

Leeds City Council

LOCAL FLOOD RISK MANAGEMENT

STRATEGY

2018 Update

003

DECEMBER, 2018 





Leeds City Council

LOCAL FLOOD RISK MANAGEMENT STRATEGY

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FOREWORD



As the Executive member holding the portfolio for Flood Risk Management within Leeds, I am delighted to be able to introduce this update to the Leeds Flood Risk Strategy.

Since the first local Flood Risk Management Strategy was adopted in 2014, Leeds has received its wake-up call to the consequences of flooding on its residents and businesses. The extraordinary winter of 2015/16 saw storms Desmond, Eva and Frank demonstrate the devastation flooding can cause. Whilst the existing strategy supported our response, the impact exceeded all Leeds’ previous flooding experiences. Since then, investigations have allowed us to understand what happened and update our records of places at risk. Our update to the Preliminary Flood Risk Assessment in 2017 has allowed baseline flood data to be refreshed and further areas of flood risk to be identified.

This update allows a newly identified Leeds Flood Risk Area, alongside new preventative measures, to be incorporated into our strategy. It also shows how previously identified works have been implemented and how priorities to remaining flooding problems have been updated. This has enabled a new programme of works as the strategy moves into its next phase.

Since 2012 flood alleviation measures have reduced flood risk to 3700 properties, the most significant of which is Leeds Flood Alleviation Scheme Phase 1. Work continues to assess feasibility and develop designs for such schemes, including Leeds Flood Alleviation Scheme Phase 2.

Construction has started on works around Killingbeck that will reduce the risk of flooding around the area and will open the area up to the potential of building new houses. We have been successful, through working with partners, in securing funding from a range of sources including the EA, local growth deal, central government, developers and our own budgets. Updating our strategy allows us to build on previous achievements and to keep our momentum to continue to deliver reductions in flood risk. By doing this we support ongoing sustainable growth and regeneration for the city region, as well as sustaining safe, healthy communities.

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EXECUTIVE SUMMARY



The scope of this updated Local Flood Risk Management Strategy covers all sources of flooding. It focuses on ‘local flooding’ that originates from ordinary watercourses, surface water, sewers (rainfall only) and groundwater. It also includes Main River flooding and although this is primarily the Environment Agency’s responsibility; however, its inclusion here allows the impact on the local situation to be recognised.

The purpose of this strategy is to guide the activities undertaken by Risk Management Authorities operating in the metropolitan district of Leeds. These are Leeds City Council, the Environment Agency, Yorkshire Water Services, Ainsty Internal Drainage Board and Highways England.

Lead Local Flood Authorities have duties under the Flood and Water Management Act to develop, maintain, apply and monitor a strategy for local flood risk management. The initial strategy was originally developed in 2012, adopted in 2014 and now is being updated in 2018 in accordance with the proposed six-year review cycle.

The strategy needs to take account of current legislation, guidance and other plans. Hence updating at regular intervals allows changes that have occurred since its initial development to be taken into account. This update has now incorporated the following:

* Changes in legislative context including Brexit, the government’s 25-year Environmental Plan and the National Infrastructure plan.
* Local plans including Leeds Best Council Plan and the Inclusive Growth Strategy for Leeds.
* Newly defined Leeds Flood Risk Area, which was identified through the updated Preliminary Flood Risk Assessment in July 2017.
* Section 19 reports following the significant flooding events, particularly winter 2015.
* Measures implemented since 2012, in particular the Leeds Flood Alleviation Scheme Phase 1.
* Ongoing development of schemes to address local and city wide flooding problems.
* Changes in funding sources and mechanisms.

List of Measures is a key part of the strategy. This has been monitored and amended annually through the Council’s scrutiny processes since the strategy was adopted in 2014. This has now been fully updated to take account of revised priorities, works completed and newly identified problems.

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1. LEGISLATIVE CONTEXT



* 1. INTRODUCTION

This Strategy has been developed with regard to all current legislation and guidance relating to flood risk management in the district of Leeds.

There is appreciation that the legislation and guidance, set out in the following sub-section, may change in the years following the departure of the United Kingdom (UK) from the European Union (EU).

Section 9 contains a list of reference material related to flood risk for Leeds district. It contains relevant legislation, guidance, reports, strategies and studies, which have been used to develop this strategy.

* 1. EUROPEAN UNION WITHDRAWAL ACT

Exactly what leaving the EU will mean for the environment of the UK is hard to predict, but it will be significant. The protection of the UK’s natural environment has been profoundly shaped by EU legislation and policy for four decades.

The European Union Withdrawal Bill had its first reading in the House of Commons on 13 July 2017. The bill proposed to do three main things:

* + - Repeal the European Communities Act 1972.This legislation provides legal authority for EU law to have effect as national law in the UK. This will no longer be the case after the UK leaves the EU.
    - Bring all EU laws onto the UK books. Laws and regulations made over the past 40 years while

the UK was a member of the EU will continue to apply after the UK leaves the EU.

* + - Give ministers power to make secondary legislation.

The European Union (Withdrawal) Act became law on 26th June 2018. At the time of writing, it is anticipated that the laws and regulations transposed from European Directives will be committed to UK law following the UK’s departure from the EU.

* 1. THE FLOOD RISK REGULATIONS

The European Union Flood Directive (2007/60/EC) is consolidated into UK law in the Flood Risk Regulations 2009 (FRR), which came into force on 10th December 2009. Under these regulations Leeds City Council (as a unitary authority) is designated a 'Lead Local Flood Authority' (LLFA) for the area.

FRR states that an LLFA must prepare a preliminary assessment report in relation to flooding in its area, described as a Preliminary Flood Risk Assessment (PFRA). The PFRA aims to locate areas in which the risk of surface water and groundwater flooding is significant and warrants further examination through the production of flood risk maps and management plans. It must be updated every six years in line with Environment Agency (EA) guidance. Leeds City Council completed their first PFRA for Leeds district in September 2011 and produced an updated PFRA in June 2017.

The Local Flood Risk Management Strategy (LFRMS) must consider the outcomes of the PFRA, and its updates, when developing the specific measures set out in the ‘List of Measures’ (Appendix

C). The updated PFRA revealed a change in understanding of flood risk across Leeds district resulting in the identification of a new Flood Risk Area (FRA) for Leeds district. The PFRA Update was accepted by the EA in December 2017 and subsequently submitted to the European Commission.



* 1. THE WATER ENVIRONMENT REGULATIONS

The European Union Water Framework Directive (2000/60/EC) is consolidated into UK law in the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

The aims of the Water Framework Directive (WFD) are to:

* + - Prevent deterioration and enhance status of aquatic ecosystems, including groundwater;
    - Promote sustainable water use;
    - Reduce pollution, and
    - Contribute to the mitigation of floods and droughts.

Regulation 33 of the Water Environment Regulations states that local authorities, as well as other public bodies, must ’have regard to the RBMP for a river basin district’ ‘when exercising functions affecting the district’. RBMP refers to the relevant River Basin Management Plan.

Regulation 35 requires local authorities to provide ‘such information in its possession’ and ‘such assistance as the Environment Agency may reasonably seek’ in connection with its WFD functions. Incorporation of WFD objectives into all aspects of local authority function are necessary to meet this requirement.

Local authorities can help to address the causes of poor water body status and make a major contribution to meeting WFD objectives, both in their own activities and in their work with others. Key local authority functions which can contribute to WFD objectives include:

* + - Local planning policies.
    - Development management and building control.
    - Drainage, flood risk management and Sustainable Drainage Systems (SuDS).
    - Environmental health and pollution control.
    - Managing a local authority’s own buildings, assets and green-space.
    - Local authority highway functions.
    - Community leadership, advocacy and partnership roles.
  1. ENVIRONMENTAL ASSESSMENT OF PLANS AND PROGRAMMES REGULATIONS

The Strategic Environmental Assessment Directive (2001/42/EC) is consolidated into UK law in the Environmental Assessment of Plans and Programmes Regulations 2004.

A Strategic Environmental Assessment (SEA) was been undertaken in parallel to the production of the initial LFRMS in accordance with these regulations. This used the Leeds Sustainability Appraisal Framework to appraise the LFRMS, with focus on the ‘Objectives for managing flood risk’ that are defined in Section 6 of the strategy and the associated ‘List of Measures’ in Appendix C. 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).

For the purpose of this update the LFRMS objectives and the objectives of the sustainability appraisal framework are unchanged. Hence it considered that the earlier SEA remains current. The appraisal undertaken confirmed that the LFRMS provides greater clarity and focus on the environment, education, cooperation, the economy, health and equality and climate change.



The SEA process established eight monitoring indicators to assess the implementation of the LFRMS; these are presented in Section 8. The SEA Report is included in Appendix B.

* 1. EQUALITY IMPACT ASSESSMENT

Section 149 of the Equality Act 2010 imposes a legal duty, known as the Public-Sector Duty (Equality Duty), on all public bodies.

The Equality Duty requires a public authority, in the exercise of its functions, to:

* + - Consider the need to eliminate unlawful (direct or indirect) discrimination, harassment and victimisation and other conduct prohibited by the Equality Act 2010;
    - Advance equality of opportunity between people who share a protected characteristic and those who do not share it; and
    - Foster good relations between people with a protected characteristic and those who do not share it.

A screening exercise was carried out into the impact of the LFRMS on Equality, Diversity, Cohesion and Integration. The finding of this was that a full Assessment was not required at this time — however further assessment will be carried out as each measure is considered.

* 1. FLOOD AND WATER MANAGEMENT ACT

As a LLFA, the Council is required under Section 9 of the Flood and Water Management Act (FWMA), which came into effect on the 12th April 2010, to develop, maintain, apply and monitor a strategy for local flood risk management — a ‘Local Flood Risk Management Strategy’.

Section 9 of the FWMA states that the LFRMS must specify:

1. The Risk Management Authorities in the Leeds LLFA area;
2. The flood and coastal erosion risk management functions that may be exercised by those authorities in relation to the area;
3. The objectives for managing local flood risk (including any objectives included in the authority's flood risk management plan prepared in accordance with The Flood Risk Regulations 2009);
4. The measures proposed to achieve those objectives;
5. How and when the measures are expected to be implemented;
   1. The costs and benefits of those measures, and how they are to be paid for;
6. The assessment of local flood risk for the purpose of the strategy;
7. How and when the strategy is to be reviewed, and
8. How the strategy contributes to the achievement of wider environmental objectives.
   1. NATIONAL FLOOD AND COASTAL EROSION RISK MANAGEMENT STRATEGY



The EA and the Department for Environment Food and Rural Affairs (Defra) jointly developed and published their National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England on the 19th July 2011 pursuant to Section 7 of the FWMA. The National FCERM Strategy for England sets out six high-level principles (‘The Guiding Principles’) to guide LLFAs in their risk management activities.

1. Community focus and partnership working.
2. A catchment and coastal ‘cell’ based approach.
3. Sustainability.
4. Proportionate, risk-based approach.
5. Multiple benefits.
6. Beneficiaries should be encouraged to invest in risk management.
   1. LOCAL DEVELOPMENT FRAMEWORK

To ensure consistency with local planning guidance the LFRMS has been produced with reference to the Leeds Local Development Framework (LDF).

The key Development Plan Documents reviewed, were the Leeds Core Strategy (adopted November 2014) and Natural Resources and Waste Local Plan (adopted January 2013).

Leeds Core Strategy Policy EN5 is presented below. It sets out the six ‘objectives for managing local flood risk’, which are listed in Section 5 of this document.

POLICY EN5: MANAGING FLOOD RISK

The Council will manage and mitigate flood risk by:

i. Avoiding development in flood risk areas, where possible, by applying the sequential approach and where this is not possible by mitigating measures, in line with the NPPF, both in the allocation of sites for development and in the determination of planning applications;

Protecting areas of functional floodplain as shown on the Leeds Strategic Flood Risk Assessment (SFRA) from development (except for water compatible uses and essential infrastructure);

Requiring flood risk to be considered for all development commensurate with the scale and impact of the proposed development and mitigated where appropriate;

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Reducing the speed and volume of surface water run-off as part of new build development; Making space for flood water in high flood risk area;

Reducing the residual risks within Areas of Rapid Inundation;

Encouraging the removal of existing culverting where practicable and appropriate, and The development of the Leeds Flood Alleviation Scheme (FAS).

The Natural Resources and Waste Local Plan provides LCC’s policy requirement for sustainable drainage. It is provided below.



POLICY WATER 7: SURFACE WATER RUN-OFF

All developments are required to ensure no increase in the rate of surface water run-off to the existing formal drainage system. Development will be expected to incorporate sustainable drainage techniques wherever possible, both:

* + - On previously developed sites peak flow rates must be reduced by at least 30%, and
    - On sites which have not previously been connected to the drainage infrastructure, or watercourse, surface water run off rates will not exceed the greenfield’ run-off rate (i.e. the rate at which water flows over land which has not previously been developed).

Water 7 policy will be reviewed in 2019, in which LCC will seek to further reductions in runoff from brownfield sites that are undergoing major development.

The LFRMS must be consistent with the National FCERM Strategy for England, and these six high- level principles. Therefore, the objectives for managing local flood risk in Section 6 of this LFRMS and the specific measures in the ‘List of Measures’ in Appendix C have been aligned with these high-level guiding principles to ensure consistency with National FCERM Strategy for England.

* 1. BEST COUNCIL PLAN 2018/19 — 2020/21

This plan maintains Leeds City Council’s long-term ‘Best City’ strategy. It focuses on tackling poverty and inequalities through a combination of: strengthening the economy, acting in a way that is compassionate and caring, and supporting vulnerable children and adults.

Building on the range of council and partnership strategies in place and in development, this Best Council Plan update sets out seven interconnected priority areas of work that flow from the council’s two main cross-cutting strategies: Inclusive Growth and Health and Wellbeing.

* + - Inclusive growth.
    - Health and wellbeing.
    - Child-friendly city.
    - Safe, strong communities.
    - Housing.
    - 21st-century infrastructure.
    - Culture.

Each strategy has a number of Key Performance Indicators (KPIs) that outline how the council will measure progress and achievements. Of these KPIs, the following relate to the management of flood risk:

* + - Growth in new homes in Leeds.
    - Number of residential and commercial properties moved to a lower level of flood risk.
  1. LEEDS INCLUSIVE GROWTH STRATEGY 2018 — 2023



This inclusive strategy sets out the ambition for Leeds to have a strong economy within a compassionate city. It set out how partners will work together to grow the economy ensuring everyone can contribute to, benefit from, and grow to their full potential.

It recognises that Leeds is the main economic centre for Leeds City Region, and a driver of growth for the Northern Powerhouse, Yorkshire and the national economy. This strategy also provides a framework for how the city will work on inclusive economic growth with the Leeds City Region Local Enterprise Partnership and West Yorkshire Combined Authority, partners across Yorkshire, the Northern Powerhouse and, in the context of the national Industrial Strategy, with central Government. It also sets out how the city intends to promote a positive, outward looking image on the global stage seeking to increase inward investment, exports and tourism.

It states that Leeds will only fulfil this potential for future growth if it sustains the progress it is making, and by taking action on areas where it could perform better. This includes tackling poverty, addressing skills gaps, housing growth and regeneration, exports, investment in research and development, developing, attracting and retaining a skilled workforce, and transport and infrastructure.

It defines twelve big ideas to shape the city by boosting long term productivity, competitiveness and social inclusion. Integral to this are the principles of sustainable development which embrace the social, economic and environmental impacts of their implementation. There is a lot of good work already taking place in Leeds but there remains an opportunity for this to have renewed focus, a clearer strategic context and stronger commitment from businesses and others in the city.

It acknowledges that flood protection and green infrastructure will form part of its vision for 21° century infrastructure.

* 1. NATIONAL INFRASTRUCTURE ASSESSMENT JULY 2018

This sets out the plan of action for the country’s infrastructure for over the next 10 — 30 years. The national infrastructure commission was set up to address problems with long term infrastructure planning in the UK. One of its core proposals includes national standard of flood resilience by 2015. The Commission’s recommendations represent a major long-term programme of investment in the UK’s infrastructure. The programme includes substantial funding for major schemes such as Crossrail 2 and Northern Powerhouse Rail, as well as to support the delivery of enhanced digital networks and flood protection.

It states that a long-term strategy for flood protection would allow a nationwide standard of resilience to flooding, with catchment based plans. These plans should evaluate the full range of options including traditional flood defences, ‘green infrastructure’ (whether Natural Flood Management or SuDS), individual property measures and spatial planning. In the Commission’s social research, 59 per cent of people agreed that everyone should have the same standard of flood resilience, even though some properties cost more to protect. The Commission believe that a national standard should be set for resilience to flooding with an annual likelihood of 0.5 per cent by 2050, where feasible. Over longer time periods, higher standards might be achievable. Densely populated areas, where the consequences of flooding are potentially much more serious, should be resilient to flooding with a likelihood of only 0.1 per cent a year by 2050. The Environment Agency should update plans for all catchments and coastal cells in England before the end of 2023.

This provides a new vision for the development of public infrastructure which will bring new challenges in promoting and securing investment in flood risk infrastructure.



1. LEEDS CITY COUNCIL ADMINISTRATIVE AREA



* 1. PHYSICAL CHARACTERISTICS

The administrative area of Leeds City Council covers an area of approximately 560 square kilometres. This includes approximately 360 square kilometres of countryside designated as Green Belt. The district encompasses the major city of Leeds as well as number of smaller settlements including: Wetherby, Otley, Guiseley, Yeadon, Horsforth, Garforth, Rothwell, Pudsey and Morley. The population of Leeds is approximately 750,000 - in around 320,000 households (figures from 2011 Census).

The general topography of the district is undulating and varies in level from 10m Above Ordnance Datum (AOD) at Fairbum on the River Aire and Thorp Arch on the River Wharfe to more than 340m AOD at Hawksworth Moor. The rocks underlying the district date from the Upper Carboniferous period: with sandstones of the older Millstone Grit Series in the north of the district and alternating shales, mudstones, coal seams and sandstones of the Lower Coal Measures in the south of the district. The overlying soils in the district mainly comprise of clays and loams, and are relatively impermeable. However, sands and gravels are commonly found adjacent to the River Aire.

* 1. DRAINAGE FEATURES

Most of the district is drained naturally via a series of watercourses, some of which are culverted in urban areas; these typically run in steep sided valleys towards the major/ strategic watercourses (designated Main Rivers) which generally travel in an easterly direction eventually discharging to the River Ouse and Humber.

The major watercourses in the district are:

* + - The River Aire, which traverses the district from the north-west to south-east and drains approximately two thirds of the district;
    - The River Wharfe, which drains an area to the north and east of the district. This drains to the River Ouse, with small areas draining to the River Nidd and direct to the River Ouse, and
    - The River Calder, which forms part of the southern boundary of the district and flows from the west to east to join the River Aire at Castleford.

In urban areas, the drainage of the district is facilitated by a sewer system. Urban areas of Leeds were originally served by ‘Combined Sewers’ (carrying both foul and surface water); however, it has been the policy since the 1950s to ensure that new developments and redevelopments incorporate separate foul and surface water systems. Consequently, a significant part of the city now has separate or partially-separate sewers, with the surface water sewers connected in many cases directly to watercourses.

Many of the combined sewers in the district drain to the Knostrop Waste Water Treatment Works which is located to the south-east of Leeds, adjacent to the River Aire.

* 1. SOURCES OF FLOOD RISK

The scope of the LFRMS covers all sources of flooding, but it focuses specifically on ‘local flooding’. Flooding that originates from Main Rivers, such as the River Aire, is not categorised as ‘local flooding’ and risk management responsibility for these watercourses sits principally with the EA.

All flooding in Leeds is of concern to the residents and business of Leeds, as well as Leeds City Council. As such, this strategy promotes a collaborative approach to flood risk management in Leeds between all RMAs, and incorporates specific measures to alleviate Main River flooding, such as Leeds FAS Phase 1 and 2.



For further information on how flood risk from Main Rivers is managed by the EA, please refer to the Leeds SFRA, the Aire and Ouse Catchment Flood Management Plans (CFMP), the Humber RBMP and the EA’s National FCERM Strategy for England.

The 5 main sources of flooding in Leeds are outlined below.

* + - Main Rivers. This type of flooding typically occurs when a watercourse cannot cope with the water draining into it from surrounding land. Main Rivers are usually larger streams and rivers, but also include smaller watercourses of strategic drainage importance, which are not categorised as ‘ordinary watercourses’.
    - Ordinary watercourses. This type of flooding includes lakes, ponds or other areas of water which flow into an ordinary watercourse (not Main River). It typically occurs when a watercourse cannot cope with the water draining into it from surrounding land.
    - Surface water. This type of flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground, but lies on or flows over the ground surface instead.
    - Sewers. This strategy only covers sewer flooding where it is wholly or partially caused by rainwater. This type of flooding occurs when sewers are overwhelmed by heavy rainfall or they become blocked. The chance of flooding depends on the capacity of the local sewer system and amount of rain that falls.
    - Groundwater. This type of flooding occurs when levels of water in the ground rise above the surface. It is most likely to happen in areas where the ground contains permeable rocks that water can soak into or pass through easily.
  1. FLOODING ISSUES
     1. PREVIOUSLY REPORTED

Leeds district is susceptible to flooding from a variety of sources and every year this area experiences flooding incidents that affect residential and business properties and city-wide infrastructure. These result from severe weather and from issues with the design and maintenance of the built environment.

A list of significant flood events in the Leeds district are shown below.

* + - * River Aire. Major floods in 1775, 1866 and 1946; minor floods in 2000, 2002 and 2007.
      * River Wharfe at Otley in 1935, 1965, 1975, 1982, and a near miss in 2000.
      * River Calder at Methley in 1960 (homes up to 13 feet underwater).
      * Wyke Beck in 2004, 2005 and 2007 (70 residential properties flooded).
      * Wortley Beck in 1946, 2002, 2005 and 2007.
      * Highway drainage at Armley Gyratory.
      * 14-15 June 2007. 100mm rainfall in 48 hours caused flooding in City, Wortley, Beeston, Pudsey, Swillington, Methley and Guiseley.
      * 19-20 June 2007. Intense rainfall caused flooding in city centre, Halton, Pudsey and Methley.
      * 25 June 2007. Over 100mm of rainfall in 24 hours flooded more than 250 properties city-wide (Halton, Collingham, Wortley, Rothwell, Mabgates, Meanwood, Kippax et at.)



* + 1. IDENTlFlED SINCE 2011
       - 10-11 June 2012. Short duration, high intensity rainfall caused surface water flooding to south east Leeds. Kippax, Austhorpe, Garforth, Swillington, Woodlesford and Whitkirk were impacted most. 11mm of rainfall was recorded on the first day of the flood event.
       - 21-23 June 2012. Steady rainfall across this period caused flooding in Allerton Bywater, Seacroft and Gipton, Bardsey, Collingham, Garforth, Wetherby and Woodlesford. 14mm of rainfall was recorded on the first day of the flood event.
       - 25-27 October 2013. Several high intensity rainfall events produced surface water flooding at Otley, Yeadon and Guisley. 22mm of rain was recorded on the first day of the flood event.
       - 8-10 August 2014. Short duration, high intensity rainfall caused surface water flooding in Allerton Bywater, Garforth and Kippax. An estimated 80mm of rain fell within a 5 hour period on the first day of the event. 102 properties were recorded as internally flooded. It was assessed as a 1 in 200 year return period event.
       - 13-16 November 2015. Many high intensity, long duration rainfall resulted in fluvial flooding that was focused at Otley, but also affected areas such as Leeds city centre. An estimated 78mm of rain fell during this period. 73 residential properties were flooded, of which 62 were in Otley.
       - 25-29 December 2015. One of the wettest winters on record; rainfall throughout this period was assessed as a 1 in 200 year return period event. The highest recorded levels were experienced on the River Aire, Calder and Wharfe. Flooding from these rivers, as well as other sources, affected homes and businesses, as well as critical and local infrastructure. Property flooding in Leeds district totalled 3368.

It is a responsibility of Risk Management Authorities to collect, record and share flood risk data for Leeds district. In 2017 an assessment of this risk data was carried out in the LCC PFRA Update. It resulted in the identification of a new Flood Risk Area (FRA), which covers much of the Leeds metropolitan district.

* 1. FLOOD MITIGATION

The List of Measures, which is provided in Appendix C, comprises the Schemes and Policies implemented by the Council to mitigate flood risk across Leeds. It is a live document that is regularly updated and reviewed ahead of the annual scrutiny board review. It contains more detail than is presented below; such as: project phase, cost and priority for previous, ongoing and future schemes.

* + 1. MEASURES COMPLETED SINCE 2011

An accompanying map for the following table is provided as Appendix E of this report. It shows the location of the schemes completed since 2011.

Table 1 — LCC schemes completed since 2011



|  |  |  |  |
| --- | --- | --- | --- |
| Scheme | Location | Properties /  infrastructure protected | Date completed |
| Leeds Road (Allerton Bywater) | Allerton Bywater | Leeds Road | 2011 |
| pumping station FAS |  |  |  |
| Newton Road property protection and resilience | Newton Road and Potternewton | 10 | 2011 |
| scheme |  |  |  |
| Lower Wortley — property | Lower Wortley | 21 | 2011 |
| protection and resilience |  |  |  |
| scheme |  |  |  |
| Church Lane, Bardsey — | Bardsey | 3 | 2011 |
| property protection and |  |  |  |
| resilience scheme |  |  |  |
| Dean Park Drive, Drighlington | Drighlington | 8 | 2011 |
| property protection and |  |  |  |
| resilience scheme |  |  |  |
| Barley Hill Recreation Ground | West Garforth | 9 | 2012 |
| Oakdene, Watercourse Improvements | Swillington | 1 | 2013 |
| Lowther Road, Garforth | Garforth | 9 | 2014 |
| Culvert Improvements |  |  |  |
| Wellhouse Drive FAS | Gledhow | 1 | 2014 |
| Culvert Headwall Repair | Otley |  | 2014 |
| Scheme |  |  |  |
| Hawthorn Terrace FAS Phase 1 | West Garforth | 10 | 2016 |
| Leeds FAS Phase 1, River Aire | River Aire (City Centre to | 3000 | 2017 |
|  | Upper Catchment) |  |  |
| Glebelands Recreation Ground | Garforth | 10 | 2017 |
| Barley Hill Recreation Ground | West Garforth | 24 | 2017 |
| Phase 2 |  |  |  |
| Ramsden Street, Kippax, FAS | Kippax | 32 | 2017 |

Westfields, Allerton Bywater Allerton Bywater Table 2 — LCC policies completed since 2011



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Policy | | Completion  date | | |
| Undertake SEA for the LFRMS | | 2012 | | |
| Publish LFRMS | | 2014 | | |
| Publish LFRMS List of Measures | | 2014 | | |
| Publish PFRA Update | | 2017 | | |
| Publish LFRMS Update | | 2018 | | |
| Publish updated LFRMS List of Measures | | 2018 | | |
| 2.5.2 | CURRENT MEASURES |  |  |  |
|  | Table 3 — Current LCC schemes |  |  |  |
|  | Scheme | Locaion | Current phase | Date |
|  |  |  |  | expected |
|  | Leeds FAS Phase 2, River Aire City Centre to | River Aire —City | Feasibility | 2018 |
|  | Upper Catchment” | Centre to Upper |  |  |
|  |  | Catchment |  |  |
|  | Queen Street Culvert” | Allerton Bywater | Design / | 2018 |
|  |  |  | Construction (on |  |
|  |  |  | hold) |  |
|  | Hawthorn Terrace FAS Phase 2” | West Garforth | Design / | 2019 |
|  |  |  | Construction |  |
|  | Killingbeck Meadows FAS” | Halton Moor | Construction | 2019 |
|  | Farnley Wood Beck FAS” | Cottingley | Feasibility | 2019 |
|  | Lin Dyke Catchment Assessment —Upper and Midd Ie catch ments” | Garforth and Kippax | Feasibility | 2020 |
|  | Wyke Beck Catchment Assessment” | Communities along | Feasibility | 2020 |
|  |  | Wyke Beck |  |  |
|  | Wortley Beck FAS” | Wortley Beck | Feasibility | 2020 |

40 2018



|  |  |  |  |
| --- | --- | --- | --- |
| Wharfedale Flooded Communities Study\* | Collingham, Linton, | Feasibility | 2020 |
|  | Wetherby and |  |  |
|  | Thorp Arch |  |  |
| Lower Mickletown Road Flood Embankment” | Mickletown | Design/ | 2021 |
|  |  | Construction |  |
| Otley FAS” | Otley | Feasibility | 2021 |
| Barnsdale Road Property Level Protection | Allerton Bywater | Design (on hold) | TBC |
| Scheme” |  |  |  |
| Potternewton Surface Water FAST | Potternewton | Pre Outline | 2021 |
|  |  | Business Case |  |
| Thorner Beck FAST | Thorner | Pre Outline | 2022 |
|  |  | Business Case |  |
| Victoria Road Surface Water FAST | Guiseley | Pre Outline | 2022 |
|  |  | Business Case |  |
| Sheepscar: evaluate the condition of formal and informal flood defences along the Sheepscar | Sheepscar | TBC | 2020 |
| Beck which were recently breached to identify |  |  |  |
| potential remedial works required./ |  |  |  |
| Develop and implement feasibility studies for | Meanwood Beck, | TBC | 2020 |
| fluvial flood mitigation to improve the standard | Bagley Beck and |  |  |
| of protection along Meanwood Beck, Bagley | Farnley Wood Beck |  |  |
| Beck and Farnley Wood Beck./ |  |  |  |
| Improvements to surface water drainage | City wide | Ongoing | NA |
| outfaIIs/ |  |  |  |
| LCC Significant Maintenance/ | Across the District | Ongoing | NA |

”Features on the EA 6-year programme

/ Featured on the LCC pipeline programme

Table 4 — Current LCC policies



Policy

Provide regular feedback to senior officers and elected members on FRM progress, working

groups, and strategies such as:

* Director of City Development (quarterly);
* City Development (annually);
* City Development Scrutiny Board (annually), and
* All Area Committees (two-yearly).

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 conform s 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.

Frequency

6 Monthly

6 Monthly

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

Review LFRMS List of Measures

Maintain internet and intranet web pages 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, and
* How flood risk is treated within the planning process.

Develop register of structures and features which are likely to have a significant effect on flood risk.

Identify locations where culverts can be removed or improved through redevelopm ent. Watercourse and beck condition surveys.

Annually

Annually

Continual

Continual Continual

Improve communications, engagement and coordination of activities with internal and external Continual

partners (including RMAs).

Investigate opportunities to reduce carbon from pump operations. Implement *SuDS* through Planning.

Engagement and communication with public on FRM issues; such as:

* 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, and
* Engagement with local flood action groups (EA and RET).

Continual Continual Continual

Leeds City Council to increase their flood risk management capacity, knowledge and skills (as Continual

LLFA) in order to deliver their new responsibilities as conferred under the FWMA 2010.

Significantly increase the percentage take-up of properties registered for flood warnings in Continual flood warning areas across city. City wide campaign as current take-up is low.

Prom ote the use of sustainable design principles in all future developments to ensure that the Continual risk of flooding and clim ate change are fully taken into account e.g.

* Promoting use of SuDS,



* Incorporating policies and recommendations within Leeds LDF;
* Developer contributions in Core Strategy;
* Biodiversity and local amenity, and

*-* Climate Change Adaptation.

Review of SFRA produced by Jacobs in October 2007; assess the need for a Level 2 SFRA Continual to be undertaken.

1. DUTIES OF RISK MANAGEMENT AUTHORITIES



* 1. INTRODUCTION

Flood risk in the district is managed the Risk Management Authorities (RMAs), which are defined in the FWMA. For Leeds district, these are identified as:

* + - Leeds City Council, as the LLFA;
    - Leeds City Council, as Highway Authority;
    - Yorkshire Water Services Limited (YWS), as the Water and Sewerage Company (WaSC);
    - Environment Agency, who have responsibility for managing flood risk for Main Rivers;
    - Highways England (previously Highways Agency), who have responsibility for motorways and major trunk roads, and
    - Ainsty IDB, the Internal Drainage Board (IDB).

As RMAs each of the above authorities has specific responsibilities in relation to FCERM and must also coordinate their activities with each other. In preparation of the LFRMS, a limited consultation of RMAs was undertaken. The key responsibilities of each of the above authorities are outlined in the following sub-section.

* 1. LEEDS CITY COUNCIL

Leeds City Council’s principal responsibilities as LLFA under the FWMA and FRR are summarised below. The following responsibilities supplement any existing duties under the Land Drainage Act 1991.

* + - Local Flood Risk Management Strategy. Develop, maintain, apply and monitor a strategy for managing local flood risk in the Leeds Metropolitan District.
    - Preliminary Flood Risk Assessment. Report on historic, current and future understanding of flood risk for the Leeds district; review and consider changes to FRAs. An update is required every six years, with the last update submitted to the EA on 22nd June 2017.
    - Co-operation & Arrangements. Co-operate with other RMAs in exercising their flood risk management functions under both the FWMA and the FRR.
    - Power to Request Information. Request a person to provide information in connection with the authority’s risk management functions.
    - Duty to Maintain a Register. Establish and maintain a register of structures and features, including ownership, which are believed to have a significant effect on a local flood risk.
    - Flood Risk Management Works under general powers. Undertake works to manage flood risk from surface runoff, groundwater and ordinary watercourses (all works must be consistent with the LFRMS).
    - Flooding Investigations. Investigate flooding incidents in the district, to the extent that it is considered necessary or appropriate, and in cooperation with other RMAs where appropriate.
    - Sustainable Development. Contribute towards sustainable development through flood risk management activities.
    - Incidental Flooding. Plan, erect, maintain, alter or remove buildings or other structures (including those used for flood defence purposes) in a way that will or may cause: flooding, an increase in the amount of water below ground, or coastal erosion.
    - Designation of Features. Powers to designate a structure or a natural or manmade feature that is considered to influence flood risk in order to prevent the alteration or removal of the structure or feature without consent.



* + - Sustainable Drainage. Approve drainage schemes (in line with non-statutory standards) and ensure they are appropriately maintained. Ensure decisions on planning applications relating to major developments (10 dwellings, or equivalent non-residential developments) have SuDS in place, unless demonstrated to be inappropriate.
  1. ENVIRONMENT AGENCY

The EA is an executive, non-departmental public body responsible to the Secretary of State for Environment, Food and Rural Affairs. Its principal aims are to protect and improve the environment, and to promote sustainable development. The EA take lead responsibility for risk-based management of flooding from Main Rivers and the sea and regulation of the safety of reservoirs with a storage capacity greater than 25,000m\*. The FWMA proposed an amendment to the Reservoirs Act to target a reduction in the capacity at which reservoirs should be regulated from 25,000m° to 10,000m°; however, this reduction is yet to be confirmed at the time of writing.

The following roles and responsibilities are set out for the body within the FWMA:

* + - Development of a National Strategy for FCERM to cover all forms of flooding.
    - The conversion of Regional Flood Defence Committees into Regional Flood and Coastal Committees with a new remit to include coastal erosion issues.
    - Powers to request information from any person in connection with the Environment Agency’s Flood and Coastal Erosion Risk Management functions.
    - Power to designate structures and features that affect flooding or coastal erosion.
    - Powers to cause flooding and erosion for nature conservation and cultural heritage reasons, and people’s enjoyment of these assets.
    - A duty to consider FCERM in carrying out other work that may affect FCERM.
    - A duty to consider the LFRMS.
    - A duty to report to Ministers about FCERM, including application of the national strategies for England and Wales.
    - Act as a statutory consultee to the SuDS approving body on sustainable drainage that impacts water quality or strategic flood risk.

The EA published National Strategy for FCERM in 2011. It sets out a national framework for managing the risk of flooding and coastal erosion and describes the roles and responsibilities of management authorities and communities. It has a significant impact upon LLFAs, as it communicates their duties under the FWMA.

Due to government commitments in its 25 year Environment Plan, the EA will revise the 2011 strategy in 2019. At the time of writing, workgroup consultation is taking place to consider the ambition for flood and coastal erosion risk management in 2050. The strategy will include:

* An overview of flood and coastal erosion risk in England.
* A long-term, strategic ambition for managing flood and coastal erosion risk in England.
* The high-level measures proposed to achieve that ambition.
* The contribution these will make towards the government’s wider environmental objectives.
* How and when the strategy will be reviewed.

Formal consultation on National FCERM Strategy 2050 will take place in 2019. At this time LLFAs will have the opportunity to comment upon FCERM, as well as any changes in their roles and responsibilities.



* 1. YORKSHIRE WATER SERVICES LIMITED

YWS is the sole WaSC operating in the Leeds district. As a provider of water infrastructure services, the company have existing responsibilities in relation to FCERM in the Leeds district, which were supplemented by the FWMA. The following responsibilities were provided by YWS in the previous iteration of the LFRMS:

* + - Where appropriate assist the LLFAs in meeting their duties in line with the National FCERM Strategy for England and guidance.
    - Where appropriate assist the LLFAs in meeting their duties in line with local strategies in its area.
    - Where appropriate share information and data with RMAs, relevant to their flood risk management functions.
    - A duty to effectually drain their area, in accordance with Section 94 of the Water Industry Act 1991.
    - A duty to register all reservoirs with a capacity greater than 10,000m\* with the Environment Agency.
    - Agreement with Ofwat to maintain a register of properties at risk from hydraulic overloading in the public sewerage system (DG5 register).
    - Appropriate management of surface water in combined systems.
    - Encourage the use of SuDS.
    - Create a detailed understanding of flood risk from the public sewer system.
    - Explore and implement multi benefit/agency schemes.

The following priorities were provided for West Yorkshire:

* + - Appropriate management of surface water from the combined sewer system.
    - Encourage the use of SuDS.
    - Where appropriate share information and data with RMAs.
    - Create a detailed understanding of flood risk from the public sewer system.
    - Explore and implement multi-agency and multi-benefit schemes to resolve issues within the company’s appointed business.
  1. AINSTY INTERNAL DRAINAGE BOARD

Ainsty IDB are the sole IDB operating in the Leeds district and cover only a very small percentage of Leeds district (in the Wetherby area) and, as such, its role is limited. Under the FWMA, Ainsty IDB have new duties and responsibilities supplementing their existing powers. Their key powers and responsibilities are:

* + - Power to designate structures and features that affect flooding or coastal erosion.
    - Power to cause flooding and erosion for nature conservation and cultural heritage reasons, and people’s enjoyment of these assets.
    - A duty to exercise their functions in a manner consistent with local and national strategies.
    - A duty to be subject to scrutiny from the LLFA’s democratic processes.



* + - The ability to work in consortia with other IDBs.
    - Statutory consultee to the SuDS approving body on sustainable drainage that impacts land drainage.
    - Power to do works on ordinary watercourses flooding within their boundary.
  1. HIGHWAYS ENGLAND

As a highway authority, Highways England manage major trunk roads and motorways in the Leeds district including the M621, M62, M1 & A1. Their responsibilities in relation to flood risk management are listed below.

* + - Provide and manage highway drainage and roadside ditches under the Highways Act 1980.
    - A duty to exercise their functions in a manner consistent with local and national strategies.
  1. OTHER RISK MANAGEMENT AUTHORITIES

Other authorities and stakeholders, with no designated role under the FWMA, also have a key responsibility for flood risk management in their own areas of discipline; as listed below.

* + - Network Rail.
    - Canal and River Trust.
    - Met Office.
    - Natural England.
    - English Heritage.
    - Association of British Insurers.
    - Local flood partnerships, forums and community groups.

It is expected that these authorities will undertake their activities in a manner that is consistent with this strategy.

1. LOCAL FLOOD RISK MANAGEMENT
   1. INTRODUCTION

### The management of flooding in Leeds district is the responsibility of the principal RMAs listed in Section 3 of this strategy. A list of the key local flood risk management contacts at each of the RMAs are included in Appendix D of this strategy.

### Management of flooding is a collaborative effort between RMAs, but the key activities and responsibilities involved can be separated into 3 stages: before, during and after a flood, as shown in Figure 1. These 3 stages (Resilience, Response, Recovery), align with the three 'P’s (Prevention, Protection and Preparedness); as defined in the EA’s flood resilience guidance.

Figure 1 — Management activities before, during and after a flood event

Before a flood



### Resilience

During a flood

### Response

Resilience The phase before a flood involves activities to reduce but not necessarily eliminate the likelihood of flooding. For example, this can include capital schemes, asset maintenance, flood warning, preparedness, planning and strategies.

Response The phase during a flood, which involves activities and responsibilities in coordinating an emergency. For example, this includes the mobilisation of emergency services, rapid response, evacuation and sand bagging.

Recovery The phase after a flood involves activities and responsibilities to reinstate conditions prior to a flood emergency. For example, this includes the reconstruction of physical infrastructure and restoration of social, economic, physical and emotional well-being.

### The flood risk management activities detailed above are implemented through a programme of measures developed by the Council. This list of measures comprises policies and schemes that aim to address flooding across Leeds district.

* 1. PRIORITISATION OF MEASURES



Measures have been prioritised following the approach set out in the previous iteration of this strategy. Prioritisation is based upon local knowledge of flood risk in Leeds held by the Council and its partner organisations. A priority has been assigned to each measure, which relates to the timescale in which the measures are delivered, reviewed, or where necessary, both.

* + - High (1-2 years),
    - Medium (2-5 years), i.e. within the lifetime of the strategy, and
    - Low priority (>5 years, to be carried forward for review in the next strategy.

Prioritisation for the previous strategy took place for the 2012 to 2018 LFRMS review cycle, whilst the LFRMS report was published in 2014. All measures prioritised for delivery during this period have been updated for the current 2018 to 2024 cycle.

Additional measures have been identified during the lifetime of the previous strategy, which reflects a change in the understanding of flooding in Leeds district. The Council’s PFRA Update, published in June 2017, describes the evidence of flooding that led to this change, which is largely associated with the winter floods of 2015-16.

As part of the annual LCC Medium Term Plan (MTP) refresh process and the annual LCC Scrutiny update, LCC FRM undertake a prioritisation exercise using the latest understanding of flooding according to modelling and incident data available.

A completed list of measures is provided in Appendix C.

* 1. FUNDING

A limited amount of funding is available to progress items on the ‘List of Measures’ provided in Appendix C. Funding comes from a number of different sources, with the largest proportion being received from central government.

A summary of the funding sources available is provided in Table 6.

Table 6 — Potential funding sources for flood risk management activities



Source of funding

FCERM Grant- in-Aid (”FCE”RM GiA)

Local Levy

Private

contributions

Water company

investment

S”ection 106 contributions (Town and ”Country Planning Act)

Community Infrastructure Levy (CIL)

Commuted Sum

Description

Central government funding for flood (and coastal) defence projects with a budget of £2.6 billion over 6 years). It encourages a partnership approach to maximise match-funding and work towards achieving specified outcomes with a requiremen”t to” evidence a reduction in”flood risk..to properties.

Annual contributions from councils to a regional ‘pot’. It is smaller than the FCERM GiA budget but offers more flexibility on the type and size of project it can fund.

Voluntary, but funding from beneficiaries of projects could make contributions from national funding viable.

Investment is heavily regulated by Ofwat, but there are opportunities for contributions to area- wide projects which help to address sewer under-capacity problems.

Contributions from developers linked to specific development sites, where off-she improvements to drainage infrastructure are required to make the bevelopers proposals acceptable

A local levy applied by the Planning Authority on developers to contribute to a general infrastructure fund. A bid for CIL must be made for flood management or drainage improvements against other competing council priorities.

Where a developer, as part of their proposals, construct works for flood alleviation. These can be separate schem es, part of a larger scheme or contributions in kind i.e. land

Administered by

Environment

Agency

Environment

Agency

Leeds City Council

Yorkshire Water Services Limited

Leeds City Council

Leeds City Council

Leeds City

Council

Appropriate for

Medium to large capitat FRM projects.

*Sm* alter FRM projects, or as a contribution to FCERM GiA projects.

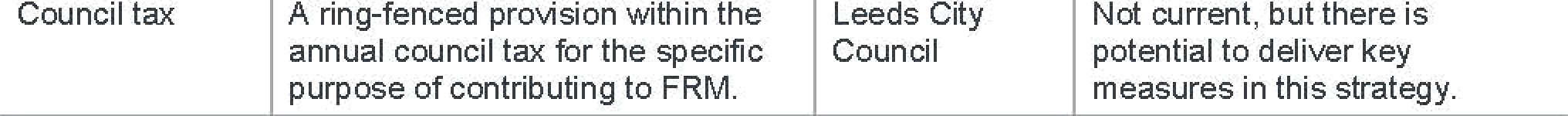
All projeds.

Projects that help to remove surface water from combined sewers.

Larser development sites.

All m easures outlined in this strategy.

Developmen”t.



Council tax

A ring-fenced provision within the annual council tax for the specific purpose of contributing to FRM.

Leeds City

Council

Not current, but there is potential to deliver key measures in this strategy.

Business rates



supplements

Agreement from local businesses Leeds City to raise rates for specified Council purposes.

Measures that address flood risk to businesses.

Council capital

funding

Council revenue funding

Leeds City Region Enterprise Partnership (LEP)

The council’s infrastructure programme, which prioritises capital improvement projects. The programme has included funding for drainage capacity improvements for many years, which is targeted at the highway drainage systems.

The Council has a number of revenue streams to support technical and admin processes and to m aintain council infrastructure.

Existing revenue budgets include highway drainage m aintenance, watercourse m aintenance and funding for the Flood Management Team discharging the LLFA duty for the council.

A business-lead partnership between local authorities, businesses and, in some cases, representatives from academic institutions.

The LEP works closely with the West Yorkshire Combined Authority to deliver a shared Strategic Economic Plan for Leeds City Region in West Yorkshire.

Leeds City Council

Leeds City Council

LEP

Measures which are sm all to medium capital projects.

Measures requiring

officer time and/or m aintenance

activity.

Seeks partnership to strategically drive economic growth; jobs and skills; inward investment; infrastructure; and

business growth.

West Yorkshire Combined Authority (WYCA)

Established in April 2014 as an WYCA authority with powers over

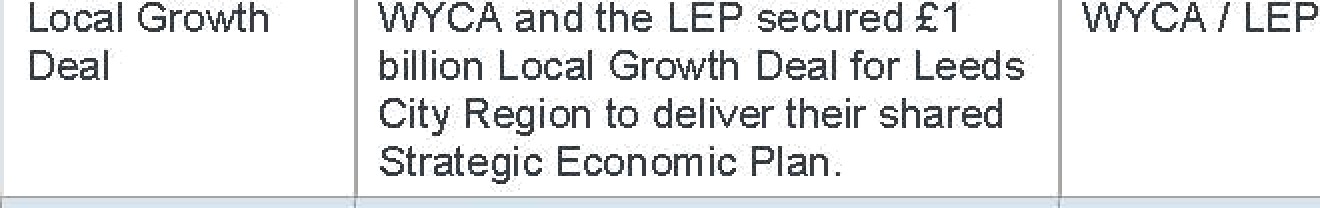
transport, economic development and regeneration for five local authorities.

Is the body responsible for delivering large-scale infrastructure projects in Leeds City Region.

Works closely with the Leeds City Region Enterprise Partnership (LEP) to deliver a shared Stra”tegic Economic Plan for Leeds City Region in West Yorkshire.

Works with the LEP and other local partners to ensure our region has the right transport, housing and environment to meet the needs of businesses and our economy.

-



Local Growth Deal

WYCA and the LEP secured £1 WYCA / LEP billion Local Growth Deal for Leeds

City Region to deliver their shared Strategic Economic Plan.

LEP Growing

Places Fund

European Structural and Investment Funds (ESIF)

Heritage Lottery

Fund (HLF)

HS2

£35.5m was provided to the LEP by LEP Government in 2012. Provides loan funding to kick-start stalled

development or infrastructure projects that will create homes, jobs and other economic benefits in Leeds City Region.

The ESIF programme is funded LEP through European Regional

Development Fund (ERDF), European Social Fund (ESF) and European Agricultural Fund for Rural Development (EAFRD).

Match funding of 50% of project costs is required.

Activity is delivered locally through the Leeds City Region Local Enterprise Partnership (LEP). £308 million programm e launched by the LEP in 2014.

£19.7m of National Lottery funding HLF

since 2017 to improve understanding and m anagement of water landscapes. £2-3 million per schem e.

Landscape Partnership schem es work with local, regional and national partners to prom ote a catchment approach to water management by engaging people, communities and landowners to improve water management in the long term.

Has changed the face of - development in the area; facilitates flood scheme development that will

be managed by the LLFA after HS2 development.

Support for projects including site access and clearance, broadband and transport infrastructure, utilities,. refurbishment of buildings and flood defence barriers.

A focus on sm art, sustainable

and inclusive growth.

S.chemes awarded funding focus on using nature and heritage to provide opportunities for communities within post- indudrial landscapes, from new skills training and educational opportunities, to boosting tourism and local business promoting heritage-led regeneration.

* 1. CLIMATE CHANGE ADAPTATION

### INTRODUCTION

A key factor impacting on the ability of RMAs to manage local flood risk is climate change. There is clear scientific evidence that global climate change is happening now. The effects of climate change

can be seen in the UK and around the world. UK temperatures and sea levels, including those of British coastal waters, have risen over the past three decades. There has also been a documented global increase in the frequency of extreme weather events such as floods, droughts and tropical storms. It is predicted that these extreme weather events will become more severe during coming decades.



In light of this, it is imperative that the effects of more extreme flooding in the Leeds district are mitigated against and that plans and schemes are developed to better manage and adapt to any increased risk of local flooding. This affects the functions of all RMAs and all council departments.

* + 1. LEEDS CLIMATE COMMISSION

The Leeds Climate Commission was established in 2017 to influence positive choices on issues relating to energy, carbon, weather and climate. It is a collaborative effort between organisations and actors from across the city and from the public, private and third sectors.

A strategy group leads the commission, which is chaired by Professor Andy Gouldson (University of Leeds), with the vice chair from Leeds City Council (Councillor James Lewis).

The purpose of the Leeds Climate Commission is to:

* + - * Promote leadership in the city on climate change, encouraging stakeholders to take effective

action now, while maintaining a long-term perspective;

* + - * Provide authoritative independent advice on the most effective steps required to meet the city’s carbon reduction target so as to inform policies and actions of local stakeholders and decision makers;
      * Monitor progress towards meeting the city’s carbon targets and recommend actions to keep on track;
      * Advise on the assessment of the climate-related risks and adaptation opportunities in the city

and on progress towards climate resilience;

* + - * Bring together major organisations and key groups in Leeds to collaborate on projects that result in measurable contributions towards meeting the city’s climate reduction target and also to deliver enhanced climate resilience, particularly in the area of flood risk;
      * Promote best practice in public engagement on climate change and its impacts in order to

support robust decision-making;

* + - * Act as a forum where organisations can exchange ideas, research findings, information and best practice on carbon reduction and climate resilience.

The Leeds Climate Commission’s Implementation Plan provides an ongoing update on progress with these areas of activity which are summarised in monthly bulletins and newsletters. Additional information on the commission, including the implementation of their plans can be found on the Can- do Cities website (www.leeds.candocities.org).

* + 1. YORKSHIRE INTEG RATED CATCHMENT SOLUTIONS PROGRAMME

Yorkshire Integrated Catchment Solutions Programme (iCASP) is an ambitious and exciting programme to generate benefits for Yorkshire by applying environmental science to catchment challenges.

The iCASP programme looks to support and undertake projects that translate existing environmental science so that it can be used to further integrated catchment management. These projects focus on:

* + - * Promoting the resilience of the region’s cities;



* + - * Mitigating drought and flood risk in the context of climate change;
      * Improving the delivery of flood forecasts;
      * Developing approaches to improve ecological and chemical status of surface and groundwaters, and water quality entering treatment works;
      * Enhancing carbon sequestration in soils and woodlands, and
      * Supporting sustainable agriculture.

iCASP’s first project helped organisations in Yorkshire to prepare in advance for the publication of new UK climate change projections due for release in November 2018 (known as UKCP18).

In collaboration with the UK Met Office, which is responsible for producing the projections, the iCASP project has been giving organisations including Leeds City Council an opportunity to rehearse ways of using the updated information in their operations and strategies; including for surface water flood risk management .

The project was selected as a demonstrator by the Met Office, to be made available nationally as part of the release guidance material\*. iCASP will continue this support following the release of UKCP18 by organising a regional forum in 2019. This will be a one day event in designed for organisations who need to use UK climate projections for resilience planning, including flood risk management.

* 1. SUSTAINABLE DEVELOPMENT

Defined by the United Nations (Brundtland Commission, 1987), sustainable development is ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. The promotion of sustainable development is a key part of climate change adaptation and will help mitigate against any increase in flood risk arising as a result of climate change.

A number of principle ways in which local flood risk management can contribute to sustainable development are identified below.

* Working with natural processes to reduce flood risk e.g. by restoring the natural capacities of soil and vegetation to intercept rainfall.
* Promoting greater use of SuDS.
* Developing flood resilient infrastructure and buildings which perform satisfactorily without suffering permanent loss of functionality during extreme flood events.
* Developing flood defences that are adaptable and flexible and take account of the projected longer-term impacts of climate change.
* Sustainable procurement of energy supplies and materials to reduce the impact on the wider environment.

https://icasp.org.uk/resources/uk-climate-projections/ [https://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/ukcp18/uoe.icasp.v2.pdf](http://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/ukcp18/uoe.icasp.v2.pdf)

* Carbon counting and offsetting with the aim of decreasing greenhouse gas emissions.



* Improving engagement with local communities to ensure that people affected by flooding are empowered to take appropriate actions to reduce flood risk.
* Improving health and wellbeing of communities through environmental improvement and a reduction in flood risk.
* Developing the knowledge, skills and awareness to improve our understanding of flood risk and the effects of climate change.
* Supporting flood response and recovery through better management of the risk of flooding to people, property, the economy and the environment.
* Benchmarking good environmental performance using environmental performance tools such as the Building Research Establishment Environmental Assessment Method (BREEAM) and the Civil Engineering Environmental Quality Assessment and Awards Scheme (CEEQUAL).

The methods and approaches identified above have been embodied in the local flood risk management objectives listed in Section 5 of this strategy and are drawn out more specifically via the measures included in the ‘List of Measures’ in Appendix C.

* 1. SUSTAINABLE DRAINAGE SYSTEMS

LCC’s policy for SuDS has been adopted through Core Strategy Policy EN5 and Natural Resources and Waste Local Plan Water Policy 7. In addition to this LCC have developed and adopted ‘SuDS Supplementary Guidance Note 22’ for new developments. In summary, this guidance:

* Explains how drainage concepts are considered when new developments are being planned, and states that LCC 'will seek to incorporate sustainable drainage systems for significant developments and will encourage sustainable drainage systems for all other developments’, and
* Outlines the requirements for an Indicative Drainage Strategy that should accompany outline planning applications; for significant developments a Drainage Impact Statement will also be required.

An update to Water 7 Policy in 2019 may provide an opportunity to update this guidance note to include:

* Specific guidance on where sustainable development would work in Leeds, and
* Increase in runoff reduction requirements for the development major brownfield sites.

It should be noted that this guidance note is limited by the National Planning Policy Framework, which indicates that the planning authority can only require sustainable drainage where practicable.

In 2017 an update of the ‘Leeds City Council Minimum Drainage Considerations for Development Control’ was carried out to reflect the most recent climate change allowances provided by the Environment Agency.

LCC’s Flood Risk Management team is preparing a SuDS Adoption Guide in collaboration with Wakefield Metropolitan District Council, which will be used to provide clarity over ownership and maintenance of SuDS.

* 1. ENGAGEMENT WITH PARTNERS



* + 1. COMMUNICATION

A stakeholder communication and engagement plan was devised as part of the 2011 LFRMS. It is a key aspect of the strategy for flood risk management. It is important that there is effective communication between all stakeholders particularly between the LLFA and other RMAs in responding to flood events, and the public, to raise awareness and involve local communities in decision making. It has been successful in the previous review cycle; therefore, the following activities of this plan will be continued in the next review cycle:

1. Develop.

Develop the LFRMS and provide ongoing opportunity for input from stakeholders.

1. Review.

Review draft LFRMS (particularly objectives for managing local flood risk and ‘List of Measures’) with all interested/affected parties.

### Scrutiny.

### Review of LFRMS by Scrutiny Committee.

1. Publish.

Publish LFRMS and a summary with guidance on the availability of further information.

1. Future.

Plan and agree future activities and schedule next review of List of Measures’.

In producing the LFRMS the council have consulted internally, with other RMAs that may be affected by the strategy, the public and also other LLFAs to ensure that the LFRMS is consistent with the catchment ‘cell’ approach set out in the National FCERM Strategy for England.

A review of the LFRMS and the List of Measures takes place annually. Remarks from the committee are included in the LCC governance comments provided in

* + 1. RESPONSE AND RECOVERY

LCC takes a lead role in planning for severe weather through the Resilience and Emergencies Team (RET), both across the Council and as part of the West Yorkshire Resilience Forum with partners including the emergency services and the NHS.

In the event of flooding, RET deploys the Leeds City Council Flood Plan, which outlines the roles and responsibilities of multi-disciplinary teams based on the level of severity. The plan was published in December 2017 and tested in March 2018 as Exercise Titan.

The plan takes the user through initial triggers, leading into a series of service specific checklists that cover the stages of flooding expected (standby), flooding occurring (response) and flooding subsides (recovery). It describes the mechanism by which the RMAs work together to manage flooding during an incident.

1. OBJECTIVES FOR MANAGING LOCAL FLOOD RISK



To manage flood risk effectively, six high-level objectives have been created to provide a strategic context and steer the flood risk management activities undertaken by all RMAs. These objectives embody the six high-level guiding principles in the EA’s National FCERM Strategy for England listed in Section 2. All RMAs should have regard to these objectives when undertaking their flood risk management activities. Measures for local flood risk management, based on these objectives, are outlined in the ‘List of Measures’ in Section 6 and presented in Appendix C of this strategy.

1. Improve procedural cooperation between LLFA and other RMAs to meet the requirements of new legislation and achieve catchment-wide solutions to identified risks and problems, such as emergency planning.
2. Promote sustainable flood risk management through WFD compliance, climate change adaptation, land management, habitat protection and creation.
3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management; such as land allocation and SuDS.
4. Increase internal skills and the 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.
6. Improve the understanding of local flood risk and seek to decrease this risk through the implementation of affordable, high quality measures to alleviate flooding, where it is practicable.
7. LIST OF MEASURES



A List of Measures has been developed for the LFRMS which is based upon the six objectives for managing local flood risk listed in Section S. The List of Measures sets out a broad range of schemes, actions, initiatives, plans and strategies for managing local flood risk in the Leeds district. Some of the measures are localised and relate to a very specific part of the district, whereas other measures are higher level district wide proposals. Where appropriate each measure has been assigned a priority ranking (high, medium, low) based on the expected timescale to implement the measure, the associated costs and benefits of the measure have also been assigned where available.

The Action Plans for the Leeds Policy Units contained in the River Aire and Ouse CFMPs have been reviewed and the relevant actions incorporated within the LFRMS ‘List of Measures’.

The ‘List of Measures’ is designed to be a ‘living document’ which will be monitored and updated on a regular basis when measures are completed or new ones added and is found in Appendix C of this strategy. The ‘List of Measures’ form the basis of the Council’s MTP.

The List of Measures has been split into the four categories outlined below.

* Flood awareness, response and recovery — this includes initiatives to improve engagement with internal and external partners, raise awareness of the LFRMS, involve local communities in decision making, improve cooperation between RMAs and plans for emergency response and recovery.
* Spatial planning and development control — this includes implementation of SuDS and promoting sustainability and climate change adaptation in future developments.
* Studies, schemes, assessments and plans — this includes investigating flooding incidents, assessing flood risk and developing and promoting schemes to alleviate flood risk.
* Asset management and maintenance — this includes developing a register for recording flood risk assets, planning routine inspection and maintenance of assets and undertaking asset maintenance works.

1. REVIEWING AND MONITORING THE STRATEGY



It is expected that this strategy will be reviewed once every six years, which will link the LFRMS review with the cycle for reviewing the PFRA, as outlined in the FRR. As such, the third review of the LFRMS is expected to be completed by December 2024.

In order to monitor the implementation of the LFRMS in the last review cycle, eight monitoring indicators were used. These indicators were identified as part of the SEA process, and are listed below:

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 CFMPs in the ‘List of Measures’?

These indicators are still relevant to the Council, and are considered during the planning and development processes for managing flood risk; however, due to the difficulty in obtaining reliable and representative data, there has been limited reporting of this information so far. The questions remain appended to the List of Measures found in Appendix C, for use in the 2018 to 2024 LFRMS cycle.

Leeds City Council monitor their performance of meeting the objectives of managing flood risk through a number of forums and planning process, which include:

* Monthly Flood Risk Management Performance Monitoring report that tracks progress against annually set performance indicators. It also tracks an assessment of corporate risks;
* Annual and monthly progress reviews against the EA’s MTP;
* Annual and monthly reporting of Corporate Performance using numbers of commercial and residential receptors better protected from flooding, and
* Annual review of progress undertaken by the Council’s Scrutiny Board (Sustainable Economy and Culture). As set out in the previous strategy, performance is indicated by assessing the progress of Schemes and Policies that comprise the List of Measures provided in Appendix C.

Additionally, the Council’s progress toward flood risk management objectives is monitored quarterly through a number of board meetings with partners; such as the Leeds Flood Resilience (LFR) Programme Board.

The LFR Programme Board is responsible for providing a strategic overview of flood resilience in Leeds, and where necessary, approvals and decision making that may affect Programme process and delivery. In addition, they will link to and create opportunities for catchment wide collaboration

and working, and develop ambitious integrated schemes. The board includes the Environment Agency, Yorkshire Water as well as LCC team representatives covering: Flood Risk, Development, Highways and Transport, Planning, Asset Management and Regeneration, Communities, Strategy and Policy, Resources and Housing, Regeneration, Civil Engineering, Communications, Parks and Countryside.



LCC has expanded the capital programme to increase delivery capacity within LCC FRM and the Civil Engineering Major Project Flood Programme team. This includes a new governance structure including the Infrastructure & Investment Group which has supported evidence and mapping based prioritisation of future schemes.

1. RELEVANT GUIDANCE AND INFORMATION



Framework to assist the development of the Local Strategy for Flood Risk Management, ‘A Living Document’, 2nd Edition, Local Government Association, November 2011.

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

Flood and Water Management Act (FWMA), Her Majesty's Stationery Office, 2010. Flood Risk Regulations (FRR), Her Majesty's Stationery Office, 2009.

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

Preliminary Flood Risk Assessment (PFRA), Leeds City Council, September 2011. Strategic Flood Risk Assessment (SFRA), Leeds City Council, October 2007.

Environmental Assessment of Plans and Programmes Regulations, Her Majesty's Stationery Office, 2004.

### National Planning Policy Framework (NPPF), Ministry of Housing, Communities & Local Government, March 2012.

Planning Practice Guidance: Flood risk and coastal change, Ministry of Housing, Communities & Local Government, March 2014.

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

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

Natural Resources and Waste Local Plan, Leeds Local Development Framework, Leeds City Council, January 2013.

Core Strategy, Leeds Local Development Framework, Leeds City Council, November 2014. Water Environment (Water Framework) Regulations, Her Majesty's Stationery Office, 2017. European Union Withdrawal Act, Her Majesty's Stationery Office, 2018.

Preliminary Flood Risk Assessment (PFRA) Update, Leeds City Council, June 2017.

The National Planning Policy Framework and relevant planning practice guidance, Ministry of Housing, Communities & Local Government, Nov 2016.

Humber River Basin District Management Plan (RBMP), Environment Agency, February 2016 (Updated June 2018).

Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities, Environment Agency, September 2011 (Updated April 2016).

Supplementary Guidance No. 22 ‘Sustainable Drainage In Leeds’, Leeds City Council, 2004. Multi-agency Flood Plan Review, Defra, June 2018.

1. GLOSSARY



Groundwater flooding

Local flood risk

Main river

Ordinary watercourse flooding

Sewer flooding

Surface water flooding

This occurs when levels of water in the ground rise above the surface. It is most likely to happen in areas where the ground contains aquifers. These are permeable rocks that water can soak into or pass through easily.

Refers to flood risk from surface runoff, groundwater, sewer flooding (attributable to rainwater) and ordinary watercourses - this includes lakes, ponds or other areas of water which flow into an ordinary watercourse.

These are usually larger streams and rivers, but also include smaller watercourses of strategic drainage importance. The EA have primary responsibility for managing flood risk from these watercourses.

This occurs when a watercourse cannot cope with the water draining into it from surrounding land. This includes lakes, ponds or other areas of water which flow into an ordinary watercourse.

This occurs when sewers are overwhelmed by heavy rainfall or when they become blocked. The chance of flooding depends on the capacity of the local sewer system and amount of rain that falls.

This occurs when rainwater does not drain away through the normal drainage system or soak into the ground, but lies on or flows over the ground surface instead.

1. ABBREVIATIONS



AOD BREEAM CEEQUAL CFMP

CIL

Defra DG5 EA ESIF EU FAS

FCERM FCERM GiA FRA

FRM P FRR FWMA HMSO iCASP IDB LFRMS LGA LLFA MAFP MHCLG MTP

Ofwat PFRA PLP RBMP RET

Above Ordnance Datum

Building Research Establishment Environmental Assessment Method Civil Engineering Environmental Quality Assessment and Awards Scheme Catchment Flood Management Plan

Community Infrastructure Levy

Department for Environment, Food and Rural Affairs Director General S (Register)

Environment Agency

European Structural and Investment Funds European Union

Flood Alleviation Scheme

Flood and Coastal Erosion Risk Management Flood and Coastal Risk Management Grant in Aid Flood Risk Area

Flood Risk Management Plan Flood Risk Regulations (2009)

Flood and Water Management Act (2010) Her Majesty’s Stationery Office

Yorkshire Integrated Catchment Solutions Programme Internal Drainage Board

Local Flood Risk Management Strategy Local Government Association

Lead Local Flood Authority Multi-Agency Flood Plan

Ministry of Housing, Communities and Local Government Medium Term Plan

Office of Water Regulation Preliminary Flood Risk Assessment Property Level Flood Protection River Basin Management Plan Resilience and Emergencies Team



|  |  |
| --- | --- |
| RMA | Risk Management Authority |
| SEA | Strategic Environmental Assessment |
| SFRA | Strategic Flood Risk Assessment |
| SuDS | Sustainable Drainage Systems |
| UK | United Kingdom |
| UKCP09 | UK Climate Projections 2009 |
| UKCP18 | UK Climate Projections 2018 |
| WaSC | Water and Sewerage Company |
| WFD | Water Framework Directive |
| WYCA | West Yorkshire Combined Authority |
| YWS | Yorkshire Water Services Limited |

Appendix



UKCPO9 CLIMATE PROJECTIONS FOR LEEDS

The figures in the table below are the UKCP09 (2009) outputs for the Humber River Basin District.

APPENDIX A - UKCP09 United Kingdom Climate Change Projections for Leeds

The values shown are for the 25km grid square centred on Leeds.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | **Change Factors** | | |
| Change Variable | Uncertainty Range | Up to 2025 | 2025 - 2055 | Beyond 2055 |
| Precipitation % Winter | Upper enhanced estimate | - | - | - |
| Upper end estimate | 8.1% | 16.4% | 46.5% |
| Central estimate | 4.7% | 11.9% | 16.0% |
| Lower end estimate | 1.6% | 7.8% | 1.7% |
| Precipitation % Summer | Upper enhanced estimate | - | - | - |
| Upper end estimate | -2.4% | -13.2% | -1.4% |
| Central estimate | -8.8% | -20.2% | -24.8% |
| Lower end estimate | -14.9% | -26.9% | -38.8% |
| Precipitation % on Wettest Day - Winter | Upper enhanced estimate | - | - | - |
| Upper end estimate | 8.2% | 16.3% | 43.9% |
| Central estimate | 4.6% | 11.9% | 16.8% |
| Lower end estimate | 1.2% | 7.7% | 0.5% |
| Precipitation % on Wettest Day - Summer | Upper enhanced estimate | - | - | - |
| Upper end estimate | 6.4% | 2.9% | 16.0% |
| Central estimate | -0.3% | -4.0% | -5.1% |
| Lower end estimate | -6.6% | -10.5% | -17.6% |
| Peak River Flow % | Upper enhanced estimate | 35.0% | 45.0% | 75.0% |
| Upper end estimate | 25.0% | 30.0% | 50.0% |
| Central estimate | 10.0% | 15.0% | 20.0% |
| Lower end estimate | -5.0% | 0.0% | 5.0% |

Appendix



STRATEGIC ENVIRONMENTAL

ASSESSMENT REPORT

Leeds City Council

**Local Flood Risk Management Strategy - 2013**

**Strategic Environmental Assessment Report**

**Final Report**

### July 2013



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### Revision Schedule

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

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| --- | --- | --- | --- | --- | --- |
| **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 |  |
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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’.

1. **Introduction**

## 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.

### 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;

### 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;

### Increase internal skills and ultimately capacity for flood risk management;

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

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

## 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.

## 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.

1. **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.

1. **Appraisal Findings**

## 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.

## 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.

## 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.

## 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.

## 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.

## 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.

## 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.

1. **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.

### 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;

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

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

### Increase internal skills and ultimately capacity for flood risk management;

### 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;

### 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.

1. **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:

### The number of measures in the ‘List of Measures’ which have been completed?

### Are there active measures in the ‘List of Measures’ which cover each of the six ‘Objectives for managing flood risk’?

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

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

### 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?

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

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

### 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’?

1. **References**

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### 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.

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### 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.

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### 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

1. **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

1. **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 CO2 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:   1. increasing entrepreneurship 2. increasing innovation 3. increasing investment in infrastructure and physical assets |
| Midstream: How does the contribution to economic success affect:   1. improved community regeneration 2. retention of investment in the local economy 3. air quality, especially industrial and transportation related emissions |
| Downstream: How does its contribution to economic success affect:   1. Waste arisings and management of waste 2. Development in flood plain 3. Rates of surface water run off 4. Remediation of contaminated land 5. Poverty levels 6. Crime levels 7. 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   1. Providing educational opportunities 2. Providing lifelong learning opportunities 3. Increasing participation rates in education and training |
| Midstream: Does it contribute to the positive development of community by:   1. Increasing community participation 2. Providing opportunities to increase educational attainment 3. Providing multiple use of facilities |
| Downstream: How does it, via improved and/or increased educational attainment, affect:   1. Waste generation and management 2. Carbon dioxide and greenhouse gas emissions, as it relates to behavioural changes 3. Public health 4. 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:   1. Culture to all 2. Leisure to all 3. Recreational activities to all |
| Midstream: Does it contribute to the positive development of community by:   1. Promoting a shared community focus 2. Providing free or subsidized CLR activities |
| Downstream: Will it, through provision of CLR, promote:   1. Recreational opportunities, such as exercise, social contact, cultural experiences or activities 2. 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:   1. Promoting the use of Previously Developed Land 2. Developing at an appropriate density for the area to promote sustainable development 3. Providing for multiple functions of land use (i.e. green infrastructure, mixed use, etc.), where appropriate 4. 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:   1. Concentrating services 2. Creating a walkable and accessible community |
| Downstream: Does it address the best use of land in relation to:   1. Remediating contaminated land 2. Maintaining, protecting and enhancing biodiversity of the areas it affects, both directly and indirectly 3. Its impact on the rate of surface water run off 4. 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:   1. Increased accessibility via public transportation 2. Increased investment into sustainable transportation network 3. 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 | 1. Accessibility community services 2. Improved air quality 3. Improved water quality |
| Downstream: How does it:   1. Reduce greenhouse gas emissions 2. Improve the health of residents 3. Mitigate against biodiversity impacts arising from air and water pollution 4. Increase access to employment opportunities 5. 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:   1. Promoting character in townscape and landscape 2. Encouraging sense of pride of place 3. Potential to walk or cycle to or through a place 4. Promoting the use of heritage assets (building/land) to conserve special interest |
| Midstream: How does it positively contribute to the development of community by:   1. Providing well designed affordable housing 2. Providing amenities for the community |
| Downstream: How does it, through addressing quality of place:   1. Remediate contaminated land 2. Reduce generation of carbon emissions 3. Successfully integrate waste facilities 4. Contribute to and support the physical and mental wellbeing of residents 5. Design out crime |
| Increase energy efficiency, low and zero carbon forms of energy  generation and local distribution | Upstream: How does it:   1. Increase energy efficiency 2. Provide for low and zero carbon generation 3. 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:   1. Reusing resources 2. Diverting resources 3. Minimising resources 4. 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:   1. Provide opportunities for biodiversity (e.g. restoration) 2. Impact on levels of flood risk 3. Impact on waste arisings and management 4. 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.**

### Pump operation - carbon reduction

### Implement SuDS Approval Body (SAB) function

### Publish Local Flood Risk Management Strategy

### Undertake Strategic Environmental Assessment (SEA)

### Review Local Flood Risk Management Strategy (LFRMS)

### 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.**

### River Aire Flood Alleviation Scheme

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

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

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

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

### Flood Alleviation Scheme - Wyke Beck

### Flood Alleviation Scheme - Collingham Beck

### Flood Alleviation Scheme - Farnley Wood Beck

### Newton Road property protection and resilience scheme

### Lowther Road, Garforth - Culvert Improvements

### Lower Wortley - property protection and resilience scheme

### Church Lane, Bardsey - property protection and resilience scheme

### Dean Park Drive, Drighlington - property protection and resilience scheme

### Environment Agency schemes

### YWS DG5 schemes

### Develop register of assets affecting local flood risk

### Watercourse and beck condition surveys

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

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

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

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

### 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*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **Score** | **Record of Decision** | **Score** | **Record of Decision** |
| **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:-* | 0  0 | Neutral impact Neutral impact |  |  |  |
| *A) INCREASING ENTREPRENEURSHIP?* |
| *B) INCREASING INNOVATION?* |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sustainability Objective and *definition*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **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:* | +  + | Marginal impact – brings land back into use and promotes new development  Increase in confidence to local firms from reduced flood risk e.g. River |  |  |  |
| *a) improved community regeneration?* |
| *b) retention of investment in the local economy?* |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sustainability Objective and *definition*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **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 | SA12: Improve water quality *How does the contribution to economic success affect water quality especially industrial and transportation related water pollution?* |  |  |  |  |  |
|  | quality |  | Strategy complies |  |
|  | *Clean water is essential* |  | with Water | Amend |
|  | *for a healthy workforce,* |  | Framework Directive | objective 2 to |
|  | *and as a raw material* |  | (WFD) – this | specifically |
|  | *for many manufacturing* | + | promotes improved | reference WFD |
|  | *processes. There is also* |  | water quality through |  |
|  | *direct regulation of water* |  | FRM activities |  |
|  | *quality in the UK making* |  |  |  |
|  | *polluting businesses* |  |  |  |
|  | *liable to fines for* |  |  |  |
|  | *pollution.* |  |  |  |
| Downstream | SA13: Employment | SA13: Employment |  |  |  |  |  |

* SEA Directive: Air
* SEA Directive: Water

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sustainability Objective and *definition*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **Score** | **Record of Decision** | **Score** | **Record of Decision** |
|  | opportunities | opportunities |  | Protecting and |  |  |  |
| *There is a direct link* | *How does the contribution to* |  | creating jobs through |
| *between economic* | *economic success affect* | + | implementing |
| *success and* | *employment opportunities?* |  | measures e.g. River |
| *employment as all* |  |  | Aire Scheme |
| *businesses need* |  |  |  |
| *employees.* |  |  |  |
| Downstream | SA14: Health  *There are recognised links between wealth and health, with the poorest communities often suffering higher morbidity rates.* | 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 |  |  |  |
|  | *Poor air quality has*  *known health effects (respiratory illness).* |  |  |  |
| Downstream | SA15: Crime | SA15: Crime |  | Minimal impact – |  |  |  |
|  | *Levels of crime* | *How does the contribution to* |  | slightly positive as |
|  | *(particularly property* | *economic success affect* | + | looting can occur in |
|  | *crime) tend to increase* | *crime levels?* |  | evacuated areas |
|  | *during periods of* |  |  | during floods |
|  | *economic recession.* |  |  |  |
| Downstream | SA17: Biodiversity / | SA17: Biodiversity / geological conservation *How does the contribution to economic success affect*  *opportunities for biodiversity?* |  |  |  |  | Amend |
|  | geological conservation |  | Strategy will comply | objective 5 to |
|  | *Investment in economic* |  | with WFD – positive | specifically |
|  | *developments can* | + | environmental | reference |
|  | *provide opportunities for* |  | impacts e.g. SuDS, | WFD/ |

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sustainability Objective and *definition*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **Score** | **Record of Decision** | **Score** | **Record of Decision** |
|  | *new wildlife habitat* |  |  | green corridors |  |  | environmental |
| *creation (e.g. clean-up* |  | enhancement |
| *of waterfront areas,* |  |  |
| *management of invasive* |  |  |
| *weeds).* |  |  |
| 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 | SA20: Waste  *How does the contribution to economic success affect waste generation and management?* |  |  |  |  |  |
|  | *Economic activity is* |  |  |
|  | *likely to stimulate* |  | Flooding generates |
|  | *production of waste* | + | waste which needs |
|  | *(industrial waste, office* |  | to be cleared up |
|  | *waste etc)* |  |  |
| Downstream | SA21: Contaminated | SA21: Contaminated land *How does the contribution to economic success affect remediation of contaminated land?* |  | Marginal positive |  |  |  |
|  | land | + | impact – brings land |
|  | *Economic activity can* |  | back into use and |
|  | *drive remediation to free* |  | allows new |
|  | *up land for* |  | development |
|  | *development.* |  |  |

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sustainability Objective and *definition*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **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:-* | +  0  0 | Objectives 3 and 4 relate to increasing awareness of flood risk  Neutral Impact  Neutral Impact |  |  |  |
| *A) PROVIDING EDUCATIONAL OPPORTUNITIES?* |
| *B) PROVIDING LIFELONG LEARNING OPPORTUNITIES?* |
| *C) INCREASING PARTICIPATION RATES IN*  *EDUCATION AND TRAINING?* |
| 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*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **Score** | **Record of Decision** | **Score** | **Record of Decision** |
|  | empowerment | *How does the contribution to* |  | Flood Action Groups |  |  | objective 4 to |
| *Education can increase* | *education affect social* | + | promote social | promote social |
| *community participation* | *inclusion and community* |  | inclusion | inclusion as |
| *and integration among* | *empowerment?* |  |  | well as |
| *different sections of* |  |  |  | awareness |
| *society* |  |  |  | raising |
| Downstream | SA13: Employment | SA13: Employment |  |  |  |  |  |
|  | opportunities | opportunities |  | Leeds Flood |
|  | *Education or training are* | *How does the contribution to* |  | Alleviation Scheme |
|  | *pre-requisites for the* | *education affect employment* | + | may possibly provide |
|  | *majority of employment* | *opportunities?* |  | training opportunities |
|  | *opportunities* |  |  |  |
| Downstream | SA14: Health  *Better education and understanding of personal health*  *Training of health professionals* | 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 |  |  |  |
|  | *Better access to education leads to higher levels of employment and greater personal wealth, which is known to be associated wealth better*  *health* |  |  |  |
| Downstream | SA18: Climate change mitigation | SA18: Climate change  mitigation |  | Marginal positive |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sustainability Objective and *definition*** | **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** |
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|  | *Higher levels of knowledge and awareness of climate impacts may change public attitudes and behaviours.* | *How does the contribution to education affect climate change mitigation?* | + | impact through increased community awareness and knowledge |  |  |  |
| *Better education may lead to development of better mitigation*  *strategies* |  |  |  |
| 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:-* | 0  + | Neutral impact  Increases amenity  value e.g. SuDS schemes, fish |  |  | Recreation areas may  used for flood storage on |
| *A) CULTURE FOR ALL?* |
| *B) LEISURE FOR ALL?* |

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

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|  |  | *C) RECREATIONAL ACTIVITIES FOR ALL?* | + | passes and upstream storage |  |  | some  occasions – last resort |
| Midstream | SA9: Mixed | SA9: Mixed neighbourhoods |  |  |  |  |  |
|  | neighbourhoods | *How does the contribution to* |  |  |
|  | *A range of cultural* | *culture, leisure and recreation* |  |  |
|  | *opportunities provide* | *affect neighbourhood* | 0 | Neutral impact |
|  | *more opportunities for* | *relations?* |  |  |
|  | *mixing between different* |  |  |  |
|  | *sectors of the* |  |  |  |
|  | *community.* |  |  |  |
| Midstream | SA10: Social inclusion and community empowerment *Provision of free or*  *subsidised CLR facilities would improve access for more people in the community.* | 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 |  |  |  |
|  | *Culture, leisure and recreational amenities will aid cohesive communities by provided a shared*  *community focus.* |  |  |  |
| 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 |  |  |  |

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|  | *facilities may improve*  *physical fitness and mental wellbeing.* | *inequalities?* |  | health benefits |  |  |  |
| Downstream | SA15: Crime | SA15: Crime |  |  |  |  |  |
|  | *Participation in sports* | *How does the contribution to* |  | Marginal negative | Maintain |
|  | *and other recreational* | *culture, leisure and recreation* | - | impact if recreational | services e.g. |
|  | *activities may reduce* | *affect crime?* |  | services e.g parks | Youth Service |
|  | *levels of certain crimes* |  |  | used for flood |  |
|  | *by providing alternative* |  |  | storage |  |
|  | *activities, particularly for* |  |  |  |  |
|  | *young people?* |  |  |  |  |
| **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:-* |  |  |  |  |  |
|  |  | + | Sustainable development, use of SuDS, making most of open spaces/ green spaces. |  |
| *A) PROMOTING THE USE OF PREVIOUSLY DEVELOPED LAND?*  *SEA (MATERIAL ASSET)* |
|  | *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

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|  |  | *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 |  |  |  |

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| Downstream | SA17: Biodiversity / | SA17: Biodiversity / geological conservation *How does the use of land affect biodiversity?* |  |  |  |  |  |
|  | geological conservation |  | Potential for habitat |  |
|  | *Greenfield land is likely* | + | creation and | Strengthen |
|  | *to support higher levels* |  | development of | objective 5 to |
|  | *of biodiversity* |  | green corridors | cover this – |
|  | *High quality green* |  |  | Water |
|  | *infrastructure can* |  |  | Framework |
|  | *provide valuable* |  |  | Directive |
|  | *habitats and aid* |  |  | (WFD) |
|  | *movement/migration of* |  |  |  |
|  | *wildlife.* |  |  |  |
| Downstream | SA18: Climate change | SA18: Climate change mitigation  *How does the use of land affect climate change mitigation?* |  |  |  |  |  |
|  | mitigation |  | Use of land for flood |
|  | *Reusing existing* | + | mitigation schemes |
|  | *buildings reduces the* |  | and storage reduces |
|  | *need to construct new* |  | flood risk |
|  | *ones, and avoids the* |  |  |
|  | *energy and resource* |  |  |
|  | *use associated with* |  |  |
|  | *wholly new* |  |  |
|  | *developments?* |  |  |
| Downstream | SA19: Flood risk | SA19: Flood risk  *How does the use of land affect flood risk?* |  |  |  |  |  |
|  | *Developments on* |  | Use of land for flood |
|  | *previously undeveloped,* | + | mitigation schemes |
|  | *vegetated ground will* |  | and storage reduces |
|  | *increase runoff and* |  | flood risk |
|  | *decrease the lag time* |  |  |

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

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|  | *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:-* | + | Protects transport infrastructure – Leeds is a key transport hub, impact |  |  |  |
| *A) INCREASED ACCESSIBILITY VIA PUBLIC TRANSPORTATION?* |

* SEA Directive: Soil
* SEA Directive: Material assets

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| *THROUGH INFLUENCING OTHERS AND CHANGING BEHAVIOUR.* |  | *B) INCREASED INVESTMENT INTO SUSTAINABLE TRANSPORTATION NETWORK?* | +  + | on economy big  Wyke Beck Sustainable Transport link – public access via cycle-ways and  pedestrian bridges along green corridor |  |  |  |
| *C) THE UPTAKE OF SUSTAINABLE*  *TRANSPORTATION METHODS?* |
| Midstream | SA9: Mixed | SA9: Mixed neighbourhoods |  |  |  |  |  |
|  | neighbourhoods | *How does the contribution to* |  |  | Flooding |
|  | *Communities can be* | *accessibility and connectivity* | + | Communities not | can |
|  | *segregated if* | *affect neighbourhood* |  | isolated by flooding | improve |
|  | *appropriate transport* | *relations?* |  |  | community |
|  | *links do not exist* |  |  |  | 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.* | SA10: Social inclusion and community empowerment *How does the contribution to accessibility and connectivity affect social inclusion and community empowerment?* | 0 | Neutral impact |  |  |  |
|  | *Improving connectivity and reducing severance may increase people’s feelings of* belonging in  their community |  |  |  |

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| 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 | SA12: Water quality  *How does the contribution to accessibility and connectivity affect water quality?* |  | SuDS mitigate and |  |  |  |
|  | *Runoff from roads can* |  | improve water |
|  | *contain oil, heavy metals* |  | quality; reduced |
|  | *and other toxic* | + | flood risk to transport |
|  | *substances which can* |  | network > reduced |
|  | *affect water quality.* |  | pollutants in water |
| Downstream |  | SA13: Employment |  | Slight positive impact |  |  |  |
|  | SA13: Employment opportunities  No justification | opportunities  How does the contribution to accessibility and connectivity affect employment | + | – improved connectivity results in improved  economy/business |
|  |  | opportunities? |  |  |
| 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.* | SA14: Health  *How does the contribution to accessibility and connectivity affect health and health inequalities?* | + | Access to surgeries and NHS services improved |  |  |  |
|  | *Road traffic accidents*  *can kill or seriously* |  |  |  |

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

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|  | *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

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|  | *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

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| *DISTINCTIVENESS OF THE LANDSCAPE AND THE HISTORIC AND BUILT ENVIRONMENT* |  | *A) PROMOTING CHARACTER IN TOWNSCAPE AND LANDSCAPE?* | -  +  +  - | 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 |
| *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 | 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 |  |  |  |

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|  | *social housing should reduce disparities in the housing markets.* | *empowerment?* |  | improve public realm and amenity |  |  |  |
| *Modern developments should provide better amenities for*  *communities (open space provision, etc).* |  |  |
| Midstream | SA12: Water quality | SA12: Water quality  *How does the contribution to quality of place affect water quality?* |  |  |  |  |  |
|  | *Particularly in former* |  | Good quality |
|  | *industrial areas, there* | + | schemes with SuDS |
|  | *may be a risk of* |  | and appropriate |
|  | *mobilising contamination* |  | contaminant removal |
|  | *from land into* |  | will enhance water |
|  | *watercourses*. |  | quality |
| Downstream | SA14: Health *Modern housing may offer accommodation*  *that provides a healthier indoor environment (as regards indoor air quality, damp, etc).* | 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 |  |  |  |
|  | *A high quality landscape can contribute to wellbeing.* |  |  |  |
| Downstream | SA15: Crime  *Building design can* | SA15: Crime  *How does the contribution to* |  | Good quality schemes will |  |  |  |

* SEA Directive: Water
* SEA Directive: Human health

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|  | *affect whether people* | *quality of place affect crime?* | + | promote pride in the |  |  |  |
| *decide to commit a* |  |  | place – reduced |
| *crime or not, by* |  |  | graffiti and low level |
| *enhancing the risk of* |  |  | crime |
| *being watched/caught* |  |  |  |
| Downstream | SA16: Cleaner, greener | 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?* |  |  |  |  |  |
|  | and more attractive city |  | Good quality |
|  | *High quality* |  | schemes will |
|  | *developments may* | + | promote pride in |
|  | *improve neighbourhood* |  | place and create a |
|  | *cleanliness.* |  | more attractive city |
| Downstream | SA18: Climate change | SA18: Climate change mitigation  *How does the contribution to quality of place affect climate change mitigation?* |  |  |  |  |  |
|  | mitigation |  |  |
|  | *Modern housing must* | 0 | Neutral impact |
|  | *be built to higher energy* |  |  |
|  | *efficiency standards* |  |  |
|  | *than in the past (building* |  |  |
|  | *regulations, BREAM).* |  |  |
| Downstream | SA19: Flood risk *Wherever possible new developments should not be built in areas at risk of flooding (identified in the SFRA/PPS25)?* | 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 |  |  |  |
|  | *Flood protection* |  |  |  |

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

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|  | *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:-* | +  + | Measure 18 – pump operation carbon reduction  Potential incorporation of hydro electric, solar panels, wind turbines |  |  | Strengthen objectives to include reference to low carbon |
| *A) INCREASE ENERGY EFFICIENCY?* |
| *B) PROVIDE FOR LOW AND ZERO CARBON GENERATION?* |

* SEA Directive: Soil
* SEA Directive: Material assets

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|  |  | *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

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| **Sustainability Objective and *definition*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **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:-* | +  +  +  + | Re-use of materials, sustainable materials, SuDS  Choice of building materials  Sustainable scheme design and implementation |  |  |  |
| *A) REUSING RESOURCES?* |
| *B) DIVERTING RESOURCES FROM THE WASTE STREAM?* |
| *C) MINIMISING RESOURCE USE?* |
| *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

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| **Sustainability Objective and *definition*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **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

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| **Sustainability Objective and *definition*** | **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** |
| **Linked to Up / Mid / Downstream topics** | **Score** | **Record of Decision** | **Score** | **Record of Decision** |
|  | *Efficient use of* | *How does the contribution to* | - | Construction creates |  |  | waste |
| *resources will result in* | *resource consumption affect* |  | waste – materials | management |
| *less waste arisings.* | *waste and waste* |  | should be reused | plans’ to |
|  | *management?* |  | and recycled | 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.

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| **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. |

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| **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. |

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| **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. |

Appendix



LIST OFMEASURES

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| **Appendix C - List of Measures (Policies)** | | | | | | | | | | | |
| **ID** | **Priority** | **Scheduled Review/Completion Date** | **Measure** | **Location (if applicable)** | **Category** | **Relevant Objective from LFRMS** | **Progress/Comments (reference other sources of information)** | **Benefits/ Outcome** | **Lead Organisation** | **Support Organisation** | **Last Reviewed** |
| CURRENT POLICIES | | | | | | | | | | | |
| P3 | **HIGH** | **Ongoing** | Develop register of structures and features which are likely to have a significant effect on flood risk. | City-wide | 4. Asset management and maintenance | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | This is a requirement under Section 21 of the Flood and Water Management Act (2010). LCC are progressing this and have purchased new software "FloodVu" which will assist with the recording of asset information. This software links directly with the LCC's | Improve knowledge of existing infrastructure and conditions and promote a sustainable approach to asset management and maintenance. | LCC Flood Risk Management | Environment Agency & Yorkshire Water Services | 17/10/2018 |
| P4 | **HIGH** | **Ongoing** | Identify locations where culverts can be removed or improved through redevelopment | City-wide | 2. Spatial planning and development control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | This measure is listed in the Aire Catchment Flood Management Plan | Improve knowledge of existing  infrastructure and conditions and promote a sustainable approach to asset management and maintenance. Redevelopment plans will include consideration of the removal of problem culverts | Environment Agency | Leeds City Council | 17/10/2018 |
| P5 | **HIGH** | **Ongoing** | Watercourse and beck condition surveys | City-wide | 4. Asset management and maintenance | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | TBC | Improve knowledge of existing infrastructure and conditions and promote a sustainable approach to asset management and maintenance. | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| P8 | **HIGH** | **Ongoing** | Implement SuDS through Planning | City-wide | 2. Spatial planning and development control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | This has replaced the SuDS Regulations, under Flood & Water Management Act 2010, that would have set up SABs | Development control - ensure new drainage systems incorporate SuDS measures to reduce runoff rates and therefore flood risk. | LCC Forward  Planning & Implementation, Sustainable Development Unit, Flood Risk Management | Environment Agency | 17/10/2018 |
| P6 | **HIGH** | **Ongoing** | 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, Metro (transport network). | - | 1. Flood awareness, response and recovery | 1. Improve co-operation between LLFA and other RMAs | Engagement and consultation is under way as part of LFRMS. Regular meetings required to share knowledge, review policy, strategy documents, list of measures… etc. | Formalise and improve cooperation between RMAs on FRM | LCC Flood Risk Management | Internal LCC departments and external stakeholders | 17/10/2018 |
| P15 | **HIGH** | **Annually** | Review LFRMS List of Measures | - | 2. Spatial planning and development control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | Review scheduled to take place at least annually to assess progress with current measures  and add or remove measures as appropriate. First review scheduled for 1 year after the strategy is published. | Will assess progress with List of  Measures and ensure continuous improvement | LCC Flood Risk Management | Internal LCC  departments and external stakeholders | 17/10/2018 |
| P9 | **MEDIUM** | **As required** | Provide regular feedback to senior officers and elected members on FRM progress, working  groups, and strategies such as:   * Director of City Development (quarterly); * City Development (annually); * City Development Scrutiny Board (annually), and * All Area Committees (two-yearly). | - | 1. Flood awareness, response and recovery | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | TBC | Ensures that there is ownership and awareness of on-going FRM work at appropriate levels of accountability. | LCC Flood Risk Management | Internal LCC departments and external stakeholders | 17/10/2018 |
| P7 | **MEDIUM** | **Ongoing** | Investigate opportunities to reduce carbon from pump operations | City-wide | 4. Asset management and maintenance | 2. Promote sustainable flood risk management | TBC | Reduce carbon emissions and improve energy efficiency | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| P11 | **MEDIUM** | **Ongoing** | Engagement and communication with public on FRM issues; such as:   * 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, and * Engagement with local flood action groups (EA and RET). | - | 1. Flood awareness, response and recovery | 5. Increase community awareness of flood risk and the work of the LLFA in managing this risk | Engagement and consultation has begun as part of LFRMS - Graham Lindsey and Paul Seddon are points of contact for flood action groups | Involve communities in decisions - localism agenda | LCC Flood Risk Management & Peacetime Emergency Planning Unit | Internal LCC departments and external stakeholders | 17/10/2018 |
| P12 | **MEDIUM** | **Ongoing** | Leeds City Council to increase their flood risk management capacity, knowledge and skills  (as Lead Local Flood Authority) in order to deliver their new responsibilities as conferred under the Flood and Water Management Act 2010. | - | 1. Flood awareness, response and recovery | 4. Increase internal skills and ultimately capacity for flood risk management; | In accordance with Defra guidance on capacity building. Improve understanding of flood risk in the city and expertise to better manage consequences. | Increases local authority capacity and skills in flood risk management | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| P13 | **MEDIUM** | **Ongoing** | Significantly increase the percentage take-up of properties registered for flood warnings in flood warning areas across city. City wide campaign as current take-up is low. | City wide | 1. Flood awareness, response and recovery | 5. Increase community awareness of flood risk and the work of the LLFA in managing this risk | This measure is listed in the Aire CFMP for the Leeds Policy Unit - to be progressed by 2030. | The consequences of flooding will be  reduced through the increased potential for effective action to take place following receipt of a flood warning | Environment Agency | Leeds City Council | 17/10/2018 |
| P10 | **MEDIUM** | **Annually** | Review and update Emergency Handbook, Generic Flooding Plan, Community Flood Action Plans, West Yorkshire Major Flood Incident Plan, Reservoir Emergency Plan. | - | 1. Flood awareness, response and recovery | 1. Improve co-operation between LLFA and other RMAs | Plans need to be updated with latest contact details, departments and processes. SG/IH have discussed with Paul Seddon in Peacetime Emergency Planning Unit and he is progressing this. This measure is listed in the Aire CFMP for the Leeds Policy Unit. | Ensures plans for coordination of FRM activities in the event of a flood are up to date and consequences and disruption of flooding are minimised. | Peacetime Emergency Planning Unit | Environment Agency & West Yorkshire Authorities | 17/10/2018 |
| P17 | **LOW** | **As required** | Maintain internet and intranet web pages 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. | - | 1. Flood awareness, response and recovery | 5. Increase community awareness of flood risk and the work of the LLFA in managing this risk | Internet and intranet pages in place and launched. Further feedback required from services on on-going basis. | Ensures that there is a single consistent source of information on flood risk management. | LCC Flood Risk Management | Internal LCC departments and external stakeholders | 17/10/2018 |
| P18 | **LOW** | **On-going** | Promote the use of sustainable design principles in all future developments to ensure that  the risk of flooding and climate change are fully taken into account e.g.   * Promoting use of SuDS; * Incorporating policies and recommendations within Leeds LDF; * Developer contributions in Core Strategy; * Biodiversity and local amenity, and * Climate Change Adaptation. | City-wide | 2. Spatial planning and development control | 2. Promote sustainable flood risk management | This measure is listed in the Aire Catchment Flood Management Plan | Bu embedding the requirements for SuDS and urban design principles within local policy we will be able to improve the management of the water environment in all new developments. | LCC Forward Planning and Implementation & Sustainable Development Unit | Environment Agency & Yorkshire Water Services | 17/10/2018 |
| P16 | **LOW** | **6 Monthly** | 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. | - | 2. Spatial planning and development control | 1. Improve co-operation between LLFA and other RMAs | The Policy should be reviewed in light of the publication of the FWMA. | Ensures clarity around Council’s legal roles and responsibilities and that work programmes have a sound foundation. |  | Internal LCC departments and external stakeholders | 17/10/2018 |
| P19 | **LOW** | **Ongoing** | Review Strategic Flood Risk Assessment (SFRA) produced by Jacobs in October 2007; assess the need for a Level 2 SFRA to be undertaken. | - | 2. Spatial planning and development control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | 24/04/12 - SG had meeting with DF to discuss this. DF indicated that the EA have published data updates online - document as a whole is broadly up to date. | Helps ensure there is a more complete  understanding of flood risk at a high- level which takes account of YWS’s network and other lessons learned or gaps. | LCC Flood Risk  Management & Forward Planning and Implementation | Leeds City Council | 17/10/2018 |
| P14 | **LOW** | **2024** | Review Local Flood Risk Management Strategy (LFRMS) | - | 2. Spatial planning and development control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | The LFRMS will be reviewed once every 6 years. This will link the LFRMS review with the  cycles for reviewing the PFRA as outlined in the FRR. The first review is scheduled to be completed by October 2018. | Ensures LFRMS is updated with  relevant information to reflect any changes in FRM | LCC Flood Risk Management | Internal LCC  departments and external stakeholders | 17/10/2018 |
| **COMPLETED POLICIES SINCE 2011** | | | | | | | | | | | |
| P20 |  | **Oct-12** | Undertake Strategic Environmental Assessment (SEA) for LFRMS | - | 2. Spatial planning and development | c2. Promote sustainable flood risk management | This is part of process of producing LFRMS. SEA Workshop planned for July 2012 to appraise the objectives and measures in the LFRMS - see 19 | Will ensure LFRMS is sustainable and workable and also secure buy in from stakeholders | LCC Sustainable  Development Unit & Flood Risk Management | Environment Agency | 17/10/2018 |
| P1 |  | **Mar-14** | Publish Local Flood Risk Management Strategy | - | 2. Spatial planning and development  control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in  flood risk management: land allocation, SuDS, SABs; | Draft strategy currently being developed in parallel with an SEA. | Will raise awareness of the LFRMS  and FRM issues in the city | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| P2 |  | **Mar-14** | Publish LFRMS List of Measures | - | 2. Spatial planning and development control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | List of measures currently being developed. | Will assess progress with List of  Measures and ensure continuous improvement | LCC Flood Risk Management | Internal LCC  departments and external stakeholders | 17/10/2018 |
| P21 |  | **Jun-17** | Preliminary Flood Risk Assessment (PFRA) Update | - | 1. Flood awareness, response and recovery | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | In accordance with EA-published self-assessment guidance. | The first review of LCC's preliminary assessment report and identification of flood risk areas (FRAs), as required by the Flood Risk Regulations (2009). | LCC Flood Risk Management | Internal LCC departments and external stakeholders | 17/10/2018 |
| P23 |  | **Dec-18** | Publish LFRMS List of Measures | - | 2. Spatial planning and development control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | List of measures currently being developed. | Will assess progress with List of  Measures and ensure continuous improvement | LCC Flood Risk Management | Internal LCC  departments and external stakeholders | 17/10/2018 |
| P22 |  | **Dec-18** | Review Local Flood Risk Management Strategy (LFRMS) | - | 2. Spatial planning and development control | 3. Develop a consistent, affordable and sustainable approach to planning and investment in flood risk management: land allocation, SuDS, SABs; | The LFRMS will be reviewed once every 6 years. This will link the LFRMS review with the  cycles for reviewing the PFRA as outlined in the FRR. The first review is scheduled to be completed by October 2018. | Ensures LFRMS is updated with  relevant information to reflect any changes in FRM | LCC Flood Risk Management | Internal LCC  departments and external stakeholders | 17/10/2018 |

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| **Appendix C - List of Measures (Schemes)** | | | | | | | | | | | | | | |
| **ID** | **Priority** | **Current phase** | **Scheduled Phase**  **Completion Date** | **Measure** | **PF %**  **Score** | **Whole Scheme**  **Estimated Cost** | **Location (if applicable)** | **Category** | **Relevant Objective from LFRMS** | **Progress/Comments (reference other sources of information)** | **Benefits/ Outcome** | **Lead**  **Organisation** | **Support**  **Organisation** | **Last**  **Reviewed** |
| CURRENT SCHEMES AND FEASIBILITY STUDIES | | | | | | | | | | | | | | |
| S37 | **High** | **Feasibility** | **2018** | Leeds Flood Alleviation Scheme Phase 2, River Aire City Centre to Upper Catchment | TBC | £112m | River Aire - City Centre to Upper Catchment | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Phase 2 of the Leeds FAS, looking at solutions across the whole catchment upstream of Leeds that will reduce flood  risk to the city along the river Aire. Modelling and feasibility work largely complete, Outline Business Case submitted to the EA and Treasury Jan 2018. Moving in to more detailed design in 2018 with construction starting late 2018 early 2019, advanced works have taken place on some 'quick win'items and works at Stourton about to start as is a programme of advanced maintenance and stewardship | Reduce flood risk from River Aire | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S29 | **High** | **Design / Construction (on hold)** | **2018** | Queen Street Culvert | NA | TBC | Allerton Bywater | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Outline design completed. Japanese knotweed treatment taking place this is a 3 year programme due to complete in 2018 | Reduce risk of flooding | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S40 | **High** | **Design / Construction** | **2019** | Hawthorn Terrace Flood Alleviation Scheme Phase 2 | TBC | TBC | West Garforth | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Initial scheme completed, but further defects with existing assets and connected infrastructure identified so further  works needed and being designed | Reduced risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S15 | **High** | **Construction** | **2019** | Killingbeck Meadows Flood Alleviation Scheme | TBC | £1.6m | Halton Moor | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Flooding to residential and commercial areas from Wyke Beck. Accelerated scheme due to combining the benefits o  releasing development sites (11 housing sites and land within the Enterprise Zone and providing green infrastructure improvements to a Local Nature reserve as well as providing flood risk reduction, this scheme should receive planning permission in March 2018 and become a registered flood storage area under the Reservoirs Act. This forms part of a joint Wyke Beck Programme delivering housing growth from Brownfield land and Local Nature resrve and green space improvements. | The risk of flooding will be managed | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S16 | **High** | **Feasibility** | **2019** | Farnley Wood Beck Flood Alleviation Scheme | 104% | £500k | Cottingley | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Flood risk to residential areas, long term issue - scheme being scoped, developer contribution secured, this scheme i  now been progressed as part of the wider Wortley Beck study | Reduce flood risk from Farnley Wood Beck | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S31 | **High** | **Feasibility** | **2020** | Lin Dyke Catchment Assessment - Upper and Middle catchments | TBC | £1.25m | Garforth & Kippax | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Continuation of work included in Section 19 Report, regarding flooding of the SE Leeds area in August 2014 and 2015,  design works are contuining to be progressed as schemes are identifie | Reduced risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S30 | **High** | **Feasibility** | **2020** | Wyke Beck Catchment Assessment | NA | £50k | Communities along Wyke Beck | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Continuation of work carried out by both LCC & EA within the Dunhills, this has now progressed in to a catchment wide  approach bringing together the EA and many departments across LCC, resulting in an initial stage bid to the LEP for ESIF funding to complete various schemes including Killingbeck meadows | Reduced risk of flooding | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S17 | **High** | **Feasibility** | **2020** | Wortley Beck Flood Alleviation Scheme | 111% | £1.1m | Wortley Beck | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Flooding to residential area and outer ring road. Work in partnership with the EA and YWS to develop a detailed flood  alleviation scheme that integrates with all sources of flooding. This measure is listed in the Aire Catchment Flood Risk Management Plan. | Reduce risk of flooding | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S39 | **High** | **Feasibility** | **2020** | Wharfedale Flooded Communities Study | NA | £90k | Collingham, Linton, Wetherby,  Thorp Arch | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Llinked to wider catchment partnership work and Otley Flood Allevation Study, initial modelling work currently bein  assessed | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S9 | **High** | **Design/ Construction** | **2021** | Lower Mickletown Road Flood Embankment | 138% | £1.1m | Mickletown | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Construction of larger flood embankment along Lower Mickletown Road to protect properties from flooding. Being  taken forward separatley from Mickletown (Pit Lane) Flood Embankment as is substantially larger scheme. New model information only recently developed scheme propossal to be assesed in line with th | Reduce risk of flooding | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S38 | **High** | **Feasibility** | **2021** | Otley Flood Alleviation Scheme | TBC | £2m | Otley | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Initial £90k studied greatly extenbded to develop full Otley FAS to be constructed by December 2020, currently assessing shortlisted options to identify solutions to protect 58 properties from flooding, funding announced in the Autumn Statement 2016 linked to wider catchment partnership work and Wharfedale Flooded communities study | Reduce risk of flooding | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S5 | **High** | **Design (on hold)** | **TBC** | Barnsdale Road Property Level Protection Scheme | TBC | TBC | Allerton Bywater | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Surface water flooding to properties. Install property level protection measures - flood barriers and doors to reduce floo  risk to residential properties on Barnsdale Road. Funding has now been made available from Local Levy . This is currently on hold due to changes in the ownership of the properties involved to allow time to link with their plans for the properties | Reduce risk of flooding | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S12 | **Medium** | **Pre Outline Business**  **Case** | **2021** | Potternewton Surface Water Flood Alleviation Scheme | 153% | £250k | Potternewton | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Surface water flooding. Install attenuation and pumping station to remove flood water to adjacent culverted  watercourse. Local levy funding secured | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S10 | **Medium** | **Pre Outline Business**  **Case** | **2022** | Thorner Beck Flood Alleviation Scheme | 101% | £150k | Thorner | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Restricted capacity of existing culverts causing overland flooding. Improve Culvert capacity. Local levy funding secured | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S11 | **Medium** | **Pre Outline Business**  **Case** | **2022** | Victoria Road Surface Water Flood Alleviation Scheme | 100% | £250k | Guiseley | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Surface water flooding to properties. Install attenuation and pumping station to remove flood water to adjacent culverte  watercourse. | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S18 | **Low** | **Pre Outline Business Case** | **2020** | Sheepscar: evaluate the condition of formal and informal flood defences  along the Sheepscar Beck which were recently breached to identify potential remedial works required | TBC | TBC | Sheepscar | 4. Asset management and maintenance | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Evaluate flood defence improvement works required. | Helps ensure that problems or new works are identified to prevent recurrence of flooding. | LCC Flood Risk Management | Environment Agency | 17/10/2018 |
| S19 | **Low** | **Pre Outline Business Case** | **2020** | Develop and implement feasibility studies for fluvial flood alleviation schemes to improve the standard of protection along Meanwood Beck, Bagley Beck and Farnley Wood Beck - integrating with all sources of flooding. | TBC | TBC | Meanwood Beck, Bagley Beck & Farnley Wood Beck | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | This measure is listed in the Aire Catchment Flood Risk Management Plan for the Leeds Policy Unit - to be progresse by 2030. | Helps ensure that areas with proven flood risk are  provided with an appropriate flood defence scheme d  at the earliest possible opportunity and that the  Council supports the EA in developing any flood alleviation scheme in the longer-term | Environment Agency | Leeds City Council & Yorkshire Water Services | 17/10/2018 |
| S33 |  | **Ongoing** | **NA** | Improvements to surface water drainage outfalls | NA | TBC | City wide | 4. Asset management and  maintenance | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Identify improvments to improve discharge of surface water from flooding hot spots, work programme ongoing | Reduce risk of flooding | LCC Flood Risk  Management | Yorkshire Water  Services | 17/10/2018 |
| S21 |  | **Ongoing** | **NA** | LCC Significant Maintenance | NA | TBC | Across the District | 4. Asset management and maintenance | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Continuation of regular maintenance of Watercourses and Hot-Spots | Reduced risk of flooding | LCC Flood Risk Management | Yorkshire Water  Services & Environment Agency | 17/10/2018 |



Appendix C - List of Measures v2.xlsx Page 1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| COMPLETED SCHEMES AND FEASIBILITY STUDIES SINCE 2011 | | | | | | | | | | | | | | |
| S22 |  | **Completed** | **2011** | Flood Alleviation Scheme - Leeds Road (Allerton Bywater) pumping station  (local levy | NA | £34k | Allerton Bywater | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S23 |  | **Completed** | **2011** | Newton Road property protection and resilience scheme | NA | £88k (estimated) | Newton Road, Potternewton | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Improve flood resistance and resilience of properties | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S24 |  | **Completed** | **2011** | Lower Wortley - property protection and resilience scheme | NA | £47k (estimated) | Lower Wortley | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Improve flood resistance and resilience of properties | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S25 |  | **Completed** | **2011** | Church Lane, Bardsey - property protection and resilience scheme | NA | £10k (estimated) | Bardsey | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Improve flood resistance and resilience of properties | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S26 |  | **Completed** | **2011** | Dean Park Drive, Drighlington - property protection and resilience scheme | NA | £25k (estimated) | Drighlington | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Improve flood resistance and resilience of properties | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S27 |  | **Completed** | **2012** | Barley Hill Recreation Ground - (Local Levy) | NA | £113k | West Garforth | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Parks and  Countryside | Environment Agency | 17/10/2018 |
| S28 |  | **Completed** | **2013** | Oakdene, Watercourse Improvements | NA | £8k | Swillington | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S1 |  | **Completed** | **2014** | Lowther Road, Garforth - Culvert Improvements | NA | £84k | Garforth | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Improve flood resistance and resilience of properties | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S4 |  | **Completed** | **2014** | Wellhouse Drive Flood Alleviation Scheme | NA | £22k (estimated) | Gledhow | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S7 |  | **Completed** | **2014** | Culvert Headwall Repair Scheme - (Local Levy) | NA | £36k | Otley | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S3 |  | **Completed** | **2017** | Leeds Flood Alleviation Scheme Phase 1, River Aire City Centre | 100% | £50m | River Aire - City Centre | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce flood risk from River Aire | LCC Civil  Engineering Projects | Environment Agency | 17/10/2018 |
| S34 |  | **Completed** | **2017** | Glebelands Recreation Ground | 101% | £70k | Garforth | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Parks and  Countryside | Environment Agency | 17/10/2018 |
| S36 |  | **Completed** | **2017** | Barley Hill Recreation Ground Phase 2 | NA | £160k | West Garforth | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Parks and  Countryside | Environment Agency | 17/10/2018 |
| S2 |  | **Completed** | **2017** | Ramsden Street, Kippax, Flood Alleviation Scheme - (Local Levy & FDGiA) | NA | £220k | Kippax | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S14 |  | **Completed** | **2017** | Carry out flood warning feasibility studies for Wortley Beck and Meanwood Beck and implement findings. | NA | £10k | Wortley Beck and Meanwood Beck | 1. Flood awareness, response and recovery | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | This measure is listed in the Aire Catchment Flood Risk Management Plan | Establish the potential for advanced warning of  flooding. Develop more accurate flood warnings for tributaries of the River Aire which will result in reduction of economic damages and improve community safety | Environment Agency | Leeds City Council | 17/10/2018 |
| S35 |  | **Completed** | **2018** | Westfields, Allerton Bywater | 101% | £600k | Allerton Bywater | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme Completed | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S32 |  | **Completed** | **2016** | Hawthorn Terrace Flood Alleviation Scheme Phase 1 | 125% | £47k | West Garforth | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Initial scheme completed, but further defects with existing assets and connected infrastructure identified so furthe  works needed and being designed | Reduced risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S20 |  | **Superceded** | **2020** | Investigate the interaction between the Leeds and Liverpool Canal and the River Aire. | TBC | £10k | River Aire and Liverpool Canal | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | This study should identify the potential for managing this interaction to ensure that flood risk is managed effectively. Thi measure is listed in the Aire Aire Catchment Flood Risk Management Plan for the Leeds Policy Unit - to be progressed by 2030. - this has now been included in the scope of Phase 2 of the Leeds Flood Alleviation Scheme | sInvestigate this relationship to improve knowledge of the risk of flooding posed by the Leeds & Liverpool canal | Environment Agency | Canal & River Trust | 17/10/2018 |
| S8 |  | **Transferred** | **NA** | Cotton Mill Beck Culvert, Valley Road | NA | £25k | Morley | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Scheme transferred to Network Rail for Review | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S13 |  | **Transferred** | **NA** | Wakefield Road Flood Alleviation Scheme (transferred to S31) | 102% | £190k | West Garforth | 3. Studies, schemes, assessments  and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Restricted culvert and surface water flow. Install new culvert and widen highway ditch, design being reviewed in line wi  the findings from the Lin Dyke study as per the above lin | Reduce risk of flooding | LCC Flood Risk  Management | Environment Agency | 17/10/2018 |
| S6 |  | **Transferred** | **NA** | Mickletown (Pit Lane) Flood Embankment (transferred to S9) | 153% | £400k | Mickletown | 3. Studies, schemes, assessments and plans | 6. Improve understanding of local flood risk and seek to decrease local flood risk. | Assessment of a proposed setback bank is being Carried out, funding from FCRM GiA and Developer Contribution.  Being taken forward separatley from larger scheme - Lower Mickletown Road Flood Embankment, relies on much delayed Lower Aire Modelling work now being reviewed by LCC consultants | Reduce risk of flooding | LCC Flood Risk Management | Environment Agency | 17/10/2018 |

Appendix C - List of Measures v2.xlsx Page 2

Appendix



KEY LOCAL FLOOD RISK MANAGEMENT CONTACTS

|  |  |  |  |
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| Appendix D - Key Local Flood Risk Management Contacts | | | |
| Organisation | Office address | Department/Role | Name |
| Leeds City Council | St. George House. 40 Great George Street. Leeds. LS1 3DL | Flood Risk Management | Jonathan Moxon |
| Merrion House, 110 Merrion Centre, Leeds, LS2 8BB | Planning and Development Control | Helen Miller |
| Civic Hall, Calverley Street, Leeds, LS1 1UR | Resilience and Emergencies Team | Steve Thornton  Jim Grafton |
| Environment Agency | Lateral, 8 City Walk, Leeds, LS11 9AT | Area Flood Risk Manager for West and South Yorkshire | Adrian Gill |
| Partnership and Strategic Overview | John Woods  Luke Williams |
| Yorkshire Water Services Ltd | Western House, Western Way, Bradford BD6 2SZ | Flood Risk and Engagement | Leah Humphries |
| Highways England | Lateral, 8 City Walk, Leeds, LS11 9AT | Regional Environmental Advisor | - |
| Ainsty Internal Drainage Board | Derwent House, Crockey Hill, York, YO19 4SR | Clerk | Williams Symons |

Appendix



MAP OF SCHEMES COMPLETED SINCE ZO11

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| Culvert Headwall Repair Scheme  Church Lane, Bardsey  Newton Road Wellhouse Drive Flood Alleviation Scheme  Barley Hill Recreation Ground  Oakdene, Watercourse Improvements  Lowther Road, Gartforth - Culvert Improvements  Lower Wortley Leeds FAS Phase 1 Glebelands Recreation Ground  Hawthorn Terrace Flood Alleviation Scheme Phase 1 Ramsden Street, Kippax, Flood Alleviation Scheme  Dean Park Drive, Drighlington  Westfields, Allerton Bywater | |
| Completed Schemes  Reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller  of Her Majesty's Stationery Office. Crown Copyright. Unauthorised reproduction infringes Crown copyright and  Leeds FAS  may lead to prosecution or civil proceedings. Licence No: LA 100019567 (2018).  PLP Schemes | |





Appendix



RESPONSES OF CONSULTEES

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| **Appendix F - Responses of consultees** | | |
| **Consultee** | **Consultee Response** | **LCC Flood Risk Management Response** |
|  | | |
| **Leeds City Council - Planning and Development Control** | Section 1: Legislative Context  The adoption date for the Natural Resources and Waste Local Plan is January 2013, with the Minerals Transport Policies of that Plan having a further adoption date of 2015 ( due to a high court challenge of policies Minerals 13 and 14). | Date of Natural Resources and Waste Local Plan updated in LFRMS |
| This section should also include the Aire Valley Leeds Area Action Plan which was adopted in 2017 as part of the LDF. This Plan includes a lot of site specific policies which include mitigation measures for flood risk so it is important that the LLFRMS includes it. The Plan also includes a green infrastructure strategy which is relevant for flood risk management.  The Site Allocations Plan (SAP) is not adopted yet but has been submitted to the Secretary of State for independent examination and therefore is a material consideration. The Plan proposes significant housing and employment growth, some of which is in areas at risk of flooding and therefore it is relevant to mention in the LLFRMS. The SAP has been underpinned by a Flood Risk Sequential and Exception Test Background Paper which attempts to avoid development in areas at risk of flooding but where this is not possible, explains the mitigation measures which will be required for the site to be developed. Where sites are being allocated for development and include a culvert or canalised watercourse in the site, the SAP includes a requirement that development proposals should consider re-opening or restoration in accordance with saved UDP Policy N39B. The flood risk management policies in the Natural Resources and Waste Local Plan apply to all sites allocated for development and those coming forward through the planning application process. | Noted, to be reviewed for next update |
| Section 6: List of Measures  The sentence that reads ‘Spatial planning and development control –this includes proposals for the creation of a SuDS Approval Body, promoting sustainability and climate change adaptation’ should be amended because the Government has abandoned the requirement for planning authorities to create a SuDS approval body. | LFRMS amended to reflect this |
| Section 7: Review and Monitoring  Within our Authority Monitoring Report we don’t currently monitor the number of SuDS that are delivered in development but I agree that this would be a very useful thing to do and I would be interested to know if the Flood risk management Team are doing this? | Noted |
| Appendix C: List of Measures P19  The Leeds SFRA is out-of –date now and needs to be updated. The data for the zone 3aii flood risk layer is nolonger reliable and there are significant changes in zones 2 and 3a in the city centre. Only the zone 3b layer and areas of rapid inundation are still correct. The SFRA update is currently being scoped. | Noted, document update being scoped |
| Is there any chance there could be a measure for consultation of the Peace and Emergency Planning Team on evacuation plans in planning applications? We don’t currently do this but as a long term aspiration it is worthy of inclusion. It need not be for every application but occasionally we get applications where the evacuation plan is an important part of  the FRA and there is no one to check it. | Noted, to be reviewed for future measures |

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| **Appendix F - Responses of consultees** | | |
| **Consultee** | **Consultee Response** | **LCC Flood Risk Management Response** |
| **Environment Agency - Partnerships and Strategic Overview** | Section 1: Legislative context  What about the DEFRA’s Surface Water Management Action Plan?  Should there be something in here about regional policy e.g.  □Leeds City Region Strategic Economic Plan has a headline initiative around infrastructure and flood risk (Leeds FAS phase 1 received Local Growth Funding from WYCA, Wyke Beck is about to and Leeds FAS phase 2 is also likely to)  □The Leeds City Region Flood Review Report (December 2016) | Noted, to be reviewed for next update |
| Section 2.5.1  It seems to be missing properties for the Hawthorne Terrace scheme that protected 10 properties in 15/16 (is this because further work is needed?) | Table 1 amended to include this protected properties |
| Section 2.5.2  There is nothing in Micklefield SW flooding –there are 7 properties in the EA capital programme | This area is being investigated following flooding in December 2015, work to this area is not currently part of the LCC  programme of work |
| Section 4.3: Funding  It mentions a figure of £595m of GiA but for when and over what period? Assume this is Yorkshire for the 6 year programme? Could just say £2.6 billion nationally over 6 years? Also it might be worth mentioning that additional funding is available for environmental outcomes. Is it worth eluding to PF scores and set payment rates here?  It is worth noting that £20m was secured in the last Local Growth Fund bid for flood risk projects across the Leeds City Region incl. a number of projects in Leeds (see above).  It says FDGiA but should be called –Flood and Coastal Erosion Risk Management (FCERM) GiA (this should be changed throughout incl. in the abbreviations section)  To add:  □Highways England Designated Funds –Environment funds are available for flood risk projects on or near to the HE network  □Housing Infrastructure Fund?  □Yorkshire Water –incl. PR19 | FCERM GiA description updated  Yorkshire water funding included in this table - 'Water Company Investment'  Other funding to be reviewed at next update |
| Section 4.1 - Appendix D  EA contact is down as John Woods. Can you put both Luke Williams and John Woods for EA PSO contact? | Appendix D Updated |
| General  It talks interchangeably about the council’s MTP and the EA MTP a few times. Is it worth clarifying somewhere the difference and perhaps defining what they are? | LFRMS changes to refer to council's programme of work not MTP |
| **Canals and Rivers Trust** | I have had a look through and note no issues of concern or omissions relating to the Canal & River Trust.  I did notice a figure in one of the tables though which looks suspect; apologies if it is actually correct. It doesn’t follow the pattern of change in all the other figures? | Table matches climate projection data |

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| **Appendix F - Responses of consultees** | | |
| **Consultee** | **Consultee Response** | **LCC Flood Risk Management Response** |
| **iCaSP** | Section 4.4.4  Suggest reword, as follows:  iCASP’s first project helped organisations in Yorkshire to prepare in advance for the publication of new UK climate change projections due for release in November 2018 (UKCP18).  In collaboration with the UK Met Office, which is responsible for producing the projections, the iCASP project has been giving organisations including Leeds City Council an opportunity to rehearse ways of using the updated information in their operations and strategies –including for surface water flood risk management .  The project was selected as a demonstrator by the Met Office to be made available nationally as part of the release guidance material . iCASP will continue this support following the release of UKCP18 by organising a regional forum in 2019 –a one day event in designed for organisations who need to use UK climate projections for resilience planning, including flood risk management. | Section updated as suggested |
| Leeds City Council are also a partner in a currently ‘live’ iCASP project on enhanced warnings for surface water flooding.  This iCASP project aims to road-test the feasibility and usefulness of converting the latest advances in probabilistic rainfall forecasting and high-resolution surface water modelling into real-time forecasts and/or warnings for Lead Local Flood Authorities (LLFAs) and other decision makers.  Leeds are a partner, as are the EA, City of York Council, Met Office & FFC, JBA & Yorkshire Water.  I’ve attached a brief summary of the main aims of the project –I think it is worth including in the strategy given the Council’s remit in responding to SWF events as part the West Yorkshire Local Resilience Forum. Let me know if you’d like more info on this. | Reference to this project included in Section 4.4.4 |
| Section 5  One of the objectives is stated as:  “Promote sustainable flood risk management through WFD compliance, climate change adaptation (UKCIP, iCASP), land management, habitat protection and creation.”  Suggest acronyms in parentheses are replaced. UKCIP is an organisation that advises on adaptation matters (based at the University of Oxford). Suggest removing all references to UKCIP in all Appendices too. iCASP is a programme which involves issues beyond strictly climate change adaptation.  Suggest reworded to something like:  “climate change adaptation (based on latest UK projections, UKCP18 with support from iCASP)” | Reference to UKCIP removed |
| Appendix A: UKCP09 Climate Projections for Leeds UKCIP not related to UKCP09 in this case  I suggest also referring to (recently revised) national guidance on ‘climate change factors’ for flood risk management: [https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-1](http://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#table-1)  I suspect these will be revised (upwards) in light of UKCP18 (although this might take some time following release in Nov). | Reference to UKCIP removed |

Appe ix



COMMENTS FROM LCC GOVERNANCE





1st Floor

LS1 Headrow

Uni 113 The Headrow, Leeds LS1 SJW