr>
<tr><td></td><td>

Municipal solid waste composting plant = 26,572 m^3;
In-vessel composting plant = 26,572 m^3;
Mechanical biological treatment plant = 109,217 m^3;
Energy from waste plant = 42,044 m^3;
Facility for processing or re-use of inert waste = 343,647 m^3;
Landfill = 112,266 m^3;
Materials recovery facility for non-inert waste = 6,913 m^3;
Energy from waste plant for non-inert waste = 2,304 m^3;
Anaerobic digestion plant = 2,304 m^3;
Civic amenity site = 6,000 m^3;
Other transfer facilities = 26,000 m^3;
TOTAL = 812,896 m^3.

</td><td>its implementation on human health from pollution issues.</td></tr>
<tr><td>North Wales Regional Transport Plan (2009)</td><td>The RTS had found that car ownership is higher in North Wales than in Wales as a whole.
Key schemes described in the RTS that may affect the Flintshire include:

The Dee Coastal Path in Flintshire will provide a direct commuter and leisure route linking residential communities, major employers and places of interest along the Dee corridor, such as those in Talacre, Mostyn, Flint, Holywell, Broughton, Deeside;
The provision of a high quality bus network within North East Wales to encourage greater use of the bus network within the area and reduce dependence on the private car; and
Hubs Concept (across North Wales): Hubs at existing settlements will be developed to include facilities for park and ride, park and share, car hire including car clubs and real time transport information. Issues considered will include transport emissions, congestion and ticketing.

</td><td>Ensuring access for residents and visitors to key services and goods, and ensuring the transport network is efficient and reliable are key priorities that could be hindered by flood risk. Flooding of key transport infrastructure can also result in lost revenue.

Transport is a significant contributor to climate change and resulting increased flood risk.

The LFRMS should consider policies to protect key transport infrastructure</td></tr>
<tr><td>Shoreline Management Plan 22: Great Ormes Head to Scotland (North West England & North West Wales)</td><td>The north-west coast in SMP 22, also known as Cell 11 is sub-divided in areas. The Flintshire coastline lies within sub-cell 11a Great Orme's Head to Southport Pier (including the Clwyd, Dee and Mersey Estuaries). The sub-cell is further divided into policy locations. Those within Flintshire are as follows:
11a.4 – Clwyd Estuary and Point of Ayr
<table>
<tr><th colspan="2" rowspan="2">Location (Policy Unit)</th><th colspan="3">Policy and Approach (from 2010)</th></tr>
<tr><th>0 – 20 years</th><th>20 – 50 years</th><th>50 – 100 years</th></tr>
<tr><td>4.4</td><td>Barkby Beach to Point of Ayr</td><td>Managed Realignment Through managing the dunes and beach. This will maintain the natural defence that the dunes provide and allow the dunes and the Point of Ayr to evolve naturally. Continue to manage access through the dunes to limit erosion. Beach recharge may be required.</td><td>Managed Realignment Through managing the dunes and beach. This will maintain the natural defence that the dunes provide and allow the dunes to roll back and the Point of Ayr to evolve naturally. Continue to manage access through the dunes to limit erosion. Beach recharge</td><td>Managed Realignment Through managing the dunes and beach. This will maintain the natural defence that the dunes provide and allow the dunes to roll back and the Point of Ayr to evolve naturally. Continue to manage access through the dunes to limit erosion Beach recharge may be required</td></tr>
</table>
</td><td>Although the LFRMS will not directly cover coastal flood risk it will take into account currently management policies set out in the SMP</td></tr>
</table>

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA

		Investigate viability of a secondary line of defence set back from the dunes.	may be required. Depending on investigations, construct a secondary line of defence to manage risks from breaches in the dunes.	to the maintain beaches and sediment supply to the Point of Ayr. Maintain the secondary defences.

11a.5 – Dee Estuary

Location (Policy Unit)		Policy and Approach (from 2010)		
		0 – 20 years	**20 – 50 years**	**50 – 100 years**
5.1	Point of Ayr to Mostyn, south of Mostyn Dock	Hold the Line Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line Manage flood risk by maintaining existing defences to an adequate standard.	Hold the Line Manage flood risk by maintaining existing defences to an adequate standard.
5.2	Mostyn to Flint Marsh	Hold the Line Manage flood risk by maintaining existing defences to an adequate standard. Undertake studies to investigate Managed Realignment opportunities in the medium term for habitat creation. Carry out Managed Realignment earlier (i.e. in this epoch) where practicable.	Managed Realignment By constructing set-back embankment or retreating to higher land where practicable, depending on the outcome of further studies.	Managed Realignment By constructing set-back embankment or retreating to higher land where practicable, dependant on the outcome of further studies.
5.3	Flint Marsh to Chester Weir to Sealand Rifle Range (Inner Dee estuary, both banks)	Hold the Line Manage flood risk by maintaining existing defences to an adequate standard. Undertake studies to investigate Managed Realignment opportunities in the medium term for flood storage and possible BAP habitat creation.	Hold the Line Manage flood risk by maintaining existing defences to an adequate standard. Possible localised Managed Realignment for flood storage or habitat creation- by constructing secondary set-back embankment, depending on outcome of further studies.	Hold the Line Manage flood risk by maintaining existing defences to an adequate standard. Possible localised Managed Realignment for flood storage- by constructing secondary set-back embankment, depending on outcome of further studies.
5.4	Sealand Rifle Range to Burton Point	Hold the Line To manage flood risk by maintaining existing defences to an adequate standard. Investigate opportunities to set back defences for habitat creation and implement earlier (i.e. in this epoch) where	Managed Realignment By constructing set-back embankment or phased retreat to higher land, depending on outcome of further studies	Managed Realignment By constructing set-back embankment or phased retreat to higher land, depending on outcome of further studies.

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
	practicable.	
Conwy and Clwyd Catchment Flood Management Plan (2010)	**Clwyd Catchment and Upland Areas** This large area covers the main upland rural section of the Clwyd Catchment. Flooding mainly occurs from rivers and surface run-off. There are few flood defences. Historically areas have been drained using 'grips', shallow ditches cut into upland blanket bog. Approximately 300 properties are currently at risk from a 1% AEP flood event, rising to around 330 in the future. The flood risk is generally dispersed across the large catchment area with a number of local concentrations of risk. Some campsites and other temporary residences are at risk of flooding. Flood risk management activity is currently disproportionately high relative to the broad level of risk. The vision and preferred policy for the area is Policy Option 2 – areas of low to moderate flood risk where we can generally reduce existing flood risk management actions. Our vision is to reduce the overall level of flood risk management activity over time. We will follow a risk based approach to rationalise our current activities and target our actions and limited resources to locations of greatest risk. It may not be justifiable to continue to maintain our defences, to replace them or to increase their height in the future. Our vision also includes: • Increased emphasis on actions to manage the consequences of flooding; and • Increased community and individual awareness of their flood risks and adoption of actions both can take to help themselves. Actions to implement the policy include: • Work with our partners to determine how the policy of reducing actions is most appropriately communicated and implemented; • Work with partners to investigate the flood risk in Llanfair Talhaiarn. If appropriate, encourage and support our partners to produce a plan to manage the current and future risks; • Seek opportunities to store water or manage run-off to provide flood risk and environmental benefits, e.g. in the upper catchments; • Engage and advise the local communities to encourage people at risk to take action to help themselves; and • Investigate opportunities to improve the flood warning to local communities, campsites and temporary residences.	The LFRMS will contribute to the understanding of the scale and extent of flooding in Flintshire. It will refer to and consider policies described in the catchment management plan that apply to Flintshire. It will involve consultation with councils and partners that share the responsibility of sub-areas within Flintshire, as well as councils and partners in other sub-areas of the catchment. This consultation process will improve the co-ordination of flood risk management activities across the catchment and will facilitate the agreement of the most effective way to manage flood risk. It will also ensure that the safe-guarding of a particular area from flood risk does not have knock on negative effects in another location.
River Dee Catchment Flood Management Plan (2010)	The River Dee catchment has a history of flooding and flood risk. Management of flood risk in the catchment is undertaken through various means including regulation of the headwaters at Llyn Tegid. For some localities, such as the tidal area of the river and much of the river corridor between Bangor-on-Dee and Chester, defences are critical to protecting communities from flooding. The highest risk areas now and in the future, are those affected by tidally influenced flooding, for example the Deeside and Sealand conurbations and Chester. **Main Alyn** This is a mainly rural area, particularly upstream of Mold. It includes the majority of the River Alyn valley, from its source to the confluence with the River Dee. It includes the communities of Gresford, Llay, Caergwrle and Hope but excludes Mold and Rhydymwyn which are in sub-area 8. Approximately 200 properties are currently at risk from the 1% AEP flood event, rising to around 290 properties in the future. The main source of flooding is the River Alyn, but there are also areas of local surface water and sewer flooding. Main roads and other infrastructure are also at risk of flooding. The main communities are protected against flooding from the River Alyn by schemes implemented since the 2000 floods. International and nationally designated environmental sites, including Alyn Valley Woods SAC are affected by flooding. The vision and preferred policy for the Main Alyn area is Policy Option 3 – areas of low to moderate flood risk where we are	The LFRMS will contribute to the understanding of the scale and extent of flooding in Flintshire. It will refer to and consider policies described in the catchment management plan that apply to Flintshire. It will involve consultation with councils and partners that share the responsibility of sub-areas within Flintshire, as well as councils and partners in other sub-areas of the catchment. This consultation process will improve the co-ordination of flood risk management activities across the catchment and will facilitate the

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
	generally managing existing flood risk effectively. Our vision is to ensure our actions are appropriate and proportionate to the risks, now and in the future. We will continue to maintain our defences, but it may not be justifiable to increase their height in the future. Our vision also includes: • Increased emphasis on actions to manage the consequences of flooding; and • Increased community and individual awareness of their flood risks and adoption of actions both can take to help themselves. Actions to implement the policy include: • Review and rationalise our current actions to ensure they are appropriate and targeted to locations of greatest risk; • Carry out a modelling study on the River Alyn to better understand the flood risk; • Encourage and support our partners to produce local long term plans to manage all sources of flooding, particularly for communities downstream of Mold. These plans should include an assessment of the consequences of flooding, including from overtopping of defences and actions to manage these. They should consider future options and investment needs for defences, emergency planning and response, and development control issues; • Engage and advise the local community, to encourage people at risk to take action to help themselves; • Encourage and support studies by partners to identify surface water and sewer flooding issues and management options; • Support opportunities to store water or manage run-off to provide flood risk and environmental benefits; and • Encourage and support opportunities for land use and management change, which assist in achieving flood risk and wider benefits. **Deeside, Wirral and North Flintshire** This area includes the Dee Estuary and the urban areas of Deeside, Sealand, Flint, Holywell, Neston, Heswall and West Kirby and large tracts of agricultural land. This area is important as a major industrial centre with large industrial plants and commercial premises such as Corus and Airbus. Deeside and Sealand conurbations are very flat with large areas of land below high spring tide levels. The River Dee channel between Chester Weir and the estuary mouth is canalised with substantial earth defences on both sides. These reduce the likelihood of tidal flooding, however tidally influenced flooding remains a significant risk to low lying areas. Approximately 1,250 properties are currently at risk of flooding from a 1% AEP river flood event increasing to around 1,700 in the future. The dominant source of flooding is the River Dee. Tidal levels can restrict the outflows from watercourses and drainage systems and exacerbate flooding behind defences. The vision and preferred policy for the area is Policy Option 5 – areas of moderate to high flood risk where we can generally take further action to reduce flood risk. This is a heavily urbanised area with a complex interaction of flood sources and environmental features. In the future, sea level rise and additional development could increase the flood risks considerably, unless these are managed. This area is dependent on flood defences to reduce the likelihood of flooding Overtopping of defences, now or in the future, by extreme flood events could have serious consequences. Defences will continue to have a dominant role in reducing the likelihood of flooding, but we will seek a broader range of integrated actions to manage both current and future flood risks. We will continue to maintain our defences, but it may not be justifiable or acceptable to increase their height in the future. The outcome we seek is a complementary set of flood risk management actions by all partners at a local community level. These will include: • Increased emphasis on actions to manage the consequences of flooding from all sources; and	agreement of the most effective way to manage flood risk. It will also ensure that the safe-guarding of a particular area from flood risk does not have knock on negative effects in another location.

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
	• Increased community and individual awareness of their flood risks and adoption of actions both can take to help themselves. Actions to implement the policy include: • We will develop a Tidal Dee Flood Risk Management Strategy to identify the appropriate mix of actions to manage flood risk from all sources, now and into the future. We will engage with and seek the support of our partners to this strategy. **Mold** This area is centred around the towns of Mold and Rhydymwyn and is predominantly urban. Approximately 440 properties are currently at risk from a 1% AEP flood event, increasing to around 540 in the future. Flood defences have recently been constructed to reduce the likelihood of flooding direct from the River Alyn. Culverts and flow constrictions on the tributaries of the River Alyn also increase the likelihood of flooding in Mold. Many locations within Mold and outlying communities are at risk of flooding from surface water run-off, local watercourses and drainage systems. Mold is one of the major areas in Flintshire identified for residential, commercial and industrial growth in North East Wales/West Cheshire. The vision and preferred policy for Mold is Policy Option 4 – areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change. Our vision includes improved integration of actions by all parties to manage all sources of flood risk, particularly local surface water and sewer flooding in Mold and Rhydymwyn. Increased naturalisation of watercourses and a reduction of constrictions to flow and culverts. Particularly in urban areas, e.g. Mold. We will continue to maintain our defences, but it may not be justifiable to increase their height in the future. Our vision also includes: • Increased emphasis on actions to manage the consequences of flooding from all sources; and • Increased community and individual awareness of their flood risks and adoption of actions both can take to help themselves. Actions to implement the policy include: • Encourage and support our partners to produce local long term plans to manage all sources of flooding at Mold. These plans should include an assessment of the consequences of flooding, including from overtopping of defences, and actions to manage these. They should consider future options and investment needs for defences, emergency planning and response, and development control issues to avoid inappropriate development in high risk areas; • Work with partners to deliver over time increased naturalisation of watercourses and a reduction of constrictions to flow and culverts in Mold; • Encourage and support studies by partners to identify surface water and sewer flooding issues and management options, in Mold and Rhydymwyn; • Include the Mold area in the River Dee Flood Forecasting Model; and • Engage and advise the local community, to encourage people at risk to take action to help themselves.	
River Basin Management Plan – Dee River Basin District (2009) and Consultation Draft	At present, because of pressures (diffuse pollution from housing, agriculture and other rural activities; point source pollution from sewage treatment works and domestic activities; physical modification of water bodies) and the higher environmental standards required by the Water Framework Directive only 28% of surface waters are currently classified as good or better ecological status/potential. 51% of assessed surface water bodies are at good or better biological status now, although this is expected to change to 48% once all water bodies have been assessed. One of the reasons for not achieving good	The LFRMS will implement where possible measures to reduce and manage flood risk that will enhance rather than diminish the status of aquatic ecosystems.

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
River Basin Management Plan – Dee River Basin District (2012)	ecological status or potential can be due to physical modification for flood protection. Key water quality objectives and targets include: • By 2015, 25% of surface waters (rivers, lakes, estuaries and coastal waters) in this river basin district are going to improve for at least one biological, chemical or physical element, measured as part of an assessment of good status according o the Water Framework Directive. This includes an improvement of 265km of the river network in relation to fish, phosphate, specific pollutants and other elements; • 38% of surface waters will be at good or better ecological status/potential and 67% of groundwater bodies will be at good status by 2015. In combination 38% of all water bodies will be at good status by 2015. The Environment Agency wants to go further and achieve an additional two per cent improvement to surface waters across England and Wales by 2015; and • The biological parts of how the water environment is assessed – the plant and animal communities – are key indicators. At least 48% of assessed surface waters will be at good or better biological status by 2015. The 2009 RBMP is being reviewed and updated by the Environment Agency and a revised plan is due to be published in December 2015. The Environment Agency are currently undertaking a consultation process to feed into the update of the RBMP.	Through its SEA, the LFRMS will consider any potential impacts arising from its implementation on water quality and quantity across Flintshire and will avoid/mitigate where appropriate.
River Basin Management Plan - Western Wales River Basin District (2009) and Consultation Draft River Basin Management Plan - Western Wales River Basin District (2012)	At present, because of pressures (diffuse pollution from agricultural and other rural activities and from historical mines; physical modification of water bodies; point source pollution from water industry sewage works; acidification) and the higher environmental standards required by the Water Framework Directive, only 29% of surface waters are currently classified as good or better ecological status/potential. 51% of assessed surface water bodies are at good biological status now. One of the reasons for not achieving good ecological status or potential can be due to physical modification for flood protection. Key water quality objectives and targets include: • By 2015, 13% of surface waters (rivers, lakes, estuaries and coastal waters) in this river basin district are going to improve for at least one biological, chemical or physical element, measured as part of an assessment of good status according to the Water Framework Directive. This includes an improvement of 900 km of the river network in the river basin district, in relation to fish, phosphate, specific pollutants and other elements; • 36% surface waters will be at good or better ecological status/potential and 60% of groundwater bodies will be at good status by 2015. In combination 36% of all water bodies will be at good status by 2015. The Environment Agency wants to go further and achieve an additional two per cent improvement to surface waters across England and Wales by 2015; and • The biological parts of how the water environment is assessed – the plant and animal communities – are key indicators. At least 59% of assessed surface waters will be at good or better biological status by 2015. The 2009 RBMP is being reviewed and updated by the Environment Agency and a revised plan is due to be published in December 2015. The Environment Agency are currently undertaking a consultation process to feed into the update of the RBMP.	The LFRMS will implement where possible measures to reduce and manage flood risk that will enhance rather than diminish the status of aquatic ecosystems. Through its SEA, the LFRMS will consider any potential impacts arising from its implementation on water quality and quantity across Flintshire and will avoid/mitigate where appropriate.
Dee Catchment Abstraction Management Strategy	The Dee CAMS area covers approximately 2,130km^2. Of this area 80% falls within North East Wales, the remainder lying in North West England. The CAMS area is defined by the extent of the river catchments that feed into the River Dee and Dee Estuary, which is situated to the west of the Wirral Peninsula. The total population of the CAMS area is around 500,000 people. The largest river of the CAMS area is the River Dee. This river rises in Gwynedd on the eastern flanks of Snowdonia, flows east through a broad valley to the Vale of Llangollen, before meandering north across the Cheshire Plain and flowing into Liverpool Bay. Numerous tributaries join the River Dee along its length: from the Afon Tryweryn, Afon Ceirw and Afon Alwen in the headwaters to the Afon Ceiriog and River Clywedog in the middle reaches, and then the River Alyn, Worthenbury Brook and Aldford Brook in the lowlands. The River Dee is one of the most highly regulated rivers in Europe. Flow regulation helps maintain a reliable year round water supply for a number of major public water supply abstractions	When developing flood management policies the LFRMS should have regard to implications these may have on water abstraction. The LFRMS should aim to avoid any adverse effects on water abstraction.

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DCWW Surface Water Management Strategy	The Strategy aims to raise awareness of surfacing water flooding and enable engagement with interested bodies, in order to work together to deliver a solution. The long term objective is to have drainage systems in developed areas that, as far as practical, mimic the original greenfield situation. Thereby most surface water is returned to the ground or open water courses at the earliest opportunity. Phase 1 - identified and categorised a range of initiatives that could achieve surface water flow reduction. These were broadly classified the initiatives as: • Engagement; • Charging; • Legislative; and • Technical. Phase 2 - will implement the recommendations of the Phase 1 report and identify additional areas for investigation and investment, to enable delivery of the long-term strategy. Through the application of sustainable urban drainage, the flow reduction strategy will aim to: • Reduce predicted future flooding; • Reduce predicted future incidents of pollution; • Decrease energy costs; • Support conservation and recreational opportunities; • Counter impermeable area creep; and • Be instrumental in minimising the impacts of climate change. The initiatives being developed during Phase 2 of the Surface Water Management Strategy for implementation in the future are: **Engagement:** The greatest potential for the success of the strategy is under the direct control of other parties. Therefore, effective engagement with them is essential to achieve significant flow reduction - to offset the adverse impact on the sewerage network of climate change and increasing urbanisation. **Charging:** Welsh Water currently charges customers for surface water drainage as part of its sewerage services. If customers have their surface water drainage disconnected from the sewer they can benefit from a reduced tariff and lower bills. **Legislative:** The Surface Water Management Strategy fits well with Government Environment Strategy policies on sustainability and climate change. The intention of the Surface Water Strategy is therefore to explore the potential for any legal changes by the Welsh Assembly Government and UK Government that will facilitate a reduction in surface water flows. **Technical:** This will include a review of previous flow reduction and infiltration schemes. Long-term flow monitoring will be explored to identify the benefits this approach can bring, and where it should be done. Rainwater harvesting equipment is to be tried at suitable company buildings and domestic properties. A 'SUDS Showcase Site' is required, that is, a development where people can see, first hand, examples of available devices and systems.	Surface water flooding from sewers is the responsibility of DCWW. However, policies for reducing and managing flood risk in the LFRMS could have significant effects on sewer flooding. The responsibilities of DCWW will be outlined in the LFRMS, and their strategies will be considered in the development of the LFRMS.
DCWW Revised Draft Water Resources Management Plan (2011)	The WRMP demonstrates how Welsh Water plans to balance supply and demand of water over the following 25 years. The key elements of the overall strategy can be summarised as follows: • Regional leakage is expected to fall from 190.45 Ml/d in 2010-11 to 184.08 Ml/d in 2014-15. This strategy is in line with the targets agreed with our economic regulator, Ofwat. As part of the option selection process for addressing supply demand deficits we have considered options involving more reductions in leakage. However, none have been selected because of their comparatively high costs; • The promotion of a wide range of water efficiency activities for both our domestic and business customers. For the period 2010-15 we will continue with our full suite of baseline promotion activities; and	Policies for reducing and managing flood risk in the LFRMS could have effects on DCWW assets. The responsibilities of DCWW will be outlined in the LFRMS, and their strategies will be considered in the development of the LFRMS.

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<tr><td></td><td>
The installation of water meters at all new properties and those households who opt to be metered under our free meter option scheme. We will continue to meter all new business customers and carry out selective metering on high water use unmeasured business premises.
The area that DCWW serves is split into water resource zones. Details about those relevant to Flintshire are:
<table>
<tr><th>Water Resource Zone Name</th><th>Area (km2)</th><th>Population served (‘000)4</th><th>Water delivered (average, Ml/d)5</th><th>Main source of water</th></tr>
<tr><td>Clwyd Coastal</td><td>152</td><td>80</td><td>22</td><td>Reservoir storage</td></tr>
<tr><td>Alwen Dee</td><td>1,142</td><td>155</td><td>45</td><td>Reservoir storage</td></tr>
</table>
</td><td></td></tr>
<tr><td colspan="3">LOCAL</td></tr>
<tr><td>Flintshire Unitary Development Plan (2011)</td><td>The Flintshire UDP was adopted in September 2011.
Strategic Aims
a. economy - to create a thriving and sustainable economy providing a wide range of quality employment opportunities for local people.
b. social and welfare - to enable all local residents the opportunity to have access to quality housing, services, shops and leisure, recreational and sports facilities.
c. health - to promote and facilitate the development of a safe and healthy environment.
d. community identity - to preserve community life by limiting development to a level which can be reasonably sustained and assimilated within existing communities.
e. natural environment - to conserve and enhance the natural environment and its diversity - landscape, nature conservation and biodiversity.
f. built environment - to conserve, regenerate and enhance the built and historic environment.
g. energy - to stabilise and ultimately reduce non renewable energy consumption and encourage appropriate renewable energy.
h. resources - to make the most prudent and efficient use of resources, including land and buildings, and encourage the use of recycled and secondary rather than primary resources.
i. pollution - to stabilise and ultimately reduce the potential of pollution.
j. waste - to stabilise and ultimately reduce waste generation and disposal utilising waste management measures.
k. culture and language - to promote and support a diverse local culture including the protection and development of the Welsh language.
l. transport and access - to integrate new land uses with the existing transport network, and to improve accessibility to varying alternative transport modes other than the car, and to promote the integration of transport modes.
m. tourism - to facilitate appropriate tourism development which meets the needs of visitors without harming the natural and cultural assets on which tourism is based.
n. proximity principle – to apply the proximity principle whereby problems are solved locally rather than passing them on to other places or to future generations.
o. respect for environmental limits – to ensure that resources are not irrecoverably depleted or the environmental irreversibly damaged.

Key strategic policies include:
STR3 Employment - The Plan will facilitate a diverse and sustainable economy through:
a. the provision of 300 ha of employment land over the Plan period;
b. the provision of a range of type and size of employment sites;</td><td>Flood management described in the LFRMS should support the policies outlined in the Unitary Development Plan.

The housing and employment targets set out in the UDP may have impacts for the LFRMS in terms of increasing flood risk.

The LFRMS will encourage appropriate development across Flintshire. It will inform planning decisions about potential flood risk issues as such ensure that spatial planning supports flood risk management policies and plans.

The LFRMS will promote a more sustainable and holistic approach to managing flood risk.

Through its SEA, the LFRMS will consider potential effects arising from its implementation on human health, environment, cultural heritage and economic activity and will avoid/mitigate where appropriate.</td></tr>
</table>

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
	c. enabling new employment generating development mainly within or adjoining existing settlements, in principal employment areas, development zones, on allocated sites and suitable brownfield sites and through the sensitive conversion of rural buildings and other appropriate rural diversification initiatives; d. existing employment sites and buildings being retained, where necessary and practicable, for that use; and e. appropriate expansion of existing firms and businesses STR4 Housing - The Plan will seek to provide for the housing needs of the County through: a. the provision of 7,400 new dwellings over the Plan period; b. distributing new housing across the County based on a settlement hierarchy comprising category A (urban centres), B (semi urban / main villages) and C (rural / small villages); c. the provision of a range of type and size of housing sites including key sites at Flint, Mold, Buckley, Connah's Quay, Penyffordd, Broughton, Mancot; d. the provision of a range of housing including affordable and special needs housing where there is a demonstrable need; e. making the most efficient and effective use of housing sites and existing housing stock and facilitating, where appropriate, the residential conversion of existing buildings.	
Flintshire Economic Strategy (2003)	The strategic theme and objective are: **Addressing the skills and qualifications deficit** - Address the skills and qualifications deficit in the County through promoting a 'learning pays' message and through supporting partner organisations in the development of a comprehensive and accessible range of training and education opportunities. **Building on our manufacturing strength** – We will build on our manufacturing strength and support business development by: 1. Developing a programme of support measures to maximise the growth potential of the Flintshire based manufacturing sector; 2. Supporting major companies in Flintshire in order to identify and provide for their infrastructure needs and develop supply chain opportunities; and 3. Promoting the service sector and knowledge based industries. **Encouraging entrepreneurship and business start up** - To identify and assist individuals who wish to become self-employed in a new business venture and to maintain sustainability and growth within the micro business and SME sectors. **Realising the tourism potential** - This will be achieved through: 1. Supporting measures to enhance the economic benefits of the tourism industry both in terms of employment and income generation; and 2. Instigating and supporting marketing initiatives to promote a positive image of the County and its facilities in conjunction with further development of the tourism and marketing areas. **Promoting social inclusion through access to opportunity and community development** - This will be achieved by: 1. Supporting measures to combat and prevent unemployment, develop human resources to promote social integration in Flintshire's Labour Market; and 2. Developing a range of activities and services that will enable and encourage people experiencing long-term unemployment and social exclusion access training, education and employment opportunities, through a programme of community development. **Investing in our towns and villages** - Promoting investment in our towns and villages will be achieved by: 1. Co-ordinating regeneration activity across the county of Flintshire through the Flintshire Local Community Strategy Partnership; 2. Supporting the development of sustainable rural communities in Flintshire; 3. Making our towns attractive, safe and vibrant to shop, work in and visit; and ensuring that Flintshire has an appropriate supply of land and buildings to meet future employment needs; and	Flooding can affect the economy in many ways. The LFRMS will support the economic renewal plan by reducing and managing flood risk which may cause economic implications.

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
	4. Ensuring that Flintshire has an appropriate supply of land and buildings to meet future employment needs.	
Flintshire Community Strategy 2009 - 2019	The 'County Vision' set out in the Strategy is based on five priority areas: • Economic prosperity; • Health improvement through everything we do; • Learning and skills for life; • Living sustainably; and • Safe and supportive communities. The 'County Vision': • Provides a statement of intent and priorities for the Local Service Board, both as a partnership but also as individual organisations; • Supports and complements the vision and priorities in the other Strategic Partnership Plans; • Will be used to influence partnership working, build and demonstrate unity amongst partners; and • Will be used as a lobbying tool for funding and influencing purposes.	The LFRMS will consider human health implications of flood risk. Through the SEA, the LFRMS will consider potential effects arising from its implementation on human health, communities and the economy. The public will be consulted regarding development of the LFRMS and SEA.
Flintshire Contaminated Land Strategy (2008)	The aims of the strategy are to: • To identify threats or potential threats to humans, protected ecological systems and the organisms forming part of such systems, property in the form of buildings, domesticated animals, livestock, crops and wild animals subject to shooting or fishing rights and controlled waters; • To prioritise areas for inspection such that those most likely to suffer from the more serious contamination are identified and dealt with first; and • To develop necessary procedures for investigating possible contamination and ensuring such contamination is suitably remediated. The objectives of the strategy are to: • To demonstrate that Flintshire County Council is fulfilling its statutory duty with regard to the identification and remediation of contaminated land by: • Describing the procedures for the inspection of land owned by the Authority; • Describing the procedures for the inspection of land owned by other bodies; • Describing the procedures for ensuring the satisfactory remediation of contaminated land; • Prioritising the individual site investigations, taking into account the Authority's own specific characteristics and policies; and • Defining a timetable for the inspection process	Flooding in areas of contaminated land can cause pollution. The LFRMS consider areas of contaminated land when developing flood management options.
Flintshire Biodiversity Action Plan	Flintshire's Local Biodiversity Action Plan aims to secure partnership work between local people and organisations to ensure biodiversity is valued and looked after in the future. The action plan sets out work to be undertaken to help important habitats and species. Flintshire has 10 habitat action plans including those for coastal sand dunes; ponds and lakes; woodland; traditional orchards; upland heathland. It has 12 species action plans including those for badgers; bats; water vole; otter; reptile; great created newt.	The LFRMS should aim to protect ecological habitats and species. The LFRMS should promote biodiversity where possible by including policies which promote natural flood defences which may benefit biodiversity. Through the SEA, the LFRMS will consider potential effects arising from

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
		its implementation on BAP species and habitats.
Clwydian Range: Area of Outstanding Natural Beauty. Management Plan 2009 -2014	The Clwydian Range was designated as an Area of Outstanding Natural Beauty in July 1985. The Clwydian Range forms a 35km north – south chain of undulating hills extending to 160 sq.km and rising to 554 metres at the summit of Moel Famau in the centre of the area. The hills stretch from the Vale of Clwyd in the west to the foothills of the Dee Estuary to the east; from Prestatyn Hillside in the north to the Nant y Garth pass in the South. The Management Plan sets out a framework for the conservation and enhancement of the Clwydian Range AONB.	Through its SEA, the LFRMS will consider potential effects arising from its implementation on the character and special features of the AONB.
Flintshire Housing Strategy 2008 - 2013	Flintshire's Housing Strategy is based on the results from a housing needs survey, stock condition survey and market assessments. This has provided an understanding of what the housing issues are in Flintshire and where the priorities should be in relation to meeting needs. Priorities include: • To increase the supply and choice of new affordable accommodation in locations throughout Flintshire in accordance with housing need and aspiration; • To aim to ensure that all homes within the County are of a good quality, particularly through ensuring that Council Housing is brought up to the Welsh Housing Quality Standard by 2012; • To seek to prevent homelessness and provide a wide range of accommodation for homeless people when homelessness is unavoidable; • To provide a range of housing-based support for vulnerable people and to maximise independence through the Supporting People programme; • To improve the quality of life of our diverse communities through joint approaches to community safety, physical and social regeneration; • To ensure that housing provision in the county is in line with our economic aspirations; • To promote the health and well-being of communities by improving the quality and design of homes and the environment in which they live; • To improve the environmental and energy performance of housing through construction, education and maintenance; • To seek to meet the housing needs and aspirations of our diverse communities; and • To make the case for housing in Flintshire.	New housing developments can have affects for flood risk in terms of increasing hard standing leading to increased surface run-off and new assets and people at risk. However, there are also opportunities to incorporate flood prevention measures into new developments. The LFRMS will set out policies to help reduce people and properties at risk at flooding.
Flintshire Tourism Strategy 2008 - 2013	The Flintshire Tourism Strategy will guide the work of Flintshire County Council and its partners in the public, private and voluntary sectors in developing tourism in the county from 2008 to 2013. The Flintshire Tourism Strategy will aim to: • Develop a stronger sense of place for Flintshire and raise the quality of the location as a destination; • Increase tourism business both from adjacent and wider markets; • Increase the value of business and activity tourism in Flintshire; • Improve access to information for residents and visitors; • Further improve the quality of accommodation and attractions, support the development of new infrastructure and attract and invest in high calibre staff; and • Monitor the impact of tourism and the effectiveness of interventions.	Tourism is extremely important to Flintshire's economy. Incidents of flooding can affect tourism. The LFRMS will compliment the Tourism Action Plan by helping to reduce and manage flood risk.
Flintshire Regeneration Strategy 2009 - 2020	Strategic objectives of the Strategy are: **A competitive Flintshire** - To develop a sustainable, world class, modern economy, based on business enterprise and a highly motivated, well trained workforce supported by modern technology, which maximises the County's physical and human assets. Key themes are: • Support business competitiveness; and • Make best use of the County's employment land.	The LFRMS will consider human health and ecological implications of flood risk. Through the SEA, the LFRMS will consider potential effects arising from its implementation on human health,

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
	Sustainable communities - Strengthen the rural economy through encouraging diversification and revitalise towns by developing them as successful local centres, each with their own distinctive character which complement each other and the wider retail offer across the County and neighbouring Counties. Key themes are: • Develop successful town centres; • Regenerate our housing stock; • Maintain viable and attractive rural areas; and • Develop the tourism potential of the County. **Employment and Skills** - Develop a range of initiatives aimed at local people who are suffering poverty, disadvantage and hardship. The most deprived communities will be helped to give them an equal opportunity of benefiting from the future economic success of Flintshire. Key themes are: • Improve levels of employment and skills; and • Tackle poverty and exclusion.	communities, infrastructure, economy, heritage and the environment.
Flintshire Preliminary Flood Risk Assessment (2011)	This Preliminary Assessment Report considers local flood risk from surface water, ground water, ordinary watercourses and small reservoirs. The aim of the Preliminary Flood Risk Assessment is to identify formal Flood Risk Areas and other areas of significant local flood risk which will inform the production of future local strategies. No indicative Flood Risk Areas (5,000 or more persons at risk flooding in a community) were identified in Flintshire. The PFRA identified past flooding of local significance (where five or more properties have been subject to flooding at one time).	The LFRMS will incorporate the findings of the PFRA. The flood risk areas identified in the PFRA will form the basis for further investigation.
OTHER AUTHORITIES		
Denbighshire Unitary Development Plan 1996 -2011	Policy CPZ8, concerning coastal planning, highlights the need for an environmental assessment in the development of Foryd Harbour, in order to assess the impact on the landscape and natural coast, nature conservation, features of historic value and any other impact likely to arise from proposed development. Policy HSG1 allows for the provision of 4100 additional dwellings over the plan period. This includes new allocation sites for 880 dwellings. Policy HSG2 states that this will predominantly be in the main centres of Corwen (low growth), Llangollen, Rhyl, St Asaph, Denbigh, Prestatyn and Ruthin. Policy EMP1 provides 164ha of employment land, 84ha of which is newly allocated. Policy EMP2 outlines that these are for Business Use B1, General Industry B2 and Warehousing and Distribution B8 uses only. St Asaph Business Park has its own guidance (Policy EMP3), which restricts use further to B1 and small scale retail, financial and other office, business or local convenience for the needs of the park. Another large allocation is the site at Glasdir, Ruthin. The main employment areas include, amongst others, Rhyl (several sites), St Asaph (2 sites) and Denbigh (2 sites).	Flood risk management can have cross-boundary effects. Therefore, the LFRMS should take into account the policies in the UDP. Through the SEA, the LFRMS will consider cross-boundary and cumulative effects.
Denbighshire Deposit Local development Plan 2006 – 2021 (2009)	The LDP strategy provides for 7,500 new dwellings to be developed over the Plan period, and average of around 500 per year. Of the 7,500 dwellings required, approximately 800 have already been built since the start of the plan period (2006), 1,600 already have planning permission or are under construction and a further 3,000 can be accommodated within existing development boundaries. This leaves approximately 2,100 homes to be provided on new sites outside added to this to give an overall 'residual requirement' of approximately 2,600. This will be met through allocations at Bodelwyddan, Corwen, Rhyl, Ruthin, St Asaph and Prestatyn. It is a Local Development Plan objective to provide employment opportunities within the County and reduce the need to commute long distances to improve sustainability. Around 50 hectares of employment land will be allocated in the Local Development Plan. Bodelwyddan has been identified as a Key Strategic Site to meet the needs of Denbighshire in line with the Local Development Plan strategy. This large mixed use site will deliver new housing, employment opportunities, open space and community facilities, creating a sustainable, expanded community.	Flood risk management can have cross-boundary effects. Therefore, the LFRMS should take into account the policies in the UDP. Through the SEA, the LFRMS will consider cross-boundary and cumulative effects.
Wrexham Unitary	Strategic policies include:	Flood risk management can have

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
Development Plan (2005)	• Policy PS5 - Provision will be made for the development of 5775 dwellings between 1996 and 2011; • Policy PS6 - Approximately 300 hectares of employment land will be made available for development between 1996 and 2011; and • Policy PS7 - The priority areas for new shopping and commercial office development will be the defined Wrexham Town Centre and district centre shopping areas. Specific policies on the water environment include: • Policy EC13 - Development which would result in an unacceptable adverse impact on the water environment due to additional surface water run-off will not be permitted; and • Policy EC14 Development which would have an unacceptable adverse impact upon the capacity, flow, quality or availability of controlled waters and associated land will not be permitted. There are also policies for the protection of cultural heritage, landscape and biodiversity. It should be noted that Wrexham CBC submitted its LDP to the Welsh Government and Planning Inspectorate for examination in September 2011. However, due to fundamental concerns raised by the Planning Inspectorate the LDP was officially withdrawn in March 2012.	cross-boundary effects. Therefore, the LFRMS should take into account the policies in the UDP. Through the SEA, the LFRMS will consider cross-boundary and cumulative effects.
Cheshire West and Chester Council Core Strategy Issues and Options	In July 2008 it was announced by the government that West Cheshire would be one of the 20 new Growth Points in England and one of six in the North West. Growth Points are part of the Government's initiative to provide three million more new homes by 2020. The Council's proposals aim to deliver an additional 2,700 homes between 2007/08 and 2018/17 (on top of the requirement for 11,853 homes set out in the Regional Spatial Strategy, an increase of 23%) whilst ensuring that 30-40% of these homes are delivered as affordable housing. The headline strategic objectives for Cheshire West and Chester Borough are: • Protecting and enhancing the environment; • Healthy and supported citizens; • Vibrant economy; Accessible places; and • Tackling climate change. The Strategy puts forward the following areas as strategic location to be included in the Core Strategy: • Chester City Centre; • Central Ellesmere Port; • In and around Northwich Town Centre; and • In and around Winsford Town Centre. The Strategy also provides a number of options for housing development, employment land provision, retail, transport, and tourism.	Flood risk management can have cross-boundary effects. Therefore, the LFRMS should take into account the policies in the UDP. Through the SEA, the LFRMS will consider cross-boundary and cumulative effects.
Chester District Local Plan (2006)	The Chester District Local Plan was adopted on 12th May 2006. It sets out the Council's policies for development and the use of land in the District between the period 1996 to 2011. It provides a statutory framework within which decisions on planning applications are made. The Local Plan policies were saved by the Secretary of State except policy HO1 on housing provision. There are seventeen guiding principles of the Local Plan: • Secure the essential link between the environment and the economy through sustainable development;	Flood risk management can have cross-boundary effects. Therefore, the LFRMS should take into account the policies in the UDP. Through the SEA, the LFRMS will consider cross-boundary and

Plan Title	Plan Description and Key Relevant Objectives/Targets	Implications of the LFRMS SEA
	• Create a safe, healthy environment for residents, visitors and people who work in the District; • Enhance opportunities for independence for people with disabilities; • Secure a healthy, vibrant economy throughout the Plan period; • Protect and enhance the architectural and historic character of the District; • Maintain the most valued habitats, wildlife species and geological and landscape features at current levels as a minimum and to seek opportunities for habitat enhancement and creation; • Enhance rural society and promote the rural economy; • Provide a range of dwellings to meet the needs of local people; • Provide an efficient transport network throughout the plan area; • Promote tourism in the District and to safeguard existing attractions, accommodation and facilities; • Provide a wide variety of sporting and recreational opportunities for residents and visitors; • Safeguard and develop community facilities; • Promote and enhance the enjoyment of the arts and culture and the District's rich heritage; • Protect and enhance the vitality and viability of Chester as a sub-regional shopping, commercial and administrative centre; • Protect and enhance the vitality and range of facilities in suburban shopping centres; • Promote the conservation of energy and other natural resources; and • Promote the city as a centre of excellence for higher and further education.	cumulative effects.
Ellesmere Port and Neston Borough Local Plan (2002)	The Plan Objectives that spring from the Guiding Principle are: • To create a thriving economy providing a wide range of employment opportunities which are accessible to local people; • To enable all residents to have quality housing, services and recreational facilities; • To secure the regeneration of urban and industrial areas; • To protect and enhance landscape, habitat and wildlife, greenspaces and the built environment in urban areas and the countryside; and • To guide development to locations which are accessible by walking, cycling and public transport. Sites allocated for employment sites are: • Stanlow Special Policy Area; • Hooton Park Strategic Site; • Ince Marshes; • Cheshire Oaks; • Ince Power Station; and • Land at Station Road, Ince.	

Appendix C. Baseline Information

C.1. Air Quality

According to the DEFRA Local Air Quality Management Areas (AQMAs) website there are no AQMAs in the County. The air quality review and assessment for Flintshire County Council demonstrated that exceedances of the National Air Quality Objectives are unlikely to occur. However, the review identified a need to obtain further monitoring data for PM_{10} and NO_2 concentrations at relevant locations near the busiest roads (A494 - A550). Diffusion tube monitoring is undertaken in the County and the 2003 results indicate that none of the site results exceeded the current annual mean standard of 40.

The major industrial estates in the County are located along the Dee Estuary in the eastern part of the County. There are a number of Part A and B authorised processes in the County including: Corus Site, BHP Petroleum, Castle Cement, National Power Plc, Powergen Combined Cycle Gas Fired Power Station, Shotton Paper Company, Owens Corning Ltd, Kimberley Clark Ltd, BAE Systems, Tarmac and a number of quarries (Flintshire UDP SA Report).

Relation to Flintshire LFRMS:

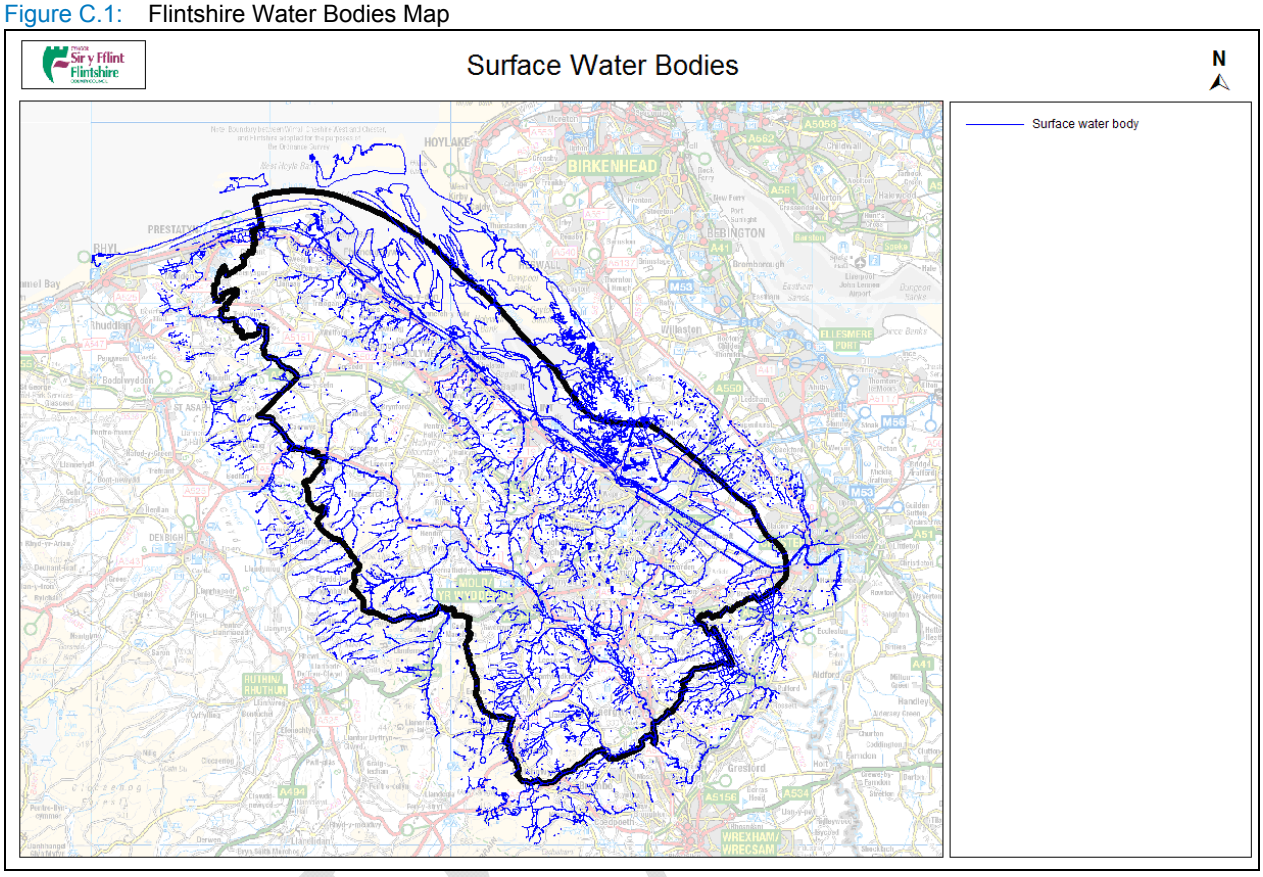
Air quality is unlikely to be effected by the Flintshire LFRMS, although it should be noted that some receptors (sites of ecological value) may be particularly sensitive to even small levels of pollutants. However, if the LFRMS proposes active intervention such as capital works in certain areas there may be minor temporary effects during construction from plant machinery and construction transportation. Due to the fact that Flintshire has no declared AQMAs and the LFRMS is unlikely to have effects on air quality it is proposed to scope out air quality from the SEA.

C.2. Water

C.2.1. Main Rivers and Tributaries

Based on records from the Environment Agency Wales' (EAW's) website there are approximately 44 main rivers and associated tributaries that are located within the boundary of Flintshire Borough as shown in the EAW's main rivers map as identified if Figure C.1 below. These main rivers are designated by the EA and are generally large watercourses but also include smaller watercourses of strategic drainage importance. The remaining rivers or streams not considered to be main rivers are 'ordinary watercourses'. The main water course that flows within the county is the River Flintshire (Afon Flintshire) and is by far the largest watercourse and discharges into the Flintshire Bay at the historic town of Flintshire.

Figure C.1: Flintshire Water Bodies Map



C.2.2. Major Lakes and Reservoirs

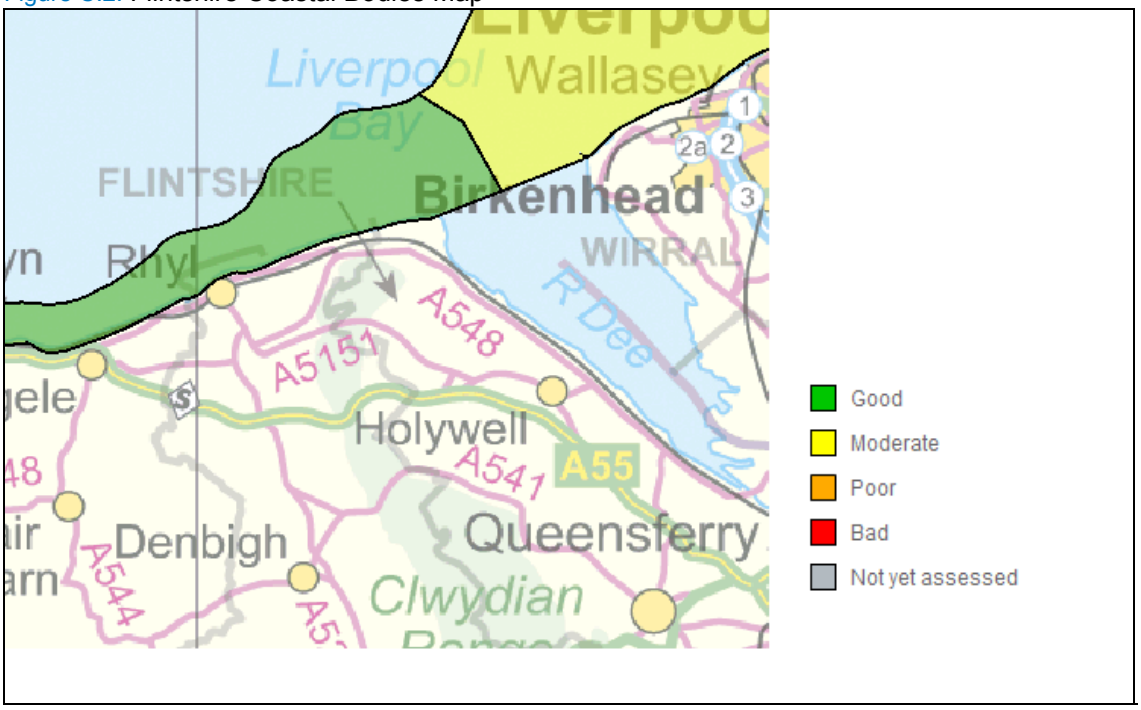
The River Dee rises on the slopes of Dduallt in the Snowdonia National Park and then flows into Bala Lake before discharging and flowing in an east-south-east direction off the Denbigh Moors. The river picks up a number of tributaries (Afon Alun and the Afon Alwen), reservoirs and lakes (Alwen Reservoir and Llyn Brenig) which contribute to form the Alwen River before joining the River Dee at Corwen.

The Dee continues to flow passing through the city of Chester in England, before discharging into the Dee Estuary and Irish Sea between Wales and the Wirral Peninsula some 110 km from the source.

C.2.3. Estuarine and Coastal Bodies

Flintshire County contains a number of important estuarine and coastal bodies which are crucial to the economy of the county through the tourism and commercial fishing industries. The Dee Estuary is protected under European conservation legislation (SAC/SPA/Ramsar/SSSI) for important marine species and habitats (shellfish fisheries).

Figure C.2: Flintshire Coastal Bodies Map



Source: Environment Agency Website

C.2.4. Groundwater Bodies

There are a total of five groundwater bodies located within the county. All the bodies (Dee Carboniferous Coal Measures, Clwyd Carboniferous Limestone, Clwyd Silurian, and Dee Carboniferous Limestone) fall within the catchment areas of the Dee River Basin District. Based on the EAW's information all of the current quantitative and chemical qualities are recorded as good, with the exception of the current chemical quality of the Dee Carboniferous Coal Measures groundwater body which is described as poor.

C.2.5. Water Pollution Issues

The River Basin Management Plan Dee River Basin District (Environment Agency Wales 2009) assesses the current water quality of the rivers and water bodies within the north east district of Wales and parts of Cheshire, Shropshire and the Wirral in England. The plan includes the majority of the Flintshire County and covers an area of 2,251 km² and a population in excess of 0.5 million. The districts consist of a single river basin; the River Dee, its tributaries and estuary. The district is characterised by a varied landscape. It ranges from the mountains and lakes of the Snowdonia National Park in the upper part of the basin, through the Vale of Llangollen on the middle reached, to the open plains of Cheshire and the mudflats of the Dee Estuary in the lower basin. Flint, Chester, Mold and Wrexham are the major urban centres, but the dominant land uses are agriculture and forestry, particularly in the upper reaches of the area.

The majority of the water courses and water bodies located within the county are classified by the EAW as being of good to moderate quality in terms of both ecological and chemical parameters. Only the River Alyn and Wheeler were described as of poor status for ecological and chemical quality. All of the estuaries and

coastal water bodies within Flintshire are classified as achieving good ecological status and potential based on the EAW's records.

It is likely that poor surface and groundwater quality within the county will be likely to be influenced by agricultural activity rather than industrial processes. Anticipated issues would include, nitrification of water courses from field surface runoff and animal activity (including the use of slurry), discharges from sewerage works, sedimentation of rivers and streams through runoff and erosion and pollution from pesticides used during the farming process. Due to the sparse distribution of the population an additional source of pollution may derive from damaged septic tanks (historic unregulated domestic supplies) and other private fuel storage areas (over and underground oil and diesel tanks).

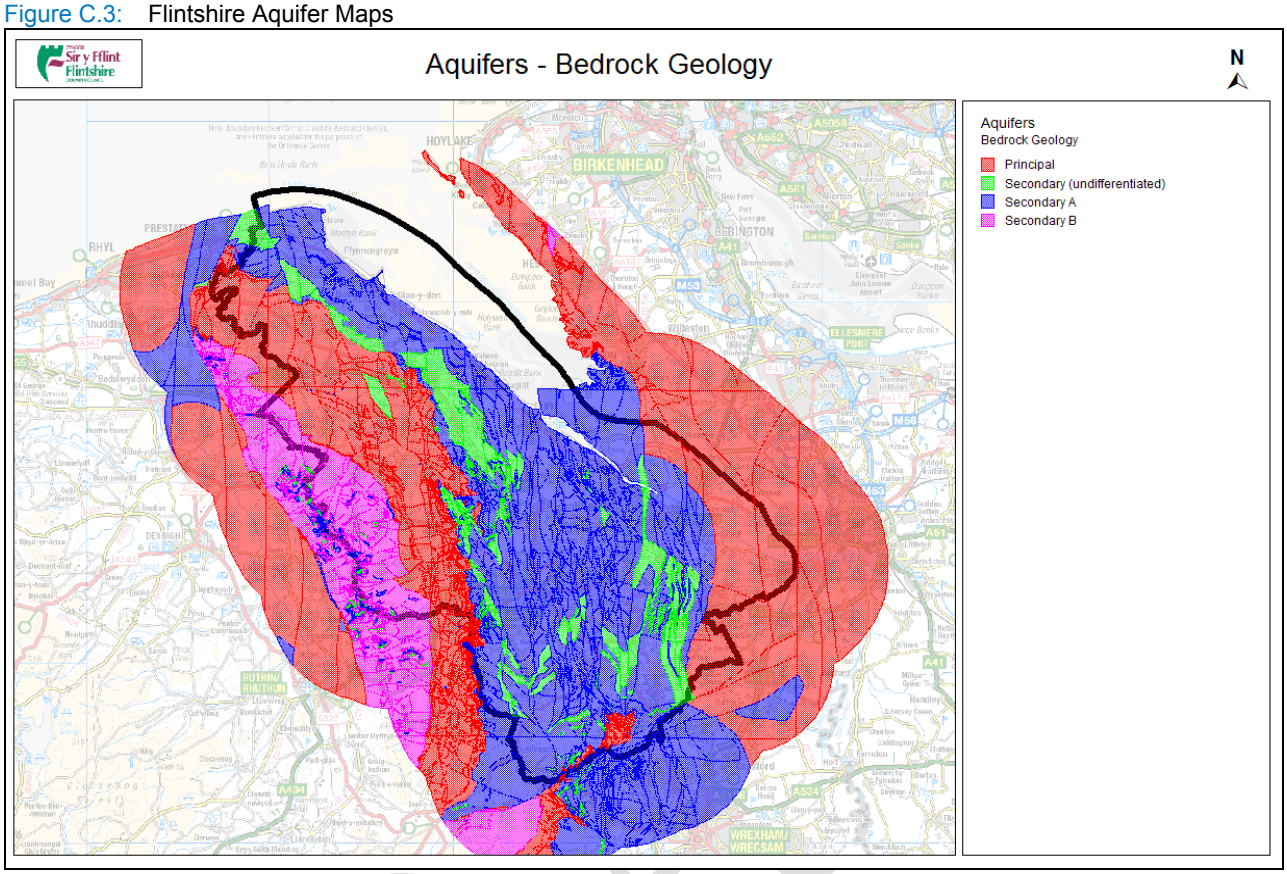
C.2.6. Hydrogeology

The steep flanks of Moel Famau in the Clwydian Range rise to the highest point in Flintshire (554 m) on the Authority's southwest boundary with Denbighshire. The hills are separated from the north-northeast trending escarpment of Carboniferous Limestone by the valleys of the Rivers Wheeler and Alyn. The River Alyn breeches the limestone escarpment to the west of Rhydymwyn and similarly at Hendre. The River Alyn flows in a southerly direction, past Mold, flowing out of the Authority's area at Cefn y Bedd on the southeast boundary with Wrexham. The River Alyn finally flows into the River Dee further to the southeast. The River Dee enters Flintshire from the northeast, it's wide flood-plain to the east of Connah's Quay giving way to a broad estuary northwest of Connah's Quay.

The features of the limestone influence the drainage pattern to the North of Flintshire. The west-facing slopes of the limestone outcrop are steeper than the more gentle slopes of the east. Consequently, streams are found at the base of the westerly to south westerly facing slopes. Other streams drain the gentle slopes facing east. The metalliferous veins present in the limestone outcrop have been mined extensively in the past (see Section 2.10.1), particularly on Halkyn Common. The consequent minetips have disrupted the local drainage pattern. Most of the eastern part of the Authority is below 150 m, with minor undulations. This area is deeply dissected by streams. Near the Dee Estuary, the ground falls away rapidly and many deep northeast trending river dissections occur.

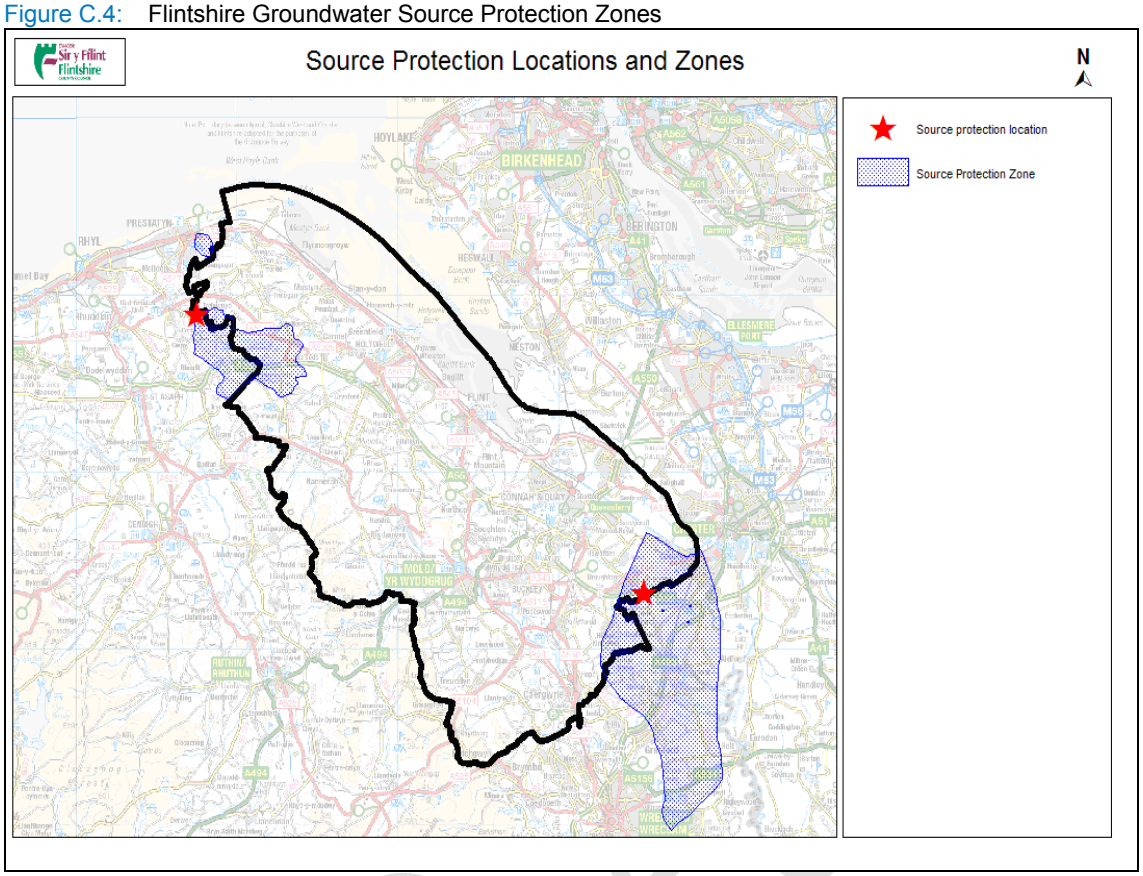
The most important aquifer in Flintshire is the Kinnerton Sandstone Formation. This is mostly recharged from the east of the County. The Carboniferous Limestone aquifer is the second major aquifer. However groundwater movement is mainly restricted to fissures enlarged by solution. The movement can be rapid. Tunnels associated with disused mineral workings have caused a significant effect on the hydrogeology of the aquifer. Groundwater Vulnerability maps produced by the British Geological Survey describe the Kinnerton Sandstone formation and Carboniferous Limestone aquifers as highly permeable, covered by soils which have a varying leaching potential ranging from high to low. Where the soils have a high leaching potential, the vulnerability of the aquifers to pollution is increased. However, parts of the aquifers are also covered by low permeability drift deposits at the surface, therefore reducing the likelihood of pollution to the aquifers. One small aquifer is recorded in the Halkyn Formation sandstones. The water within the Westphalian Strata sandstones is generally present within the joints and fractures caused by mining subsidence. The recharge is limited by separation of the aquifers into fault-blocks and the extensive cover of low permeability superficial deposits (Flintshire Contaminated Land Strategy).

Figure C.3: Flintshire Aquifer Maps



The River Dee is a regulated river, permitting a continual supply of water to water supply companies, namely Dŵr Cymru - Welsh Water, North-West Water, Dee Valley Water and the Shropshire Union Canal. The confluence of the River Alyn with the River Dee is situated upstream from three abstraction points supplying potable water to the water supply companies. These companies supply water to northeast Wales, Cheshire and Merseyside. The River Dee was the first river to be designated as a Water Protection Zone under the Water Resources Act 1991. The Zone encompasses the whole of the freshwater catchment area which ends at the Chester weir, the tidal limit. It therefore includes the section of the River Alyn and its tributaries which run through Flintshire. The controls of the designation are designed to minimise pollution incidents caused by industrial activities, which may impact on the River Dee as a potable water supply.

Figure C.4: Flintshire Groundwater Source Protection Zones



Three boreholes, situated between Bretton and Poulton, may be used by Welsh Water to abstract water from the Kinnerton Sandstone Formation in the event of the Dee River intakes being shut down for a prolonged period. The aquifers are also used for numerous private water supplies. The Environment Agency recognises the importance of protecting aquifers used to supply drinking water and have identified two Source Protection Zones in Flintshire. Both Source Protection Zones are classified as Total Catchment Zones. One applies to the majority of the Kinnerton Sandstone Formation aquifer. The other, situated in the northwest of Flintshire, applies to an area of the Carboniferous Limestone aquifer. Source Protection Zones provide an indication of the risk to ground water from potentially polluting activities and land contamination (Flintshire Contaminated Land Strategy).

C.2.7. Flooding

Significant work has been conducted by FCC under their role as LLFA with regard to identifying areas that may be impacted by flooding from surface water, groundwater and ordinary watercourses.

C.2.7.1. Sources and Types of Flood Risk

The cause and sources of floods are often complex and difficult to attribute to a single factor. Flooding within the county can occur from a variety of different sources which can include tidal and fluvial flooding, overland flows, groundwater flooding, drainage (sewers) and flooding from artificial sources such as man made water bodies (lakes, reservoirs and canals).

Flooding can be influenced by a number of factors, which may include high river levels preventing the discharge of surface water sewers causing localised surface water flooding through the backing up of water within the sewer system.

Surface water flooding is a common source of flooding within Flintshire and occurs when periods of high intensity rainfall generates run-off which flows over the ground's surface and collects in low lying areas. While not in all circumstances, the surface water flooding is quite often exasperated by saturated ground or when the drainage network is of insufficient capacity to cope with the additional flow. As such surface water flooding is extremely complex and can occur anywhere with limited or no warning and can be highly localised.

Flooding attributed to groundwater is again complex and relies on numerous factors including geology, aquifer surcharge rates and localised or area wide rainfall, which in their nature are difficult to predict.

C.2.7.2. Historical Flood Records

The Flood Risk Regulations 2009 placed a duty on the Lead Local Authority (FCC) to produce a Preliminary Flood Risk Assessment (PFRA) to manage local flood risk from surface water, groundwater and ordinary watercourses and deliver the requirements of the regulations.

In June 2011 FCC published its PFRA which identifies those areas in the county at risk of flooding with significant consequences (Flood Risk Areas).

The PRFA reviewed all of the historical records held by the council and the EAW through a desk based assessment. The incidents were collated and assessed for local significance, where a significant event was defined as one where generally 5 or more properties were affected from flooding at one time.

The PRFA identified 5 historical incidences of significant local flood events based on the criteria above.

The PFRA also identified future flood risk. The thresholds used to identify places where flood risk is an issue are: more than 200 people affected, or, more than 20 businesses affected, or, more than 1 critical service affected. The PFRA has identified 18 areas where this threshold was met.

Relation to Flintshire LFRMS

The influence of the LFRMS options on water resources and flooding need to be considered separately as the implementation of options have varying impacts (both positive and negative on each topic).

Flooding

The implementation of the strategy for Flintshire should provide a better understanding of flooding and associated flood risk within the county. As such this should enable adverse flood (including tidal) events to be controlled, managed, and predicted with a better degree of accuracy.

Under the Flood Risk Regulations the LLFA will fulfil the role of SuDS Approval Body (SAB) and as such the LFRMS will describe how the LLFA will manage the implementation of SuDS within the county. While the use of SuDS for new developments within the county would not contribute towards the current loading of the existing drainage systems, it would not alleviate the problems in existing areas that have

experienced flooding historically. SuDS systems do however control the quality of run-off by attenuating pollutants, which may assist in reducing potential damage to wildlife, ecology and water quality.

Any construction activities undertaken relating to flood defence assets, have the potential to negatively impact on water quality through release of contamination (fuel and oil spills), and generation of silt and sediment during the construction process. Any works conducted as part of the LFRMS options should be conducted in line with environmental best practice and comply with the relevant environmental legislation (Land Drainage Consents, etc.).

Water Quality and Resources

The LLFRMS is unlikely to have a significant impact on the water quality and resources within the County.

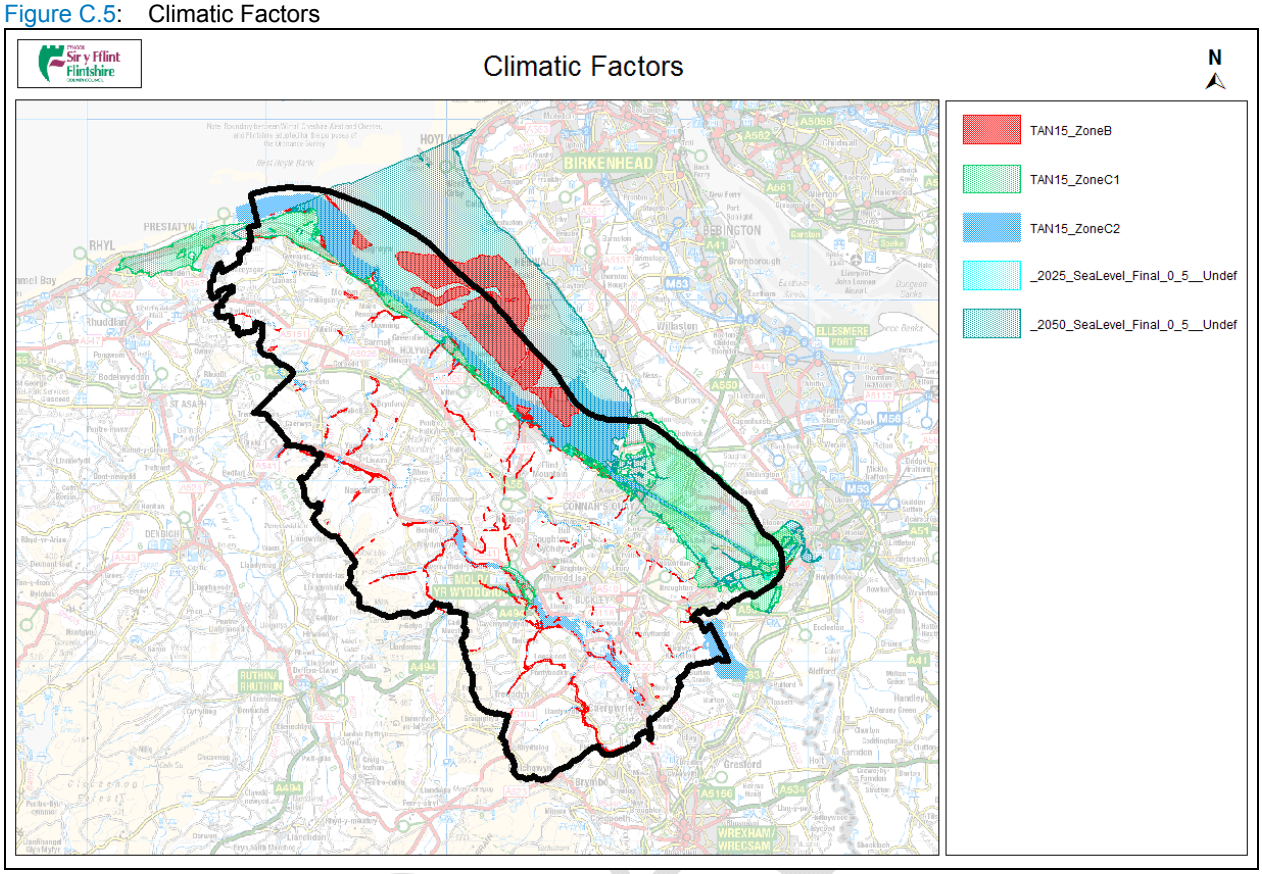
Construction activities associated with flood defence assets may introduce potential negative impacts during the construction phase, however these are likely to be short term impacts and not perceived as significant. Strategic decisions on whether to allow areas to flood in close proximity to known contaminated sites and landfills may have a detrimental impact on water quality, however these should be identified during the scoping stage of any future decisions and avoided if possible.

C.3. Climatic Factors

According to the UK Climate Change Projections 2009 (UKCCP09), Wales is predicted to experience changes in temperature, rainfall and sea level as a consequence of climate change. These changes are predicted to occur under all three emissions scenarios (i.e. low, medium and high greenhouse gas (GHG) emissions), which are incorporated into the climate change models produced by the Met Office Hadley Centre. The general trend for this region is warmer and drier summers and warmer and wetter winters.

Under the medium emissions scenario for 2050, the average summer temperature is estimated to increase by 2.5°C with a range of uncertainty of 1.2°C-4.1°C. The average winter temperature is estimated to increase by 2.0°C with a range of uncertainty of 1.1°C-3.1°C. The average summer rainfall rate is estimated to decrease by 17%, whereas the average winter rainfall rate is estimated to increase by 14%. Sea levels within the Principality have been predicted to rise between 0.10 m and 0.32 m by 2050. Climate change is likely to result in an increase in the occurrence of more extreme flooding events across Wales, as a consequence of increased rainfall levels in winter time. This could potentially result in an increase in the frequency and intensity of flooding events. Over the last 270 years of UK rainfall records, the last 45 years have shown a marked increase in the number of rainfall events. In some locations, this increase coincided with the worst flooding events experienced in the UK – such as the Cumbria floods of 2009. Similarly, a rise in sea level may potentially lead to an increase in flooding along coastal areas and at upstream sites subject to tidal influence (known as storm surge). It is estimated that flood damage costs the UK government approximately £1 billion a year (DEFRA 2012) and with an increase in the frequency and intensity of flooding, this figure is likely to increase. Conversely, climate change may indirectly result in water scarcity issues as a consequence of decreased rainfall levels and increase temperature in the summer time. Additional allowances may have to be integrated into designs for resilience of infrastructure against climate change.

Figure C.5: Climatic Factors



Relation to Flintshire LFRMS

Any construction activities associated with developing (and maintaining) flood defences through implementation of the proposed options for the strategy would increase the release of greenhouse gasses and contribute towards climate change. Opportunities do exist to mitigate any increases and to promote 'greener' solutions to flood defences through the use of sustainable and locally sourced materials during construction, use of renewable technologies and promotion of sustainable drainage systems for new build schemes (recycling grey water, etc.).

C.4. Soils

C.4.1. Geology

The County of Flintshire consists of an area of approximately 439 km², and has a diverse landscape, and geological setting. There are various soil types across the county including coastal frontage, moorland, and glacial and fluvial valleys.

The geology of the county is heavily influenced by the last ice age (Pleistocene Period) which occurred approximately 1.8 million years ago. Ice sheets, glaciers and changes in sea level carved and moulded the underlying bedrock to leave the landscape in its existing form.

The solid geology of the county is complex and variable across the county. Information obtained from the British Geological Survey indicates that on the western boundary of the county the bedrock geology consist

of Ludlow Rocks (Undifferentiated) consisting of Mudstones, Sandstones, and Siltstone rocks from the Silurian Period (419 to 423 million years ago). Moving to the east the bedrock geology changes to Dinantian Rocks (Undifferentiated) consisting on Limestone with Subordinate Sandstone and Argillaceous Rocks from the Carboniferous Period (327 to 354 million years ago). The bedrock geology is again from a younger period as you move further eastward towards the Dee estuary where the underlying geology to the east dating from 316 to 354 million years ago (again the Carboniferous Period) from the Bowland High Group and Craven Group (Undifferentiated) consisting of Mudstones, Siltstone and Sandstone. Along the coastal fringes of the county the bedrock geology is describes as Pennine Lower Coal Measures Formation and South Wales Lower Coal Measures Formation (Undifferentiated) which are sedimentary rock formed approximately 314 to 316 million years ago during the late Carboniferous Period.

Superficial materials are limited across the whole of the county particularly on the western side of the county (reflected in the poor agricultural classification). However, where present the overlying materials are dominated by Diamicton Glacial Till from the Quaternary Period (2 million years ago), Glacial Sands and Gravels with Alluvial and River Terrace Deposits follow the line of the major rivers across the county.

The formation of the geology in the area has left a number of rich veins and deposits of heavy metals, particularly Lead deposits in the county. These deposits have been mined and exploited by the Romans in the 1st Century AD developed significantly during the 1720's. The majority of the mines were concentrated around the Halkyn and Brynford areas and continued to expand and were fully exploited by the Victorians, until they were replaced by the cheap imports of ores from America and Australia in the late 1880's.

C.4.2. Contamination

Flintshire County Council produced a strategy for how the council intends to identify and deal with contaminated land. The first strategy document was published in September 2002 and the latest revision No. 3 was issued in October 2008. The Strategy describes the legislative requirements for sites within its administrative jurisdiction that may be affected by contamination.

Generally Flintshire does not generally have a history of heavy (or polluting) industries in comparison with Merseyside, with the main employment associated with agriculture and forestry. However, a number of potentially polluting industries have occurred in the county as further detailed.

The mining of lead for over 200 years, has resulted in heavy metal contamination in a number of locations across the county and has resulted in a legacy of contamination to soils and groundwater in the Halkyn area. The Halkyn District United Mines Limited was formed through the amalgamation of nine mining companies and two drainage companies which together covered an area of over 40 km². In the 1930's the mine was the largest non-ferrous metal mining company in the UK.

Mining was not restricted to metals, and the coalfields in the County have been worked for hundreds of years and later in the 19th Century came into commercial usage feeding the local iron and steelworks. Until the mid 1990's coal was extracted using open cast mining techniques in the area before the final drift mine closed in 1996 (Point of Ayr Colliery).

During the First World War an explosive factory was established in Queensferry which operated from 1915 until 1918. At the start of the Second World War a Royal Ordinance Factory was located in Rhydymwyn which was involved in the production and storage of weapons filled with mustard gas. In addition a number of aircraft factories were set up in Broughton for the production of bombers between 1937 and 1945, and still survives as a factory today.

Other potential contaminative sources include the steel works at Shotton, and other metal processing industries (smelting and galvanising), rope making, paper production, oil works and chemical manufacture. Additional historical sources of contamination include rail sidings and associated workshops, former gas work sites used to store and refine coal gas associated with street and residential lighting.

FCC are required to keep a register of contaminated sites and record contaminated land within the county boundaries to comply with Part IIA of the Environmental Protection Act 1990 which came into force by the Contaminated Land (Wales) Regulations 2001.

Under Section 15 of the Act the Council is required to keep a Public Register of sites identified as being contaminated. These records are maintained and are available for public review on the Council's website (www.flintshire.gov.uk).

At present (20th of July 2012) only 2 sites are on the register as detailed below:

- Land at Bilberry, Beechwood, Glenroyd and Northwood, Mod Road Alltami, near Mold (kerosene contamination); and
- Wirral View, Connah's Quay (hydrocarbon contamination).

Both of the sites were fully investigated and remediated through insurers in the instance of Bilberry and by the Council with additional assistance from the Welsh Government for Wirral View.

While only a limited number of sites are contained in the register, the majority of contaminated sites (as a result of historical use) are dealt with through the planning process and as such do not appear on the register. In these cases the EAW will impose planning conditions to ensure that these sites are correctly remediated to the appropriate and current standards through qualitative and quantitative assessment and associated remedial strategies.

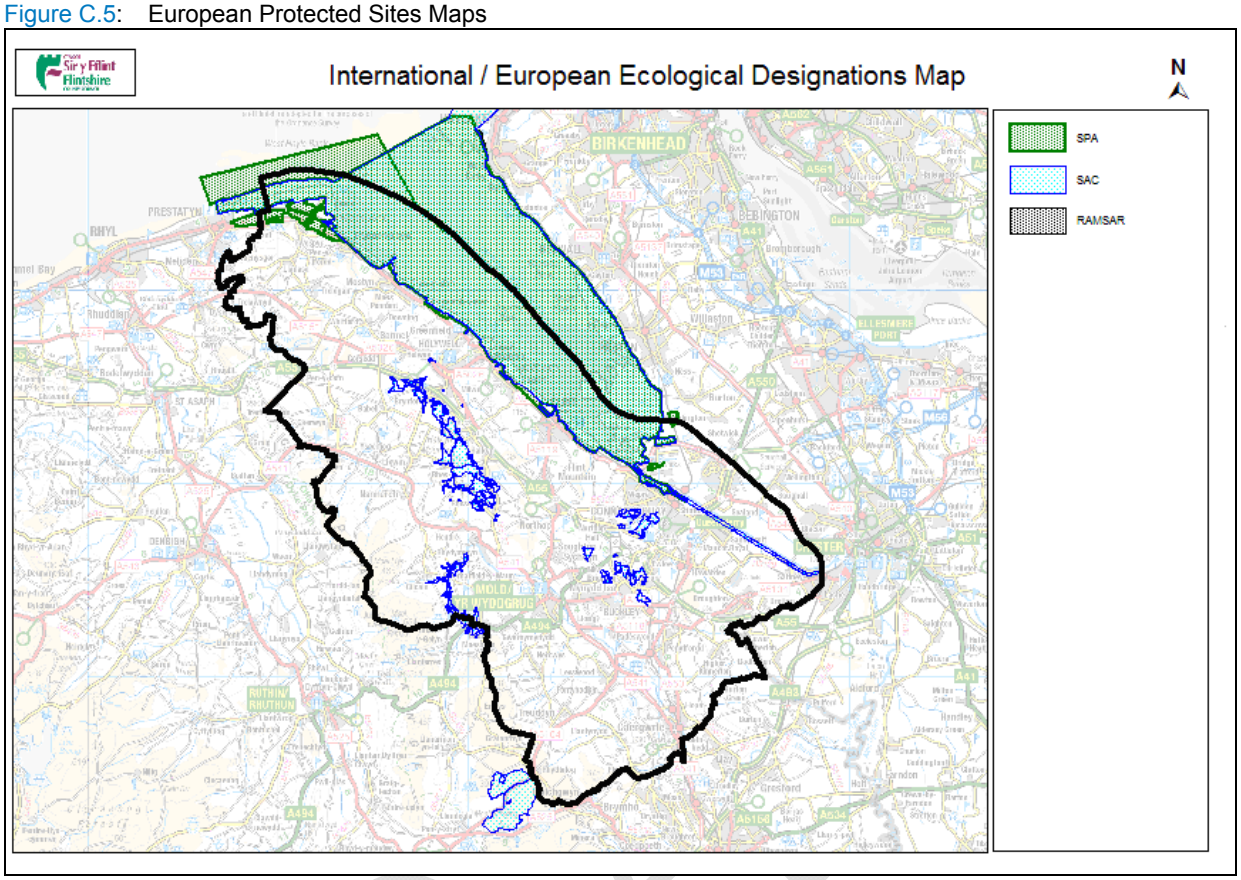
Records obtained from both the Council and the EAW's records, indicate that there are currently 13 authorised landfill sites within the county.

C.5. Biodiversity, Fauna and Flora

Flintshire is home to a rich variety of wildlife which the Council recognises needs protecting and enhancing. As such the Flintshire Biodiversity Partnership has developed a Local Biodiversity Action Plan (LBAP) to identify a list of protected species and habitats that are of conservation concern within the county. The list also includes species identified as being of Principal Importance for Conservation in Wales under Section 42 of the Natural Environment and Rural Communities Act 2006. As part of the LBAP 12 Species Plans and 10 Habitat Plans have been developed to manage and enhance the breeds and varied species and habitats that are present within the county.

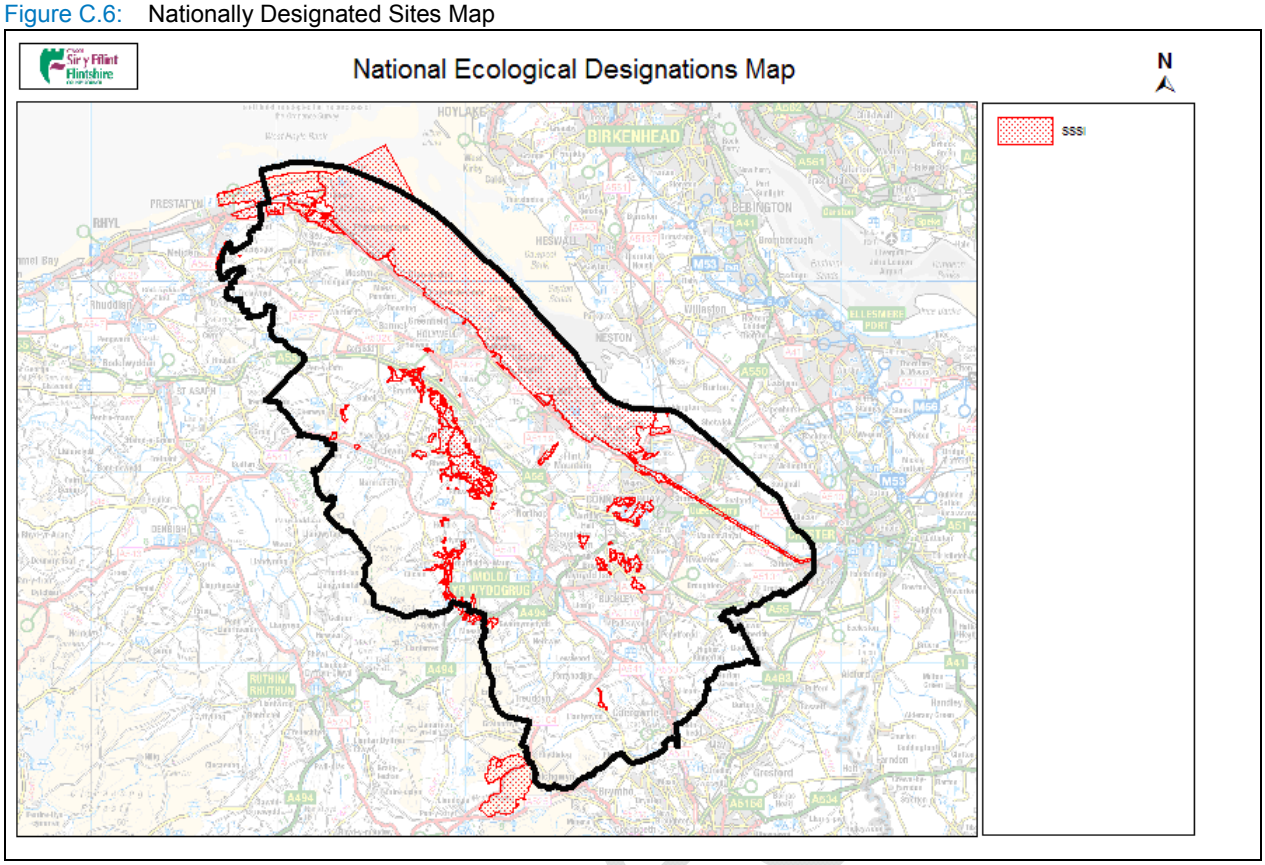
There are 8 European designated sites in Flintshire which include 6 Special Areas of Conservation (SAC) and 2 Special Protection Area (SPA), one of which is also a Ramsar site, which are afforded protection under European legislation. Liverpool Bay SPA is a marine site and lies off the coast of Flintshire. These sites are designated due to a broad range of habitats including mudflats, sandflats, salmarsh, semi-natural broadleaved woodland, blanket bog, and dry heath. In addition to the geological and habitat features, the areas have been identified as providing prime habitats for breeding and feeding area for Schedule 1 birds, flowering water plants, the rare floating water-plantain, great crested newt, natterjack toad, otters, and important fish species such as sea, river and brook lamprey, bullhead and Atlantic salmon.

Figure C.5: European Protected Sites Maps



There are a large number of nationally designated sites which are afforded statutory protection at a national level on grounds of their wildlife and geology. These designations ensure the appropriate protection and management are afforded to the sites to ensure they are preserved for future generations. They include 25 Sites of Special Scientific Interest (SSSI) designated for their geology, biodiversity or habitat quality (a further SSSI lies exactly on the boundary of Flintshire within Denbighshire). In additional 25 Regionally Important Geological Sites (RIGS) are present within the county. While these are non-statutory designations they are chosen on the basis of their scientific, educational, historic and aesthetic value.

Figure C.6: Nationally Designated Sites Map



On a local level there is 1 Local Nature Reserves (LNR) which is designated for a broad variety of flora, fauna, geology, and biodiversity

Relation to the Flintshire LFRMS:

The nature of the impacts on biodiversity, flora and fauna associated with the options for the LFRMS can be both positive and negative. While the construction of flood alleviation schemes may lead to the protection of certain habitats and the option to create new habitats through mitigation, the changes in the area may cause irreversible changes to the hydrological balance and effect foraging habitats for mobile species. These changes could negatively affect other habitats and biodiversity and move the flood risk further downstream. However, any such changes may create opportunities by establishing new habitats, and increasing the biodiversity in the area.

C.6. Landscape

Flintshire is the north-eastern gateway to Wales, and is bounded by the counties of Wrexham, Denbighshire and Cheshire. Wirral Metropolitan Borough shares a boundary along the tidal estuary of the River Dee. The extreme north-west of the County is bounded by the Irish Sea, while the built up area of the City of Chester straddles the English/Welsh border at Saltney. The south-west of the county is bounded by the Clwydian Hills, which form a distinct boundary with Denbighshire. Apart from the urban strip along the Dee Estuary, much of the County is rural and there are several areas of natural beauty (Flintshire Housing Strategy)

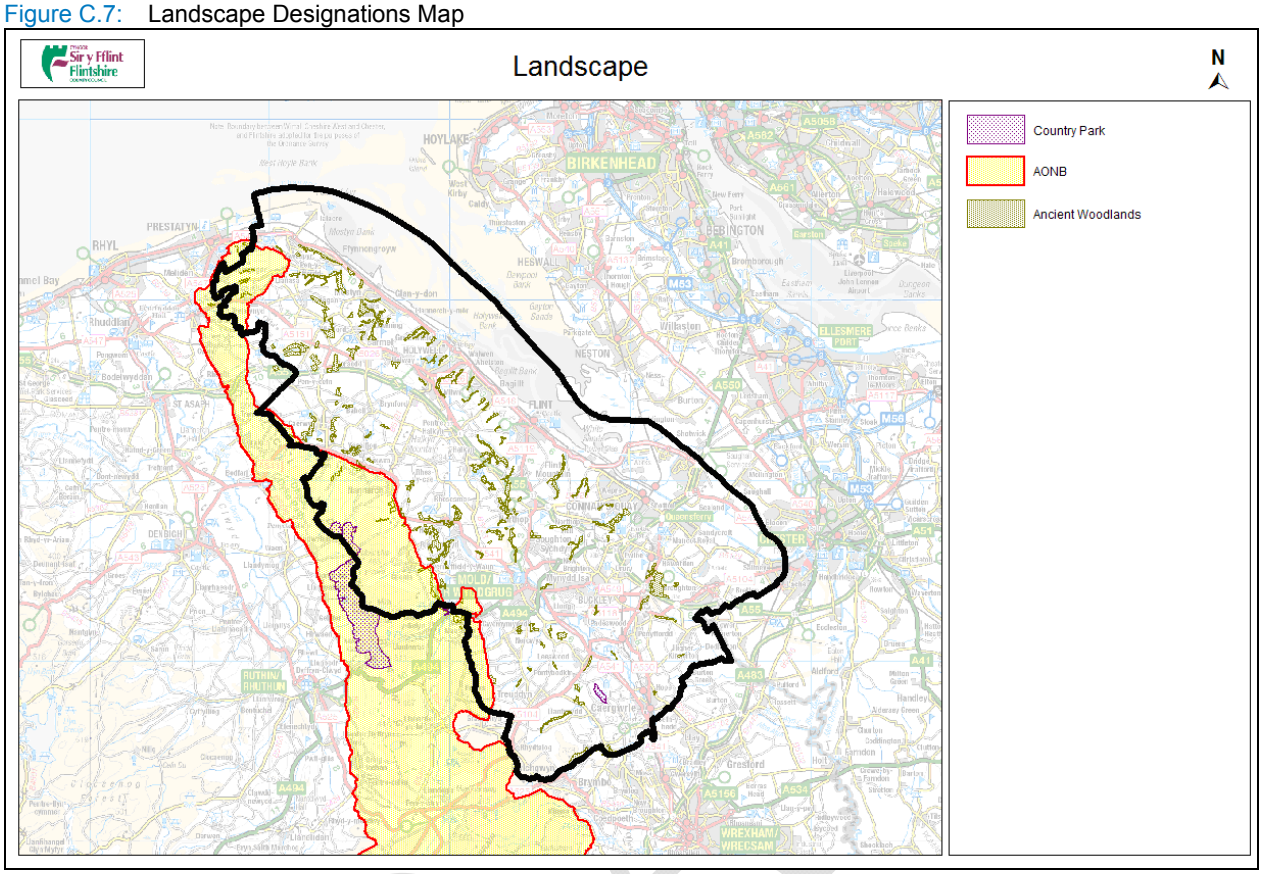
Flintshire has diverse landscape character types ranging from linear undulating hills and heather moorland of the Clwydian Range (Area of Outstanding Natural Beauty (AONB)) to the coastal and estuarine flats of the River Dee.

The Holywell and Halkyn Mountain landscape of historic importance lies within Flintshire. It is an upland limestone plateau between the Clwydian Hills and the Dee Estuary in northern Flintshire. It comprises extensive and highly distinctive relict 18th and 19th century lead mining remains, associated features and settlements. A small part of the Vale of Clwyd landscape of historic importance lies in Flintshire. This is a broad lowland valley, edged by the Clwydian Hills that is centred on Denbighshire. It is the best surviving and most complete historic part of the Vale of Clwyd. It contains significant evidence of the late prehistoric and medieval land use (Flintshire UDP SA Report).

Flintshire falls partly within the Clwydian Range AONB. The Clwydian Range was designated as a AONB in 1985 under Part VI of the National Parks and Access to the Countryside Act 1949. The purpose of the AONB designation is to conserve the most important landscapes of the nation for the benefit of this and future generations. The Clwydian Range forms a 35 km north – south chain of undulating hills extending to 160 km² and rising to 554 metres at the summit of Moel Famau in the centre of the area. The hills stretch from the Vale of Clwyd in the west to the foothills of the Dee Estuary to the east; from Prestatyn Hillside in the north to the Nant y Garth pass in the South. Impressive limestone outcrops burst through the surface in a number of places down the eastern side of the range, most notably at Prestatyn Hillside, Llanferres and Loggerheads which boast rich grasslands of orchids and other wildflowers that provide a haven for butterflies. The hills are cut in places by deep valleys carrying the area's two main rivers, the Alyn and the Wheeler, often disappearing under ground into hidden watercourses amongst the limestone. The varied landscape types within the Clwydian Range AONB support a rich diversity of wildlife species and habitats. Within the AONB a range of ‘semi-natural’ vegetation occurs including heather moorland, limestone grassland, rivers and woodland. The AONB has a wealth of archaeological and historic remains which date from the early prehistoric period right through to the Second World War. Sites range from the massive Iron Age Hillforts to the less conspicuous crop marks and finds in the lower areas. Many of these archaeological sites are Scheduled Ancient Monuments and are afforded protection through Cadw: Welsh Historic Monuments. Many other historic features, such as boundary stones, village wells and milestones are not protected and as such are much more vulnerable (Clwydian Range website).

CCW, Cadw, and the International Council of Monuments and Sites (ICOMOS UK) in association with the Welsh Archaeological Trusts (Clwyd Powys and Gwynedd Trusts) and the Royal Commission on Ancient and Historic Monuments in Wales (RCAHMW) have compiled a Register of Landscapes of Historic Interest in Wales and Flintshire. The Register comes in two volumes and describes 58 landscapes in Wales that are of outstanding or special historic interest.

Figure C.7: Landscape Designations Map



Relation to Flintshire LFRMS:

The options proposed within the strategy may include construction of flood defences, changes in flood frequency and water levels within the county that have the potential to have negative impacts on the landscape value and character of the area. Alternatively, opportunities may exist to enhance the existing area by creating new landscape features, through sympathetic landscape designs. Reduction of flood risk could also help protect landscape areas and features from flood damage.

C.7. Cultural Heritage (architectural and archaeological heritage)

The Council has a duty to preserve listed buildings and designated Conservation Areas. The county possesses a wealth of heritage assets and Conservation Areas which are not only designations of historical importance in UK terms; they also generate significant money into the regional economy. The council has recognised the value of the areas to the local community, approving conservation management plans that ensure that the areas of historical importance are maintained through careful planning and sympathetic alterations.

C.7.1. Listed Buildings

The Welsh Government is required by law to compile lists of buildings of special archaeological or historic interest. The work is conducted by Cadw (the historic environment service of the Welsh Government) and each building or structure of interest are classified under one of three Grades; I, II* and II depending on their significance (Grade I assessed as highest significance). Based on the current records held by the

council there are approximately 1,000 listed buildings within Flintshire varying from medieval halls to Edwardian villas (see Figure 5.9).

C.7.2. Scheduled Ancient Monuments

There are currently around 132 Scheduled Ancient Monuments in the Flintshire area which are protected under the Ancient Monuments and Archaeological Areas Act 1979 (see Figure 5.9). The monuments are scheduled and recorded through Cadw, and are based on monuments of national importance and cover a diverse range of archaeological sites. Scheduled monuments are often in a ruinous or semi-ruinous condition or take on the form of earthworks. More complete structures of national significance are usually protected as listed buildings. There are also many unscheduled archaeological monuments and remains in Flintshire that are not protected.

C.7.3. Conservation Areas

According to the FCC website there are currently 32 Conservation Areas in Flintshire, many of which were designated in the early 1970's (see Figure 5.9). They range from Edward I strongholds, such as Caerwys, estate villages, such as Llanasa and Hawarden, former industrial villages, such as Ffynnongroew, to places with strong monastic associations, such as Holywell and Pantasaph. 9 Conservation Areas, including Cadole and Cilcain, also lie in the Clwydian Range AONB, which straddles both Denbighshire and Flintshire. Conservation Areas are areas of special architectural or historic interest. The local planning authority has a statutory duty to designate them and to preserve and enhance their special character or appearance. A number of features may make up the character of a Conservation Area, such as building materials, styles and features, a particular road layout or development pattern. Archaeology, the local topography, trees, landscaping, the wider landscape, views and vistas are also important (FCC website).

C.7.4. Historic Parks and Gardens

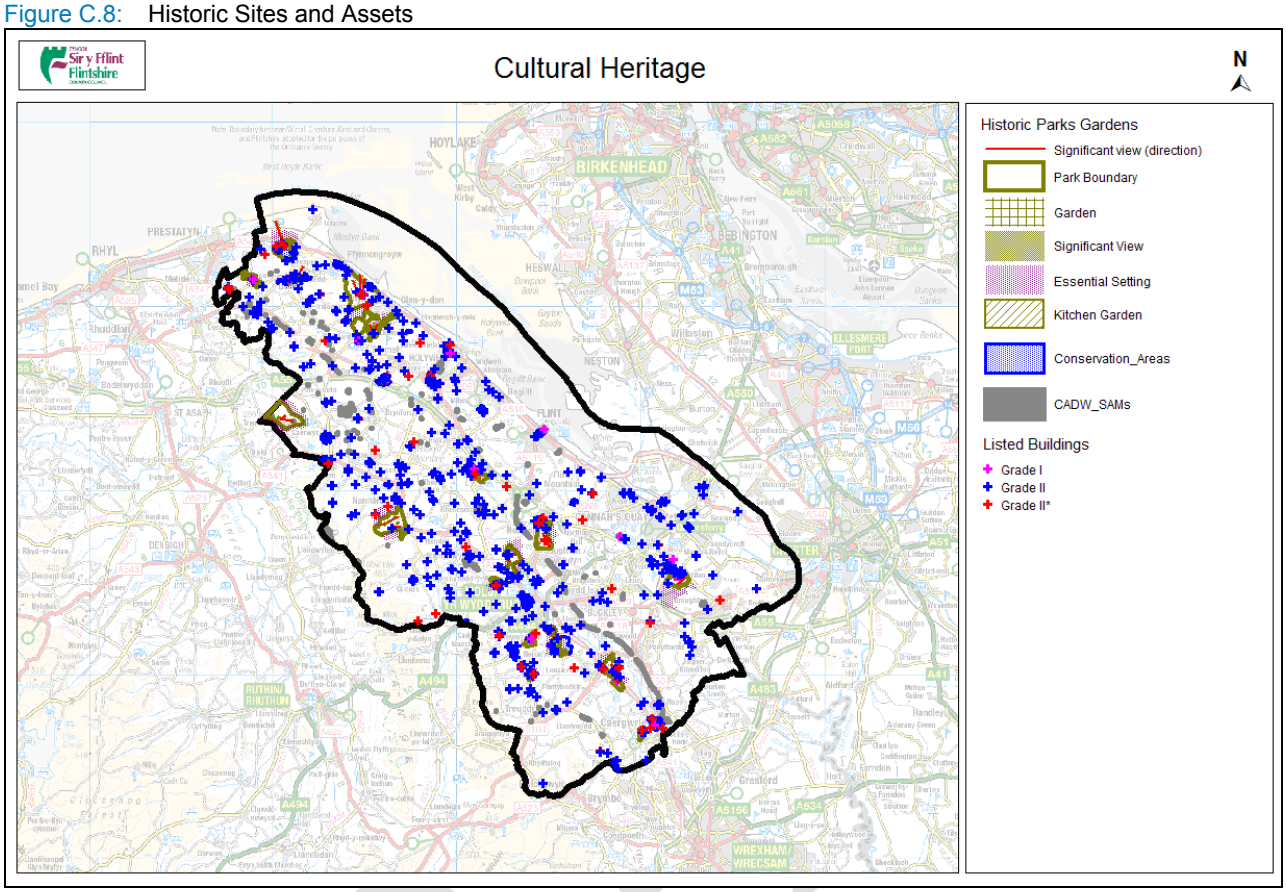
Flintshire has a rich inheritance of historic parks and gardens and they form an important and integral part of the historical and cultural fabric of the county. Within the county there are 24 areas, however unlike listed buildings and Conservation Areas, historical parks and gardens are not afforded legal protection within the UK (see Figure 5.9). However, it is important not to let an insensitive development harm the historical and visual character of these areas and consultation during the planning process is a mechanism to try to prevent any adverse development which is considered out of character.

C.7.5. Un-Designated Historic Assets

There are a substantial number of undesignated historic assets within the County with regional and local importance. Some categories of monuments can be particularly vulnerable to flooding and flood management actions including bridges, harbours, World War II defensive structures and coastal/river-side monuments.

The county of Flintshire falls under the Clwyd Powys Archaeological Trust. The Trust hold a regional Historic Environment Record (HER). This is a database and archive of information about sites of archaeological and historical interest within the area. The HER contains data on Listed Buildings, Scheduled Ancient Monuments, individual find spots, and other archaeological features.

Figure C.8: Historic Sites and Assets



Relation to Flintshire LFRMS:

Flooding has the potential to cause negative impacts on cultural heritage within the county. However, the construction of flood defences may negatively impact the historical landscape character of an area, while protecting the asset itself.

C.8. Population and Human Health

C.8.1. Population

According to the 2011 Census (published in July 2012), the population of Flintshire is estimated to be approximately 152,500 people. This indicates an increase of approximately 2.6% from 2001 to 2011. Wales as a whole experienced a 5.5% increase in population from 2001 to 2011.

Records provided from the Office of National Statistics (ONS) indicate that Flintshire has a population density of 348 people per km^2, this is higher than Wales (147 people per km^2). Population density is at the highest across the coastal fringes of the county and along major transport routes. There are significant rural areas with low population density (Flintshire Housing Strategy).

Flintshire has no single key centre. Population is concentrated in the central and eastern part of the County, around Flint, Mold, Buckley and Deeside. In addition the Dee Estuary gives a linear settlement pattern stretching across Flintshire from east to north-west. Elsewhere, the west and south of Flintshire

forms a substantial and more dispersed rural hinterland, largely characterised by smaller villages. (Flintshire UDP)

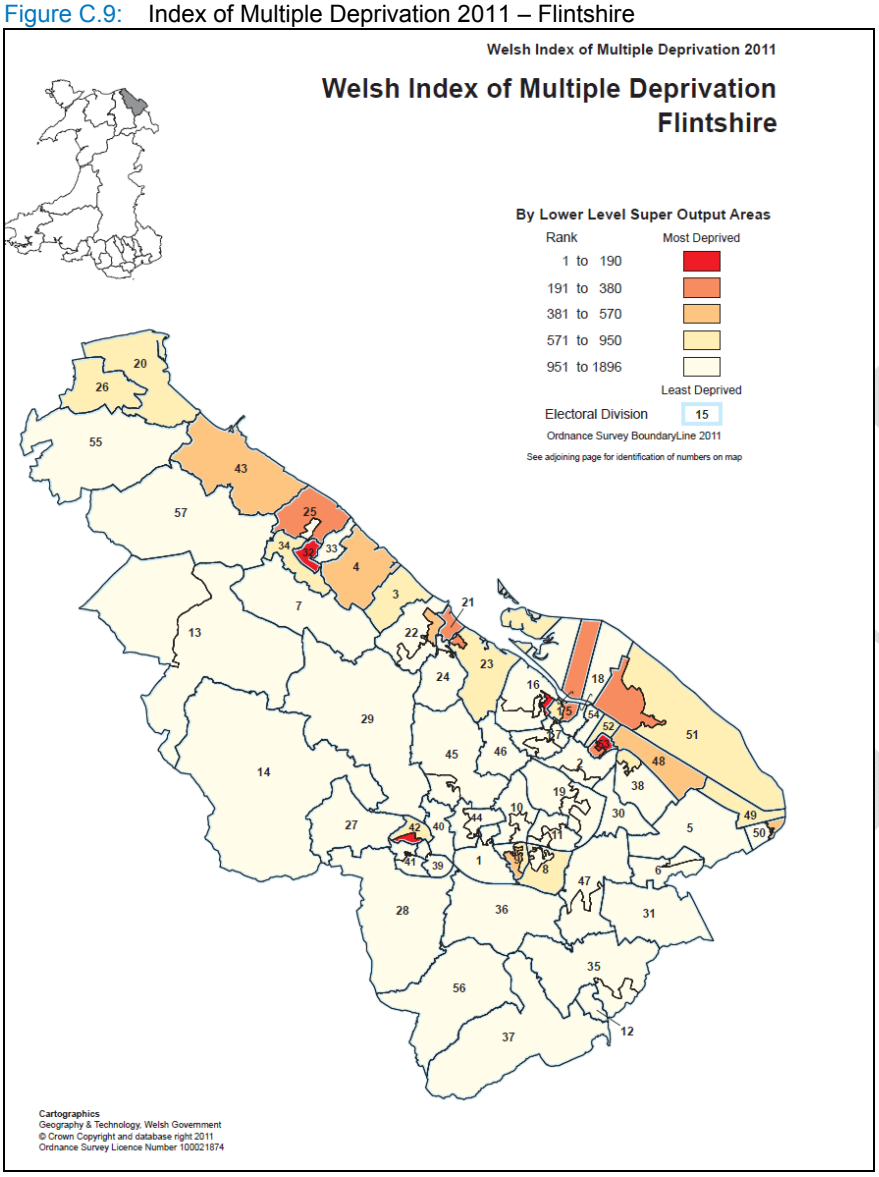
C.8.2. Human Health

The health profile of a local authority considers a range of factors that provide information on the overall current population health state. Some of the key headline issues in Flintshire are:

- Life expectancy in males and females in above the Wales average;
- The percentage of adults with a limiting long-term illness is lower than the Wales average; and
- The percentage of adults who are obese is lower than the Wales average.

Indices of Multiple Deprivation (IMDs) are used to measure the level of deprivation in a Super Output Area (SOA). They are calculated from a range of scores based on income, employment, health and disability, education, skills and training, barriers to housing and services, crime and disorder and the living environment. According to the Welsh Index of Multiple Deprivation 2011 Flintshire has four Lower Super Output Areas (LSOA) which are considered to be the most deprived areas of the Country. These are Holywell Central, Shotton Higher, Mold West, and Connah's Quay Golftyn. In general the more deprived areas in Flintshire tend to be located along the eastern side of the County.

Figure C.9: Index of Multiple Deprivation 2011 – Flintshire



Source: Welsh Government StatsWales

C.8.3. Economy and Employment

The relative success of the economy in Flintshire today is very much a reflection of the well-resourced, multi-agency efforts in attracting significant new investment and jobs to the area following the setbacks of the early 1980s when the textile and steel industries collapsed.

Flintshire acts as a key focal point for the wider regional economy of North Wales and the North West, providing, for example, 'high-value' manufacturing employment at Deeside Industrial Park and Airbus at Broughton. Some of the key economic indicators suggest that Flintshire's economy is currently strong and performing well: unemployment is relatively low, GDP and economic activity are relatively high.

However there are still weaknesses in the County economy such as pockets of high unemployment and deprivation in both rural and urban parts of Flintshire; low work force qualifications; high dependence on manufacturing employment; and a weak enterprise culture.

The Flintshire UDP has estimated that future employment land requirements will be equivalent to a land take up rate of between 12 and 19 hectares per annum, depending on whether large 'one-off' developments are included (e.g. BHP terminal and Powergen) (Flintshire UDP).

C.8.4. Tourism

Tourism is possibly an area of the local economy which is underdeveloped in Flintshire as it is often overlooked by visitors on their way west to the more well known attractions of Snowdonia and the North Wales seaside towns. However, the tourist attractions of Flintshire are ideal for short breaks, a stop off en-route, or a day out. They include the Clwydian Range AONB, the traditional seaside resort of Talacre Beach, the Greenfield Valley Heritage Park and Wepre Park along with traditional market towns such as Mold.

The most recent tourist accommodation survey for N.E. Wales was in 1995**,** which identified a total of 28,361 bedspaces for Flintshire of which 22,361 bedspaces were accounted for by static caravans. The Scarborough Tourism Economic Activity Model (STEAM) has been adopted by North Wales Authorities and has estimated a total tourism expenditure within Flintshire of £107m in 2001 and some 2.4 million tourist visits. Approximately 2,000 full time equivalent jobs are estimated to be supported by the tourism industry in Flintshire (Flintshire UDP).

Key Population and Human Health Trends:

- According to the 2011 Census the population of Flintshire has increased by approximately 2.6% from 2001 to 2011 and is predicted to continue to increase;
- Life expectancy in both males and females is above the Wales average;
- Future employment land requirements will be equivalent to a land take up rate of between 12 and 19 hectares per annum; and
- Room for growth has been identified in the tourism sector.

Relation to Flintshire LFRMS:

The LFRMS and the options considered in it will seek to manage flood risk for the benefit of the population of Flintshire.

The LFRMS options considered may affect public access to recreational features, goods and public services that can make a material difference to their Quality of Life.

The perceived level of flood risk that communities are exposed to may also affect levels of stress and impact on Quality of Life.

The perceived level of flood risk that communities are exposed to may also affect levels of stress and impact on Quality of Life.

C.9. Material Assets

C.9.1. Housing

The population of Flintshire has grown significantly over the last 10 years, and it is the most densely populated area in terms of housing in North Wales. There are approximately 62,000 households in the County, the majority of whom are owner-occupiers living in houses or bungalows. Flintshire has fewer vacant dwellings than the North Wales, Wales and UK averages (Flintshire Housing Strategy).

Population increase in Flintshire is likely to generate a significant need for new dwellings. According to the Flintshire UDP a projected demand of 7,400 dwellings will be required over the life of the UDP. This will cover predominantly the needs of local people, but also allows for the needs of those who move into the area. Flintshire has a history of net in-migration which is a reflection of its border location, relative economic prosperity and attractive environment.

C.9.2. Community Assets and Facilities

There are 4 community hospitals in Flintshire. These are: Deeside Community Hospital; Flint Community Hospital; Holywell Community Hospital; and Mold Community Hospital.

There are approximately 70 primary schools, 12 secondary schools and two colleges, Deeside College; and the Welsh College of Horticulture.

The Flintshire Library and Information Service operates a network of local libraries, a mobile library and a service for those who are housebound. The mobile library provides three-weekly access to Flintshire library stock for small communities that do not have a branch library. There are 13 public libraries at: Broughton; Buckley; Connah's Quay; Flint; Halkyn; Hawarden; Holywell; Hope; Mancot; Mold; Mynyold Isa; Queensferry; Saltney

C.9.3. Energy and Power Assets

There are three main power stations in Flintshire. These are described below.

Deeside Power Station is a combined cycle gas turbine power station owned by International Power and opened in 1994.The station is sited at the head of the estuary of the River Dee near the English-Welsh boarder in the Alyn and Deeside district of Flintshire.

Connah's Quay Power Station and Gas Treatment Plant is a natural gas-fired combined cycle gas turbine power station located on the Welsh side of the Dee Estuary. It is owned by E.ON UK. Gas from Liverpool Bay is delivered to site through a 27 km pipeline from the Point of Ayr gas terminal, operated by BHP Petroleum. A back-up gas supply is available through a 2.6 km pipeline connected to the National Transmission System at Burton Point. The gas treatment plant at Connah's Quay processes gas surplus to power station requirements for export into the National Transmission System (NTS).

Shotton is a Combined Heat and Power Station. It is located next door to the Deeside Power Station. It was opened in 2001 and is currently owned by GDF Suez.

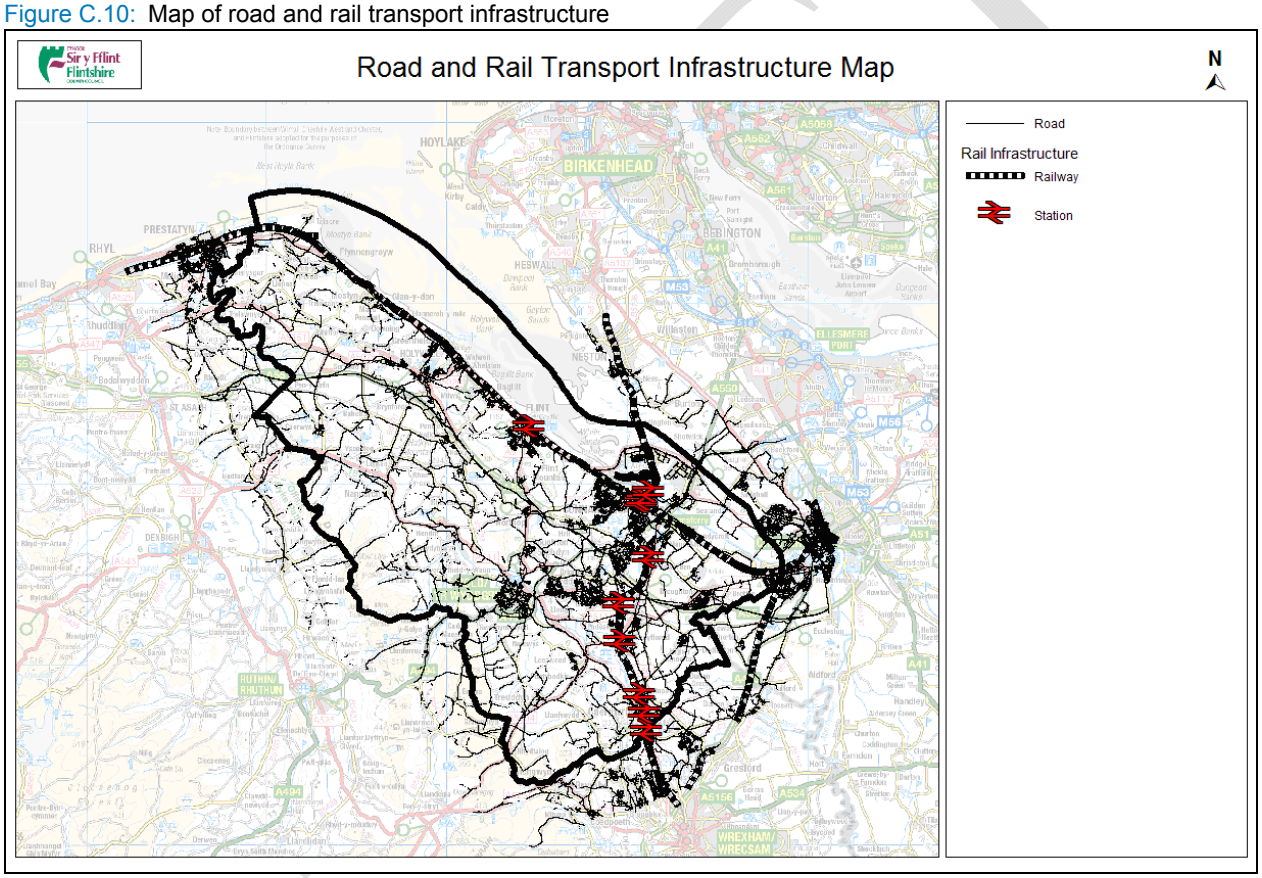
There are several off shore wind farms off the coast near Flintshire. The nearest are North Hoyle Offshore Wind Farm (operating), and Gwynt y Mor Offshore Wind Farm (consented).

C.9.4. Transport

Flintshire contains the strategic transport links between North Wales and England. The A55 road forms part of the E22 Trans European Road Network (TERN), linking Dublin to continental Europe. As the County is highly accessible to the M56 corridor it is functionally linked to the wider North West Region and is closely related, in employment and housing terms, to west Cheshire and the Wirral with significant commuting movements across the Border. The North Wales Coast railway line provides important links between North Wales and the remainder of the National Rail Network.

Within the County there are a number of key transport interchanges including Shotton (Wrexham – Bidston railway line with North Wales Coast railway line & local bus services), Flint (railway station and local bus services), Mostyn (port/railway) and minor interchanges on the Wrexham – Bidston railway line at Cefn y Bedd, Caergwrle, Penyffordd, Little Mountain (Buckley) and Hawarden. Furthermore, there are transport hubs at Mold and Holywell Bus Stations. The key roads in the County are the A55(T), A494(T) and A548.

Figure C.10: Map of road and rail transport infrastructure



C.9.5. Waste Management Facilities

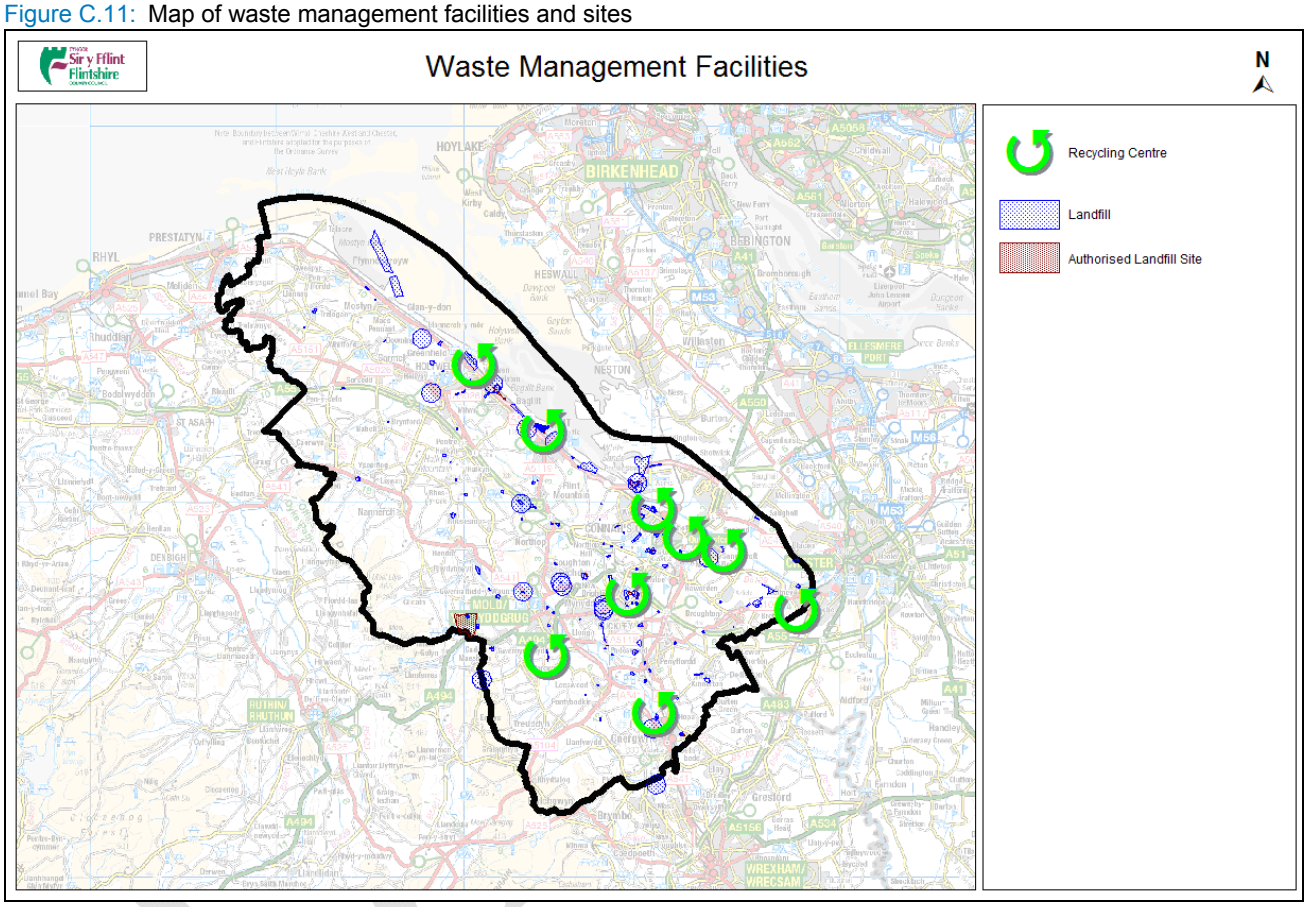
According to the Flintshire Waste Management Strategy, Flintshire households together generate on average 89,527 tonnes of municipal waste every year. It should be noted that municipal waste volumes are not representative of all waste produced in the County and broadly speaking form 20% of all wastes produced in Flintshire. FCC waste infrastructure includes:

- A Material Recovery Facility (MRF) at Spencer's Industrial Estate, Buckley;

- Transfer Pad – Bulking Residual Waste at Brookhill Landfill Site;
- Recycling and Bulking and Baling Facility at Unit 5&6 Castle Park Industrial Estate, Flint;
- 26 Bring sites countrywide;
- Windrow Compost Facility at Greenfield Business Park; and
- 8 recycling parks.

There are also 13 authorised landfill sites within the county. These are not owned by FCC.

Figure C.11: Map of waste management facilities and sites



According to the North Wales Regional Waste Plan the future capacity requirements for waste facilities in Flintshire are:

- Material recovery facility for primary source segregation = 95,771 m^3;
- Open windrow composting plant = 13,286 m^3;
- Municipal solid waste composting plant = 26,572 m^3;
- In-vessel composting plant = 26,572 m^3;
- Mechanical biological treatment plant = 109,217 m^3;
- Energy from waste plant = 42,044 m^3;
- Facility for processing or re-use of inert waste = 343,647 m^3;
- Landfill = 112,266 m^3;
- Materials recovery facility for non-inert waste = 6,913 m^3;
- Energy from waste plant for non-inert waste = 2304 m^3;
- Anaerobic digestion plant = 2,304 m^3;

- Civic amenity site = 6,000 m^3;
- Other transfer facilities = 26,000 m^3; and
- TOTAL = 812,896 m^3.

Key Material Asset Trends:

- Future population increase is likely to generate a significant need of new dwellings. The Flintshire UDP identified a projected demand of 7,400 new dwellings over its life (2000 – 2015);
- Flintshire has a history of net in-migration; and
- Future population increase is likely to lead to additional capacity and land required for future waste arisings.

Relation to Flintshire LFRMS:

The LFRMS options will seek to manage flood risk to critical infrastructure and material assets within Flintshire. The implementation of options has the potential to disrupt critical transport infrastructure (such as road or rail networks), waste management facilities, utilities (such as clean water) or access to community care facilities (hospitals or health centres). The location of such infrastructure may influence the range of available options.

Appendix D. Options Assessment

8.2.4 LFRMS Objective 1 Assessment

		LFRMS Objective 1: To improve the understanding of local flood (surface water, groundwater and ordinary watercourses) and coastal risks							
		Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6	Measure 7	Measure 8
Strategic Environmental Assessment Objectives	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST - - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT 0
		LT - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT 0
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST - - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST + (T)
		MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT 0
		LT - - - (P)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT 0
	3. Enhance human health and wellbeing through reducing flooding effects	ST - - - (T)	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST ++ (T)	ST ++ (T)	ST + (T)
		MT - - - (T)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T)	MT +++ (T)	MT 0
		LT - - - (T)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T)	LT +++ (T)	LT 0
	4. Protect and enhance biodiversity and geo-diversity across the County.	ST - - (T/P)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST 0	ST 0
		MT - - (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT + (T)	MT + (T)	MT 0
		LT - - (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT + (T)	LT + (T)	LT 0
	5. Protect and enhance landscape quality and character across the County.	ST - - (T/P)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST 0	ST 0	ST 0
		MT - - (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT 0	MT 0	MT 0
		LT - - (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT + (T)	LT + (T)	LT 0
	6. Protect historic assets and their landscapes.	ST - - (P)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT - - - (P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT ++ (T/P)	MT + (T)	MT ++ (T)	MT 0
		LT - - - (P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT + (T)	LT ++ (T)	LT 0
	7. Educate, manage, plan and adapt for the effects of climate change.	ST - - (P)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST ++ (T)	ST + (T)	ST 0
		MT - - - (P)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT 0
		LT - - - (P)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT 0
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST - - - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST + (T)
		MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT 0
		LT - - - (T)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T/P)	LT ++ (T)	LT +++ (T)	LT 0
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST - - (T/P)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST 0	ST + (T)	ST 0
		MT - - - (T/P)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT 0	MT ++ (P)	MT 0
		LT - - - (T/P)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (P)	LT 0

Measure 1 – Do nothing
If the FCC flood management team, Risk Authorities and the public do not understand flood risks and issues then the risks cannot be effectively managed and flooding will continue to be a problem and furthermore is likely to get worse as climate change affects cause more frequent and severe weather events. This is likely to have significant negative effects on flood risk reduction, human health, infrastructure, property and businesses, historic assets and soils. In addition, the measure would not allow for climate change planning and adaptation. There are also likely to be moderate negative effects on biodiversity, water quality and landscape from flood damage.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
The flood management team keep up-to-date with current flood risk knowledge and flood management techniques and communicate these to the public so that all have an understanding of current flood risk issues. As more data is recorded and built up over time the understanding of risks and risk areas will increase and more efficient and effective management can be implemented to reduce flood risk. This will have benefits in terms of protecting humans, property and businesses, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage. Business as Usual also involves keeping abreast of climate change effects and projectors and taking these into consideration in planning flood management.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is felt that more measure would also be required.

Measure 3 – Record all flooding incidents and where appropriate carry out flooding investigations
This measure would ensure that the process for recording flood incidents and carrying out flood investigation was consistent and transparent, allowing data to be used for future flood management. This is likely to result in more effective flood management, identifying responsibility, bringing all useful information together in one place, providing an understanding of the incident, outlining possible causes of flooding and potential long-term solutions to protect people and their homes from flooding. This is likely to have benefits in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage in the future. It will also help plan for future climate change effects.
SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 4 – Record all appropriate structures/assets on watercourses so that ownership and responsibility can be identified in the event of a problem with flooding
This measure would ensure a consistent and complete database was kept up-to-date of flood and drainage assets in the County. This would help plan maintenance and upgrading of assets and identify where issues may occur. This measure would also help ensure that everyone knew who owned which assets and what their responsibilities are regarding those assets. This would help reduce flood risk as people are more likely to take ownership and responsibility of looking after their own assets, and also if a flood event occurs there will be no disagreement over whose responsibility it is to take action. However, just because people know they have responsibilities doesn't mean they will carry them out. The measure is likely to have benefits in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage. It will also help plan for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Develop a consistent approach to the designation of flooding/drainage structures
This measure is similar to measure 4 and will therefore have similar effects. It would ensure a consistent and complete database was kept up-to-date of flood and drainage assets in the County. This would help plan maintenance and upgrading of assets and identify where issues may occur. This is likely to have benefits in terms of protecting humans, property, infrastructure, water quality, biodiversity, landscape, soils and historic assets from flood damage. It will also help plan for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 6 – Identify and assess condition of existing drainage assets within the County, to prioritise capital investment
This option would provide a more proactive active looking at the condition of drainage assets to identify what and when assets will need upgrading to prioritise investment. This is likely to have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses. It is likely to have minor positive effects on biodiversity, water quality, historic assets and climate change adaptation and planning.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, this is the same as Measure 3, Objective 6. Therefore, only one or the other needs to be included in the LFRMS.

Measure 7 – Develop a county wide map based record of flood risk assets, flood investigation reports, historical flooding and areas at risks of flooding to allow a proactive risk management approach to be taken by the flood authority
This measure is likely to have significant positive effects in terms of better understanding and reducing flood risk and will have a positive impact in terms of protecting human health, infrastructure, property and businesses. Larger benefits are likely to be felt in the medium and long term as more data is recorded and fed into the model making it more accurate. Reduced flood risk will have moderate positive effects for biodiversity, water quality, historic assets and soils. The model should also help manage and plan for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 8 – Digitalise all relevant paper reports and information to protect historical knowledge and make it accessible for future flood investigations
This measure is unlikely to have significant effects but is important for preserving past knowledge on flood risk and flooding incidents which may help in the future. Effects are likely to be short term as once all the paper reports and information are digitalised is likely that a move will be made to digital and all subsequent reports will automatically be digital. There will be minor positive effects in terms of flood risk reduction and protection of humans, property, infrastructure, businesses, historic assets and water quality.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

8.2.5 LFRMS Objective 2 Assessment

		LFRMS Objective 2: Increasing individual and community awareness and preparedness for flood and coastal erosion events and the impacts of climate change on flood risk								
		Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6	Measure 7	Measure 8	Measure 9
Strategic Environmental Assessment Objectives	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST – (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT - - (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT ++ (T)	MT + (T)	MT + (T)
		LT - - (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)	LT ++ (T)	LT + (T)	LT + (T)
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST - - (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
		MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)	MT ++ (T)
		LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)	LT ++ (T)
	3. Enhance human health and wellbeing through reducing flooding effects	ST - -	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
		MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)	MT ++ (T)
		LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)	LT ++ (T)
	4. Protect and enhance biodiversity and geo-diversity across the County.	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0
		MT – (T)	MT 0	MT 0	MT 0	MT 0	MT 0	MT + (T)	MT 0	MT 0
		LT – (T)	LT + (T)	LT + (T)	LT + (T)	LT 0	LT + (T)	LT + (T)	LT + (T)	LT + (T)
	5. Protect and enhance landscape quality and character across the County.	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0
		MT – (T/P)	MT 0	MT 0	MT 0	MT 0	MT 0	MT 0	MT 0	MT 0
		LT – (T/P)	LT + (T/P)	LT + (T/P)	LT + (T/P)	LT 0	LT + (T/P)	LT + (T)	LT + (T/P)	LT + (T/P)
	6. Protect historic assets and their landscapes.	ST - - (P)	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST + (T)	ST + (T/P)	ST + (T)	ST + (T/P)	ST + (T/P)
		MT - - - (T/P)	MT + (T/P)	MT + (T/P)	MT + (T/P)	MT + (T)	MT + (T/P)	MT ++ (T)	MT + (T/P)	MT + (T/P)
		LT - - -(T/P)	LT + (T/P)	LT + (T/P)	LT + (T/P)	LT + (T)	LT + (T/P)	LT ++ (T)	LT + (T/P)	LT + (T/P)
	7. Educate, manage, plan and adapt for the effects of climate change.	ST – (T)	ST 0	ST 0	ST 0	ST 0	ST 0	ST + (T)	ST 0	ST 0
		MT – (T)	MT + (T)	MT + (T)	MT + (T)	MT 0	MT + (T)	MT +++ (T)	MT + (T)	MT + (T)
		LT - - (T)	LT + (T)	LT + (T)	LT + (T)	LT 0	LT + (T)	LT +++ (T)	LT + (T)	LT + (T)
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST - - (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
		MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)	MT ++ (T)
		LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)	LT ++ (T)
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST – (T/P)	ST 0	ST 0	ST 0	ST + (T)	ST 0	ST + (T)	ST 0	ST 0
		MT - - (T/P)	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT ++ (P)	MT + (T)	MT + (T)
		LT - - (T/P)	LT + (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)	LT ++ (P)	LT + (T)	LT + (T)

Measure 1 – Do nothing
Doing nothing will have significant negative effects in terms flood risk, human health and impacts on property, infrastructure, businesses and historic assets because individuals and communities will not be aware of the risk and what measure they should put in place to reduce flood risk and flooding consequences. In the medium and long term as frequency and severity of flooding events increase with climate change effects, doing nothing to prepare for this will have negative impacts on water quality, biodiversity, landscape and soils.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
Currently FCC carry out some awareness raising campaigns and events, especially in high flood risk areas. This helps increase public awareness of flood risks and what to do to prepare for a flood. Therefore, this measure is likely to have positive effects on reducing the impact and consequences of flooding for human health, infrastructure, property, businesses and historic assets. As understanding and awareness increases there may be beneficial effects for biodiversity, landscape and soils from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 3 – Raise public awareness of the impacts of climate change on flooding and (failure of) coastal defences
Climate change will have significant impacts on coastal erosion and flooding in the future. It is important that people are aware of this so that they can plan for the future and prepare and adapt their homes for future flood risk. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting historic assets, property and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Publish a clear public awareness strategy and communicate it (Workshops, public awareness events, publish information on the Council Website, adverts in local press)
Implementing a public awareness strategy through a range of media should engage with a wide variety and geographical distribution of people. The more people that are aware of flood risk and how to deal with it the more benefits will be gained in terms of flood protection. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting historic assets, property, assets and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Develop a capacity to deal effectively and appropriately with non-emergency flood incidents
This measure will help ensure that flood support is provided to people in non-emergency situations. The team can provide advice on what to do to prepare and protect assets and property from flooding. This measure is likely to have positive effects on reducing impacts and consequences of flooding, protecting historic assets, property and businesses, resulting in benefits for human health. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 6 – To collaborate with statutory bodies to promote the existing flood warning service (EAW) and their proposed flooding campaigns
Awareness of flood warning services and flooding campaigns are important to allow people to prepare for a flood event and understand what to do in a flood event. This will have benefits on human health and reducing the impacts and consequences of flooding. It may also have minor positive effects on biodiversity, water quality, landscape and soils. By collaborating, FCC can utilise staff and expertise from other authorities and help reduce costs to the Council.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 7 – Collaborate with other Flood Risk Authorities to create an integrated county wide real time hydraulic and flood alert map
This measure is likely to have significant positive effects in terms of understanding and raising awareness of flood risk and reducing flood risk and associated impacts on human health, infrastructure, property and businesses. Larger benefits are likely to be felt in the medium and long term as more data is recorded and fed into the model creating a more accurate reflection of flood risk in the County. Reduced flood risk will have positive effects for biodiversity, water quality, historic assets and soils. The model should also help manage and plan for future climate change effects.

SEA Recommendation – This measure would provide significant positive effects in terms of flood risk understanding and awareness, and flood reduction and could be included in the LFRMS.

Measure 8 – Make public aware of available flood prevention and mitigation measures (resistance and resilience) to protect their property and assets
If the public are aware of the flood prevention options and mitigation measures available to them to reduce flooding and alleviate the effects of flooding then they are more likely to use these to protect themselves, their properties and businesses. This is likely to have positive effects in terms of reducing the impacts and consequences of flooding on human health, property and businesses. Measures such as storing fuels and oils out of the way of flood water will help protect water quality from pollution. Owners of historic assets and farmers can also implement these measures to protect their assets from flood damage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, this measure is the same as Measure 5 under Objective 4 and therefore only one or the other should be included in the LFRMS.

Measure 9 – Target areas of historical flooding (or at high probability of flooding) to increase awareness of emergency procedures in the event of a flood
This measure should help people plan and prepare for flooding events which in turn should reduce the impacts on human health, property, businesses, infrastructure and historic assets. The measure is more focused on increasing awareness of what the public can do to stay safe in a flood and in clearing up afterwards than biodiversity and landscape. However, there may be some long term minor positive effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

8.2.6 LFRMS Objective 3 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 3: To work together (both FRMA, stakeholders and public) to reduce flood and coastal risks, sharing data and resources to the greatest benefit					
	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST – (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)
	LT - (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST - - (T)	ST ++ (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT - - (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT - - (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
3. Enhance human health and wellbeing through reducing flooding effects	ST - - (T)	ST ++ (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST + (T)
	MT - - (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT + (T)
	LT - - (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT + (T)
4. Protect and enhance biodiversity and geo-diversity across the County.	ST 0	ST 0	ST 0	ST 0	ST 0	ST + (T)
	MT – (T)	MT 0	MT 0	MT 0	MT 0	MT + (T)
	LT - (T)	LT + (T)	LT 0	LT + (T)	LT + (T)	LT + (T)
5. Protect and enhance landscape quality and character across the County.	ST 0	ST 0	ST 0	ST 0	ST 0	ST 0
	MT 0	MT 0	MT 0	MT 0	MT 0	MT 0
	LT - (T/P)	LT + (T/P)	LT 0	LT + (T/P)	LT + (T/P)	LT + (T/P)
6. Protect historic assets and their landscapes.	ST 0	ST + (T/P)	ST + (T)	ST + (T/P)	ST + (T/P)	ST + (T/P)
	MT – (T/P)	MT + (T/P)	MT + (T)	MT + (T/P)	MT + (T/P)	MT + (T/P)
	LT - (T/P)	LT + (T/P)	LT + (T)	LT + (T/P)	LT + (T/P)	LT + (T/P)
7. Educate, manage, plan and adapt for the effects of climate change.	ST 0	ST 0	ST 0	ST 0	ST 0	ST + (T)
	MT 0	MT + (T)	MT 0	MT + (T)	MT + (T)	MT ++ (T)
	LT - (T)	LT + (T)	LT 0	LT + (T)	LT + (T)	LT ++ (T)
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST - - (T)	ST ++ (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT - - (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT - - (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST 0	ST 0	ST + (T)	ST 0	ST 0	ST + (T)
	MT – (T/P)	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)
	LT - (T/P)	LT + (T)	LT ++ (T)	LT + (T)	LT + (T)	LT + (T)

Measure 1 – Do nothing
Not working together and sharing data and knowledge on flood risk is likely to have negative, transboundary effects and flooding issues in other catchments that can not be fully understood and collaboratively tackled. This will lead to flood risk issues resulting in negative effects on water quality, human health, biodiversity, historic assets, soils, infrastructure, property and businesses.

SEA Recommendation – This measure is not realistic and will have negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
Currently there is a certain amount of data sharing and collaboration with FRMA's, stakeholders and the public. This provides positive effects in terms of reducing flood risk which will have resulting benefits in protecting humans, property, infrastructure, businesses, soils, water quality and historic assets from flood damage. There will be minor benefits for biodiversity and landscape.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 3 – Identify responsibilities of riparian owners of managing their assets through public engagement
This measure would ensure that riparian owners understood their responsibilities of managing their assets. This would slightly help to reduce flood risk as owners should fully understand what they are required to do. However, just because people know they have responsibilities doesn't mean they will carry them out. Therefore, there are likely to be minor positive effects in terms of reducing flood risk and impacts on humans, infrastructure, property, businesses, historic assets and soils. There are unlikely to be effects on biodiversity and landscape.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Continue to meet with the North Wales LFRMA's and Coordination Group to share knowledge, data and lessons learnt
This measure will ensure that FCC continue to participate in sharing knowledge, data and lessons learnt. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Develop an effective communication plan to ensure collaborative working and data sharing
This measure will help ensure continued and effective communication to share data and work together to address flood issues. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. For clarity it is recommended that the measure is reworded to 'Develop and implement an effective communication plan to ensure collaborative working and data sharing'.

Measure 6 – Undertake stakeholder engagement to identify responsibilities of flood risk partners

Ensuring flood risk partners are aware of, and understand, their responsibilities is important for effective and collaborative flood management. This is likely to help reduce flood risk effects for humans, property, infrastructure and businesses. It may also have minor positive effects in terms of protecting water quality, soils and historic assets from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

8.2.7 LFRMS Objective 4 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 4: To reduce the impact and consequences for individuals, communities, businesses and the environment from flooding and coastal erosion					
	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST – (T) MT - - (T) LT - - (T)	ST + (T) MT 0 LT - (T)	ST 0 MT 0 LT 0	ST 0 MT D LT D	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within Conwy County.	ST - - (T) MT - - - (T) LT - - - (T)	ST 0 MT - (T) LT - - (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST 0 MT 0 LT 0
3. Enhance human health and wellbeing through flood risk awareness raising and emergency planning.	ST - - - (T) MT - - - (T) LT - - - (T)	ST 0 MT - (T) LT - - (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST + (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)
4. Protect and enhance biodiversity and geo-diversity across the Conwy County.	ST – (T) MT - - (T) LT - - (T)	ST 0 MT – (T) LT - (T)	ST 0 MT 0 LT 0	ST (P/T) - + MT (P/T) - + LT (P/T) - +	ST 0 MT 0 LT + (T)	ST 0 MT 0 LT 0
5. Protect and enhance landscape quality and character across the county.	ST 0 MT - (T/P) LT - (T/P)	ST 0 MT 0 LT - (T/P)	ST 0 MT 0 LT 0	ST (P/T) - + MT (P/T) - + LT (P/T) - +	ST 0 MT 0 LT + (T)	ST 0 MT 0 LT 0
6. Protect historic assets and their landscapes.	ST - - (T/P) MT - - - (T/P) LT - - - (T/P)	ST 0 MT – (T/P) LT - - (T/P)	ST 0 MT 0 LT 0	ST (P/T) - + MT (P/T) - + LT (P/T) - +	ST + (T) MT + (T) LT + (T)	ST 0 MT 0 LT 0
7. Educate, manage, plan and adapt for the effects of climate change.	ST – (T) MT - - (T) LT - - -(T)	ST 0 MT – (T) LT - (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT ++ (T) LT ++ (T)	ST 0 MT + (T) LT + (T)	ST 0 MT 0 LT 0
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST - - - (T) MT - - - (T) LT - - - (T)	ST 0 MT - (T) LT - - (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST + (T) MT + (T) LT + (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST – (T/P) MT - - (T/P) LT - - (T/P)	ST 0 MT – (T) LT - (T)	ST 0 MT 0 LT 0	ST (P/T) - + MT (P/T) - + LT (P/T) - +	ST 0 MT + (T) LT + (T)	ST 0 MT 0 LT 0

Measure 1 – Do nothing
Under the do nothing option, flood risk and the associated consequences would not be addressed and the situation would continue to get worse as flood events increase due to climate change. This would have significant negative effects on human health, infrastructure, property, businesses and historic assets from flood damage. It is also likely to have minor and moderate negative effects on water quality, biodiversity, landscape and soils.

SEA Recommendation – This measure is not realistic and will have negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
FCC currently manage and reduce flood risk using the resources available but not every area of the County can be protected. In the future as the impacts of climate change results in more frequent and severe flooding events FCC will not have the capacity to deal with all flooding issues. This is likely to result in negative effects in terms of increased flood risk and flood damage for humans, infrastructure, property, businesses, historic assets, and soils.

SEA Recommendation – This measure will have negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 3 – Identify vulnerable groups within the community, and prepare action plans in the event of flooding
This measure is aimed at the protection of vulnerable groups within the community from flooding. Therefore, there will be positive effects in terms of human health and flood reduction but only for certain groups and areas. It is unlikely that there would be any effects on biodiversity, water quality, landscape, historic assets or soils.

SEA Recommendation – Although this measure only provides limited positive effects. The positive effects are considered important in protecting vulnerable groups from the effects of flooding, and could be included in the LFRMS.

Measure 4 – Identify areas at greatest risk of flooding, and develop a capital cost investment programme to alleviate flooding
Identifying high flood risk areas will allow investment to be prioritised and targeted at the most appropriate areas. A capital cost investment programme is likely to result in construction of flood alleviation schemes. This will have positive effects in terms of reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features. Effects on water quality will depend on the type or flood defence scheme implemented. For example, creation of a wetland or reedbed will have positive effect on water quality. However, other defence works could affect water flows or could have potential for spillages and contamination during construction.

SEA Recommendation – The positive effects associated with this measure are likely to outweigh the negative effects and could be included in the LFRMS. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes.

Measure 5 – Educate general public on options for protecting their properties through flood prevention options, resistance and resilience measures

If the public are aware of the flood prevention options and resilience measures available to them to reduce flooding effects then they are more likely to use these to protect themselves and their properties and businesses. This is likely to have positive effects in terms of reducing the impacts and consequences of flooding on human health, property and businesses. Measure such as storing fuels and oils out of the way of flood water will help protect water quality from pollution. Owners of historic assets and farmers can also implement these measures to protect their assets from flood damage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, this measure is the same as Measure 8 under Objective 2 and therefore only one or the other should be included in the LFRMS.

Measure 6 –Assist and provide support following a flood event

Although this measure is likely to have limited benefits it is important for people's peace of mind to know that there is someone they can call to get advice and support following a flood incident. The support team may also be able to advise people what do to next time there is a flood. This could help reduce impacts and consequences for property and businesses. It may also help protect water quality as advice could be provided on where to store fuels, oils etc so they don't pollute the water during a flooding incident.

SEA Recommendation – Although this measure only provides limited positive effects. The positive effects are considered important in providing peace of mind and support to people following a flood event, and could be included in the LFRMS.

8.2.8 LFRMS Objective 5 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 5: To ensure that planning decisions are properly informed by flooding issues and the impact future planning may have on flood risk management and long term developments						
	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6	Measure 7
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)
	LT - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST - - (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
3. Enhance human health and wellbeing through reducing flooding effects	ST - - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT ++ (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT +(T)	LT ++ (T)	LT ++ (T)
4. Protect and enhance biodiversity and geo-diversity across the County.	ST - (T)	ST + (T)	ST + (T)	ST + (T)	ST ++ (T)	ST 0	ST + (T)
	MT - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT 0	MT ++ (T)
	LT - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT 0	LT ++ (T)
5. Protect and enhance landscape quality and character across the County.	ST - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST 0	ST + (T)
	MT - - (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT 0	MT + (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT 0	LT ++ (T)
6. Protect historic assets and their landscapes.	ST - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST 0	ST + (T)
	MT - - (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)	MT 0	MT + (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT 0	LT ++ (T)
7. Educate, manage, plan and adapt for the effects of climate change.	ST - - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT + (T)	MT + (T)	MT ++ (T)
	LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT + (T)	LT ++ (T)
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST - - (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST + (T)	ST + (T)	ST ++ (T)
	MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT + (T)	MT ++ (T)	MT ++ (T)
	LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT ++ (T)	LT ++ (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST – (T/P)	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST 0	ST + (T/P)
	MT - - T/P)	MT + (T/P)	MT + (T/P)	MT + (T/P)	MT + (T/P)	MT 0	MT + (T/P)
	LT - - (T/P)	LT + (T/P)	LT++(T/P)	LT++(T/P)	LT+ (T/P)	LT 0	LT++(T/P)

Measure 1 – Do nothing
If the planning department are not aware of flood risk areas and issues then they may allow development in inappropriate places such as floodplains and high flood risk areas. This will increase flood risk and the number of people and properties at risk. This will have significant effects in terms of increased flood risk negatively affecting humans, infrastructure, property, businesses, water quality, biodiversity, landscape, historic assets and soils. It may also exacerbate future climate change effects.

SEA Recommendation – This measure is not realistic and will have negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
Currently the FCC flood management team and planning department do have some communications on development policies in flood risk areas. This provides minor benefits in terms of flood reduction through appropriate location of new developments in relation to flood risk areas. This is likely to have minor positive effects in terms of protection of biodiversity, water quality, landscape, human health, historic assets and soils from flood damage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 3 – Develop clear guidance for the Planning Department when assessing planning applications
This measure would provide clear guidance to the Planning Department on how to deal with planning applications in flood risk areas and what standards should be set. This should help ensure development is not permitted in inappropriate locations such as floodplains or areas at high risk of flooding. It would also provide a consistent approach for determining all planning applications. The measure is likely to have positive effects in terms of reducing flood risk and assets at risk of flooding. Thus, having positive effects through protection of humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from flood damage. It will also help plan and adapt for future climate change effects through discouraging building in appropriate places such as floodplains which may be needed in the future for flood water storage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Develop a process with the Planning Department to create clear advice and direction to developers on FRMS and drainage (including incorporation of SuDS into new developments)
This measure would help ensure that developers design new developments with appropriate drainage and with consideration of flood risk issues. It would also encourage developers to incorporate appropriate SuDS into designs and plan for future climate change effects. The measure is likely to have positive effects in terms of preventing further areas of the County becoming at risk from flooding and lead to the protection of humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from flood damage.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Establish a SuDS Approval Body (SAB)
Establishing a SuDS Approval Body (SAB) should move SuDS higher up the agenda and encourage more implementation of SuDS in developments as flood management techniques. SuDS are likely to provide more environmental benefits for water quality, biodiversity, soils and

landscape. They will also help to reduce flood risk having minor positive effects for humans, property, infrastructure, businesses and historic assets. Implementation of SuDS will also assist in planning and adapting for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 6 – Keep the Planning Department informed and up-to-date with flood areas in the County
This measure will help the planning department determine where new development should be appropriately placed to avoid flood risk areas. This should help reduce the numbers of development on floodplains or in high flood risk areas. This is likely to have positive effects in terms of flood reduction, human health and protection of infrastructure, property, businesses and water quality. It will also help contribute to future climate change planning and adaptation. The measure is concerned with development in relation to flood risk and is unlikely to have impacts on biodiversity, landscape, historic assets and soils.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 7 – Develop policies for effective land use management and enhance development control procedures where appropriate
This measure would provide a clear and consistent approach to land use management and development control procedures in relation to development and flood risk. This would help planners to effectively plan new developments away from high flood risk areas and incorporate spatial development policies. This is likely to have positive effects in terms of flood risk reduction and benefits for humans, infrastructure, property, businesses, historic assets, water quality, biodiversity, landscape and soils from protection from flooding effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

8.2.9 LFRMS Objective 6 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 6: Improve and/or maintain the capacity of existing drainage systems by targeted maintenance				
	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST - - (T)	ST + (T)	ST + (T)	ST ++ (T)	ST ++ (T)
	MT - - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST - - (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++(T)
	LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)
3. Enhance human health and wellbeing through reducing flooding effects	ST - - (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++(T)
	LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)
4. Protect and enhance biodiversity and geo-diversity across the County.	ST - - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - – (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)
	LT - - (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)
5. Protect and enhance landscape quality and character across the County.	ST 0	ST 0	ST 0	ST 0	ST 0
	MT – (T)	MT 0	MT 0	MT 0	MT 0
	LT - (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)
6. Protect historic assets and their landscapes.	ST 0	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT – (T)	MT + (T)	MT + (T)	MT + (T)	MT + (T)
	LT - (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)
7. Educate, manage, plan and adapt for the effects of climate change.	ST – (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST - - (T)	ST + (T)	ST ++ (T)	ST ++ (T)	ST ++ (T)
	MT - - - (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT +++(T)
	LT - - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST 0	ST 0	ST 0	ST 0	ST 0
	MT – (T)	MT 0	MT 0	MT 0	MT 0
	LT - (T)	LT + (T)	LT + (T)	LT + (T)	LT + (T)

Measure 1 – Do nothing
If drainage systems were not maintained then they would block up causing flooding and potential sewage overflows. These effects are likely to get worse with time as more drains become blocked increasing flooding. Both flooding and sewage will have health implications for humans, significant negative effects on water quality, and moderate negative effects on biodiversity and climate change adaptation. It will also have minor negative effects on landscape, cultural heritage and soils.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual
Currently drainage maintenance is largely reactive. The maintenance team are usually called to unblock or mend/upgrade a drainage asset which prevents it from flooding. However, sometimes the drainage system floods before the team can remove the obstruction or upgrade the asset. Continued maintenance will provide minor benefits through a small reduction in flood risk. This is likely to have benefits in terms of human health, reduction of impact and consequences of flood, planning for climate change, protection of biodiversity and historic assets.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is felt that more measure would also be required.

Measure 3 – Identify and assess condition of existing drainage assets within the County, to prioritise capital investment
This option would provide a more proactive active looking at the condition of drainage assets to identify what and when assets will need upgrading to prioritise investment. This is likely to have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses. It is likely to have minor positive effects on biodiversity, water quality, historic assets and climate change adaptation and planning.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is the same as Measure 6, Objective 1. Therefore, only one or the other needs to be included in the LFRMS.

Measure 4 – Develop a risk based proactive and cyclical maintenance regime
This measure builds on Measure 2 by ensuring a prescribed and regular maintenance regime was in place. This would have moderate positive effects in terms of reducing flood risk and the associated impacts and consequences on human health, property, infrastructure and businesses, and water quality. It is likely to have minor positive effects on biodiversity and historic assets as a result of decreased flood risk.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 – Develop a risk based programme for improving existing infrastructure
This measure builds on Measures 3 and 4 by using a proactive risk-based approach to improve existing drainage infrastructure. Improving drainage infrastructure will include upgrading assets that are failing and upgrading assets to deal with larger future flows from climate change. This will have significant effects in reducing future flood risk and impacts and consequences for human health, infrastructure, property and

businesses. It will also have benefits in terms of protecting biodiversity, historic assts and water quality from the effects of flooding. Long term as more assets are improved the benefits will increase.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

8.2.10 LFRMS Objective 7 Assessment

		LFRMS Objective 7: Take a sustainable approach to flood risk management balancing economic, environmental and social benefits					
		Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6
Strategic Environmental Assessment Objectives	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST 0 MT – (T) LT - (T)	ST + (T) MT + (T) LT + (T)	ST ++ (T) MT ++ (T) LT +++ (T)	ST ++ (T) MT ++ (T) LT +++ (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within Conwy County.	ST + (T) MT + (T) LT 0	ST + (T) MT + (T) LT + (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)
	3. Enhance human health and wellbeing through flood risk awareness raising and emergency planning.	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST 0 MT 0 LT 0	ST 0 MT 0 LT 0
	4. Protect and enhance biodiversity and geo-diversity across the Conwy County.	ST (T/P) - + MT (T/P) - + LT (T/P) - +	ST + (T) MT + (T) LT + (T)	ST + (T) MT ++ (T) LT ++ (T)	ST + (T) MT ++ (T) LT ++ (T)	ST 0 MT 0 LT 0	ST 0 MT 0 LT 0
	5. Protect and enhance landscape quality and character across the county.	ST (T) - + MT (T) - + LT (T) - +	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)	ST 0 MT 0 LT 0	ST 0 MT 0 LT 0
	6. Protect historic assets and their landscapes.	ST (T) - + MT (T) - + LT (T) - +	ST 0 MT 0 LT 0	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)	ST 0 MT 0 LT 0	ST 0 MT 0 LT 0
	7. Educate, manage, plan and adapt for the effects of climate change.	ST + (T) MT + (T) LT 0	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST + (T) MT + (T) LT 0	ST + (T) MT + (T) LT + (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST ++ (T) MT ++ (T) LT ++ (T)	ST + (T) MT + (T) LT + (T)	ST + (T) MT + (T) LT + (T)
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST – (T/P) MT – (T/P) LT - - (T/P)	ST + (T/P) MT + (T/P) LT + (T/P)	ST ++ (T/P) MT ++ (T/P) LT +++ (T/P)	ST ++ (T/P) MT ++ (T/P) LT +++ (T/P)	ST 0 MT 0 LT 0	ST 0 MT 0 LT 0

Measure 1 – Do nothing

It has been assumed that in the do nothing option economic and social benefits would be prioritised over environmental issues when making flood management decisions. Therefore, flood risk may be reduced in the short and medium term using unsustainable methods but at climate change increases frequency and severity of flood events unsustainable methods will not be as effective as reducing and managing flood risk. Also unsustainable flood management could cause long term environmental impacts that could worsen flood risk in the future. There will be positive and negative effects on biodiversity, landscape and cultural heritage. Positive effects are likely from reduced flood risk and negative effects are likely from prioritisation of social and economic issues over environmental issues, resulting in negative environmental effects.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as usual

Currently environmental issues are given consideration as well as economic and social issues. This is likely to have a minor positive effect on water quality biodiversity, landscape and soils as flood management decision will take environmental effects into consideration. Currently historic assets are not given as significant priority as other environmental issues, social and economic issues. Therefore, a score of neutral has been determined. The current approach will help reduce flood risk for humans, properties, infrastructure and businesses.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is felt that more measure would also be required.

Measure 3 – Consider use of attenuation through wetlands to increase the length of flow durations, store flood water, and provide amenity and ecological benefits

This measure is likely to have moderate positive effects for biodiversity through habitat creation such as wetlands. This will also have moderate and significant positive effects on water quality from reduced pollutants entering water bodies. Creation of wetlands areas may also have minor positive effects on improving the landscape character and quality. Increasing length of flow durations and creating flood water storage will also help to reduce flood risk and the impacts on consequences on humans, property, businesses, infrastructure and historic assets.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Consider the use of bio-retention areas to remove sediment and pollutants

This measure is likely to have moderate positive effects for biodiversity through creation of bio-retention areas that enhance or create habitat. This will also have moderate and significant positive effects on water quality from reduced pollutants and sediment entering water bodies. Creation of bio-retention areas may also have minor positive effects on improving the landscape character and quality, and will help to reduce flood risk and the impacts on consequences on humans, property, businesses, infrastructure and historic assets.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 5 - Ensure the environmental consequences of implementing the LFRMS are considered against the technical, economic and social benefits

Consideration of environmental issues as well as economic and social issues is likely to have a minor positive effect on water quality biodiversity, landscape and soils as flood management decision will take environmental effects into consideration. It is assumed that historic assets would be

given equal weight with other environmental issues. This approach will help reduce flood risk for humans, properties, infrastructure and businesses.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 4 – Embed policies from other local basin management plans, catchment flood management plans, local environmental policies and European protected sites into flood risk management procedures and programmes
This measure is unlikely to affect biodiversity, landscape, historic assets, soils and human health. Taking other plans into account may have minor benefits in terms in a clearer understanding of the wider picture of flood risk and cross-boundary effects. This will help plan flood management strategies for the local area.

SEA Recommendation – This measure will produce some minor positive effects and could be included in the LFRMS. However, other measures may provide greater benefits.

8.2.11 LFRMS Objective 8 Assessment

Strategic Environmental Assessment Objectives	LFRMS 8: Adopt a holistic approach to drainage solutions				
	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST – (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - - (T)	MT ++ (T)	MT + (T)	MT + (T)	MT + (T)
	LT - - (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT + (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST – (T)	ST ++ (T)	ST + (T)	ST + (T)	ST + (T)
	MT - - (T)	MT ++ (T)	MT ++ (T)	MT + (T)	MT + (T)
	LT - - - (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT + (T)
3. Enhance human health and wellbeing through reducing flooding effects	ST – (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - - (T)	MT + (T)	MT ++ (T)	MT + (T)	MT + (T)
	LT - - - (T)	LT +(T)	LT ++ (T)	LT + (T)	LT + (T)
4. Protect and enhance biodiversity and geo-diversity across the County.	ST - (T)	ST ++ (T)	ST + (T)	ST + (T)	ST + (T)
	MT - - (T)	MT ++ (T)	MT + (T)	MT + (T)	MT + (T)
	LT - - (T)	LT ++ (T)	LT ++ (T)	LT + (T)	LT + (T)
5. Protect and enhance landscape quality and character across the County.	ST – (T/P)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - -(T/P)	MT + (T)	MT + (T)	MT + (T)	MT + (T)
	LT - - (T/P)	LT + (T)	LT ++ (T)	LT + (T)	LT + (T)
6. Protect historic assets and their landscapes.	ST – (T/P)	ST + (T)	ST + (T)	ST 0	ST + (T)
	MT - -(T/P)	MT + (T)	MT + (T)	MT 0	MT + (T)
	LT - - (T/P)	LT + (T)	LT ++ (T)	LT 0	LT + (T)
7. Educate, manage, plan and adapt for the effects of climate change.	ST – (T/P)	ST + (T)	ST 0	ST + (T)	ST 0
	MT – (T/P)	MT + (T)	MT + (T)	MT + (T)	MT + (T)
	LT - - (T/P)	LT + (T)	LT ++ (T)	LT + (T)	LT + (T)
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST – (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
	MT - - (T)	MT + (T)	MT ++ (T)	MT + (T)	MT + (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT + (T)	LT + (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST – (T/P)	ST + (T/P)	ST + (T/P)	ST + (T/P)	ST + (T/P)
	MT - -(T/P)	MT + (T/P)	MT + (T/P)	MT + (T/P)	MT + (T/P)
	LT - - (T/P)	LT + (T/P)	LT ++ (T/P)	LT + (T/P)	LT + (T/P)

Measure 1 – Use traditional approaches to drainage
Traditional drainage approaches are likely to become out-dated in the future and less efficient and effective than other solutions. Using only traditional approaches is likely to lead to increased future flood risk resulting in negative effects on humans, property, infrastructure, businesses, water quality, biodiversity, landscape, historic assets and soils.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Adopt soft engineering including SuDS
Implementing soft engineering approaches including SuDS can have benefits over just using traditional solutions in the majority of cases. SuDS are likely to provide more environmental benefits for water quality, biodiversity, soils and landscape. They will also help to reduce flood risk having minor positive effects for humans, property, infrastructure, businesses and historic assets. Implementation of SuDS will also help plan and adapt for future climate change effects.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS.

Measure 3 – Explore new and innovative technologies for flood defence and flood management
The assessment has assumed that this measure is to explore and implement where appropriate new and innovative technologies. New and innovative technologies are being continuously developed. However, it is likely that significant new and innovative technologies will not be developed until some time into the future. Therefore, larger benefits are likely to be realised in the medium and long term. It is likely that new and innovative technologies will make flood defences more efficient and effective, reducing flood risk and adapting to climate change. This would have benefits for human health, property, infrastructure, businesses, water quality, biodiversity, landscape, historic assets and soils.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 4 – Where possible incorporate multiple benefits such as water quality, biodiversity and amenity benefits
This measure is about incorporating multiple benefits into flood management schemes. Incorporation of new or enhanced habitat, landscaping, use of local materials, creation of amenity area will have benefits for biodiversity, water quality, landscape, climate change and human health. Creation of new wetland, for example, will help reduce flood risk and benefit the environment and society.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 5 – Develop and implement a culverting policy
The culverting policy will have a presumption against culverting. This is likely to have positive effects as culverts can get blocked or collapse causing flooding. A reduction in culverting will reduce this risk and have minor positive effects in terms of reduced flood risk and effects for humans, water quality and historic assets. It will also allow waterways to be open having positive effects for biodiversity and landscape.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

8.2.12 LFRMS Objective 9 Assessment

Strategic Environmental Assessment Objectives	LFRMS Objective 9: Ensure the development of skills required to implement effective and innovative flood risk management measures					
	Measure 1	Measure 2	Measure 3	Measure 4	Measure 5	Measure 6
1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST – (T)	ST +	ST +	ST +	ST +	ST +
	MT - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within the County.	ST - - (T)	ST +	ST +	ST + (T)	ST ++ (T)	ST + (T)
	MT - - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)
3. Enhance human health and wellbeing through reducing flooding effects	ST - - (T)	ST +	ST +	ST + (T)	ST ++ (T)	ST + (T)
	MT - - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)
4. Protect and enhance biodiversity and geo-diversity across the County.	ST – (T)	ST +	ST +	ST +	ST + (T)	ST + (T)
	MT - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
5. Protect and enhance landscape quality and character across the County.	ST – (T)	ST +	ST +	ST +	ST +	ST +
	MT - - (T)	MT + (T)	MT ++ (T)	MT ++	MT ++	MT ++
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
6. Protect historic assets and their landscapes.	ST - - (T)	ST +	ST +	ST +	ST +	ST +
	MT - - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
7. Educate, manage, plan and adapt for the effects of climate change.	ST – (T)	ST +	ST +	ST +	ST +	ST +
	MT - - - (T)	MT +	MT ++	MT ++	MT +++	MT ++
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)
8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST - - (T)	ST +	ST +	ST + (T)	ST ++ (T)	ST + (T)
	MT - - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT +++ (T)	MT ++ (T)
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT +++ (T)	LT ++ (T)
9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST – (T)	ST +	ST +	ST +	ST +	ST +
	MT - - (T)	MT + (T)	MT ++ (T)	MT ++ (T)	MT ++ (T)	MT ++
	LT - - - (T)	LT + (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)

Measure 1 – Do Nothing
If staff don't have the skills, knowledge and equipment to provide effective flood management then flood risk is likely to increase. The most significant effects are likely to be seen in the medium and long term when an accumulation of increased frequency and severity of flood events from climate change together with a lack of understanding and knowledge in how to deal with this will result in significant negative effects on humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as Usual
Currently the flood risk management team keep abreast of the latest news, legislation and techniques in the industry, and employ new staff members where a shortage is identified. This current situation is likely to have short, medium and long terms benefits for on humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets because the team will understand the current issues relating to flood risk and how to deal with them. However, there are barriers that hinder the team such as funding for additional staff, bureaucracy, and severe flood events requiring a large amount of resources which take staff aware from other work.

SEA Recommendation – This measure will produce positive effects and could be included in the LFRMS. However, it is felt that larger benefits could be achieved through inclusion of other measures with more positive effects.

Measure 3 – Provide appropriate staffing levels and develop staff expertise to deliver the requirements of the Act
The Act places additional duties on the LLFA and in order that the quality of flood protection and response does not decrease with the extra workload additional members of staff will be required. Having additional staff will ensure that all the requirements of the Act are implemented effectively, allow staff to develop flood risk mapping and asset management systems to increase the efficiency and effectiveness of responses, and allow staff time to read up on new innovations and attend conferences. This is likely to have positive effects for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 4 – Invest in appropriate software and hardware
Having the appropriate software and hardware for a task is essential for effective flood management. Often there are financial barriers to achieving this. This measure would ensure that appropriate software and hardware was available to the flood management team. This would allow them to conduct their work more efficiently and effectively, provide a consistent method and recording system, and manage data and interpretation to better understand flood risk. This is likely to have positive effects for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 5 – Outsource specialist skills to deliver specific projects

Some skills are very specialist and the flood management team may not have the technical knowledge and expertise in these areas. Employing a specialist to provide support, advice and delivery of specific projects is important to ensure projects are designed and implemented successfully. Using a specialist during project design and development can have significant future benefits in terms of innovation, operational life and reliability, success of the project in protecting people and assets from flooding, and minimisation of negative environmental effects.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

Measure 6 – Collaborate and provide support, training and networks of staff across the region
This measure will help ensure that knowledge is shared between the risk management authorities to help better understand flood risk. Appropriate training is important so that staff can do their job effectively. This in turn should help understanding and reduction of flood risk which will have benefits for humans, assets, properties, infrastructure, business, biodiversity, landscapes, soils, water quality and historic assets.

SEA Recommendation – This measure will have positive effects and could be included in the LFRMS.

8.2.13 LFRMS Objective 10 Assessment

		LFRMS Objective 10: Identify projects and programmes which are affordable, maximising capital funding from internal and external sources				
		Measure 1	Measure 2	Measure 3	Measure 4	Measure 5
Strategic Environmental Assessment Objectives	1. Protect and enhance where possible the ecological and chemical status of watercourses and water bodies in accordance with the WFD objectives.	ST – (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT - - (T)	MT ++ (T)	MT +++ (T)	MT +++ (T)	MT +++ (T)
		LT - - (T)	LT ++(T)	LT +++ (T)	LT +++ (T)	LT +++ (T)
	2. Reduce and manage flood risk from ordinary watercourses, surface water run-off, groundwater and artificial water bodies within Conwy County.	ST - - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT - - - (T)	MT ++(T)	MT +++ (T)	MT +++ (T)	MT +++ (T)
		LT - - - (T)	LT ++ (T)	LT +++ (T)	LT +++ (T)	LT +++ (T)
	3. Enhance human health and wellbeing through flood risk awareness raising and emergency planning.	ST - -(T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT - - - (T)	MT ++ (T)	MT +++ (T)	MT +++ (T)	MT +++ (T)
		LT - - - (T)	LT ++ (T)	LT +++ (T)	LT +++ (T)	LT +++ (T)
	4. Protect and enhance biodiversity and geo-diversity across the Conwy County.	ST – (T)	ST (T/P) - +	ST (T/P) - +	ST (T/P) - +	ST (T/P) - +
		MT - - (T)	MT (T/P) - - ++	MT (T/P) - - ++	MT (T/P) - ++	MT (T/P) - - ++
		LT - - (T)	LT (T/P) - - ++	LT (T/P) - - +++	LT (T/P) - +++	LT (T/P) - - +++
	5. Protect and enhance landscape quality and character across the county.	ST – (T)	ST (T/P) - +	ST (T/P) - +	ST (T/P) - +	ST (T/P) - +
		MT - - (T)	MT (T/P) - - ++	MT (T/P) - - ++	MT (T/P) - ++	MT (T/P) - - ++
		LT - - (T)	LT (T/P) - - ++	LT (T/P) - - +++	LT (T/P) - +++	LT (T/P) - - +++
	6. Protect historic assets and their landscapes.	ST – (T)	ST (T/P) - +	ST (T/P) - +	ST (T/P) - +	ST (T/P) - +
		MT - - (T)	MT (T/P) - - ++	MT (T/P) - - ++	MT (T/P) - ++	MT (T/P) - - ++
		LT - - (T)	LT (T/P) - - ++	LT (T/P) - - +++	LT (T/P) - +++	LT (T/P) - - +++
	7. Educate, manage, plan and adapt for the effects of climate change.	ST 0 (T)	ST 0	ST + (T)	ST + (T)	ST + (T)
		MT - - (T)	MT +	MT ++ (T)	MT ++ (T)	MT ++ (T)
		LT - - (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)	LT ++ (T)
	8. Minimise the key impacts and consequences of flood risk on key assets, infrastructure, properties and businesses.	ST - - (T)	ST + (T)	ST + (T)	ST + (T)	ST + (T)
		MT- - - (T)	MT ++ (T)	MT +++ (T)	MT +++ (T)	MT +++ (T)
		LT - - - (T)	LT ++ (T)	LT +++ (T)	LT +++ (T)	LT +++ (T)
	9. Protect best quality soil and agricultural land and minimise the potential for pollution.	ST – (T)	ST (T/P) - +	ST (T/P) - +	ST (T/P) - +	ST (T/P) - +
		MT - - (T)	MT (T/P) - - ++	MT (T/P) - - ++	MT (T/P) - ++	MT (T/P) - - ++
		LT - - (T)	LT (T/P) - - ++	LT (T/P) - - +++	LT (T/P) - +++	LT (T/P) - - +++

Measure 1 – Do Nothing
If funding is not obtained then flood protection projects cannot be implemented. In the short term this is likely to have minor negative effects on water quality, biodiversity, landscapes, historic assets and soils as flood events will go unmanaged. In the future, as the frequency and severity of flood events increases due to climate change the effects of flood damage will worsen. If flood management programmes and projects are not implemented, then flood risk and severity of flooding will increase. This is likely to have significant medium and long term negative effects on human health, key assets, infrastructure, properties and businesses.

SEA Recommendation – This measure is not realistic and will have significant negative effects. Therefore, it should not be taken forward into the LFRMS.

Measure 2 – Business as Usual
Currently funding is obtained from internal and external sources and projects are implemented based on risk, priority and costs. There is a limit to current funding and so many flood management programmes and projects are not implemented. In the short term a few new flood management projects are likely to be implemented having minor positive effects in terms of protecting humans, assets, infrastructure, property, business , biodiversity, landscape, soils water quality and historic assets from flooding. However, there can also be temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. In the medium and long terms more projects are likely to be implemented resulting in larger cumulative positive and negative effects.

SEA Recommendation –The positive effects associated with this measure are likely to outweigh the negative effects. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes. However, some of the other measures are likely to have larger positive effects and should be taken forward first.

Measure 3 – Identify potential funding sources which may include communities and local businesses
Identifying new funding sources should increase the funds available for flood management projects resulting in more programmes and schemes being implemented. The most significant benefits are likely to be seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features.

SEA Recommendation – The positive effects associated with this measure are likely to outweigh the negative effects and could be included in the LFRMS. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes.

Measure 4 – Undertake full lifecycle cost benefit analysis for projects including social and environmental benefits
Undertaking lifecycle benefit analysis is likely to help prioritise projects and ensure that the most cost effective and beneficial project is taken forward. This should help reduce wasting money on projects with few benefits that could be better spent on alternative projects. The most significant benefits are likely to be seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features. Consideration of social and environmental benefits as part of the lifecycle analysis is also likely to reduce negative effects associated with a project and maximise positive effects.

SEA Recommendation – The positive effects associated with this measure are likely to outweigh the negative effects and could be included in the LFRMS. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes.

Measure 5 – Investigate opportunities for match funding and grants
Investigating opportunities for match funding and grants should increase the funds available for flood management projects resulting in more programmes and schemes being implemented. The most significant benefits are likely to be seen in the medium and long terms as a larger number of projects will have been implemented over the period resulting in cumulative benefits in reducing flood risk and therefore protecting humans, assets, infrastructure, properties, businesses, biodiversity, soils, landscape, water quality and historic assets. However, implementation of schemes also has the potential for temporary and permanent negative effects on biodiversity, landscape, soils and historic assets associated with construction and loss of land or an asset for flood defence works. Negative effects are likely to be minimised through the planning process and legislation protecting these assets and features.

SEA Recommendation – The positive effects associated with this measure are likely to outweigh the negative effects and could be included in the LFRMS. Negative effects should be mitigated through consideration of the environment when choosing location and type of defence works, and through the planning, EIA and legislative processes.