Leeds City Council

Local Flood Risk Management Strategy - 2013

Strategic Environmental Assessment Report

Final Report
July 2013

This page is left blank intentionally

Revision Schedule

Local Flood Risk Management Strategy - 2013
Strategic Environmental Assessment Report
July 2013

Rev	Date	Details	Prepared by	Reviewed by	Approved by
1.0	04 July 2013	Final Report (for Internal Distribution)	**Simon Gilliland** Engineer	**Ian Hope** Group Engineer	

This page is left blank intentionally

Table of Contents

1. Executive Summary

This report has been produced to document the Strategic Environmental Assessment (SEA) undertaken on the Council's Local Flood Risk Management Strategy (LFRMS). An SEA is required in order to comply with the Environmental Assessment of Plans and Programmes Regulations 2004. Leeds City Council is required under Section 9 of the Flood and Water Management Act (FWMA), to develop, maintain, apply and monitor a LFRMS for the metropolitan district of Leeds to guide all flood risk management activities undertaken.

The Leeds Sustainability Appraisal Framework, developed by the Council's Sustainable Development Unit has been used to structure the SEA process and ensure compliance with legislation. This framework promotes sustainable development: development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987).

The appraisal of the LFRMS principally comprised a workshop session on 5th July 2012 where internal departments and external partner organisations reviewed the LFRMS to appraise its performance against various sustainability objectives. The feedback provided at this workshop session has been incorporated in the final version of the LFRMS. The appraisal process focused on the 'Objectives for managing local flood risk', which steer the overall direction of the LFRMS. Consequently, the LFRMS 'Objectives' have been strengthened to provide greater clarity, improve consideration of a wider range of factors and promote sustainable flood risk management; which includes the addition of a sixth objective.

In order to effectively monitor the implementation of the LFRMS and its success in managing flood risk in Leeds eight monitoring indicators have been established; these are presented in Chapter 6 of this SEA report. Reviews of these monitoring indicators will be undertaken concurrently with reviews of the 'List of Measures'.

2. Introduction

2.1. Local Flood Risk Management Strategy

As Lead Local Flood Authority (LLFA), Leeds City Council is required under Section 9 of the Flood and Water Management Act (FWMA), to develop, maintain, apply and monitor a strategy for local flood risk management – a "Local Flood Risk Management Strategy" (LFRMS).

The scope of the LFRMS covers all sources of flooding including Main River flooding, although this is primarily the Environment Agency's responsibility, but it focuses more specifically on 'local flooding' which originates from ordinary watercourses, surface water, sewers (rainfall only) and groundwater.

The purpose of the LFRMS is to guide the flood risk management activities undertaken by Risk Management Authorities operating in the metropolitan district of Leeds; namely, Leeds City Council, the Environment Agency, Yorkshire Water Services, Ainsty Internal Drainage Board and the Highways Agency.

The five principal 'Objectives for managing flood risk' in Leeds, as specified in the LFRMS, are listed below. These are the first draft of the objectives which were issued prior to the appraisal of the LFRMS undertaken on the 5th July 2012. The updated version of the 'Objectives for managing flood risk' are presented in Chapter 5.

1. Improve co-operation between LLFA and other RMAs, in terms of procedure, to meet the requirements of new legislation and achieve holistic solutions to identified risks/problems;

2. Develop a consistent approach to planning and investment in flood risk management between RMAs (land allocation, sustainable development, climate change adaptation and emergency planning) and avoid duplication of effort or inefficient investment;

3. Increase internal skills and ultimately capacity for flood risk management;

4. Increase community awareness of the work of the LLFA and local flood risk and involve local communities in decision making – localism agenda;

5. Improve understanding of local flood risk and seek to decrease local flood risk through implementation of measures to alleviate flooding where practicable.

2.2. Strategic Environmental Assessment

The Strategic Environmental Assessment (SEA) Directive (2001) (EC Directive 2001/42/EC) is transposed into UK law as The Environmental Assessment of Plans and Programmes Regulations 2004. This legislation aims to increase the consideration of environmental issues during the decision making and preparation of

strategic level documents such as plans, programmes or strategies. The LFRMS is a statutory plan and is therefore subject to the requirements of The Environmental Assessment of Plans and Programmes Regulations 2004.

2.3. Leeds Sustainability Appraisal Framework

The Council's Sustainable Development Unit (SDU) developed its Sustainability Appraisal (SA) Framework in 2004 in anticipation of the introduction of the Planning Compulsory Purchase Act (2004) which requires SEA's to be undertaken for all Development Plan Documents (DPD's); and also the requirement for compliance with the SEA Directive.

The scope of the SA Framework is to appraise the economic, environmental and social impacts of emerging DPD's, policies and proposals against a set of identified objectives/criteria. The underlying purpose of this being to seek to improve the effectiveness of planning (and other strategic documents) in delivering sustainable development: development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland Commission, 1987); and to ensure compliance with the SEA Directive.

Whilst the 2004 framework has enabled the systematic appraisal of documents against the requirements, it was felt by practitioners that there was considerable scope for improvement in terms of a more targeted and efficient process, to lead to clearer outcomes. Within this context, the Council has undertaken a number of reviews and revisions to the SA process, with the overall ambition to meet these important requirements.

To date several documents, including Supplementary Planning Documents (SPD), which previously required SEA's have been appraised using this framework. The current revision of the framework, used in this SEA, was finalised in November 2011.

For more information on the development of the Leeds SA Framework refer to the document prepared by the Council's SDU entitled 'Leeds Sustainability Appraisal Revised Methodology, Version 5, November 2011.

3. Appraisal Process

In order to facilitate the appraisal of the LFRMS using the Leeds SA Framework a full day workshop session was held on Thursday 5th July 2012 at Leeds Civic Hall. This was attended by representatives from Leeds City Council: Flood Risk Management, Emergency Planning, Sustainable Development and Transport Policy and also by the Environment Agency. The Workshop was facilitated by Dr Tom Knowland from SDU. A full list of workshop participants is included in Appendix A.

The following appraisal process was followed:

- Baseline data, prepared in advance of the workshop by staff from the Council's Flood Risk Management section, was presented and discussed. This included specific information on the risk of flooding in the Leeds district and the extent of drainage infrastructure; this data is included in Appendix B. In addition to this baseline data, other information was also provided on the day including copies of the 'The State of the City Report – Leeds 2011' which sets out key facts about the city, and the challenges that it faces and the Council's Environmental Statement (EMAS) which documents the Council's environmental performance over the past year.

- The revised SA Framework was explained and discussed. In the revised methodology eight of the twenty four sustainability appraisal objectives have been identified as 'upstream' objectives that could in turn lead to 'midstream' and 'downstream effects. A complete list of the SA objectives is included in Appendix C. The LFRMS was tested in terms of its 'upstream' effects first, and was then tested for related 'midstream' and 'downstream' effects associated with the upstream objective. More attention was paid in the SA process to the appraisal of upstream objectives as this should result in more positive outcomes for the associated downstream effects.

- Each of the five flood risk management objectives in the LFRMS was appraised along with the draft 'List of Measures' (Action Plan) included in Appendix D, although this is subject to revision. The focus of the appraisal was firmly on making the LFRMS as sustainable as possible: the appraisal process was used as a checklist and trigger for discussion about whether the LFRMS says the right things in the right way, rather than an end in itself. The SA process also included a Health and Equality Impact Assessment and a Climate Proofing Assessment.

- Comments made during the discussions, and suggestions for changing the LFRMS to make it more sustainable, were documented and written up. A summary of the discussions are included in Appendix E for the SA and Appendix F for the Climate Proofing Assessment.

4. Appraisal Findings

4.1. Summary

The sustainability appraisal undertaken confirmed that the LFRMS should have very positive impacts in terms of reducing and managing the risk of flooding, encouraging sustainable development and drainage design, contributing to economic success, increasing the quality and number of green spaces, raising public awareness of flood risk, promoting social inclusion and ensuring the operation of key transport infrastructure during flood events. In doing so, it should also increase support for regeneration and promote the remediation and development of Brownfield sites. A more detailed summary of the SA discussions is included in Appendix E.

4.2. Environment

There is potential that measures in the 'List of measures' involving construction related activities will have a detrimental impact on the wider environment both visual and environmental. Therefore, rewording objectives in the LFRMS to put a greater focus on high quality sustainable design of Sustainable Drainage Systems (SuDS) and flood alleviation schemes will ensure that the public realm is enhanced and will also promote greater pride in place and provide environmental improvements. Sustainable construction techniques will also keep resource consumption low and promote the use of recycled materials and low carbon alternatives.

In addition, the LFRMS has significant potential to improve the public realm and provide new recreational opportunities. The promotion of SuDS and green corridors will enhance local environments and provide new amenities there may also be opportunities with the implementation of the 'List of Measures' to provide regeneration opportunities on contaminated sites through land remediation.

Fine-tuning of the flood risk management objectives in the LFRMS to put greater emphasis on ensuring that the Water Framework Directive is complied with in the implementation of measures will also ensure that water quality and biodiversity are enhanced.

4.3. Education and Training

The LFRMS objectives will provide a minimal increase in external education and training opportunities; although there may be some indirect increases through job opportunities on the River Aire Flood Alleviation Scheme for example. However, the LFRMS objectives do provide opportunities for the development of internal Council staff to meet the requirements of new legislation and improve the Council's understanding of flood risk and its capacity for flood risk management.

4.4. Cooperation

New legislation, such as the Flood and Water Management Act (2010) have been the drivers for closer cooperation and planning between risk management authorities. There is a need to improve engagement with local communities on the current and projected impacts of climate change; in particular, overcoming the

apathy of residents, which is considered to be a key problem. Work is ongoing by the EA and the Council to improve understanding of flood risk and promote cost effective solutions to flooding problems; for example: partnership funding and property level protection and resilience schemes.

Rewording the LFRMS objectives to promote greater community inclusion and engagement rather than just increasing community awareness of flood risk as at present will also more proactive engagement with local communities.

4.5. Economy

The LFRMS objectives encourage efficient investment in flood risk management, this is investment which provides benefits to the local economy in terms of reduced flood damage and disruption and an increase in economic opportunities. There are measures in the 'List of Measures' which will undoubtedly bring significant benefits to the economy of Leeds. This is particularly the case with the River Aire Flood Alleviation Scheme, the first item in the 'List of Measures', which will help secure the long-term economic success of businesses in Leeds city centre.

4.6. Health and Equality

It is noted that the LFRMS objectives say nothing specifically about health and equality issues. In relation to health, the impacts of the LFRMS are clearly positive as the objectives will benefit health through reduction in flood risk and better management of flood risk in general. In relation to equality the impacts are less clear, however, the measures in the 'List of Measures' are generally targeted at communities where there has been historic flooding or where the risk of flooding is greatest, which are often areas of higher social deprivation, in this way the LFRMS will actually reduce social inequalities.

4.7. Climate Proofing

The Climate Proofing Assessment which was undertaken as part of the SA process demonstrated that LFRMS performs well in relation to mitigating existing and projected climate risks. Allowances for climate change are currently being used, however, greater use of the latest data provided by the United Kingdom Climate Impacts Programme (UKCIP) should be promoted. In addition, new tools are being developed by the EA to improve the mapping of flood risk such as the Mapping All Sources Tool (MAST) which will bring together all sources of flooding on one map. A more detailed summary of the Climate Proofing discussions is included in Appendix F.

5. Changes to LFRMS

Following the SEA workshop the LFRMS objectives have been strengthened to provide greater clarity, improve consideration of a wider range of factors and promote sustainable flood risk management. This includes splitting objective 2 to create an additional objective. The revised LFRMS objectives are listed below; these are also presented in the LFRMS.

1. Improve co-operation between LLFA and other RMAs, in terms of procedure, to meet the requirements of new legislation and achieve holistic (catchment wide) solutions to identified risks and problems – emergency planning;

2. Promote sustainable flood risk management through: WFD compliance, climate change adaptation (UKCIP), land management, habitat protection and creation;

3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs;

4. Increase internal skills and ultimately capacity for flood risk management;

5. Increase community awareness of flood risk and the work of the LLFA in managing this risk; engage with local communities and involve them in decision making – localism agenda;

6. Improve understanding of local flood risk and seek to decrease local flood risk through implementation of affordable, high quality measures to alleviate flooding where practicable.

6. Monitoring of LFRMS

In order to monitor the implementation of the LFRMS and its success in managing flood risk in Leeds eight monitoring indicators were identified at the SEA workshop. These will ensure that the 'Objectives for managing flood risk' are providing the intended steer to the flood risk management activities undertaken in Leeds and that the 'List of Measures' are being progressed. Reviews of the monitoring indicators will be undertaken concurrently with reviews of the 'List of Measures'.

The eight key monitoring indicators for the LFRMS are listed below. Additional monitoring indicators will be added as appropriate:

1. The number of measures in the 'List of Measures' which have been completed?

2. Are there active measures in the 'List of Measures' which cover each of the six 'Objectives for managing flood risk'?

3. Improving engagement on flood risk - How many public engagement events have taken place? School events, flood fairs, flood action group meetings.

4. The number of new developments where SuDS have been installed? Include SuDS, green corridors, rainwater harvesting, green roofs, land management (tree planting).

5. Are property level flood protection (PLP) schemes reducing flood risk – Number of properties where PLP schemes have been installed and operated successfully in a flood event?

6. Number of Leeds City Council staff engaged in flood risk management activities?

7. Reliability of public transport – Number of Metro bus and train routes disrupted by flooding/drainage problems?

8. Is the LFRMS consistent with the plans and actions of partner organisations? Review and incorporate relevant actions from the Aire and Ouse CFMP's in the 'List of Measures'?

7. References

Framework to assist the development of the Local Strategy for Flood Risk Management, 'A Living Document', 2nd Edition, LGA, November 2011.

National Flood and Coastal Erosion Risk Management Strategy for England, EA and Defra, July 2011.

Flood and Water Management Act (FWMA), HMSO, 2010.

Flood Risk Regulations (FRR), HMSO, 2009.

Water Framework Directive (WFD), European Parliament, 2010.

Preliminary Flood Risk Assessment (PFRA), Leeds City Council, September 2011.

Leeds Local Flood Risk Management Strategy (LFRMS) – Draft, Leeds City Council, August 2012.

Environmental Assessment of Plans and Programmes Regulations, HMSO, 2004.

Building Trust with Others – a guide for staff, Environment Agency.

National Planning Policy Framework (NPPF), DCLG, March 2012

Aire Catchment Flood Management Plan (CFMP), Environment Agency, July 2010.

Ouse Catchment Flood Management Plan (CFMP), Environment Agency, July 2010.

Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities, Environment Agency, August 2011.

Guidance for risk management authorities on sustainable development in relation to their flood and coastal erosion risk management functions, Defra, October 2011.

Leeds Sustainability Appraisal Revised Methodology, Version 5, Leeds City Council Sustainable Development Unit, November 2011.

A Practical Guide to the Strategic Environmental Assessment Directive, Office of the Deputy Prime Minister, September 2005.

Leeds City Council Environmental Management Statement, Leeds City Council, April 2010 – 31 March 2011.

State of the City – Our vision to be the best city in the UK, Leeds City Council, 2011

8. Acronyms

BREEAM	Building Research Establishment Environmental Assessment Method
CFMP	Catchment Flood Management Plan
CLR	Contaminated Land Report
DCLG	Department for Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
DPD	Development Plan Document
EA	Environment Agency
EC	European Community
EMAS	Environmental Management Statement
FRM	Flood Risk Management
FRR	Flood Risk Regulations (2009)
FWMA	Flood and Water Management Act (2010)
HMSO	Her Majesty's Stationery Office
LCC	Leeds City Council
LFRMS	Local Flood Risk Management Strategy
LGA	Local Government Association
LLFA	Lead Local Flood Authority
MAST	Mapping All Sources Tool
PEPU	Peacetime Emergency Planning Unit
PFRA	Preliminary Flood Risk Assessment
PLP	Property Level Flood Protection
PPS25	Planning Policy Statement 25: Development and Flood Risk
RMA	Risk Management Authority
SA	Sustainability Appraisal
SDU	Sustainable Development Unit
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SPD	Supplementary Planning Document
SuDS	Sustainable Drainage Systems
UK	United Kingdom
UKCIP	UK Climate Impacts Programme
UKCP09	UK Climate Projections (latest)
WFD	Water Framework Directive
YWS	Yorkshire Water Services

9. Appendices

APPENDIX A – SEA Workshop Participants

APPENDIX B – Baseline Data

APPENDIX C – Leeds Sustainability Appraisal Framework

APPENDIX D – List of Measures

APPENDIX E – Summary of SEA Workshop Discussions

APPENDIX F – Climate Proofing Assessment

Appendix A – SEA Workshop Participants

Dr Tom Knowland	Sustainable Development Unit
Jon Andrews	Sustainable Development Unit
Ian Hope	Flood Risk Management
Simon Gilliland	Mouchel
Paul Seddon	Peacetime Emergency Planning Unit
Dave Cherry	Transport Policy
Claire Brown	Environment Agency
Karen Robson	Environment Agency
Libby Turpin	Leeds University

Appendix B – Baseline Data

Data provided to participants in advance of SEA Workshop on 5th July 2012.

- The metropolitan district of Leeds covers an area of approximately 560 square kilometres;
- The population of the metropolitan district of Leeds is approximately 750,000;
- The employment rate in Leeds is 69%, which is broadly in line with regional and national averages;
- Leeds has over 150 designated nature conservation sites across the city;
- The road network in Leeds totals 2,965 kilometres;
- In 2010 38% of travel into Leeds was via public transport;
- The average annual CO_2 emissions per capita is 6.3 tonnes (2009 survey); this is similar to other large metropolitan districts in the UK;
- The Environment Agency estimates that there are 1500 homes and 500 businesses at 'significant' risk of river flooding within the district (at risk of annual flooding with a probability of 1 in 75 years);
- Parts of Leeds city centre are estimated to have a 1 in 20 year risk of flooding from the River Aire;
- There are approximately 500km of ordinary watercourses 'non-main river' in the Leeds district, which are managed by Leeds City Council.
- Approximately 80% of the population is in the catchment that is drained by sewers to Knostrop Waste Water Treatment Works;
- The general topography Of Leeds is undulating and varies in level from 10m above Ordnance Datum at Fairburn on the River Aire and Thorp Arch on the River Wharfe to more than 340m at Hawksworth Moor;

Appendix C – Leeds Sustainability Appraisal Framework

SA objective	Upstream, midstream and downstream effects
Maintain or improve the conditions which have enabled business success, economic growth and investment through increased entrepreneurship and innovation and investment in infrastructure and physical assets	Upstream: Does it contribute to economic success by: a) increasing entrepreneurship b) increasing innovation c) increasing investment in infrastructure and physical assets
	Midstream: How does the contribution to economic success affect: a) improved community regeneration b) retention of investment in the local economy c) air quality, especially industrial and transportation related emissions
	Downstream: How does its contribution to economic success affect: a) Waste arisings and management of waste b) Development in flood plain c) Rates of surface water run off d) Remediation of contaminated land e) Poverty levels f) Crime levels g) Biodiversity
Increase participation in education and life-long learning and reduce the disparity in participation and qualifications achieved across Leeds	Upstream: Will it result in increased educational attainment by a) Providing educational opportunities b) Providing lifelong learning opportunities c) Increasing participation rates in education and training
	Midstream: Does it contribute to the positive development of community by: a) Increasing community participation b) Providing opportunities to increase educational attainment c) Providing multiple use of facilities
	Downstream: How does it, via improved and/or increased educational attainment, affect: a) Waste generation and management b) Carbon dioxide and greenhouse gas emissions, as it relates to behavioural changes c) Public health d) Obtaining employment
Provide, maintain and improve culture, leisure and recreational activities that are available to all	Upstream: How does it provide, maintain and improve access (non car based) to: a) Culture to all b) Leisure to all c) Recreational activities to all
	Midstream: Does it contribute to the positive development of community by: a) Promoting a shared community focus b) Providing free or subsidized CLR activities
	Downstream: Will it, through provision of CLR, promote: a) Recreational opportunities, such as exercise, social contact, cultural experiences or activities b) The reduction of crime
Make the best use of land as a resource	Upstream: Does it make best use of land as a resource by: a) Promoting the use of Previously Developed Land b) Developing at an appropriate density for the area to promote sustainable development c) Providing for multiple functions of land use (i.e. green infrastructure, mixed use, etc.), where appropriate d) Make appropriate use of land, given constraints and opportunities (i.e. flood risk, etc.)
	Midstream: Does it contribute to the positive development of the community by: a) Concentrating services b) Creating a walkable and accessible community
	Downstream: Does it address the best use of land in relation to: a) Remediating contaminated land b) Maintaining, protecting and enhancing biodiversity of the areas it affects, both directly and indirectly c) Its impact on the rate of surface water run off d) Its impact on development in the flood plain d) Minimising the generation of transport related greenhouse gases
Increase accessibility and connectivity through investment in a	Upstream: How does it promote: a) Increased accessibility via public transportation b) Increased investment into sustainable transportation network c) The uptake of sustainable transportation methods
	Midstream: How does it contribute positively to the promotion of:

SA objective	Upstream, midstream and downstream effects
high quality transport system and through influencing others and changing behaviours	a) Accessibility community services b) Improved air quality c) Improved water quality
	Downstream: How does it: a) Reduce greenhouse gas emissions b) Improve the health of residents c) Mitigate against biodiversity impacts arising from air and water pollution d) Increase access to employment opportunities e) Promote and enhance a cleaner and greener city
Maintain and enhance the quality and distinctiveness of the landscape and the historic and built environment	Upstream: Does it contribute to quality of place by: a) Promoting character in townscape and landscape b) Encouraging sense of pride of place c) Potential to walk or cycle to or through a place d) Promoting the use of heritage assets (building/land) to conserve special interest
	Midstream: How does it positively contribute to the development of community by: a) Providing well designed affordable housing b) Providing amenities for the community
	Downstream: How does it, through addressing quality of place: a) Remediate contaminated land b) Reduce generation of carbon emissions c) Successfully integrate waste facilities d) Contribute to and support the physical and mental wellbeing of residents e) Design out crime
Increase energy efficiency, low and zero carbon forms of energy generation and local distribution	Upstream: How does it: a) Increase energy efficiency b) Provide for low and zero carbon generation c) Provide for local distribution
	Downstream: How does it reduce the production of greenhouse gases
Reduce consumption (increase efficient use) of natural resources (e.g. minerals, water)	Upstream: How does it reduce the use of resources by: a) Reusing resources b) Diverting resources c) Minimising resources d) Design and method reduce impact
	Midstream: Does it by decreasing the consumption of natural resources: a) improve water quality
	Downstream: Does it, by decreasing consumption of natural resources: a) Provide opportunities for biodiversity (e.g. restoration) b) Impact on levels of flood risk c) Impact on waste arisings and management d) Design and methods reduce impact

Leeds Sustainability Appraisal Revised Methodology, November 2011, Version 5

Appendix D – List of Measures

This is the 'List of Measures' provided to participants at the SEA Workshop on 5th July 2012. The updated version of the 'List of Measures' is in Appendix C of the Leeds Local Flood Risk Management Strategy.

Objective 1
Improve co-operation between LLFA and other RMAs, in terms of procedure, to meet the requirements of new legislation and achieve holistic solutions to identified risks/problems.

22. Improve communications, engagement and coordination of activities with internal and external partners (including RMAs): Leeds City Council Flood Risk Management Group; Technical Standards and Guidance; Planning and Flood Risk; Yorkshire and Humber Learning Alliance.

24. Review and update Emergency Handbook, Generic Flooding Plan, Community Flood Action Plans, West Yorkshire Major Flood Incident Plan, Reservoir Emergency Plan.

34. Review Council Policy on FRM - e.g. 'Maintaining Water Resources and Responding to Flood Incidents' approved by Exec Board on 17 May 2006 to ensure that it conforms to the requirements of the FWMA that Local authorities should lead on the management of local flood risk, with the support of the relevant organisations.

Objective 2
Develop a consistent approach to planning and investment in flood risk management between RMAs and avoid duplication of effort or inefficient investment.

18. Pump operation - carbon reduction

19. Implement SuDS Approval Body (SAB) function

20. Publish Local Flood Risk Management Strategy

21. Undertake Strategic Environmental Assessment (SEA)

25. Review Local Flood Risk Management Strategy (LFRMS)

26. Review LFRMS 'List of Measures'

30. Review and update as appropriate the Strategic Flood Risk Assessment (SFRA) produced by Jacobs in October 2007

33. Climate change adaptation

35. Provide regular feedback to senior officers and elected members on FRM progress: working groups, strategies, list of measures...etc

- Director of City Development (quarterly)
- City Development SLT (annually)
- Other key officers as needs arise
- City Development Scrutiny Board (annually)
- All Area Committees (two-yearly)

Objective 3
Increase internal skills and ultimately capacity for flood risk management.

37. Leeds City Council to increase their flood risk management capacity and skills (as Lead Local Flood Authority) in order to deliver their new responsibilities as conferred under the Flood and Water Management Act 2010.

Objective 4
Increase community awareness of the work of the LLFA and local flood risk and involve local communities in decision making – localism agenda.

23. Engagement and communication with public on FRM issues
- Targeted 'flood fairs' held in at-risk locations highlighting flood protection products;
- Wider public information campaigns for at-risk households drawing attention to useful resources;
- Engage with local flood action groups (EA and PEPU).

36. Maintain internet and intranet webpages to provide comprehensive information to all stakeholders on:
- The sources of flooding and who is responsible for what;
- How to prepare for flooding emergencies;
- What to do when flooding occurs and who to report this to;
- How flood risk is treated within the planning process.

5. Improve understanding of local flood risk and seek to decrease local flood risk through implementation of measures to alleviate flooding where practicable.

1. River Aire Flood Alleviation Scheme

2. Flood Alleviation Scheme - West Garforth recreation ground (local levy)

3. Flood Alleviation Scheme - Leeds Road (Allerton Bywater) pumping station (local levy)

4. Flood Alleviation Scheme - Ramsden Street, Kippax (local levy)

5. Flood Alleviation Scheme - Station Road (Morley) culvert renewal scheme

6. Flood Alleviation Scheme - Wyke Beck

7. Flood Alleviation Scheme - Collingham Beck

8. Flood Alleviation Scheme - Farnley Wood Beck

9. Newton Road property protection and resilience scheme

10. Lowther Road, Garforth - Culvert Improvements

11. Lower Wortley - property protection and resilience scheme

12. Church Lane, Bardsey - property protection and resilience scheme

13. Dean Park Drive, Drighlington - property protection and resilience scheme

14. Environment Agency schemes

15. YWS DG5 schemes

16. Develop register of assets affecting local flood risk

17. Watercourse and beck condition surveys

27. Carry out flood warning feasibility studies for the Wortley Beck and Meanwood Beck.

28. Investigate the interaction between the Leeds and Liverpool Canal and the River Aire.

29. Produce a register of culverts and outfalls, to identify capacity and other issues.

31. Sheepscar: evaluate the condition of formal and informal flood defences along the Sheepscar Beck which were recently breached to identify potential remedial works required.

32. Meanwood: work with EA to support the development of an holistic flood defence and resilience strategy for the Meanwood Beck catchment which takes account of the watercourse, sewers and highway drains in problem locations.

Appendix E – Summary of SEA Workshop Discussions

This is a summary of the discussions undertaken on 5th July 2012 to appraise the Leeds Local Flood Risk Management Strategy. Notes from the SEA workshop session are in the **blue** coloured font.

KEY

	Upstream sustainability objectives
	Midstream sustainability objectives
	Downstream sustainability objectives
	Health decision making criteria
	Equality decision making criteria
	Health & Equality decision making criteria

Questions relating to the criteria in the SEA Directive are clearly marked *

UPSTREAM SUSTAINABILITY OBJECTIVES

Sustainability Objective and *definition* **Linked to Up / Mid / Downstream topics**	**Justification**	**Linked objective and *Decision making criteria:*** **Yellow highlight = Health Impact Monitoring** **Blue highlight = Equality Impact Monitoring** **Green highlight = Health and Equality Impact Monitoring**	**OPTION A** **Score**	**Record of Decision**	**OPTION B** **Score**	**Record of Decision**	**Opportunities to improve sustainability / mitigate negative sustainability impacts**
UPSTREAM SA1: ECONOMIC SUCCESS *MAINTAIN OR IMPROVE THE CONDITIONS WHICH HAVE ENABLED BUSINESS SUCCESS, ECONOMIC GROWTH AND INVESTMENT THROUGH INCREASED ENTREPRENEURSHIP AND*		**SA1: ECONOMIC SUCCESS** *DOES IT CONTRIBUTE TO ECONOMIC SUCCESS BY:-*					
		A) INCREASING ENTREPRENEURSHIP?	0	Neutral impact			
		B) INCREASING INNOVATION?	0	Neutral impact			

Sustainability Objective and *definition* **Linked to Up / Mid / Downstream topics**	**Justification**	**Linked objective and *Decision making criteria:*** **Yellow highlight = Health Impact Monitoring** **Blue highlight = Equality Impact Monitoring** **Green highlight = Health and Equality Impact Monitoring**	**OPTION A**		**OPTION B**		**Opportunities to improve sustainability / mitigate negative sustainability impacts**
			Score	**Record of Decision**	**Score**	**Record of Decision**	
INNOVATION AND INVESTMENT IN INFRASTRUCTURE AND PHYSICAL ASSETS.		*C) INCREASING INVESTMENT IN INFRASTRUCTURE AND PHYSICAL ASSETS?*	+	Partnership funding encourages ongoing investment in flood risk infrastructure			
Midstream	SA9: Mixed Neighbourhoods SA10: Social inclusion and community empowerment *Generation of money from economic success often funds/stimulates regeneration projects providing better quality environments, housing and access to amenities.*	SA9: Mixed Neighbourhoods SA10: Social inclusion and community empowerment *How does the contribution to economic success affect:*					
		a) improved community regeneration?	+	Marginal impact – brings land back into use and promotes new development			
		b) retention of investment in the local economy?	+	Increase in confidence to local firms from reduced flood risk e.g. River			

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
				Aire Scheme			
Midstream	SA11: Air quality *There may be direct impacts on air quality from industrial processes.* *The increased levels of road traffic associated with economic success will bring an associated increase in emissions of air pollutants.*	SA11: Air quality* *How does the contribution to economic success affect air quality especially industrial and transportation related emissions?*	+	Reduced risk of flooding – flooding can cause grid lock and traffic congestion effecting air quality			
Midstream	SA12: Improve water quality *Clean water is essential for a healthy workforce, and as a raw material for many manufacturing processes. There is also direct regulation of water quality in the UK making polluting businesses liable to fines for pollution.*	SA12: Improve water quality* *How does the contribution to economic success affect water quality especially industrial and transportation related water pollution?*	+	Strategy complies with Water Framework Directive (WFD) – this promotes improved water quality through FRM activities			Amend objective 2 to specifically reference WFD
Downstream	SA13: Employment	SA13: Employment					

* SEA Directive: Air
* SEA Directive: Water

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	opportunities *There is a direct link between economic success and employment as all businesses need employees.*	opportunities *How does the contribution to economic success affect employment opportunities?*	+	Protecting and creating jobs through implementing measures e.g. River Aire Scheme			
Downstream	SA14: Health *There are recognised links between wealth and health, with the poorest communities often suffering higher morbidity rates.* *Poor air quality has known health effects (respiratory illness).*	SA14: Health* *How does the contribution to economic success affect health and health inequalities?*	+	Flooding causes stress – measures to reduce flooding through FRM activities have a positive impact on health			
Downstream	SA15: Crime *Levels of crime (particularly property crime) tend to increase during periods of economic recession.*	SA15: Crime *How does the contribution to economic success affect crime levels?*	+	Minimal impact – slightly positive as looting can occur in evacuated areas during floods			
Downstream	SA17: Biodiversity / geological conservation *Investment in economic developments can provide opportunities for*	SA17: Biodiversity* / geological conservation *How does the contribution to economic success affect opportunities for biodiversity?*	+	Strategy will comply with WFD – positive environmental impacts e.g. SuDS,			Amend objective 5 to specifically reference WFD/

* SEA Directive: Health
* SEA Directive: Biodiversity, fauna, flora

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	new wildlife habitat creation (e.g. clean-up of waterfront areas, management of invasive weeds).			green corridors			environmental enhancement
Downstream	SA19: Flood risk *Flooding can be very costly to businesses if their premises flood.* *Flooding of transport infrastructure (roads, rail lines, etc) may also hinder business.*	SA19: Flood risk* *How does the contribution to economic success affect local flood risk?*	++	**Very positive** – protects economic success through reduced flood risk and improved insurance chances			Ensure downstream flooding issues are considered – 'Catchment Cell Approach'
Downstream	SA20: Waste *Economic activity is likely to stimulate production of waste (industrial waste, office waste etc)*	SA20: Waste* *How does the contribution to economic success affect waste generation and management?*	+	Flooding generates waste which needs to be cleared up			
Downstream	SA21: Contaminated land *Economic activity can drive remediation to free up land for development.*	SA21: Contaminated land* *How does the contribution to economic success affect remediation of contaminated land?*	+	Marginal positive impact – brings land back into use and allows new development			

* SEA Directive: Material assets
* SEA Directive: Material assets
* SEA Directive: Soil

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
UPSTREAM SA2 EDUCATION *INCREASE PARTICIPATION IN EDUCATION AND LIFE-LONG LEARNING AND REDUCE THE DISPARITY IN PARTICIPATION AND QUALIFICATIONS ACHIEVED ACROSS LEEDS*		**SA2: EDUCATION** *WILL IT RESULT IN INCREASED EDUCATIONAL ATTAINMENT BY:-*					
		A) PROVIDING EDUCATIONAL OPPORTUNITIES?	+	Objectives 3 and 4 relate to increasing awareness of flood risk			
		B) PROVIDING LIFELONG LEARNING OPPORTUNITIES?	0	Neutral Impact			
		C) INCREASING PARTICIPATION RATES IN EDUCATION AND TRAINING?	0	Neutral Impact			
Midstream	SA9: Mixed neighbourhoods *Education can increase understanding between communities.* *Education can sometimes divide communities were there is a disparity in opportunities available to different sectors of the community.*	SA9: Mixed neighbourhoods *How does the contribution to education affect neighbourhood relations?*	+	Encourages community to work together e.g. flood action groups & Property level protection schemes			
Midstream	SA10: Social inclusion and community	SA10: Social inclusion and community empowerment					Strengthen

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	empowerment *Education can increase community participation and integration among different sections of society*	*How does the contribution to education affect social inclusion and community empowerment?*	+	Flood Action Groups promote social inclusion			objective 4 to promote social inclusion as well as awareness raising
Downstream	SA13: Employment opportunities *Education or training are pre-requisites for the majority of employment opportunities*	SA13: Employment opportunities *How does the contribution to education affect employment opportunities?*	+	Leeds Flood Alleviation Scheme may possibly provide training opportunities			
Downstream	SA14: Health *Better education and understanding of personal health* *Training of health professionals* *Better access to education leads to higher levels of employment and greater personal wealth, which is known to be associated wealth better health*	SA14: Health* *How does the contribution to education affect health and health inequalities?*	+	Ensures people know what to do in a flood. Community are aware – less stress			
Downstream	SA18: Climate change mitigation	SA18: Climate change mitigation*		Marginal positive			

* SEA Directive: Human health

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	Higher levels of knowledge and awareness of climate impacts may change public attitudes and behaviours. *Better education may lead to development of better mitigation strategies*	*How does the contribution to education affect climate change mitigation?*	+	impact through increased community awareness and knowledge			
Downstream	SA20: Waste *Education could play an important role in changing peoples' attitudes and behaviour towards reducing waste.*	SA20: Waste* *How does the contribution to education affect waste generation and waste management?*	0	Marginal/neutral impact			
UPSTREAM SA3: CULTURE, LEISURE AND RECREATION *PROVIDE, MAINTAIN AND IMPROVE CULTURE, LEISURE AND RECREATIONAL ACTIVITIES THAT ARE AVAILABLE TO ALL*		**SA3: CULTURE, LEISURE AND RECREATION** *HOW DOES IT PROVIDE, MAINTAIN AND IMPROVE ACCESS (NON CAR BASED) TO:-*					
		A) CULTURE FOR ALL?	0	Neutral impact			
		B) LEISURE FOR ALL?	+	Increases amenity value e.g. SuDS schemes, fish			Recreation areas may used for flood storage on

* SEA Directive: Climatic factors
* SEA Directive: Material assets

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
		C) RECREATIONAL ACTIVITIES FOR ALL?	+	passes and upstream storage			some occasions – last resort
Midstream	SA9: Mixed neighbourhoods *A range of cultural opportunities provide more opportunities for mixing between different sectors of the community.*	SA9: Mixed neighbourhoods *How does the contribution to culture, leisure and recreation affect neighbourhood relations?*	0	Neutral impact			
Midstream	SA10: Social inclusion and community empowerment *Provision of free or subsidised CLR facilities would improve access for more people in the community.* *Culture, leisure and recreational amenities will aid cohesive communities by provided a shared community focus.*	SA10: Social inclusion and community empowerment *How does the contribution to culture, leisure and recreation affect social inclusion and community empowerment?*	0	Marginal/neutral impact			
Downstream	SA14: Health *Access to more/better cultural, recreational and particularly leisure*	SA14: Health* *How does the contribution to culture, leisure and recreation affect health and health*	+	Some schemes may provide improved amenity value and			

* SEA Directive: Human health

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	facilities may improve physical fitness and mental wellbeing.	*inequalities?*		health benefits			
Downstream	SA15: Crime *Participation in sports and other recreational activities may reduce levels of certain crimes by providing alternative activities, particularly for young people?*	SA15: Crime *How does the contribution to culture, leisure and recreation affect crime?*	-	Marginal negative impact if recreational services e.g parks used for flood storage			Maintain services e.g. Youth Service
UPSTREAM SA4: BEST USE OF LAND *MAKE THE BEST USE OF LAND AS A RESOURCE*		**SA4: BEST USE OF LAND*** *DOES IT MAKE BEST USE OF LAND AS A RESOURCE BY:-*					
		A) PROMOTING THE USE OF PREVIOUSLY DEVELOPED LAND? *SEA (MATERIAL ASSET)*	+	Sustainable development, use of SuDS, making most of open spaces/ green spaces.			
		B) DEVELOPING AT AN APPROPRIATE DENSITY FOR THE AREA TO PROMOTE SUSTAINABLE DEVELOPMENT?	+				Strengthen objective 2 in the strategy to cover this

* SEA Directive: Material asset

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
		C) PROVIDING FOR MULTIPLE FUNCTIONS OF LAND USE (I.E. GREEN INFRASTRUCTURE, MIXED USE ETC), WHERE APPROPRIATE?	+	Flood storage in park areas and open space, energy generation e.g. hydro electric			
		D) MAKE APPROPRIATE USE OF LAND, GIVEN CONSTRAINTS AND OPPORTUNITIES (I.E. FLOOD RISK ETC)	+				
Midstream	SA9: Mixed neighbourhoods SA10: Social inclusion and community empowerment *Making best use of existing land for the benefit of mixed neighbourhoods and communities.*	SA9: Mixed neighbourhoods *How does the use of land affect neighbourhood relations?*	0	Neutral impact			
Midstream	SA10: Social inclusion and community empowerment *Making best use of existing land for the benefit of mixed neighbourhoods and communities*	SA10: Social inclusion and community empowerment *How does the use of land affect social inclusion and community empowerment?*	0	Neutral impact			

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Downstream	SA17: Biodiversity / geological conservation *Greenfield land is likely to support higher levels of biodiversity* *High quality green infrastructure can provide valuable habitats and aid movement/migration of wildlife.*	SA17: Biodiversity* / geological conservation *How does the use of land affect biodiversity?*	+	Potential for habitat creation and development of green corridors			Strengthen objective 5 to cover this – Water Framework Directive (WFD)
Downstream	SA18: Climate change mitigation *Reusing existing buildings reduces the need to construct new ones, and avoids the energy and resource use associated with wholly new developments?*	SA18: Climate change mitigation* *How does the use of land affect climate change mitigation?*	+	Use of land for flood mitigation schemes and storage reduces flood risk			
Downstream	SA19: Flood risk *Developments on previously undeveloped, vegetated ground will increase runoff and decrease the lag time*	SA19: Flood risk* *How does the use of land affect flood risk?*	+	Use of land for flood mitigation schemes and storage reduces flood risk			

* SEA Directive: Biodiversity, fauna, flora
* SEA Directive: Climatic factors
* SEA Directive: Material assets

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	for this extra water to find it's way to the rivers. This enhances the risk of flooding. *Developments in greenfield floodplains are at risk from flooding events.*						
Downstream	SA21: Contaminated land *Contaminated land usually only exists in previously developed land. Restricting development to brownfield sites will necessitate the remediation of this land as site as prepared for construction*	SA21: Contaminated land* *How does the use of land affect remediation of contaminated land?*	+	Flood alleviation schemes may make areas of contaminated land developable			
UPSTREAM SA5: ACCESSIBILITY AND CONNECTIVITY *INCREASE ACCESSIBILITY AND CONNECTIVITY THROUGH INVESTMENT IN A HIGH QUALITY TRANSPORT SYSTEM AND*		**SA5: ACCESSIBILITY AND CONNECTIVITY*?** *HOW DOES IT PROMOTE:-* *A) INCREASED ACCESSIBILITY VIA PUBLIC TRANSPORTATION?*	+ +	Protects transport infrastructure – Leeds is a key transport hub, impact			

* SEA Directive: Soil
* SEA Directive: Material assets

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
THROUGH INFLUENCING OTHERS AND CHANGING BEHAVIOUR.		*B) INCREASED INVESTMENT INTO SUSTAINABLE TRANSPORTATION NETWORK?* *C) THE UPTAKE OF SUSTAINABLE TRANSPORTATION METHODS?*	on economy big + +	Wyke Beck Sustainable Transport link – public access via cycle-ways and pedestrian bridges along green corridor			
Midstream	SA9: Mixed neighbourhoods *Communities can be segregated if appropriate transport links do not exist*	SA9: Mixed neighbourhoods *How does the contribution to accessibility and connectivity affect neighbourhood relations?*	+	Communities not isolated by flooding		Flooding can improve community cohesion	
Midstream	SA10: Social inclusion and community empowerment *Improving connectivity and access, particularly through public transport, walking and cycling would enable higher levels of social inclusion.* *Improving connectivity and reducing severance may increase people's feelings of* belonging in their community	SA10: Social inclusion and community empowerment *How does the contribution to accessibility and connectivity affect social inclusion and community empowerment?*	0	Neutral impact			

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
Midstream	SA11: Air quality *Road traffic emissions are the major source of poor air quality in Leeds.*	SA11: Air quality* *How does the contribution to accessibility and connectivity affect air quality?*	+	Flooding disrupts transport and causes traffic congestion			
Midstream	SA12: Water quality *Runoff from roads can contain oil, heavy metals and other toxic substances which can affect water quality.*	SA12: Water quality* *How does the contribution to accessibility and connectivity affect water quality?*	+	SuDS mitigate and improve water quality; reduced flood risk to transport network > reduced pollutants in water			
Downstream	SA13: Employment opportunities No justification	SA13: Employment opportunities How does the contribution to accessibility and connectivity affect employment opportunities?	+	Slight positive impact – improved connectivity results in improved economy/business			
Downstream	SA14: Health *Poor air quality resulting from road transport emissions can have serious health impacts, particularly those with existing cardio-vascular disease and the elderly.* *Road traffic accidents can kill or seriously*	SA14: Health* *How does the contribution to accessibility and connectivity affect health and health inequalities?*	+	Access to surgeries and NHS services improved			

* SEA Directive: Air
* SEA Directive: Water
* SEA Directive: Human health

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	injured people. *High levels of private car use encourage lower levels of physical activity and fitness. Opportunities should be taken where possible to encourage and facilitate more walking and cycling.*						
Downstream	SA16: Cleaner, greener and more attractive city *Road transport is the most extensive source of environmental noise pollution, and can have lead to high levels of annoyance and health impacts in exposed locations.*	SA16: Cleaner, greener and more attractive city* *How does the contribution to accessibility and connectivity affect creating a cleaner, greener and more attractive city?*	+	No silt, sewage, sludge from floods on streets – improves connectivity. Improved public realm and access through provision of SuDS and green spaces			
Downstream	SA17: Biodiversity / geological conservation *Poor air quality and water quality resulting from transport can*	SA17: Biodiversity* / geological conservation *How does the contribution to accessibility and connectivity affect biodiversity?*	+	Provision of improved public realm and access through SuDS and			

* SEA Directive: Interrrelationship between factors
* SEA Directive: Biodiversity, fauna, flora

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	reduce levels of biodiversity, particularly for very pollution-sensitive organisms such as lichen. *Wildlife fatalities from traffic collisions.*			green spaces			
Downstream	SA18: Climate change mitigation *There is the potential to reduce CO2 emissions from road transport through encouraging less private car use and promoting cleaner vehicles technologies/fuels.*	SA18: Climate change mitigation* *How does the contribution to accessibility and connectivity affect climate change mitigation?*	+	Flooding disrupts transport and causes traffic congestion – protecting transport infrastructure is good for climate change adaptation; more electronic information signs on the road			
Downstream	SA19: Flood risk No justification	SA19: Flood risk* How does the contribution to accessibility and connectivity affect flood risk?	+	Highway improvements such as drainage reduce flood risk; improved cooperation on FRM			
UPSTREAM SA6: QUALITY OF PLACE *MAINTAIN AND ENHANCE THE QUALITY AND*		**SA6 QUALITY OF PLACE*** *DOES IT CONTRIBUTE TO QUALITY OF PLACE BY:-*					

* SEA Directive: Climatic factors
* SEA Directive: Material assets
* SEA Directive: Cultural heritage including architectural and archaeological heritage

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
DISTINCTIVENESS OF THE LANDSCAPE AND THE HISTORIC AND BUILT ENVIRONMENT		*A) PROMOTING CHARACTER IN TOWNSCAPE AND LANDSCAPE?* *B) ENCOURAGING SENSE OF PRIDE OF PLACE?* *C) POTENTIAL TO WALK OR CYCLE TO OR THROUGH A PLACE?* *D) PROMOTING THE USE OF HERITAGE ASSETS (BUILDING / LAND) TO CONSERVE SPECIAL INTEREST?*	- + + -	Potential negative impact if public realm works are not high quality Provision of improved access to water environment e.g. SuDS and green corridors Potential negative impact on listed structures e.g. weirs on River Aire may need to be removed			Flood alleviation schemes should be good quality and reduce flood risk e.g. flood walls with glass panels and hydraulic barriers Revise objectives in LFRMS to promote good design
Midstream	SA9: Mixed neighbourhoods *Good quality social housing should be of a good design and compliment existing land use in the area*.	SA9: Mixed neighbourhoods *How does the contribution to quality of place affect neighbourhood relations?*	+	Positive impact if good quality scheme design			
Midstream	SA10: Social inclusion and community empowerment *Good quality and well designed affordable or*	SA10: Social inclusion and community empowerment *How does the contribution to quality of place affect social inclusion and community*	+	Community groups are supportive of schemes which			

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	social housing should reduce disparities in the housing markets. *Modern developments should provide better amenities for communities (open space provision, etc).*	*empowerment?*		improve public realm and amenity			
Midstream	SA12: Water quality *Particularly in former industrial areas, there may be a risk of mobilising contamination from land into watercourses.*	SA12: Water quality* *How does the contribution to quality of place affect water quality?*	+	Good quality schemes with SuDS and appropriate contaminant removal will enhance water quality			
Downstream	SA14: Health *Modern housing may offer accommodation that provides a healthier indoor environment (as regards indoor air quality, damp, etc).* *A high quality landscape can contribute to wellbeing.*	SA14: Health* *How does the contribution to quality of place affect health and health inequalities?*	+	Good quality schemes will enhance public realm and improve amenity value			
Downstream	SA15: Crime *Building design can*	SA15: Crime *How does the contribution to*		Good quality schemes will			

* SEA Directive: Water
* SEA Directive: Human health

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	affect whether people decide to commit a crime or not, by enhancing the risk of being watched/caught	*quality of place affect crime?*	+	promote pride in the place – reduced graffiti and low level crime			
Downstream	SA16: Cleaner, greener and more attractive city *High quality developments may improve neighbourhood cleanliness.*	SA16: Cleaner, greener and more attractive city* *How does the contribution to quality of place affect the creation of a cleaner, greener and more attractive city?*	+	Good quality schemes will promote pride in place and create a more attractive city			
Downstream	SA18: Climate change mitigation *Modern housing must be built to higher energy efficiency standards than in the past (building regulations, BREAM).*	SA18: Climate change mitigation* *How does the contribution to quality of place affect climate change mitigation?*	0	Neutral impact			
Downstream	SA19: Flood risk *Wherever possible new developments should not be built in areas at risk of flooding (identified in the SFRA/PPS25)?* *Flood protection*	SA19: Flood risk* *How does the contribution to quality of place affect flood risk?*	+	Good quality schemes will provide both improvements to public realm and flood risk benefits			

* SEA Directive: Interrelationship between factors
* SEA Directive: Climatic factors
* SEA Directive: Material assets

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	measures should be designed into any new development sited in a flood risk area? *A lot of the flood risk area in Leeds city centre constitutes historical buildings (waterfront/wharf areas).*						
Downstream	SA21: Contaminated land *A lot of historical industrial areas known to be heavily contaminated.*	SA21: Contaminated land* *How does the contribution to quality of place affect remediation of contaminated land?*	+	Opportunity for remediation through schemes which provide opportunity for new development			
UPSTREAM SA7: ENERGY AND LOW CARBON GENERATION *INCREASE ENERGY EFFICIENCY, LOW AND ZERO CARBON FORMS OF ENERGY GENERATION AND LOCAL DISTRIBUTION*		**SA7: ENERGY AND LOW CARBON GENERATION*?** *HOW DOES IT:-* *A) INCREASE ENERGY EFFICIENCY?* *B) PROVIDE FOR LOW AND ZERO CARBON GENERATION?*	 + +	 Measure 18 – pump operation carbon reduction Potential incorporation of hydro electric, solar panels, wind turbines			Strengthen objectives to include reference to low carbon

* SEA Directive: Soil
* SEA Directive: Material assets

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
		C) PROVIDE FOR LOCAL ENERGY (INCLUDING HEAT) DISTRIBUTION?	+	in schemes			
Downstream	SA14: Health *Community CHP projects could reduce fuel poverty by providing cheap or free sources of heat to homes, and would therefore alleviate ill health resulting from living on cold or damp conditions (particularly for the elderly).*	SA14: Health* *How does the contribution to energy and low carbon generation affect health and health inequalities?*	0	Neutral impact – could possibly sell on electricity			
Downstream	SA18: Climate change mitigation *Increasing energy efficiency and introducing alternative local energy generation are likely to produce fewer carbon emissions.*	SA18: Climate change mitigation* *How does the contribution to energy and low carbon generation affect climate change mitigation?*	-	More pumping would be bad for the environment but potentially offset by green energy			Strengthen objectives to include reference to low carbon
Downstream	SA20: Waste *New energy production processes are likely to involve energy-from-waste*	SA20: Waste* *How does the contribution to energy and low carbon generation affect waste and waste management?*	+	Management of (waste) water is improved			

* SEA Directive: Human health
* SEA Directive: Climatic factors

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
UPSTREAM SA8: RESOURCE CONSUMPTION *REDUCE RESOURCE CONSUMPTION AND ENCOURAGE EFFICIENT USE OF NATURAL RESOURCES*		**SA8: RESOURCE CONSUMPTION*** *HOW DOES IT REDUCE THE USE OF RESOURCES BY:-*					
		A) REUSING RESOURCES?	+	Re-use of materials, sustainable materials, SuDS			
		B) DIVERTING RESOURCES FROM THE WASTE STREAM?	+	Choice of building materials			
		C) MINIMISING RESOURCE USE?	+	Sustainable scheme design and implementation			
		D) REDUCING THE IMPACT OF RESOURCE USE THROUGH DESIGN AND METHOD?	+				
Midstream	SA11: Air quality No justification	SA11: Air quality* How does the contribution to resource consumption affect air quality?	-	Consumption of more resources would affect air quality			Keep resource consumption low
Midstream	SA12: Water quality *Reduced water*	SA12: Water quality* *How does the contribution to*					

* SEA Directive: Material assets
* SEA Directive: Material assets
* SEA Directive: Air
* SEA Directive: Water

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	consumption means that less water will be exposed to contaminants, requiring less treatment.	*resource consumption affect water quality?*	+	SuDS have positive impact on water quality			
Downstream	SA17: Biodiversity / geological conservation *Encouraging efficient use of natural resources means more biological and geological resources will be left intact.*	SA17: Biodiversity [*] / geological conservation *How does the contribution to resource consumption affect biodiversity?*	+	SuDS amd green corridors have a positive impact on biodiversity			
Downstream	SA18: Climate change adaptation *Reduced resource consumption mean less extraction and processing of materials and will therefore result in fewer greenhouse gas emissions.*	SA18: Climate change mitigation[*] *How does the contribution to resource consumption affect climate change mitigation*	+	Marginal improvement through efficient use of resources			
Downstream	SA19: Flood risk *Green design (grass roofs, porous surfaces, etc) can reduce flood risk.*	SA19: Flood risk[*] *How does the contribution to resource consumption affect flood risk*	+	Efficient use of resources will reduce flood risk			
Downstream	SA20: Waste	SA20: Waste[*]					Use of 'site

[*] SEA Directive: Biodiversity, fauna, flora
[*] SEA Directive: Climatic factors
[*] SEA Directive: Material assets

Sustainability Objective and *definition* Linked to Up / Mid / Downstream topics	Justification	Linked objective and *Decision making criteria:* Yellow highlight = Health Impact Monitoring Blue highlight = Equality Impact Monitoring Green highlight = Health and Equality Impact Monitoring	OPTION A		OPTION B		Opportunities to improve sustainability / mitigate negative sustainability impacts
			Score	Record of Decision	Score	Record of Decision	
	Efficient use of resources will result in less waste arisings.	*How does the contribution to resource consumption affect waste and waste management?*	-	Construction creates waste – materials should be reused and recycled			waste management plans' to reduce waste consumption

* SEA Directive: Material assets

Appendix F – Climate Proofing Assessment

This is a summary of the discussions undertaken on 5th July 2012 to appraise the Leeds Local Flood Risk Management Strategy. The discussions from the SEA workshop are in the **blue** coloured font.

STRATEGY OBJECTIVE		EXISTING CLIMATE RISKS (vulnerability mapping / LCLIP / PEPU Plans)	PROJECTED CLIMATE RISKS (use of EA models or UKCIP models)
Objective 1: Improve co-operation between LLFA and other RMAs, in terms of procedure, to meet the requirements of new legislation and achieve holistic solutions to identified risks/problems.	- Improve communications; - Review and update relevant guidance / plans; - Review Council policy on flood risk management.	- OK - but can improve; - Currently flood mapping produced with 1 in 100yr, 1000yr + 20% CC allowance; - Mapping improvements for surface water - looking to develop these maps; - Hydraulic modelling - combined risk > river and surface water; - UK climate database available.	- Use best available data - could develop local models utilising local knowledge to improve SW mapping. Use UKCP's to account for climate change; - MAST (Mapping All Sources) Tool: Will bring together all flood sources on one map (Groundwater/ surface water/ fluvial) - currently being developed by EA.
Objective 2: Develop a consistent approach to planning and investment in flood risk management between RMAs (land allocation, sustainable development, climate change adaptation and emergency planning) and avoid duplication of effort or inefficient investment.	- Pump operation - carbon reduction; - Implement SuDS Approval Body function; - Publish local flood risk management strategy and List of Measures; - Review and update Strategic Flood Risk Assessment; - Climate change adaptation; - Regular feedback to senior officer and elected members.	- Appropriate flood legislation - FWMA 2010 key driver; - YWS have their own investment strategy - cooperation with YWS could be strengthened - closer working on SuDS adoption; - Need to engage with communities to think more about SuDS - closer engagement with Planning Authority on where development is taking place.	- As for existing but with pressures e.g. Large developments - Kirkstall Forge; - Legislation on the development of impermeable areas; - SuDS investment strategy could be strengthened.

STRATEGY OBJECTIVE		EXISTING CLIMATE RISKS (vulnerability mapping / LCLIP / PEPU Plans)	PROJECTED CLIMATE RISKS (use of EA models or UKCIP models)
Objective 3: Increase internal skills and ultimately capacity for flood risk management.	- Increase LCC flood risk management capacity and skills (as LLFA).	- Improved training for all staff – engineers…etc. Try to improve proactive measures for whole river catchment; - Use of UKCP data in all designs - not just 20% or 30% allowances; - Strengthen cooperation with neighbouring authorities; - Improved catchment management activities - refer to CFMP e.g. tree planting - assess benefits of this.	- As for existing.
Objective 4: 4. Increase community awareness of the work of the LLFA and local flood risk and involve local communities in decision making – localism agenda.	- Engagement and communication with public (flood fairs, wider public info campaigns, engage with local flood action groups); - Maintain internet and intranet pages to provide comprehensive info to all stakeholder.	- Resident Apathy - need to improve involvement once a contact has been established; - Attend existing community events rather than create own; - Investigate alternative events e.g. around school pickup time.	- Deliver best value for money.

STRATEGY OBJECTIVE		EXISTING CLIMATE RISKS (vulnerability mapping / LCLIP / PEPU Plans)	PROJECTED CLIMATE RISKS (use of EA models or UKCIP models)
Objective 5: Improve understanding of local flood risk and seek to decrease local flood risk through implementation of measures to alleviate flooding where practicable.	- Flood alleviation schemes; - Property protection and resilience schemes; - Culvert improvements; - Environment Agency and YWS dG5 schemes; - Develop register of assets affecting local flood risk; - Watercourse and beck condition surveys; - Flood warning feasibility studies (Wortley Beck and Meanwood Beck); - Investigate interaction between Leeds & Liverpool Canal and the River Aire; - Produce register of culverts and outfalls; - Evaluate condition of flood defences along Sheepscar Beck; - Work with EA to support development of flood defence and resilience strategy for the Meanwood Beck catchment.	- Identify existing flooding hot spots; - What is right for a specific community - not just Standard of Protection - check hydraulic modelling methodology; - Understand flood risk now and what risk will be in 50 years time - use UKCP and relevant guidance; - Assumptions for UKCP's - emissions - should use upper end estimates; - Indirect effects of major schemes - e.g. River Aire/Leeds - effects downstream on Castleford; - Cost/benefit analysis for each applicable area – affordability; - Improve capability to deal with a flood when it happens - property protection and resilience e.g. Todmorden.	- Understanding of flood risk in the future; - Improve understanding of downstream catchment effects - unforeseen impacts, indirect effects, effect of bridges, reduced risk, increased capacity; - Potential Partnership Funding - include paragraph for this in strategy and strengthen objectives 4 and 5.