Department for Infrastructure
An Roinn Bonneagair
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Living With Water

2025

LIVING WITH WATER IN DERRY/LONDONDERRY

An integrated Plan for Drainage and Wastewater Management in Derry/Londonderry

LIVING WITH WATER IN DERRY/LONDONDERRY

PROTECT
ENHANCE
GROW

MINISTERIAL FOREWORD

DEPARTMENT FOR INFRASTRUCTURE MINISTER

I am pleased to present this draft Living With Water in Derry Plan for consultation, which sets out proposals for a strategic long term approach to drainage and wastewater management in the city and surrounding area.

Infrastructure is the foundation to a more prosperous society and is the enabler for everything we do in our homes, businesses and communities.

Wastewater infrastructure is integral to delivering the priorities in the draft Programme for Government, to ensure that investment in homes and businesses can proceed across urban and rural communities without adverse environmental impacts.

Development of this draft Plan demonstrates my commitment to pursuing more sustainable drainage and wastewater solutions to help protect against flooding, provide a cleaner and greener environment and enable economic development in the Derry area.

The drainage of surface water and the effective treatment and management of wastewater are essential for good public health, economic growth, and a healthy, natural environment. We all 'live with water', so it is in all our interests to identify and deliver the best solutions to PROTECT against flooding, ENHANCE our environment and GROW our economy.

Elements of the existing drainage and wastewater infrastructure throughout the Derry area are under pressure and are in need of modernisation. In recent years, flooding has had devastating consequences for many and the impact of climate change places even more pressure on our ageing drainage network. The effective treatment of wastewater is therefore critical for the health and wellbeing of our citizens and to the economic prosperity of the city and surrounding area. The wastewater treatment works and much of the sewerage network in the draft Plan area are at, or nearing, capacity, meaning future connections for new developments may not be accepted by NI Water. This could in turn mean significant constraints on economic growth and house building; the potential for increased pollution and damage to the environment; and an increased risk of flooding.

This draft Plan takes a holistic, multi-agency approach to drainage and wastewater management by encouraging partners to work in collaboration to develop the right solutions in the right places. The approach promotes a combination of traditional hard engineered measures but importantly alongside natural or blue / green solutions such as open green spaces to naturally absorb and store surface water. Blue / green solutions help improve water quality in our rivers, reduce flood risk within the surrounding area, and reduce the amount of wastewater having to be treated at the treatment works. They can also be designed to aesthetically enhance our urban areas and green spaces to bring wider benefits to communities such as active travel and amenity improvements.

Investment in our infrastructure can unlock the potential for growth and provide the foundation for a prosperous economy, thriving communities and a cleaner and greener environment. Whilst the funding position is challenging, my Department will continue to seek opportunities to develop and invest in sustainable infrastructure that will have the potential to transform communities both now and in the future.

This draft Plan identifies potential opportunities and focusses on developing and delivering the right solutions to maximise benefits and reduce costs through collaborative working between partners across the city. When schemes are identified and approved, it will be for the partner organisations to put in place delivery mechanisms and funding streams, from their own annual budgets, to deliver the projects effectively and efficiently for the benefit of the citizens of Derry.

It is important that everyone has the opportunity to express their views on the approaches that are being advocated though this draft Plan. This consultation, which will be open for 12 weeks from 13 January 2025, offers you an opportunity to have your say on the future delivery of drainage and wastewater services in Derry.

> We all 'live with water', so it is in all our interests to identify and deliver the best solutions to **PROTECT** against flooding, **ENHANCE** our environment and **GROW** our economy.

EXECUTIVE SUMMARY

LIVING WITH WATER

The Department for Infrastructure (DfI) is leading the LWW approach to drainage and wastewater management. It is an interdepartmental initiative which promotes a holistic and collaborative approach to addressing drainage and wastewater infrastructure issues. LWW focuses on delivering integrated solutions which provide multiple benefits whilst minimising cost and disruption compared to traditional methods.

An example of this approach is using open spaces and watercourses to sustainably manage water and reduce flood risk, while enhancing the environment and promoting recreational opportunities. This is commonly referred to as blue / green infrastructure.

In addition to blue / green infrastructure it is recognised that significant investment is also required in more traditional "hard engineered" infrastructure, like sewers, pumping stations, river/coastal flood defences and upgrades to our wastewater treatment works.

LIVING WITH WATER IN DERRY / LONDONDERRY

In 2021, DfI announced the development of a Strategic Drainage Infrastructure Plan (SDIP) for Derry / Londonderry, to:

- **Protect** against flooding by managing the flow of water through a catchment from source to sea.
- **Enhance** the environment through effective wastewater management and the provision of enhanced blue/green spaces to benefit local communities.
- **Grow** the economy by providing the necessary capacity in our drainage and wastewater management systems to facilitate new development projects, including house building.

> LWW focuses on delivering integrated solutions which provide multiple benefits

A VISION FOR LIVING WITH WATER IN DERRY / LONDONDERRY

As a precursor to this draft Plan, '**A Vision for Living With Water in Derry / Londonderry**'[1] was published in May 2023, hereafter referred to as 'The Vision'. The Vision outlines the approach being undertaken by DfI to work collaboratively with various stakeholders from across central and local government and the private sector, to develop integrated and sustainable drainage solutions across the city and surrounding areas. The Vision explains the challenges involved, the opportunities for potential solutions and outlines the need for a draft Plan. The Vision was the first step in developing this draft Plan, aiming to highlight the complex nature of the issues associated with drainage and wastewater infrastructure.

DEVELOPMENT OF THE PLAN

Since 2021, appraisal work has been carried out to identify potential opportunities for integrated solutions that will help provide a modern and efficient drainage and wastewater system with the capacity needed to facilitate economic growth. Whilst it will be a challenge to provide the investment needed to implement the current opportunities identified in the draft Plan, without these projects, flooding and pollution will intensify, and future development of the area may be constrained.

This consultation document helps to explain the challenges involved, the opportunities for potential solutions and the areas where investment is needed to deliver them. It also gives consultees the opportunity to provide their views on the problems faced and the Living With Water approach to trying to solve them.

Implementation of this draft Plan is central to the delivery of the Floods Directive, the Water Framework Directive, the United Nations Sustainable Development Goals and the NI Executive's long-term water strategy, Sustainable Water. In February 2020 the Northern Ireland Assembly declared a climate emergency. Implementation of this draft Plan will help the city to adapt to changing rainfall patterns and mitigate against the effects of climate change.

The policy, regulation and funding of drainage and wastewater management in Northern Ireland is currently provided by a number of different organisations. This draft Plan coordinates and optimises the strategic planning of future drainage and wastewater related works in the Derry / Londonderry area.

We all 'live with water', so we all have a stake in delivering long-term, integrated solutions for our drainage and wastewater management needs. The drainage of surface water and the effective treatment and management of sewage are essential for good public health, economic growth, and a healthy, natural environment. It is also needed to support development of homes, schools, hospitals, commercial businesses and industry.

BACKGROUND

As the population and commerce of the area continue to grow and climate change produces more intense rainfall events, the ageing drainage infrastructure will continue to come under pressure with many parts now operating at or above design capacity.

The wastewater system requires significant levels of investment to facilitate future growth and development. Furthermore, the area has experienced a number of serious flooding events in recent years.

If these issues are not addressed, future development may be constrained, and flooding and pollution will intensify.

The Living With Water approach combines carefully planned investment in wastewater and drainage infrastructure with a range of catchment based measures to help manage surface water generated from rainfall in a more natural way. Together, these improvements will help reduce the risk of flooding in urban areas and will reduce the pollution to our watercourses and the sea.

Green spaces have not traditionally been considered to be drainage infrastructure. Yet, when these green spaces are developed and replaced with hard surfaces, the rainwater that was previously absorbed and attenuated becomes surface water, which can cause flooding and overload combined sewers resulting in pollution. Green spaces therefore already play a key role in managing surface water flood risk and should be considered as an integral part of the urban drainage system. When considered holistically, green spaces potentially form an extensive city-wide network of permeable areas that can absorb and hold water.

Although blue / green infrastructure has a key role to play in helping to address our future drainage needs, investment in conventional 'hard engineered' infrastructure assets will still be required.

Whilst it is recognised that significant investment is needed, this in itself is not enough to ensure the long-term sustainable management of surface water and wastewater. We need to change and influence behaviour to ensure maximum benefit from the investment made and avoid unintentionally contributing to these problems in the future. Policy and procedural proposals to facilitate integrated and sustainable drainage provision are outlined below in Setting the Scene (Chapter 1).

The geographical scope of the draft Plan, shown in Figure 1, covers areas that are considered to contain significant overlapping or interlinked pressures and issues, such as flooding, pollution and development constraints.

1 https://www.infrastructure-ni.gov.uk/publications/vision-living-water-derrylondonderry

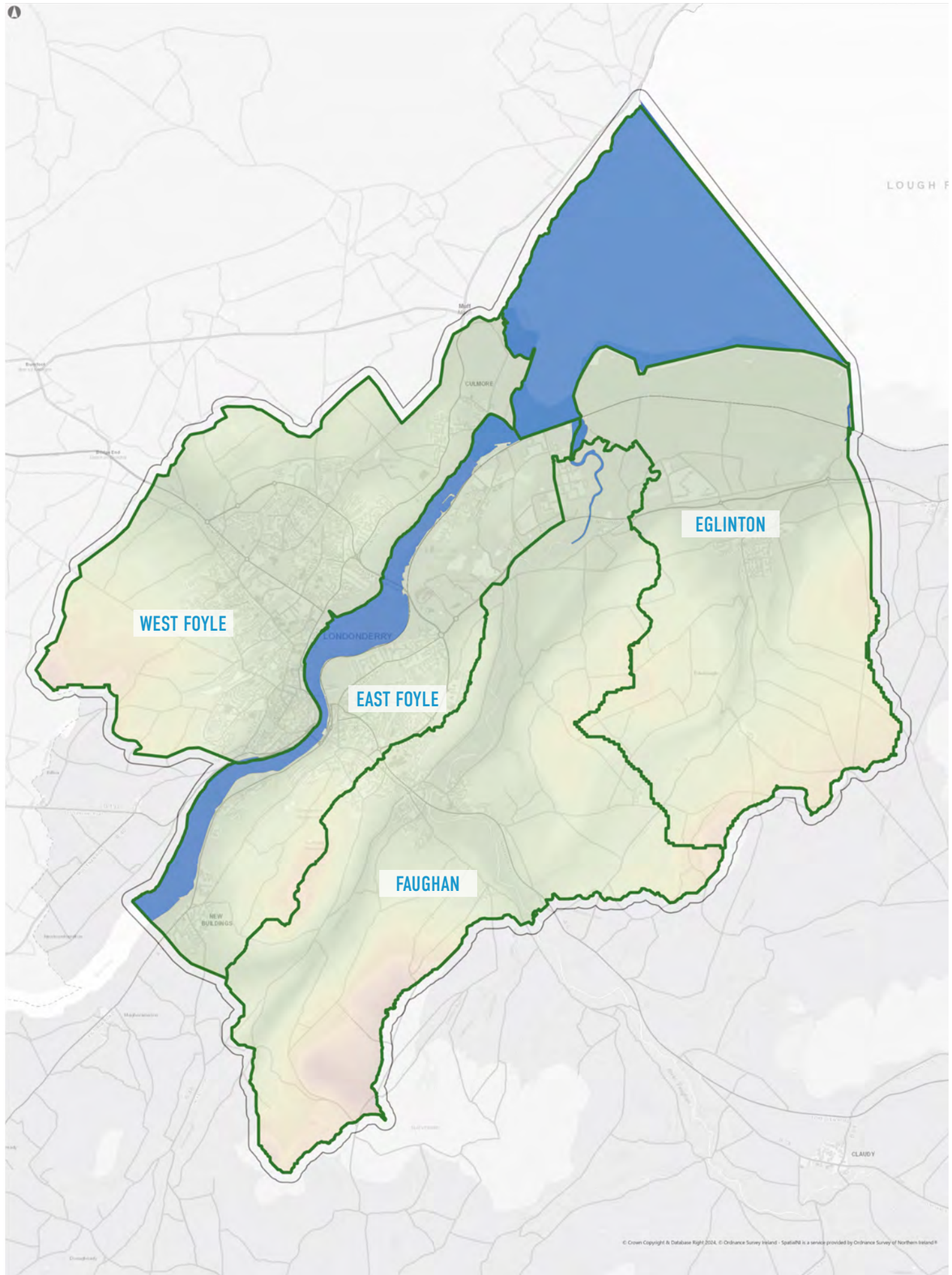


Figure 1 - Geographical area of the Plan

Due to the proximity to the Republic of Ireland, any opportunities for cross-border collaboration will be considered.

The geographical area of the draft Plan has been subdivided into four study areas:

- **West Foyle** – extending from the western banks of the River Foyle to the border with the Republic of Ireland.
- **East Foyle** – extending from New Buildings in the southwest to Strathfoyle in the north.
- **Faughan** – extending from the area south-east of Drumahoe to the lower reaches of the River Faughan to the north.
- **Eglinton** – extending from Lettershandoney in the south of the area, to Lough Foyle in the north.

THE CASE FOR CHANGE

Much of the drainage and wastewater infrastructure serving the area needs urgent upgrade and requires significant levels of investment to protect against flooding, enhance the water environment and facilitate economic growth. However, investment alone is not enough; we need to do things differently. The scale of the problem is such that a holistic and coordinated multi-agency response is required to deliver an integrated and catchment-based approach to future drainage and wastewater management.

One of the biggest issues that needs addressed is the amount of rainwater entering our drainage and wastewater infrastructure. Not only does this increase wastewater collection and treatment costs by allowing the rainwater to mix with sewage, but it also causes increased instances of pollution and flooding.

The LWW Directorate within Dfl is working collaboratively with the drainage providers and other key stakeholders to develop an integrated, strategic, and sustainable long-term approach to drainage and wastewater management on a whole catchment basis.

This could mean that the solution to a flooding or environmental issue in one location, that is the responsibility of one drainage organisation, could well be solved by using land or assets owned by a different organisation at another location in the area. This involves the organisations working together, outside of their normal areas of responsibility, to develop solutions that not only address their own problems, but which could address issues faced by other partners.

The LWW approach also promotes the use of blue / green infrastructure rather than continuing our reliance on hard engineered measures such as bigger pipes and higher flood defences. Blue / green infrastructure offers more benefits to communities than just drainage, such as providing new opportunities for walking and cycling and acting as a catalyst for cultural change in the way we work, live and travel.

THE PLAN OUTPUTS

Representatives from Dfl, Northern Ireland Water (NI Water), Northern Ireland Environment Agency (NIEA), Loughs Agency and other key partners, including Derry City and Strabane District Council (DCSDC), have informed the assessment for each study area. These groups helped identify the strategic drainage pressures and issues, along with potential opportunities to provide solutions, such as the use of existing green spaces to help control the flow of water, or planned schemes that could be modified to incorporate integrated drainage.

A range of integrated drainage proposals were then developed for each of the four study areas using a catchment-based approach. This focused on achieving the overarching objectives, and the proposals can be broadly categorised under the following headings.

Catchment Based Solutions – these potential measures are focused on managing rainwater more naturally through the catchment by controlling run-off, reducing peak flows in the drainage systems, and

EXECUTIVE SUMMARY

providing areas for flood storage. These include both blue / green infrastructure and conventional hard engineered measures.

Wastewater Treatment Works (WwTW) Upgrades – upgrades to WwTW within the Draft Plan area are potentially needed in terms of the volume of wastewater they can treat and the standard to which it is treated.

In addition, work to develop **new policies and procedures** to encourage greener drainage solutions and a collaborative approach to drainage and wastewater management is ongoing.

Although all of these proposals have been subject to high level initial feasibility studies and environmental assessment, they are still at conceptual stage. Progression to a programme of capital works is dependent on the successful outcome from further public engagement and consultation, detailed appraisal and design work, and securing the necessary approvals.

Partner organisations will work together to find the best way to deliver and fund projects from within their own annual budgets.

Further detail is laid out in Chapter 2.

THE ENVIRONMENTAL ASSESSMENTS

A Strategic Environmental Assessment (SEA) and a Habitats Regulations Assessment (HRA) have been developed alongside the draft Plan.

The draft Plan has been guided by the environmental objectives of the SEA and HRA which have been integrated with the water management objectives, to ensure more sustainable water management.

THE DELIVERY FRAMEWORK

Delivery of sustainable integrated solutions necessitates sustained communication and collaboration between organisations to identify the optimum solution to pressures and to ensure that no part of the system is detrimentally affected either in the short or the long term. Implementation of the Final Plan will be monitored by the LWW Directorate.

THE CONSULTATION PROCESS

We want to hear your views on all aspects of this consultation document, and we would encourage you to answer the questions in the consultation survey. We are particularly interested to hear about opportunities to deliver blue / green infrastructure to naturally manage the flow of water through catchments. If you feel there are potential opportunities which are not included in the draft Plan, please let us know by answering the questions.

TABLE OF CONTENTS

CHAPTER 01

SETTING THE SCENE

CHAPTER 01.
SETTING THE SCENE

1.1 LIVING WITH WATER

Drainage and wastewater infrastructure in many areas throughout Northern Ireland is currently inadequate to meet the requirements expected of it. This is the case in Northern Ireland's second largest city – Derry / Londonderry where there have been a number of flooding events in recent years. Current issues are likely to be exacerbated as a result of climate change and this could impact upon future growth plans for the city. To address these issues, the Department for Infrastructure (DfI) announced plans in 2021 to develop a Strategic Drainage Infrastructure Plan (SDIP) for the city and surrounding areas. This consultation document, entitled 'Living With Water in Derry / Londonderry' is the draft SDIP for the area and is hereafter referred to as the 'draft Plan'.

The main objectives of the draft Plan are to:

- **Protect** against flooding by managing the flow of water through a catchment from source to sea.
- **Enhance** the environment through effective wastewater management and the provision of enhanced blue / green spaces to benefit local communities.
- **Grow** the economy by providing the necessary capacity in our drainage and wastewater management systems to facilitate new development projects including house building.

This draft Plan has been developed by working collaboratively with various stakeholders from across central and local government. The LWW approach promotes holistic and integrated drainage and wastewater management solutions.

The DfI LWW Directorate was originally established to deliver – Living With Water in Belfast[2], which was published in November 2021 and is now being delivered. A similar approach has been used to develop this draft Plan.

1.2 A VISION FOR LIVING WITH WATER IN DERRY / LONDONDERRY

'A Vision for Living With Water in Derry / Londonderry', hereafter referred to as 'the Vision', was published in May 2023, as a precursor to this draft Plan. The Vision outlines the approach being undertaken by DfI to work collaboratively with various stakeholders from across central and local government, to develop integrated and sustainable drainage solutions across the city and surrounding areas.

The Vision explains the challenges involved, the opportunities for potential solutions and outlines the need for a Plan. The Vision was the first step in developing this draft Plan, aiming to highlight the complex nature of the issues associated with drainage and wastewater infrastructure.

1.3 THE NEED FOR A LIVING WITH WATER IN DERRY / LONDONDERRY PLAN

As set out in the Vision, the need for the Plan is evident. Derry / Londonderry is ranked second on the 12 Areas of Potential Significant Flood Risk (APSFR) in Northern Ireland, as identified in the Northern Ireland Flood Risk Assessment (NIFRA)[3] 2018 . Flooding from surface water, rivers and coastal sources were identified as posing risk to property, key infrastructure, and cultural heritage, with surface water being the most prominent source of risk. NIFRA 2018 figures state that the Aggregated Annual Average Damage (AAAD) for Derry / Londonderry equate to £5.56 million per year.

These issues are expected to be amplified with the increased frequency and intensity of storm events due to climate change, which will add to the pressure on ageing infrastructure with many parts already at or above design capacity.

It is clear that the scale of the problem requires a coordinated and integrated, multi-agency approach.

1.4 LIVING WITH WATER AIMS

As outlined in the Vision, the key aims of the LWW approach are in accordance with the principles set out in Sustainable Water – A Long-Term Water Strategy for Northern Ireland (2015-2040) published by DfI in March 2016[4]. These are to:

Key Aims of Living With Water in Derry/ Londonderry	
1.	Reduce flood risk in compliance with the Floods Directive (**Protect**)
2.	Maintain and achieve environmental compliance by improving the quality of water in the rivers and waterbodies including Lough Foyle (**Enhance**)
3.	Support economic growth by enabling development (**Grow**)
4.	Maintain essential drainage and wastewater assets
5.	Adapt to climate change by providing increased resilience
6.	Where possible as part of the solutions, provide new and improved amenity benefits to the community
7.	Reduce the burden of operational costs relating to drainage and the provision of wastewater services
8.	Determine the most cost-effective solutions through integrated investment planning

1.5 DELIVERING THE LIVING WITH WATER APPROACH

Significant progress has already been made in recognising the role that blue / green spaces can provide in meeting our future drainage needs and the solid foundations provided by the Long-Term Water Strategy.

Derry City & Strabane District Council (DCSDC) and its partners have developed a Green Infrastructure (GI) Plan 2019-2032 for the District that aims to improve its green and blue spaces. It outlines a new approach that requires a change to the way we think about and value these spaces. It highlights that these areas provide a range of benefits including helping mitigate the impact of climate change, improving public parks, play areas, food growing opportunities and the development of greenways as well as protecting biodiversity and providing a range of ecosystem services.

This now provides a solid foundation for progressing the Living With Water approach across the draft Plan area.

1.6 SUPPORTING POLICY MEASURES

Sustainable Water has identified a number of policy measures as being necessary to facilitate integrated and sustainable drainage provision. It suggests that a framework must be put in place that ensures drainage providers work openly and collaboratively to achieve this. Such an approach will help make investment more effective and reduce the future costs of maintaining and operating drainage and wastewater infrastructure. This is the crux of integrated urban drainage and is what the LWW approach is all about - making the best use of the finite resources available to manage surface water and wastewater in an effective and sustainable manner.

2 Living with Water in Belfast
3 Northern Ireland Flood Risk Assessment (NIFRA)

4 https://www.infrastructure-ni.gov.uk/sites/default/files/publications/drd/sustainable-water-a-long-term-water-strategy-for-northern-ireland-2015-2040.PDF

CHAPTER 01.
SETTING THE SCENE

The need to develop new policy measures and to change and influence behaviour is already widely accepted.

This is to ensure that maximum benefit is gained from our investment and to avoid unintentionally contributing to problems in the future.

Living With Water in Belfast, an Integrated Plan for Drainage and Wastewater Management, published in 2021, provided detail on a number of policy proposals, which built on the proposals identified in Sustainable Water. Work on the development and implementation of these policies, to manage flood risk and drainage in a more sustainable manner, continues across a number of Government departments.

Some of these policy proposals include Sustainable Drainage Systems (SuDS) and Natural Flood Management (NFM). Examples of these measures are shown below.

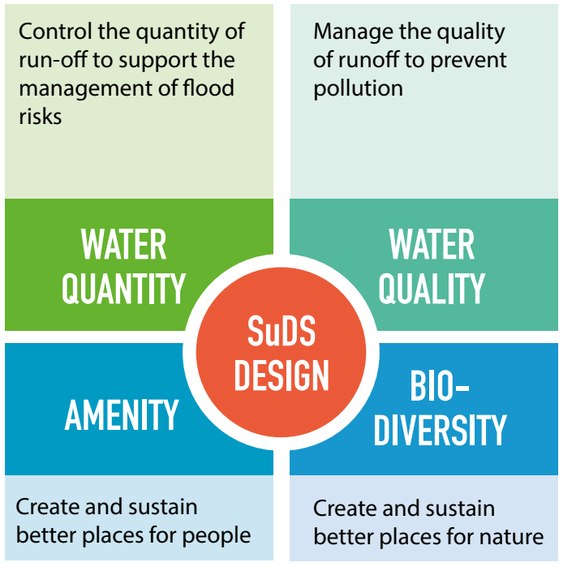


Figure 2 - Benefits of SuDS

CASE STUDY SUSTAINABLE DRAINAGE SYSTEMS (SuDS).

Mansfield SuDS -
Sustainable Flood Resilience Project

Mansfield SuDS addresses societal and environmental challenges through the implementation of nature-based solutions. The project creates a more resilient and adaptive city, with the benefits extending beyond flood resilience to encompass broader environmental and community benefits.

Through the implementation of SuDS, the project directly addresses the need for resilience against flooding and climate change. Turning the town into a sponge, these blue / green interventions will free up capacity in sewers by capturing up to 58,000m^3 of surface water. By providing up to 60% of the additional capacity needed by 2050, it contributes to the long-term sustainability and resilience of the city.

CASE STUDY NATURAL FLOOD MANAGEMENT

Coatham Wood NFM scheme

The Coatham Wood scheme forms part of the Lustrum Beck Flood Alleviation Scheme aiming to reduce flood risk in Stockton, Co. Durham. The project's primary goal is to employ Natural Flood Management (NFM) techniques to hold back water and reduce downstream flood risk.

The project enhances the standard of protection up to a 1 in 100-year return period for communities downstream, through provision of 12,500m^3 of offline storage across three ponds.

In addition to flood risk management, the establishment of these ponds enhances habitat along the river corridor. The pond embankments and footbridges provide connectivity for walkers, improving the social amenity value of the site

These solutions not only manage stormwater but also enhance biodiversity, improve air quality, and provide recreational spaces for the community.

1.7 STUDY AREA BOUNDARY

Figure 3 provides an illustration of the geographical scope of this draft Plan. The area located within the boundary is considered to contain significant overlapping or interlinked pressures and issues, such as flooding, pollution and development constraints.

Given the proximity of the study area to the Republic of Ireland, the transboundary impacts and opportunities for cross-border collaboration have been considered during the development of this draft Plan.

1.8 ENVIRONMENTAL CONSIDERATIONS

A Strategic Environmental Assessment (SEA) has been prepared for this draft Plan, in accordance with the Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004).

A Habitats Regulations Assessment (HRA) has also been undertaken for the draft Plan, in accordance with the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995.

The draft Plan has been guided by the environmental objectives of the SEA and HRA which have been integrated with the water management objectives, to ensure more sustainable water management.

1.9 OTHER POTENTIAL IMPACTS

The impact of the draft Plan was assessed in terms of regulatory and rural needs and on equality of opportunity and the need for an Equality Impact Assessment (EQIA) was screened out. A copy of the screening form can be viewed on the Equality Section of the Department's website.

Photos: Copyright Arup, Richard Holmes (Tees Rivers Trust)

CHAPTER 01.
SETTING THE SCENE

1.10 CONSULTATION PROCESS

Purpose of Consultation

This consultation welcomes your views on the draft Plan. Your answers to the questions in the consultation survey will help inform the development of the final Plan.

Your Views

Responses to the consultation can be made via a survey link available at https://www.infrastructure-ni.gov.uk/consultations/living-water-derrylondonderry-draft-plan-consultation

Please note that the consultation will run for 12 weeks from 13 January 2025 until 7 April 2025. All responses received within this timeframe will be considered. If you wish to request a hard copy of the consultation and questions please contact LivingWithWater@infrastructure-ni.gov.uk

Confidentiality of Responses

Please note that all responses will be treated as public and may be published on the Department's website. If you do not want your response to be used in this way, or if you prefer for it to be used anonymously, please indicate this when responding. Following consideration of all responses, a report may be published on the Department's website. Information you provide in your response, including personal information, could be published, or disclosed under the Freedom of Information Act 2000 (FOIA) or the Environmental Information Regulations 2004 (EIR).

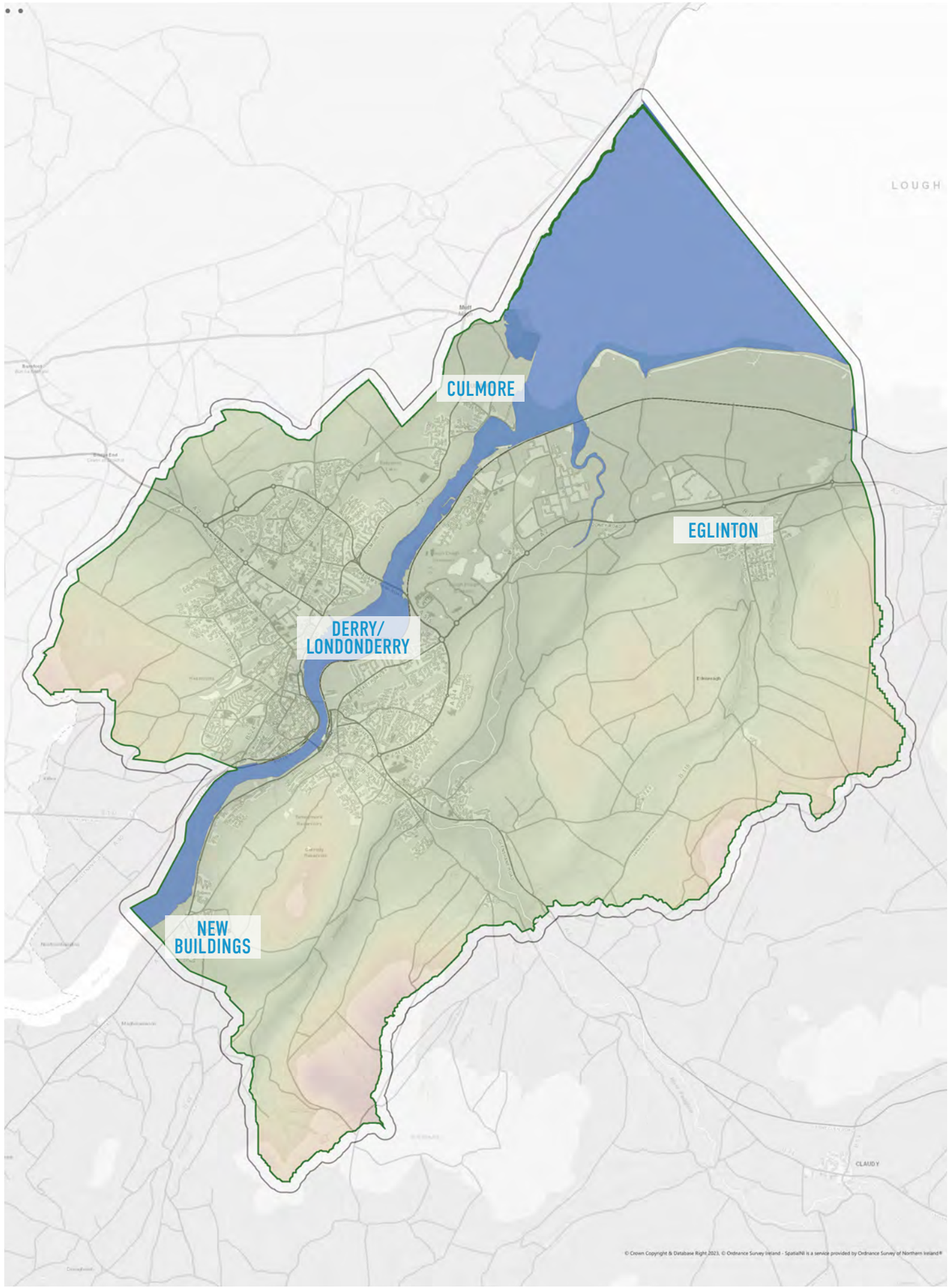


Figure 3 - Geographical scope of the Plan.

CHAPTER 02

THE PLAN OUTPUTS

CHAPTER 02.

THE PLAN OUTPUTS

2.1 CATCHMENT AREAS

The Catchment Areas are based on natural drainage catchments and sewerage network characteristics. Four distinct Catchment Areas have been created within the study area, namely, West Foyle; East Foyle; Faughan; and Eglinton as illustrated in Figure 4.

Pressures and issues within each of the catchment areas have been reviewed and used to define the objectives and potential opportunities for solutions.

2.2 OBJECTIVES

Catchment Area objectives were developed and selected based on the potential strategic pressures and issues within each area. These objectives are based on the Living With Water key aims to:

- **Protect** against flooding, by managing the flow of water through a catchment from source to sea;
- **Enhance** the environment, through effective wastewater management and the provision of enhanced blue / green spaces to benefit local communities; and
- **Grow** the economy, by providing the necessary capacity in our drainage and wastewater management systems to facilitate new development projects.

It should be noted that certain pressures and issues may not have been considered as part of this draft Plan.

2.3 PROTECT

The main sources of flooding, fluvial (river), pluvial (surface water), tidal and out of sewer, have been considered in the development of this draft Plan.

Groundwater and reservoir flood risk have not formed part of the objectives for this draft Plan because: suitable data on the risk of groundwater flooding is not available in Northern Ireland; and reservoir flood risk is covered by The Reservoirs Act (Northern Ireland) 2015.

2.4 ENHANCE

Water quality data informed the 'Enhance' Catchment Area objectives, including the latest Water Framework Directive classification information from NIEA.

2.5 GROW

Land zoning information from the Derry Area Plan 2011, was used to inform the 'Grow' Catchment Area objectives of facilitating sustainable residential and non-residential growth.

In addition to Protect, Enhance and Grow objectives, Environmental objectives were also developed to align with the SEA and HRA, to ensure that the environmental assessment of potential opportunities was integrated throughout development of the draft Plan.

2.6 CATCHMENT BASED APPROACH

The LWW approach involves the development of catchment-based solutions, which are focused on managing rainwater more naturally, by controlling run-off, reducing peak flows in the drainage systems, and providing areas for flood storage. They typically mimic natural processes and manage rainfall on the surface and close to source. These measures, inspired and supported by nature, can help to enhance resilience, support climate adaptation, and align with Net Zero commitments. It is important to recognise that optimum solutions to pressures and issues could involve construction of conventional 'grey' infrastructure alongside blue / green solutions.

This chapter identifies the strategic drainage pressures and issues within each of the four Catchment Areas and includes potential opportunities for integrated catchment-based solutions to address these.

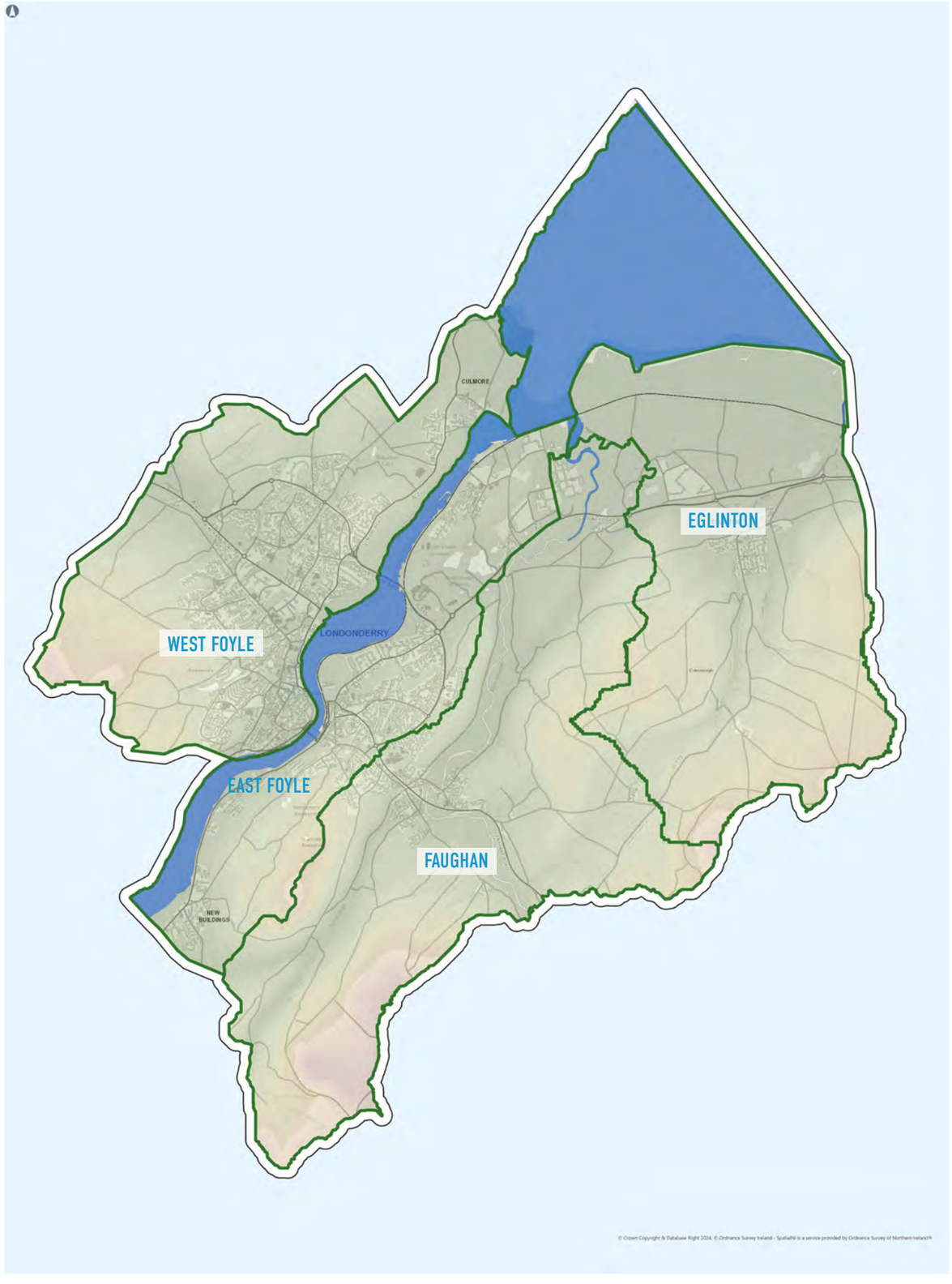


Figure 4 - Catchment Areas.

CHAPTER 02.
THE PLAN OUTPUTS

2.7 PRESSURES & ISSUES

The main pressures and issues identified throughout the Catchment areas are illustrated in Figures 5,7,9 &11 and include:

- Flood risk in various areas attributed to a number of sources, including surface water that is unable to enter the drainage network, flood risk from rivers such as the River Foyle, and from sewerage networks that are overwhelmed during storm events;
- Pollution arising from unsatisfactory discharges from combined sewer overflows due to lack of capacity within the sewerage network, and misconnections to the network; and
- Development constraints throughout the area due to sewerage network capacity issues and at Culmore Wastewater Treatment Works (WwTW) – the main wastewater treatment works in the city.

2.8 OPPORTUNITIES FOR INTEGRATED CATCHMENT BASED SOLUTIONS

A series of opportunities present themselves within each Catchment area as illustrated in Figures 6, 8, 10 and 12. Opportunity based solutions are listed below and will be taken forward for more detailed assessment as part of the delivery of the final Plan.

- Potential to provide upland storage and reduce surface water run-off.
- Opportunities to redevelop green spaces, along with river and floodplain restoration works by opening culverted rivers and incorporating storm attenuation features.
- Improvements to the sewerage and drainage network aimed at reducing the risk of flooding.
- Potential to provide increased capacity within the combined sewerage network, together with appropriate screening at sewer overflows, to help mitigate flood risk and reduce pollution.

It is emphasised that while these identified opportunities have been subject to an initial high-level feasibility assessment, they are conceptual, indicative proposals that seek to identify and highlight how we could optimise our existing environment, enabling us to better manage and live with water. Further opportunities to resolve issues within the draft Plan area may be identified and brought forward in the future. The LWW team will also continue to work with partners to explore the potential to work together to achieve LWW aims.

Possible opportunities for interventions that could contribute to meeting the objectives identified within the study area, alongside planned capital projects that could be extended to cover integrated drainage, have been explored.

2.9 WEST FOYLE CATCHMENT AREA

The West Foyle Catchment area extends from the western banks of the River Foyle to the border with the Republic of Ireland in the west. The drainage system in the West Foyle area consists of numerous small streams and watercourses including the Pennyburn Stream and Creggan Burn, which flow and discharge to the River Foyle. The Skeoge River flows northwest into County Donegal.

The sewerage network within the study area discharges to Culmore WwTW, located at Culmore Point. Sewers are predominantly combined (they carry both storm and foul water flows), due to the historical nature of development on the western side of the city. More recently constructed housing developments, comprising separate surface water and foul systems are typically located towards the outer extents of this area.

2.10 EAST FOYLE CATCHMENT AREA

The East Foyle Catchment area extends from New Buildings in the southeast to Strathfoyle in the north.

The drainage system within the East Foyle area consists of numerous watercourses including the Woodburn Park Stream and Gransha Stream, which generally flow west and discharge into the River Foyle.

The flows in the foul sewers in the East Foyle Catchment area are collected, directed, and discharged to either Duke Street pumping station, near the eastern end of the Craigavon Bridge, or towards the siphons across the River Foyle, located at Strathfoyle.

2.11 FAUGHAN CATCHMENT AREA

The Faughan Catchment area extends from the area upstream of Drumahoe to the lower reaches of the River Faughan.

The natural drainage in this area is directed to the River Faughan which has notable tributaries, including the Burngibbagh, that flows through Drumahoe village upstream of its discharge point into the River Faughan.

There are no operational wastewater treatment works within the Faughan catchment. The wastewater flows from this catchment area are conveyed via Drumahoe Wastewater Terminal Pumping Station and through the Strathfoyle Siphons to Culmore WwTW.

2.12 EGLINTON CATCHMENT AREA

The Eglinton Catchment area extends from Lettershandoney in the south to the interface with Lough Foyle in the north.

Notable watercourses located within the study area include the Castle River and Muff River. Tributaries of these watercourses traverse the Eglinton area and flow in various directions. The drainage system within this catchment is typically facilitated through watercourses and drainage systems that eventually discharge into Lough Foyle which is located north of Eglinton.

The majority of foul and combined sewage flows in the Eglinton catchment are drained to Donnybrewer WwTW. Minor wastewater treatment works are also present within the Eglinton Catchment area including Killylane Eglinton, Longfield Eglinton and Tamnaherin.

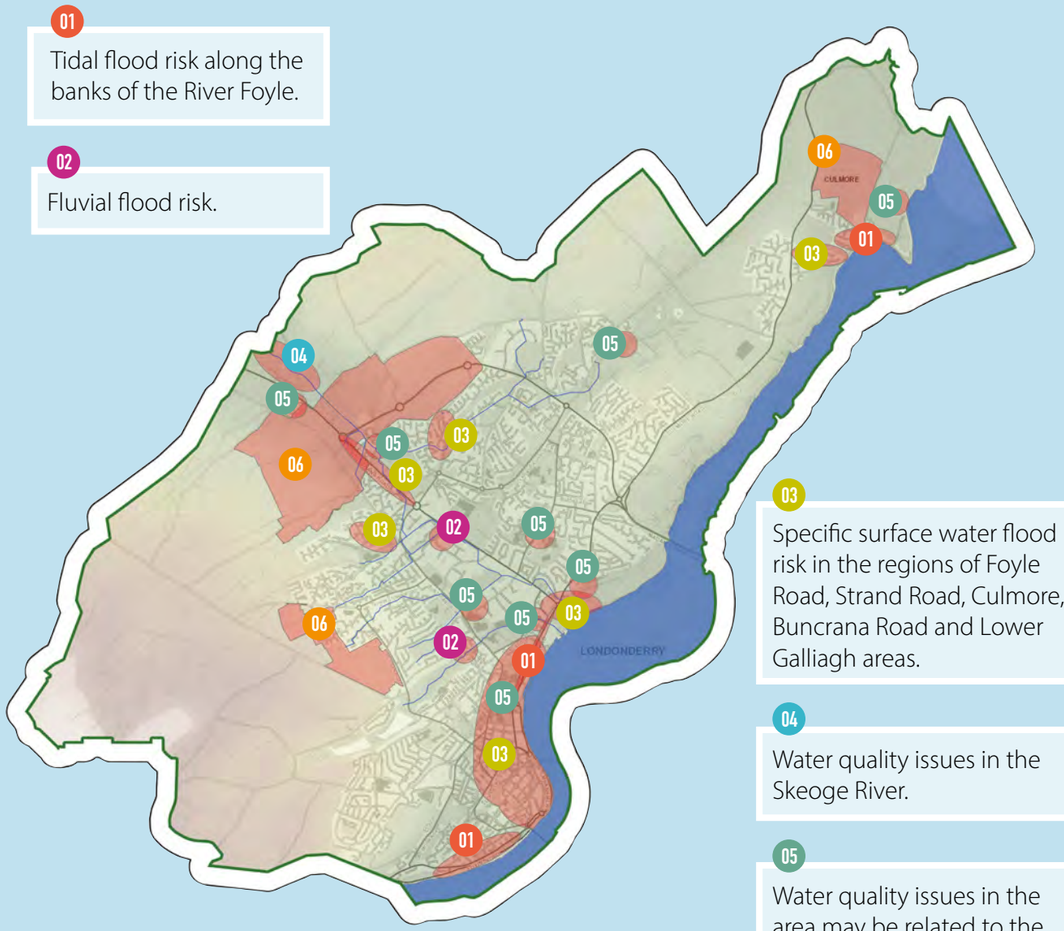
PRESSURES AND ISSUES

WEST FOYLE CATCHMENT

General surface water flood risk throughout the urban area.

01 Tidal flood risk along the banks of the River Foyle.

02 Fluvial flood risk.



03 Specific surface water flood risk in the regions of Foyle Road, Strand Road, Culmore, Buncrana Road and Lower Galliagh areas.

04 Water quality issues in the Skeoge River.

05 Water quality issues in the area may be related to the operation of the sewer network and/or diffuse pollution.

06 Constraints to development throughout the catchment due to lack of capacity in the sewer network.

CATCHMENT OBJECTIVES

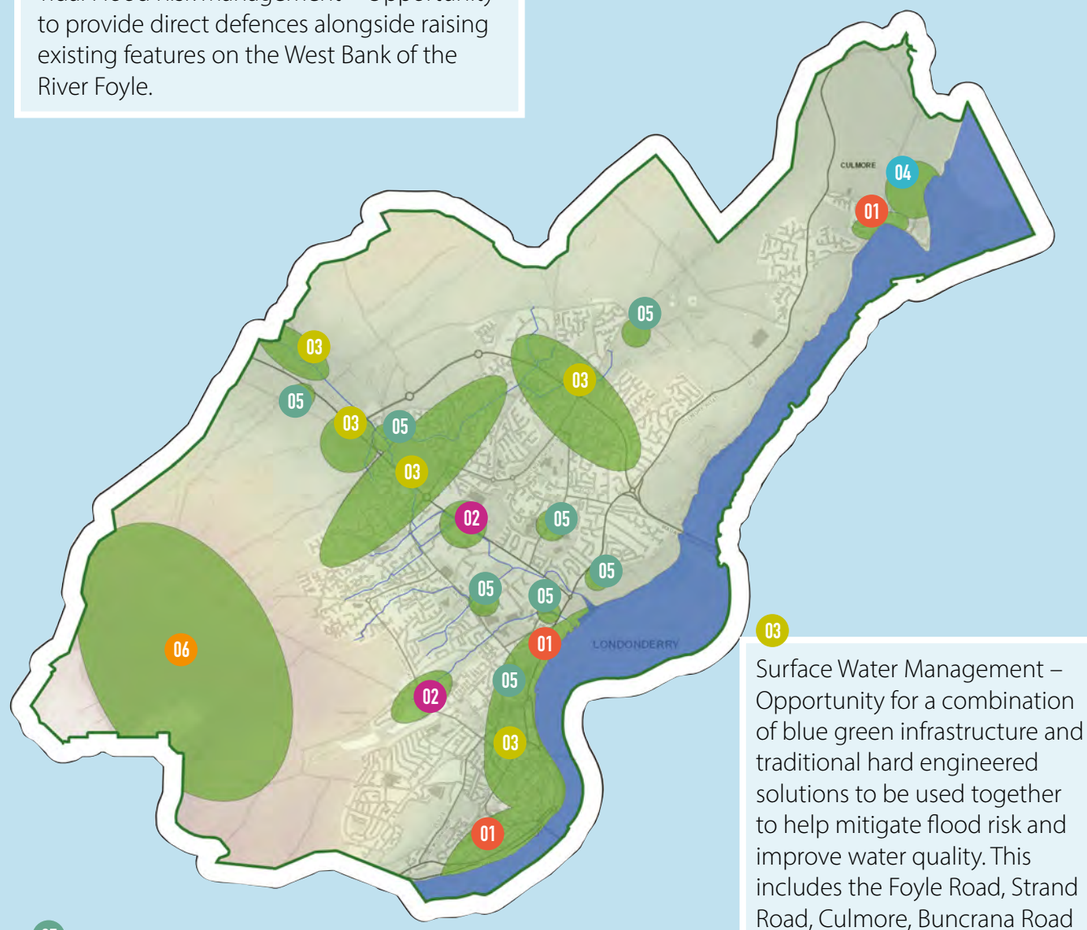
- Reduce the number of people and properties at risk of flooding.
- Contribute to achieving Good Ecological Potential in the Skeoge River.
- Facilitate sustainable development across the area and further downstream.

Figure 5 - West Foyle Pressures and Issues

OPPORTUNITY BASED SOLUTIONS

02 Fluvial Flood Management – Opportunities may include increasing capacity, daylighting, diverting existing culverts and construction of flood walls.

01 Tidal Flood Risk Management – Opportunity to provide direct defences alongside raising existing features on the West Bank of the River Foyle.



03 Surface Water Management – Opportunity for a combination of blue green infrastructure and traditional hard engineered solutions to be used together to help mitigate flood risk and improve water quality. This includes the Foyle Road, Strand Road, Culmore, Buncrana Road and Lower Galliagh areas.

04 WwTW Upgrades – Upgrading Culmore WwTW to provide increased treatment capacity necessary to facilitate the upgrade of the sewerage networks and enable growth within the city.

05 Sewerage Infrastructure – Opportunities include increasing capacity within the combined sewerage network, storm overflow screening and the provision of additional storage to help mitigate flood risk and improve water quality.

06 Natural Flood Management – There are opportunities to manage the uppermost parts of the catchment to reduce surface water run-off, increase attenuation, and reduce diffuse pollution.

Figure 6 - West Foyle Opportunity Based Solutions

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PRESSURES AND ISSUES

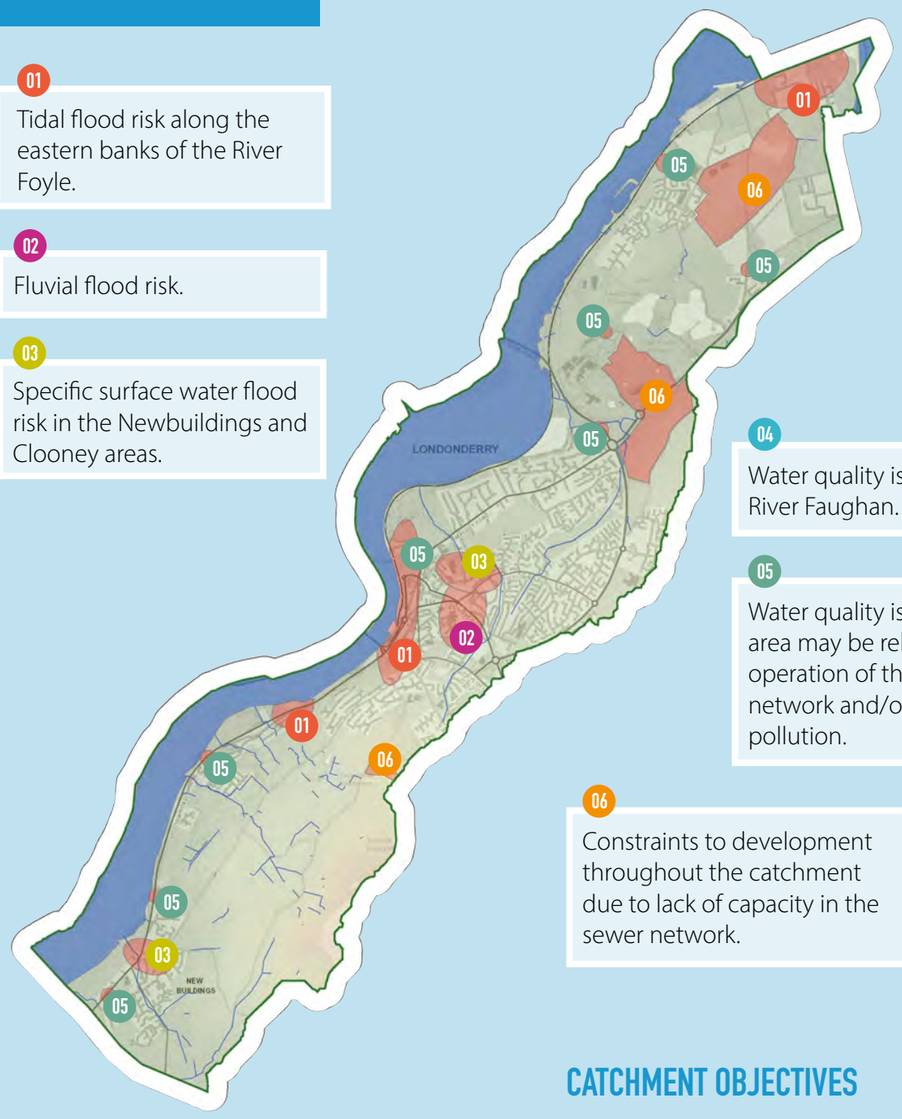
EAST FOYLE CATCHMENT

General surface water flood risk throughout the urban area.

01
Tidal flood risk along the eastern banks of the River Foyle.

02
Fluvial flood risk.

03
Specific surface water flood risk in the Newbuildings and Clooney areas.



04
Water quality issues in the River Faughan.

05
Water quality issues in the area may be related to the operation of the sewer network and/or diffuse pollution.

06
Constraints to development throughout the catchment due to lack of capacity in the sewer network.

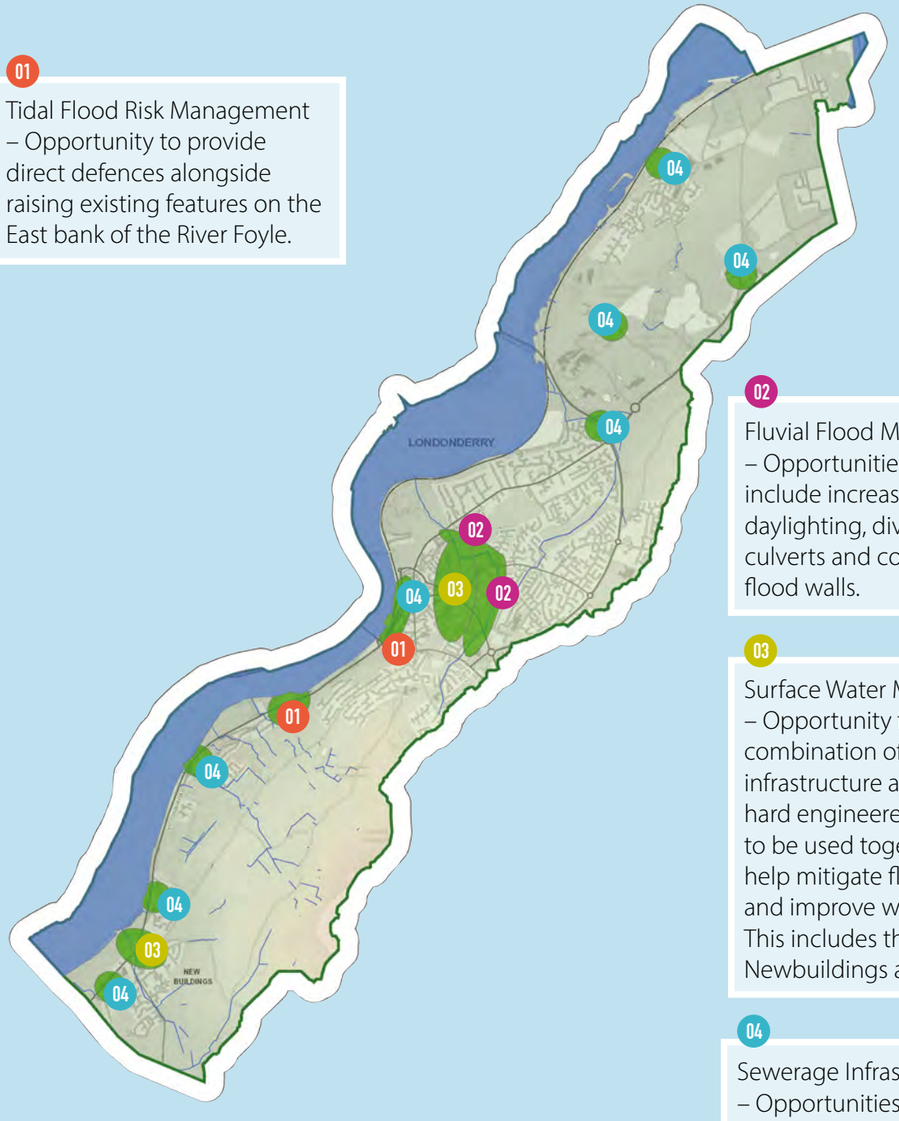
CATCHMENT OBJECTIVES

- Reduce the number of people and properties at risk of flooding.
- Contribute to achieving Good Ecological Potential in the River Faughan.
- Facilitate sustainable development across the area and further downstream.

Figure 7 - East Foyle Pressures and Issues

OPPORTUNITY BASED SOLUTIONS

01
Tidal Flood Risk Management – Opportunity to provide direct defences alongside raising existing features on the East bank of the River Foyle.



02
Fluvial Flood Management – Opportunities may include increasing capacity, daylighting, diverting existing culverts and construction of flood walls.

03
Surface Water Management – Opportunity for a combination of blue green infrastructure and traditional hard engineered solutions to be used together to help mitigate flood risk and improve water quality. This includes the areas of Newbuildings and Clooney.

04
Sewerage Infrastructure – Opportunities include increasing capacity within the combined sewerage network, storm overflow screening and the provision of additional storage to help mitigate flood risk and improve water quality.

Figure 8 - East Foyle Opportunity Based Solutions

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PRESSURES AND ISSUES

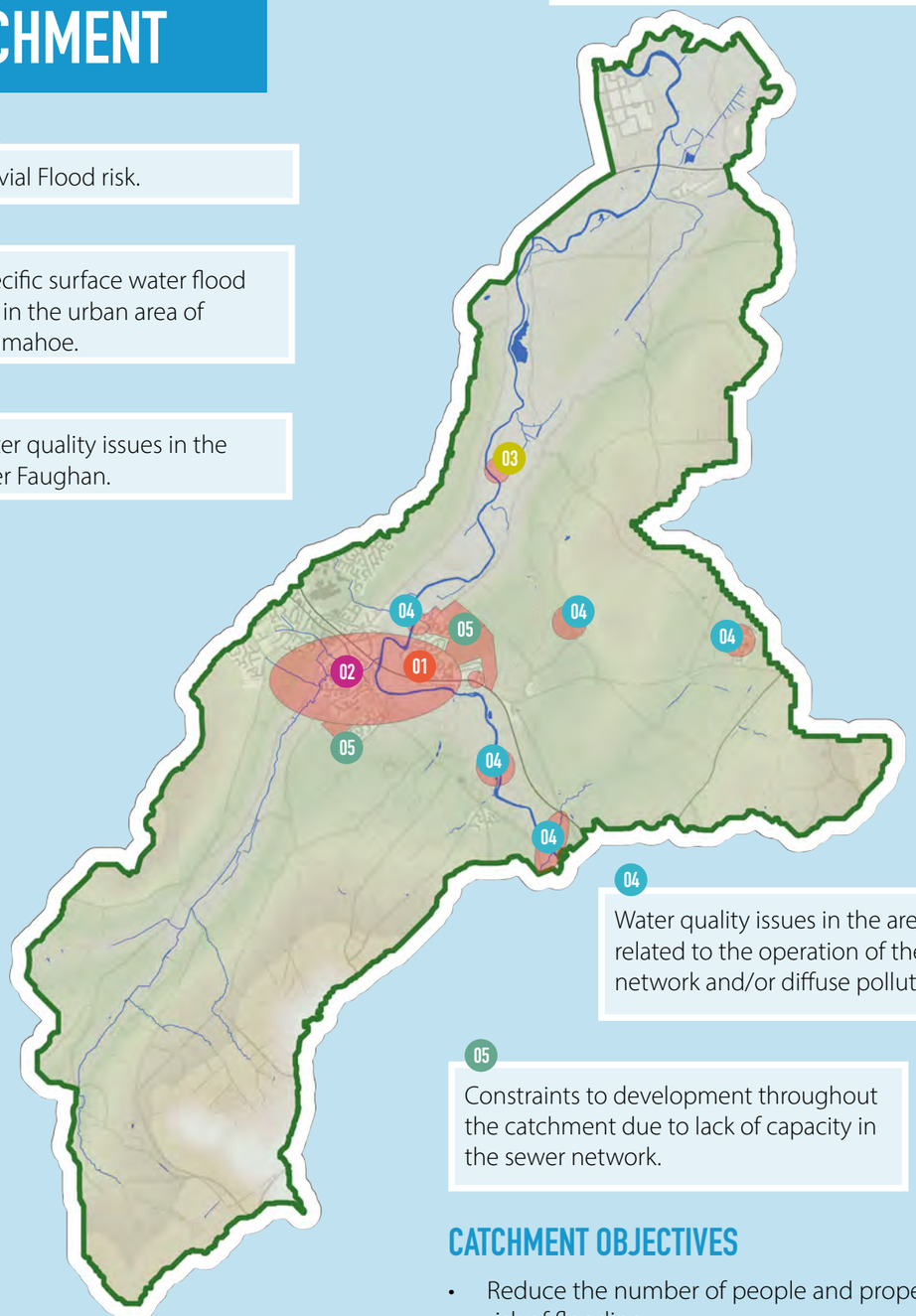
FAUGHAN CATCHMENT

01
Fluvial Flood risk.

02
Specific surface water flood risk in the urban area of Drumahoe.

03
Water quality issues in the River Faughan.

General surface water flood risk throughout the urban area.



04
Water quality issues in the area may be related to the operation of the sewer network and/or diffuse pollution.

05
Constraints to development throughout the catchment due to lack of capacity in the sewer network.

CATCHMENT OBJECTIVES

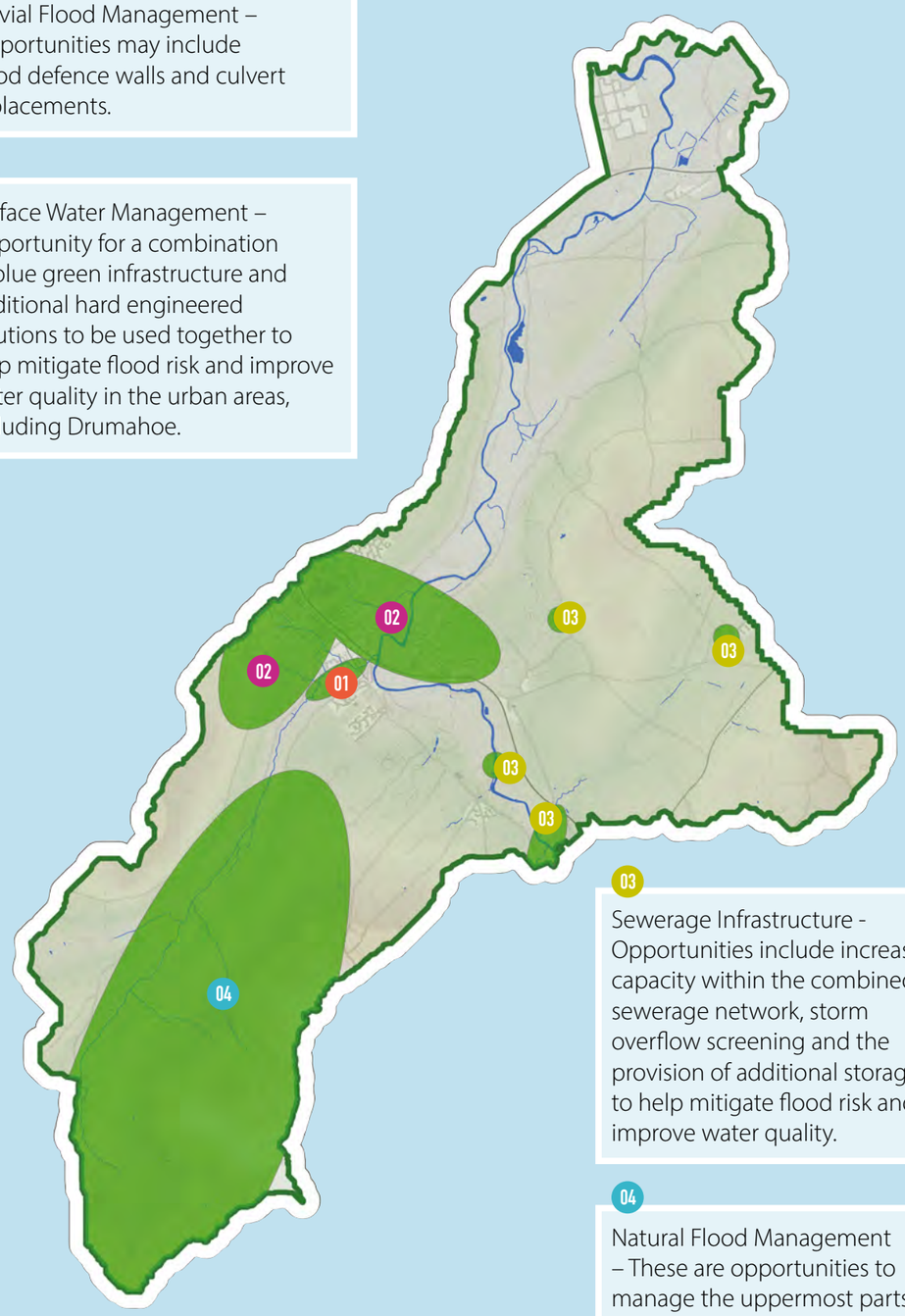
- Reduce the number of people and properties at risk of flooding.
- Contribute to achieving Good Ecological Potential in the River Faughan.
- Facilitate sustainable development across the area and further downstream.

Figure 9 - Faughan Pressures and Issues

OPPORTUNITY BASED SOLUTIONS

01
Fluvial Flood Management – Opportunities may include flood defence walls and culvert replacements.

02
Surface Water Management – Opportunity for a combination of blue green infrastructure and traditional hard engineered solutions to be used together to help mitigate flood risk and improve water quality in the urban areas, including Drumahoe.



03
Sewerage Infrastructure - Opportunities include increasing capacity within the combined sewerage network, storm overflow screening and the provision of additional storage to help mitigate flood risk and improve water quality.

04
Natural Flood Management – These are opportunities to manage the uppermost parts of the catchment to reduce surface water run-off, increase attenuation, and reduce diffuse pollution.

Figure 10 - Faughan Opportunity Based Solutions

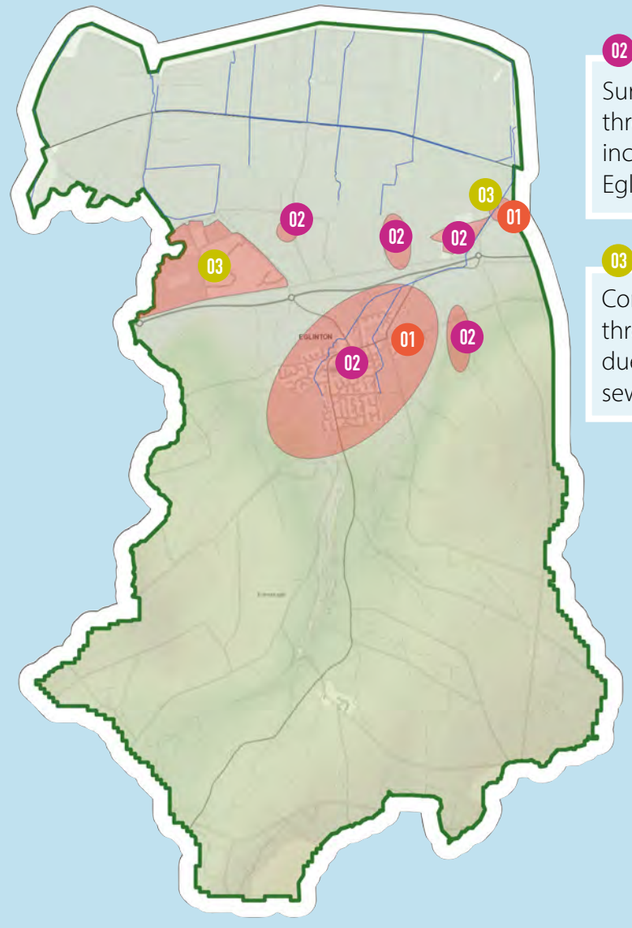
PRESSURES AND ISSUES

EGLINTON CATCHMENT

General surface water flood risk throughout the urban area.

01

Fluvial Flood risk.



02

Surface water flood risk throughout the catchment including in the vicinity of Eglinton Village

03

Constraints to development throughout the catchment due to lack of capacity in the sewer network.

CATCHMENT OBJECTIVES

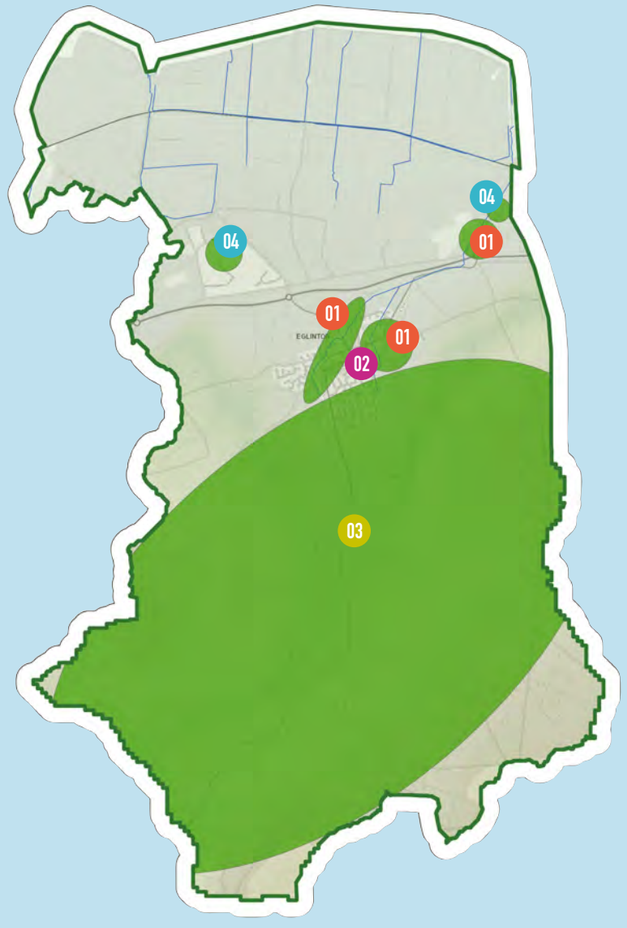
- Reduce the number of people and properties at risk of flooding.
- Facilitate sustainable development across the area and further downstream.

Figure 11 - Eglinton Pressures and Issues

OPPORTUNITY BASED SOLUTIONS

01

Fluvial Flood Management – Opportunities may include culvert upgrades and direct defences; a combination of flood walls and embankments.



03

Natural Flood Management – These are opportunities to manage the uppermost parts of the catchment to reduce surface water run-off, increase attenuation, and reduce diffuse pollution.

04

Sewerage Infrastructure – Opportunities include increasing capacity within the combined sewerage network, storm overflow screening and the provision of additional storage to help mitigate flood risk and improve water quality. There is also opportunity to upgrade sewerage infrastructure to provide capacity and facilitate development.

02

Surface Water Management – Opportunity for a combination of blue green infrastructure and traditional hard engineered solutions to be used together to help mitigate flood risk and improve water quality, especially in the vicinity of Eglinton village.

Figure 12 - Eglinton Opportunity Based Solutions

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CHAPTER 03

STRATEGIC ENVIRONMENTAL ASSESSMENT AND HABITATS REGULATIONS ASSESSMENT

CHAPTER 03

STRATEGIC ENVIRONMENTAL ASSESSMENT AND HABITATS REGULATIONS ASSESSMENT

3.1 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

Strategic Environmental Assessment (SEA) requires implementation of environmental considerations into certain plans and programmes at an early stage of their development[1] .

The aim is to give high level protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of specified plans and programmes to promote sustainable development.

A SEA Screening Report and SEA Scoping Report were completed in July 2023 for consideration by the Department of Agriculture, Environment and Rural Affairs (DAERA), as the statutory consultation body for SEA in Northern Ireland. It was concluded that the Plan would require a SEA and that the scope proposed was appropriate.

An integrated environmental assessment of opportunities took place as part of the draft Plan assessment process including both SEA and Habitats Regulation Assessment, with mitigation and monitoring identified by both assessments incorporated into the draft Plan.

3.2 HABITATS REGULATIONS ASSESSMENT (HRA)

A Habitats Regulations Assessment (HRA) is required under legislation in Northern Ireland when any plan or project, either alone or in combination with other plans or projects, is likely to have a significant effect on a designated European nature conservation site[2] .

Those European sites are designated as Special Areas of Conservation for a variety of important habitats and species, or Special Protection Areas for a variety of important bird species and the habitats they depend on. In broad terms, the assessment process first identifies the risk of effects from any plan or project, and then if that risk exists, whether there could be adverse effects on the integrity of a site and whether mitigation is needed to avoid those effects.

3.3 INTEGRATION OF ENVIRONMENTAL ASSESSMENT

The environmental assessment process has formed an integral part of the development and assessment of the draft Plan and was aligned to its development as shown in Figure 13. Integrating the environmental assessments with the draft Plan development process encouraged the selection of the most sustainable opportunities for long term drainage and wastewater management.

Strategic Environmental Objectives (SEOs) were formulated and integrated during the draft Plan's development through Multi Criteria Analysis (MCA) to promote the selection of sustainable integrated water management opportunities. The SEOs are provided in Figure 14.

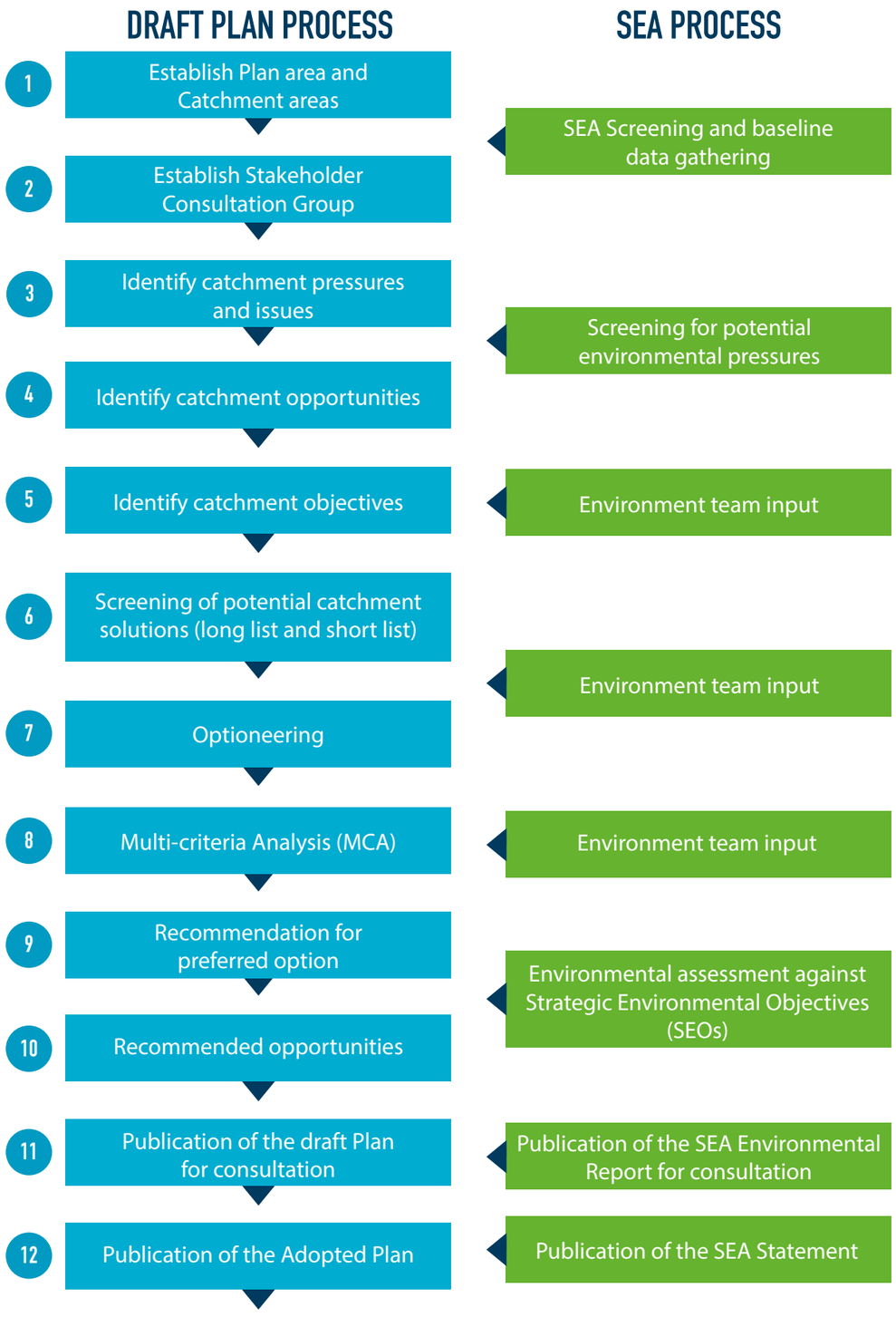

Figure 13 - Draft Plan development process and integration of the SEA

[1] SEA is required under The Environmental Assessment of Plans and Programmes Regulations (Northern Ireland) 2004 (S.R. 280/2004) originating from the European Strategic Environment Assessment (SEA) Directive (2001/42/EC).

[2] HRA is required under The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended), originating from the Habitats Directive (Council Directive 92/43/EEC) and certain elements of the Wild Birds Directive (Directive 2009/147/EC) (known as the Nature Directives).

CHAPTER 03

STRATEGIC ENVIRONMENTAL ASSESSMENT AND HABITATS REGULATIONS ASSESSMENT

Objectives	Targets	Indicators
Biodiversity, Flora, and Fauna		
Protect, conserve, enhance where possible and avoid loss of diversity and integrity of the broad range of habitats, species, and wildlife corridors.	No loss of protected habitats and species during the lifetime of the Plan. Improve/maintain protection for protected sites and species. Siting of development of infrastructure installation on non-sensitive sites. Improve/maintain protection for important wildlife sites, particularly urban wildlife corridors. Ensure new development is set back from rivers.	Conservation status/habitat quality for habitats and species positively impacted by an improvement in water quality and any interactions with the Plan.
Conserve and protect sites of nature conservation including Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar, National Nature Reserves (NNR), Country Parks, Wildfowl Sanctuaries as well as protected species outside these areas as covered by the Wildlife Act.	Maintenance of favourable conservation status for all habitats and species protected under the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended).	Conservation status/habitat quality for all sites and species within the zone of influence of the Plan.
To minimise and, where possible, eliminate threats to biodiversity including invasive species.	Prevent the introduction of new invasive or alien species. Control/ manage new invasive species.	Number of invasive species records within the zone of influence of the Plan area and number of treatment areas of invasive species completed.
Biodiversity, Flora, and Fauna		
Provide opportunities for people to come into contact with and appreciate wildlife, wild places and increase education opportunities.	Promote more proactive education, monitoring, and citizen science initiatives to protect biodiversity.	Number of opportunities for public engagement with nature which are created out of potential projects in the Plan.
Promote Biodiversity Net Gain (BNG) / biodiversity enhancement.	Enhance biodiversity through the Plan.	Level of biodiversity gain/ enhancement achieved as a result of the implementation of the Plan. Level of biodiversity lost as a result of the implementation of the Plan.
Population and Human Health		
Create conditions to improve health and reduce health inequalities through the provision of better drainage and wastewater infrastructure.	No significant deterioration in human health as a result of environmental factors. No spatial concentrations of health problems arising from environmental factors.	Key health indicators for councils within the zone of influence of the Plan.
Protect human health from hazards or nuisances, such as vibration and odour.	Minimise population exposure to high levels of vibration and air pollution.	Improvement of air quality within areas within the zone of influence of the Plan. Number of complaints during construction of opportunities.
Provide all of the water services required to sustainably meet future housing demands.	Enable residential planning permissions.	Number or percentage of planning permissions refused/ granted due to lack of water services.
Increase opportunities for outdoor recreation and exercise.	Increase provision of outdoor accessible spaces and encourage public use for recreation.	Quantity and quality of publicly accessible open space.

Figure 14 - SEA Objectives, Targets and Indicators

STRATEGIC ENVIRONMENTAL ASSESSMENT AND HABITATS REGULATIONS ASSESSMENT

Objectives	Targets	Indicators
Reduce flood risk across the geographical scope of the Plan.	Decrease in flood risk experienced, within the zone of influence of the Plan.	Level of flood compensation and assistance required for residents and businesses.
Geology, Soils and Land Use		
Minimise the excavation and movement of soils within site works.	Soil management plans for any significant interaction of projects with soils.	Number of soil management plans prepared where applicable. Total volumes of soil retained in-situ.
Minimise the consumption of non-renewable deposits on site.	Minimise the consumption of non-renewable sand, gravel, and rock deposits.	Total volumes of non-renewable sand, gravel, and rock deposits retained in-situ and reduced in supply chain.
Minimise the amount of waste to landfill from site.	Minimise the consumption of non-renewable sand, gravel, and rock deposits. Reuse site won materials on site wherever feasible.	Rates of re-use/recycling of site won materials and construction waste in the implementation of the catchment objectives of the Plan.
Reduce contamination and safeguard soil quantity and quality.	Prevent pollution of soil through adoption of appropriate environmental protection procedures during construction, installation and maintenance works on site. No incidences of soil contamination. Ensure appropriate management of existing contaminated soil in accordance with the requirements of current waste legislation.	Level of contamination reduced through the implementation of the Plan.
Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species, or their sustaining resources in designated sites.	No loss of diversity and integrity of designated habitats, geological features, species, or their sustaining resources in designated sites.	Data from DAERA on loss/ maintenance of diversity and integrity of designated habitats, geological features, species, or their sustaining resources in designated sites.
Use brownfield or underutilised land where available.	Preference for development on brownfield site over green field.	Rates of brownfield site and contaminated land re-use for the implementation of the Plan. Quantity of prime agricultural land and greenfield lost as a result of the implementation of the Plan.
Water		
Maintain or improve the quality of surface water and groundwater (including estuarine) to status objectives as set out in the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017.	Support the achievement of "good" ecological and chemical status/potential of waterbodies by 2015 in accordance with the Water Environment (Water Framework Directive) Regulations (Northern Ireland) 2017. Demonstrate an on-going status improvement and an upward trend in water quality.	WFD status of waterbodies within the Plan area.
Implement appropriate sustainable drainage systems (SuDS) within the geographical scope of the Plan.	Promote sustainable drainage practices to improve water quality and flow.	Improvement of water quality within the Plan area.

CHAPTER 03

STRATEGIC ENVIRONMENTAL ASSESSMENT AND HABITATS REGULATIONS ASSESSMENT

Objectives	Targets	Indicators
Reduce the impact of polluting substances to all waters and prevent pollution and contamination of ground water by adhering to aquifer protection plans and to maintain and improve the quality of drinking water supplies.	No polluting substances to waters and no pollution and contamination of ground water and maintain and improve the quality of drinking water supplies.	Number of pollution instances to water sources.
Protect and enhance the status of aquatic ecosystems and key ecological processes (e.g. hydrology, water quality, coastal processes)	Demonstrate an on-going status improvement and an upward trend in water quality. Maintain water quality, no pollution or contamination issues in our rivers and lakes.	Number of contributions from water management implemented through the Plan to deterioration/improvement of status or not achieving/achieving good status.
Promote sustainable water use and water conservation within the geographical scope of the Plan and to maintain and improve the quality of drinking water supplies.	Sustainable water use and water conservation in the draft Plan area is widespread. Maintenance and improvement of the quality of drinking water supplies is consistent.	Positive engagements with residential and business regarding sustainable water use.
Protect flood plains and areas of flood risk from development through avoidance, mitigation, and adaptation measures.	Minimise flood risk through appropriate management of flood vulnerable zones.	Level of flood risk within the geographical scope of the Plan.

Objectives	Targets	Indicators
Air and Noise		
Protection of ambient environment through the implementation of international, national, and regional policy and legislation relating to air quality and noise levels.	Maintain ambient air quality. Minimise air emissions during construction and operation of new developments. Minimise odour impacts on sensitive receptors. Minimise noise impacts on sensitive receptors.	Baseline air quality within Plan area. Number of complaints from construction impacts on air quality and dust during implementation of Plan. Number of odour complaints within Plan area. Number of noise complaints within Plan area.
Climatic Factors		
Comply with relevant national climate change targets e.g. Northern Ireland Climate Change Adaptation Programme 2019 – 2024, and EU Strategy on Adaptation to Climate Change and the Paris Agreement Targets.	Achieve a reduction in greenhouse gas emissions. Promote minimisation of greenhouse gas emissions to the atmosphere. Compliance with regulatory requirements.	Proportion of carbon and GHG that the industry contributes within the Plan area. Record of compliance with regulations and contribute to national climate targets.
Comply with the requirements of the Derry City and Strabane District Council (DCSDC) Climate Change Adaptation Plan 2020-2025.		
Minimise greenhouse gas emissions associated with the construction and operation of Plan opportunities.	Greenhouse gas emissions associated with the construction and operation of Plan opportunities are minimised.	Amount of carbon used in the construction and operation of the opportunities of the Plan.
Reduce vulnerability to the effects of climate change e.g. flooding, disruption to travel by extreme weather, etc.	Increase resilience to flooding and reduce number of flood events experienced.	Extent of flood risk across the geographical scope of the Plan.

STRATEGIC ENVIRONMENTAL ASSESSMENT AND HABITATS REGULATIONS ASSESSMENT

Objectives	Targets	Indicators
Material Assets		
Make best use of existing infrastructure and phase the introduction of new infrastructure to meet demands in a sustainable way.	High levels of drainage infrastructure and water management demand growth are accommodated.	Rates of brownfield site and contaminated land re-use for the implementation of the Plan.
Enhance resilience of existing infrastructure to flooding and water management issues.	Enable residential planning applications to be supported by NI Water.	Number of leaks/sewage overflows recorded.
Support sustainable growth of material assets and infrastructure in Derry City.	Increased capacity in the network for new sustainable development.	Number of planning applications within the Plan supported by NI Water.
Archaeological, Architectural and Cultural Heritage		
Protect, conserve and where appropriate enhance places, features, buildings, and landscapes of cultural, archaeological, architectural heritage and marine heritage assets.	Minimise the deterioration of features of archaeological/ architectural/ cultural significance as a result of the implementation of the Plan. Identify opportunities to conserve and enhance heritage assets and their settings.	No deterioration of features of archaeological/ architectural/ cultural significance as a result of the implementation of the Plan. Condition of heritage assets within the Plan area.
Landscape and Visual Amenity		
Ensure no significant disruption of landscapes and features.	Improve protection for landscapes of recognised quality.	No deterioration of landscapes of areas with high scenic value.
Ensure no significant visual impact from developments/ installations.	Ensure development and infrastructure installations are sensitive to its surroundings.	No deterioration in quality visually sensitive areas.
Ensure no significant disruption of high landscape values.	Ensure no significant disruption of historic/cultural landscapes and features.	No deterioration of landscapes of areas with high scenic value.
Improve the quantity and quality of publicly accessible open space.	Increase provision of and enhance public open space.	Quantity and quality of publicly accessible open space.

CHAPTER 03

STRATEGIC ENVIRONMENTAL ASSESSMENT AND HABITATS REGULATIONS ASSESSMENT

3.4 SEA SUMMARY CONCLUSIONS

An assessment of likely significant effects arising from the opportunities, on the environmental receptors within the geographical scope of the Plan was completed.

Mitigation measures have been presented to prevent, reduce and as fully as possible offset any likely significant negative (adverse) effects as a result of the implementation of the Plan. Best practice mitigation has also been provided to reduce the significance of the likely environmental negative effects identified. The majority of the opportunities were predicted to have a positive environmental effect in the medium and long term, particularly on water, biodiversity, climatic factors and material assets. However, there are a number of opportunities that in the short term may have a negative environmental impact during construction, particularly those relating to new development where biodiversity, land and soils, water and landscape and visual impacts may arise.

3.5 HRA SUMMARY CONCLUSIONS

The HRA examined and analysed, in light of the best scientific knowledge, with respect to the relevant European sites, the sources and pathways for effect, and how these may result in adverse effects on the qualifying species and habitats and, therefore, the integrity of European sites.

Mitigation measures are set out within the report to ensure that adverse effects on the integrity of European sites will be avoided during the implementation of the Plan either alone or in combination with other plans or projects.

3.6 MITIGATION

SEA and HRA mitigation measures have been provided in Section 10 of the SEA Environmental Report and Section 7 of the HRA Report. Mitigation within the SEA is provided where there is a risk of potential negative impacts from developing or implementing the Plan on the receiving environment. These mitigation measures aim to prevent, reduce and as fully as possible offset any significant adverse effects on the environment. Mitigation provided within the HRA Report enables the conclusion of no adverse effects on the integrity of the national site network.

The overarching potential negative impacts associated with the draft Plan are related to risk of failure to follow the integrated process and fully achieve the LWW objectives. It is a vision of LWW to develop a Plan for Derry/Londonderry to protect against flood risk, enhance the environment and support economic growth, in accordance with the principles set out in the Long-Term Water Strategy.

In the absence of undertaking these catchment-based solutions, in line with LWW objectives, there is a risk that the drainage and wastewater management options will be undertaken in a non-integrated way.

The outlined mitigation will be fully implemented and developed further, where appropriate, at the next stages of planning for any proposed integrated drainage and wastewater schemes and projects that arise from the draft Plan.

3.7 MONITORING

A recommended environmental monitoring programme is provided in Section 10.3 of the SEA Environmental Report. This will be undertaken at regular intervals during the implementation of the Plan, to align with Northern Ireland Water investment periods (i.e. every six years) and tracked against the SEOs. This should identify at an early stage any unforeseen adverse effects, as well as measure positive outcomes as a result of the implementation of the Plan.

CHAPTER 04

THE DELIVERY FRAMEWORK

CHAPTER 04.

THE DELIVERY FRAMEWORK

4.1 OVERVIEW OF DRAFT PLAN

The draft Plan promotes partnership working to develop and deliver integrated sustainable drainage solutions for the benefit of society. Figure 15 below sets out the key stages of scheme development.

4.2 IMPLEMENTATION OF PROPOSALS

Implementation of the catchment based opportunities in this draft Plan will include investment in rivers flood alleviation schemes, wastewater treatment upgrades and sewerage improvements alongside natural drainage and flood management solutions. This requires collaborative working by the LWW partners to develop and deliver the best and most cost effective solutions for the citizens of Derry / Londonderry. The onus will be on these partner organisations to work within established delivery mechanisms and funding streams to take these projects forward from within their annual budgets.

This consultation document does not include an estimated cost for delivering the draft Plan, as the scale and scope of the individual opportunities identified have yet to be determined. Implementation of any of the schemes will require detailed appraisal to assess feasibility and cost. It is also anticipated that further opportunities may be identified through the consultation process and following publication of the final Plan.

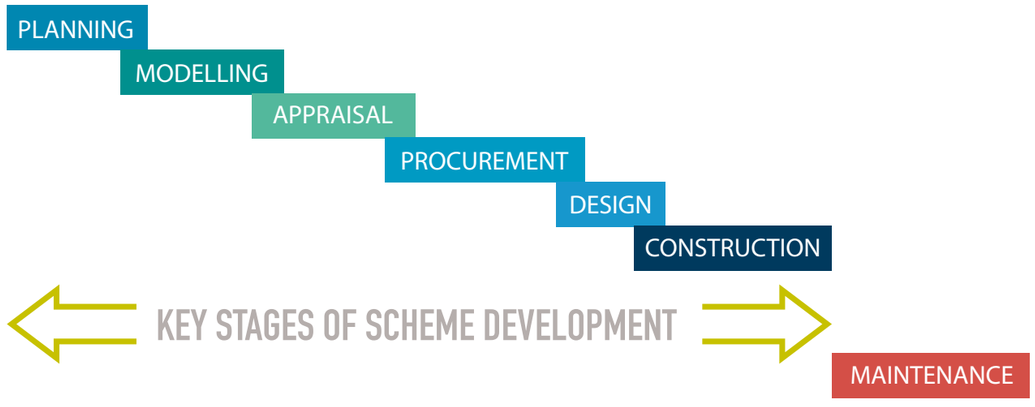

Figure 15 – Stages of Scheme Development

4.3 OVERSIGHT AND GOVERNANCE

Dfl will be responsible for managing the delivery of the final Plan through LWW governance and delivery structures. This includes:

- Continuing to develop partnerships with key stakeholders including large landowners, other government departments, councils, and other public bodies; and
- Ensuring integrated drainage and wastewater management becomes a key consideration in future land use planning decisions.

4.4 DELIVERY OF INTEGRATED DRAINAGE

The LWW approach will require a significant change to the delivery of drainage infrastructure across a range of providers and partners and it will take time to develop and embed these new processes. To progress development and delivery of the Plan proposals, new arrangements are needed for the various key stages of scheme development, from initial planning through to construction and long-term maintenance.

4.5 PROCUREMENT, DESIGN, CONSTRUCTION & MAINTENANCE

Each of the drainage providers already have well established and proven arrangements for procuring, designing, and constructing upgrades and carrying out maintenance to their own infrastructure and assets which will be used to efficiently implement the final Plan. However, new maintenance arrangements will have to be developed for NFM and SuDS measures delivered as part of the final Plan.

4.6 STAFFING AND RESOURCES

Dfl will facilitate the collaborative working between delivery partners in the appraisal, design, procurement and delivery of blue / green infrastructure measures to complement the hard engineered elements of the Plan.

Additional staff resources may be secured as required, to progress delivery of the blue / green measures within the draft Plan where no existing delivery mechanism exists.

GLOSSARY OF TERMS

TERM	DEFINITION
Asset	An asset is a resource with economic value that an individual company or country owns or controls with the expectation that it will provide a future benefit.
Attenuation (water)	Holding back part of the main flow caused by a rainfall event (otherwise known as a storm), therefore making the peak smaller and reducing the risk of flooding
Blue / green infrastructure	A strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services.
Catchment	The area of land, including the hills and mountains, woodland, and buildings which water drains from, before flowing into a river, lake, or lough.
Climate change	The rising average temperature of Earth's climate system, called global warming, is driving changes in rainfall patterns, extreme weather, arrival of seasons and more. Collectively, global warming and its effects are known as climate change.
Coastal flooding	Flooding that has come onto land from the sea.
Combined sewers	These pipes carry both wastewater from homes and businesses, and rainwater (also known as storm water), which runs off from roads, drives and roofs (impermeable surface areas), to wastewater treatment works.
Combined sewer overflows	Combined sewer overflows are pipes and pumps which allow excess flows of highly diluted wastewater which, in many cases passes through screens, to remove plastic and rags, to be returned into watercourses/rivers and the sea to help prevent homes and businesses from being flooded. Many of these overflows are designed to comply with national standards and any discharges are consented to by the NIEA.
Culverted watercourse	A section of a watercourse that passes below the ground by means of a drain or culvert, where a "culvert" is used to describe any pipe or conduit through which a watercourse passes.
Designated watercourse	A watercourse within NI that is designated by the Drainage Council under the Drainage (Northern Ireland) Order 1973. Designated watercourses are maintained (not owned) by DfI Rivers.
Drainage infrastructure	A term used to collectively describe all the assets within a drainage system.
Drainage network	A collective term to cover a system of open channels, watercourses or pipes that convey surface water.
Fluvial flooding	Sometimes known as 'river flooding'. Flooding that has come onto land from a watercourse.
Habitats Regulations Assessment (HRA)	This refers to the several distinct stages of assessment which must be undertaken, to determine if a plan or project may affect the protected features of a habitats site, before deciding whether to undertake, permit or authorise it.
Hard engineering	Hard engineering refers to construction of physical structures, typically involving concrete.
Sewage	The flow in foul and combined water that is produced by a community of people. For example, from toilets, sinks, washing machines, baths and showers. Typically used to describe the contents of foul and combined sewers, which can also be called 'wastewater'. Sewage is one of the main components of wastewater.
Sewerage network	This term is used to describe all of the NI Water sewers, overflows, storm tanks and pumping stations that convey flow to either a WwTW or to a receiving water.
Sewers	These are the pipes that carry surface water or wastewater.
Strategic Environmental Assessment (SEA)	A systematic process for evaluating the environmental implications of a proposed policy, plan or programme which provides the means to look at cumulative effects and appropriately address them at the earliest stage of decision making, alongside economic and social considerations.
Sustainable Drainage Systems (SuDS)	Drainage systems designed to mimic nature and typically manage rainfall close to where it falls.
Surface water	This is caused by rainwater that falls on the ground, roofs, roads, pavements, and paths. It can either evaporate back into the air, infiltrate the ground, pond on the surface, or flow into a receiving water (such as a river, lake, or sea) via a wide range of flow paths.

GLOSSARY OF TERMS

TERM	DEFINITION
Surface water flooding	Sometimes known as 'pluvial flooding'. Flooding that occurs when the ground is unable to absorb the rainwater, causing it to flow over the surface and fill depressions and low spots in the landscape where local natural and engineered drainage systems are overwhelmed.
Wastewater	This is sewage plus other materials such as trade effluent (wastewater from commercial processes) and leachate (polluted water from landfill sites) that could also be discharged into sewers or directly to the WwTW by a tanker.
Wastewater treatment works (WwTW)	WwTW have four main stages of treatment – preliminary, primary, secondary, and tertiary. The number of stages depends on what quality the treated wastewater needs to reach before it can be safely returned back into rivers or the sea.
Watercourse	A channel or passage through which water flows.