Living With Water Programme

Strategic Drainage Infrastructure Plan

An Overview

Provided for circulation within the key stakeholders (DRD, NI Water, Rivers Agency, Transport NI, Belfast City Council, DoE, NIEA, DFP, SIB)

Version 2 24/09/15
Prepared by Paddy Brow Reviewed by Linda MacHugh

Introduction

1. The drainage infrastructure of many towns and cities in Northern Ireland is currently inadequate, with the problems being most acute in the greater Belfast area. This has resulted in the following:
   - Instances of serious flooding have occurred across Northern Ireland on several occasions in recent years - the EU Floods Directive Preliminary Flood Risk Assessments has identified Belfast as the largest of the 20 significant flood risk areas in Northern Ireland.
   - Partly as a result of the continuous discharges from a number of Wastewater Treatment Works (WwTWs) and intermittent (storm) overflows from over 90 Combined Sewer Overflows in Belfast, the Water Framework Directive (WFD) classification of the Belfast Harbour area fell from Moderate in 2009 to Bad in 2012. NIEA has warned of the risk of EU infraction proceedings being initiated.
   - The main WwTW serving Belfast (Belfast WwTW at Duncrue) is already operating above its theoretical design capacity, receiving more sewage than it was designed to treat.

2. This document provides an overview on the programme of work called the 'Living With Water Programme' which is being progressed to develop solutions that will make up the Strategic Drainage Infrastructure Plan.

Current Infrastructure

3. The existing drainage infrastructure of Belfast has gradually evolved and consists of many types of key components. These components have many complex interactions, and are the responsibility of a number of owners.

	Type of Component	Purpose	Owner
1	Private drains & watercourses	Convey storm water (rainfall) to other watercourses / sewers / the sea	Many
2	Designated watercourses	Convey storm water to other watercourses / sewers / the sea	Rivers Agency
3	Public foul sewers	Convey sewage to WwTWs	NI Water
4	Public storm sewers	Convey storm water to other watercourses / the sea / combined sewers.	NI Water
5	Public combined sewers	Convey both foul and storm water to	NI Water

		overflows, pumping stations and WwTWs	
6	Combined Sewer Overflows (CSO)	Discharge excess storm water from combined sewers to watercourses / the sea	NI Water
7	Storm tunnels and tanks	To reduce pollution these catch the 'first flush' from combined sewer overflows and reduce the frequency of spills.	NI Water
8	Wastewater Treatment Works (WwTW)	Treat wastewater before discharge to the sea	NI Water
9	Road Drains	Road drainage – conveys storm water to watercourses and public sewers	TNI
10	Lagan Weir and River Lagan Aeration System	Maintains the River Lagan water level and water quality	Belfast City Council
11	Pumping Stations	Lift flows. These exist on most types of watercourse, sewers and at WwTWs	Various

Actions Required

4. During 2013, it became apparent that significant capital investment will be required in Belfast drainage infrastructure to address a number of risks and issues. This was identified through the following engagement:

- With **NI Water, TransportNI and Rivers Agency** as a result of investigations into the severe flooding that occurred in June 2012.
- With **NI Water** in relation to development of the PC15 Business Plan. As part of this NI Water assessed the capital investment necessary between the period 2015 and 2039 required to:
  - comply with existing EU Legislation such as the Urban Wastewater Treatment Directive (UWWTD), Water Framework Directive (WFD) and revised Bathing Water Directive (rBWD)
  - provide increased capacity to allow for new connections / economic growth
  - reduce out of sewer flooding
  - maintain existing assets.
- With **DOE NIEA** during development of the NI Executive Long Term Water Strategy (LTWS). NIEA is the NI responsible authority in relation to key EU environmental legislation, such as the UWWTD, rBWD, and WFD. The WFD requires the development of River Basin Management Plans for Northern Ireland.
- With **DARD Rivers Agency** during development of the LTWS. Rivers Agency is the NI responsible authority in relation to the EU Floods Directive, which requires the development of Flood Risk Management Plans for Northern Ireland.
- With **DOE Climate Change Unit** during development of the Northern Ireland Climate Change Adaptation Programme (NICCAP).

Key Risks and Issues

5. The key risks and issues are summarised below:

	Risk / Issue
1	Flooding – is occurring with increased frequency. The risk needs to be reduced.
2	Compliance with Environmental Legislation – 'NI' is at risk of EU Infraction
3	Capacity - many components of the drainage network do not have adequate capacity to enable new connections (economic growth)
4	Maintenance - many components of the drainage network now require maintenance / replacement to maintain serviceability
5	Amenity potential has been lost
6	Climate Change - more intense storms predicted
7	Drainage operational costs are a burden
8	Capital is constrained

6. The programme will seek to address these. The most important are to **Protect** against flooding, **Enhance** the environment and enable the economy to **Grow.**

Need for Cross-sectoral Approach

7. A cross-sectoral approach is required to develop the optimum solutions that can be efficiently delivered. This is due to the complex drainage infrastructure of Belfast, and the number of different organisations that operate and maintain it. This approach will:
   - Facilitate the development of 'shared solutions' – projects which deliver a number of different types of benefits to a number of stakeholders. For example the upgrade of a Rivers Agency watercourse which reduces fluvial flooding and allows NI Water to progress an upstream storm separation project to reduce out of sewer flooding and remove a polluting CSO discharge.
   - Facilitate the development of innovative sustainable solutions – new approaches to achieving the outputs made possible through a holistic catchment based approach rather than conventional 'end of pipe' solutions.
   - Reduce disruption
   - Reduce capital cost
   - Reduce operating costs
   - Secure the necessary community and stakeholder support

8. Given the need for cross-sectoral working, DRD set up a Strategic Drainage Infrastructure Board in January 2015 with representatives from key stakeholders.

Progress

9. The key milestones in the establishment of the SDIP are outlined below:

Date	Milestone
Oct 2013	A proposal to development a 'SDI Programme' was jointly agreed by DRD, NI Water, Utility Regulator, Consumer Council for NI, NI Environment Agency, and Drinking Water Inspectorate.
July 2014	Development of SDI Programme approved by the NI Executive.
Jan 2015	SDI Programme Board established
June 2015	PID approved by the Programme Board. In addition, representatives of the SDI PB visited Glasgow to see how the city has addressed its drainage problems and met with the members of the Metropolitan Glasgow Strategic Drainage Partnership.
July 2015	NI Water's Head of Asset Strategy Paddy Brow seconded to DRD WPSD to become the SDI Programme Manager.

Work Packages

10. The SDIP will be developed through a number of work packages, as follows:

WP	Title	Lead Org.*
1	Belfast Capital Works Programmes, Appraisals, Resources: Gap Analysis and Integration	DRD
2	Private Drainage Infrastructure	Rivers Agency
3	NI Storm Separation Pilot Projects	NI Water
4	Belfast Environmental Drivers	NIEA
5	NI Wastewater Marine Investment Steering Group	NI Water
6	Belfast Drainage Area Planning	NI Water
7	Belfast WwTW Appraisal	NI Water
8	Belfast Roads and Streets Drainage Investment	TNI
9	Belfast Watercourses Investment	Rivers Agency
10	Belfast Lough Diffused Pollution Assessment and Reduction	NIEA
11	Belfast Integrated Solution Development, Appraisal, Planning – The Belfast SDI Plan	DRD
12	Belfast SDI Plan Future Financing	DRD
13	SDI Programme Stakeholder Engagement	DRD
14	Belfast Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment (HRA)	DRD
15	NI Integrated Drainage Investment Planning Guide and Programme	DRD

11. Note that:
    - Work associated with some of these work packages has already commenced.
    - Other work packages may be similar to an organisation's Business As Usual (BAU) activity, but need to be modified to align to the scope and aims of the SDIP.
    - The approach taken to the development and delivery of the Programme has been endorsed by experts in both Scottish Water and Welsh Water.

12. *Although Belfast City Council (BCC) is not a lead organisation for any work package, it will provide input to many packages through its roles related to:
    - Preparation of Local Development Plans
    - Planning Control
    - Management of the Lagan Weir (which includes a flood alleviation role)

- Management of the River Lagan aeration system (which degrades pollution that has entered the Lagan)
- Off-street car parks (which may need to be modified to contribute to storm separation and / or include storm attenuation)
- Recreation & Access (parks may be modified to provide flood pathways, flood storage, flood barriers)
- Ownership of other lands
- Public engagement and communication (WP 13)

Capital Outputs

13. The main Belfast Strategic Infrastructure Plan outputs are expected to be:
    a) Private drainage infrastructure – ownership defined, brought up to standard
    b) Storm separation - progressed across areas of Belfast
    c) Sewers - capacity increased and maintained
    d) Watercourses – capacity increased, maintained, amenity value increased
    e) Drainage infrastructure - designed for exceedance
    f) Combined Storm Overflows – some closed, others improved
    g) Sewage pumping stations - upgraded or replaced
    h) Increased storm storage within the sewerage network and WwTW
    i) Belfast WwTW upgraded (increased capacity & new discharge standard)

15. Other activity will include:
    - Catchment management measures to reduce diffused pollution
    - Increased used of SuDS

Key issues for new Department for Infrastructure

16. Development of the SDIP will drive close working between a number of different organisations, many of which are to become part of the new Department for Infrastructure from May 2016 (WPSD, NI Water, Transport NI, Rivers Agency, Planning and SIB). As such, it will be at the forefront of establishing new ways of integrated working to deliver improved services and essential infrastructure.

17. When Tony Harrington, Welsh Water Director of Environment, and Programme Manager of the UK '21st Century Drainage Programme' presented to the SDI Programme Board in March 2015, he noted the huge opportunity that the creation of the new Department for Infrastructure provides to allow shared solutions to be developed and implemented. In this regard he noted that NI may be able to lead the UK.

18. The SDIP will implement the approaches for the design of sustainable infrastructure that have been set out in the NI Executive draft Long Term Water Strategy.

Financial Implications

19. At this stage, the development of the programme is being funded through existing resources from the members of the Programme Board. For example, NI Water made provision for significant investment in catchment modelling in the PC15 Business Plan. Rivers Agency will utilise existing resources allocated for development of the Flood Risk Management Plans that are required under the EU Floods Directive. As the SDIP

develops further, additional internal staff and external specialist resources are likely to be required. In future years, significant capital will be required to deliver the plan which results from the work of the SDIP.

20. Early estimates range from £350m to £750m for Belfast alone, and the various elements of the Programme need to be fully costed. However, it is believed that by working together and cross-sectorally, the ultimate cost of delivering a long-term solution for Belfast will be minimised. This level of investment is clearly a challenge, given the current budgetary environment, and one of the SDIP Work Packages will explore how funding can be provided.