

Stormwater management

Implementation in Northern Ireland

Ballyclare Pilot Project

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Why Sustainable Stormwater Management

- Climate change - wetter winters, more intense storm events
- Drainage infrastructure & sewage treatment systems currently operating at capacity - status quo will mean increased urban flooding
- In the next few years it is Governments intention that sustainable drainage will be mandatory in Northern Ireland
- Water Framework Directive compliance - diffuse pollution / bio diversity gains
- Economics - they cost less to build, to maintain and to retro-fit

Progress to date

*Managing Stormwater -
A Strategy for Promoting the Use of
Sustainable Drainage Systems (SuDS)
within Northern Ireland (September 2011)*



Stormwater guidance leaflet
(March 2012)



Legislative & Policy Drivers

- EU Water Framework Directive
- EU Habitats Directive
- EU Freshwater Fish Directive
- EU Urban Waste Water Treatment Directive
- EU Floods Directive
- NI Sustainable Development Strategy
- Planning Policy Statements (7&15)

Stormwater Management Group

- In June 2011 the Stormwater Management Group was set up to implement recommendations published in the Strategy document.
- Inter-departmental group jointly chaired by the Northern Ireland Environment Agency (NIEA) (an Agency within the Department of the Environment (DOE)) and the Water Policy Division within the Department for Regional Development (DRD).
- Other members include representation from:
 - DOE Environmental Policy Division
 - DOE Planning Policy Division
 - DOE Planning NI
 - DRD Roads Service
 - Department of Agriculture & Rural Development - Rivers Agency
 - Northern Ireland Authority for Utility Regulation
 - Northern Ireland Water
- Aim of this group is to establish and develop an integrated and catchment based approach to stormwater management which will deliver multiple sustainable and economic benefits.

Examples of sustainable stormwater management implemented as best practice in Northern Ireland



Solid Conventional Capital Solutions

Belfast Sewers Project Tunnel & Input Locations

Aims:

- Restoring capacity to 1:30yr RP
- Repair of sewers
- Reducing flooding & overflows

Cost: £160m (Spring 2010)



4.0m dia

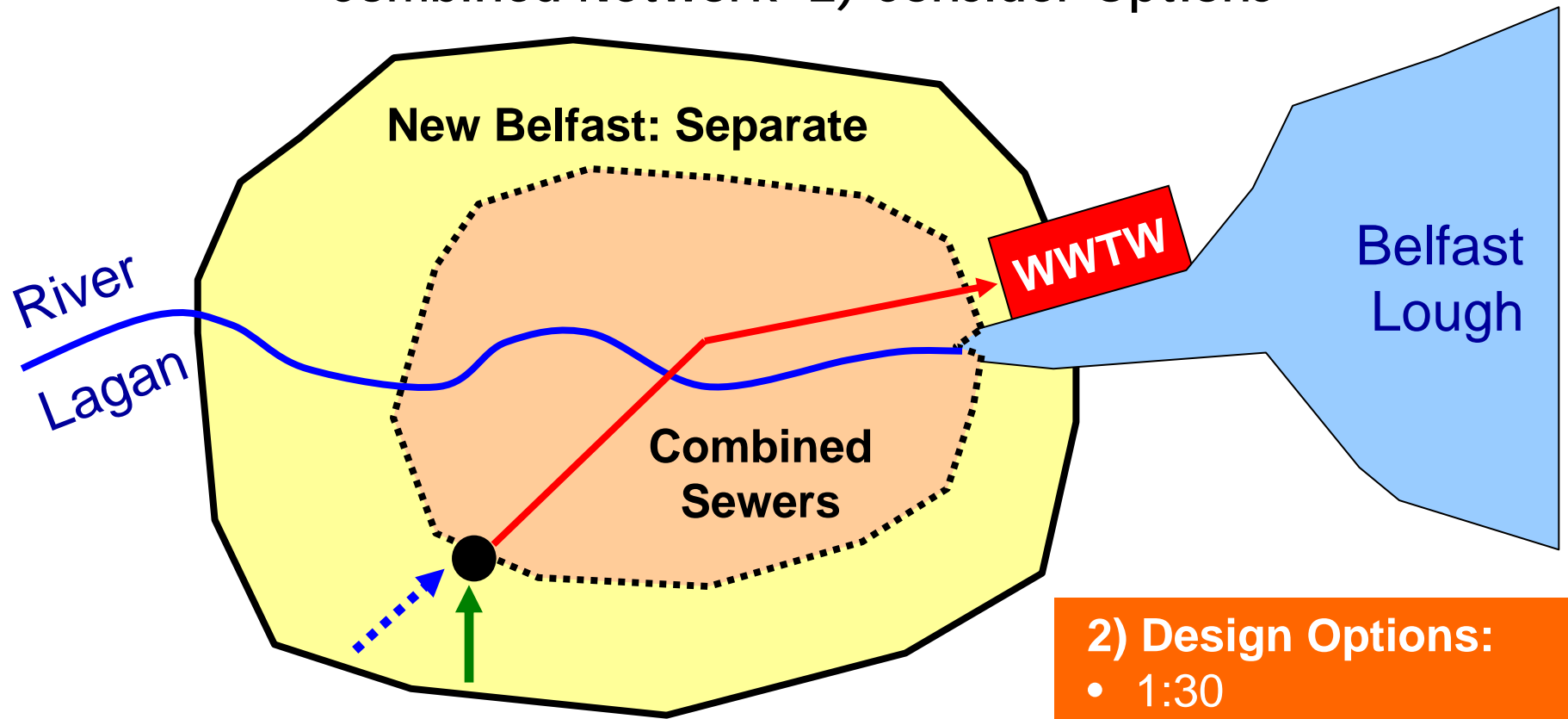
1.95m dia

2.44m dia



Sustainable Sewerage Network Adaptation:

- 1) Remove Existing Storm Sewers (incl. Road Drainage) from the Combined Network
- 2) Consider Options



2) Design Options:

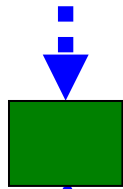
- 1:30
- 1:30 + 20% intensity





Future Policy: NI Water may adopt an increased range of SuDS Types – 2012 Carrowreagh Project SuDS Pilot

**New Housing
Development
(20 hectares)**



**1,300 m³
Geocellular
retention
tank
(£230k saving
over
Conventional)**



River





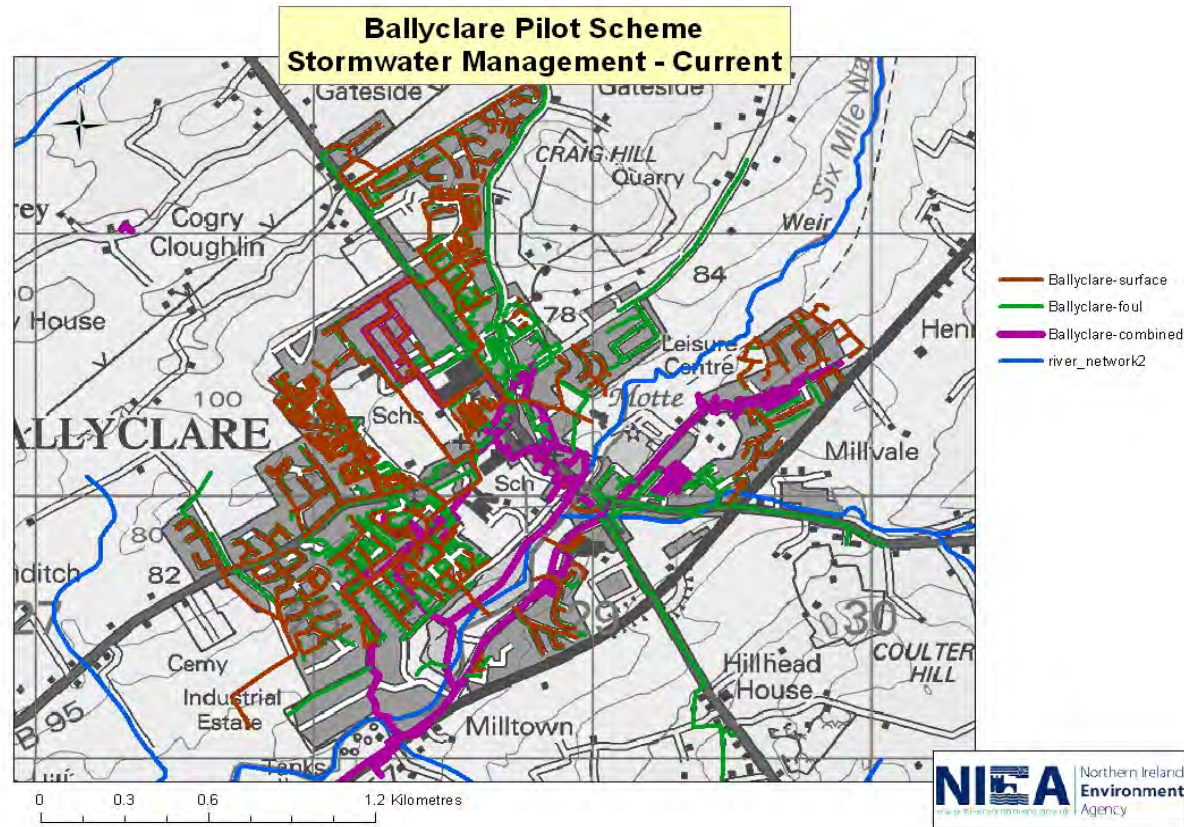
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CIWEM MORNING CONFERENCE SEPT. 2012

Ballyclare Pilot



- Pilot study exploring the benefits of implementation sustainable drainage systems within the catchment of the town.
- Findings will inform legislation, policy and appraisals necessary to drive forward implementation.

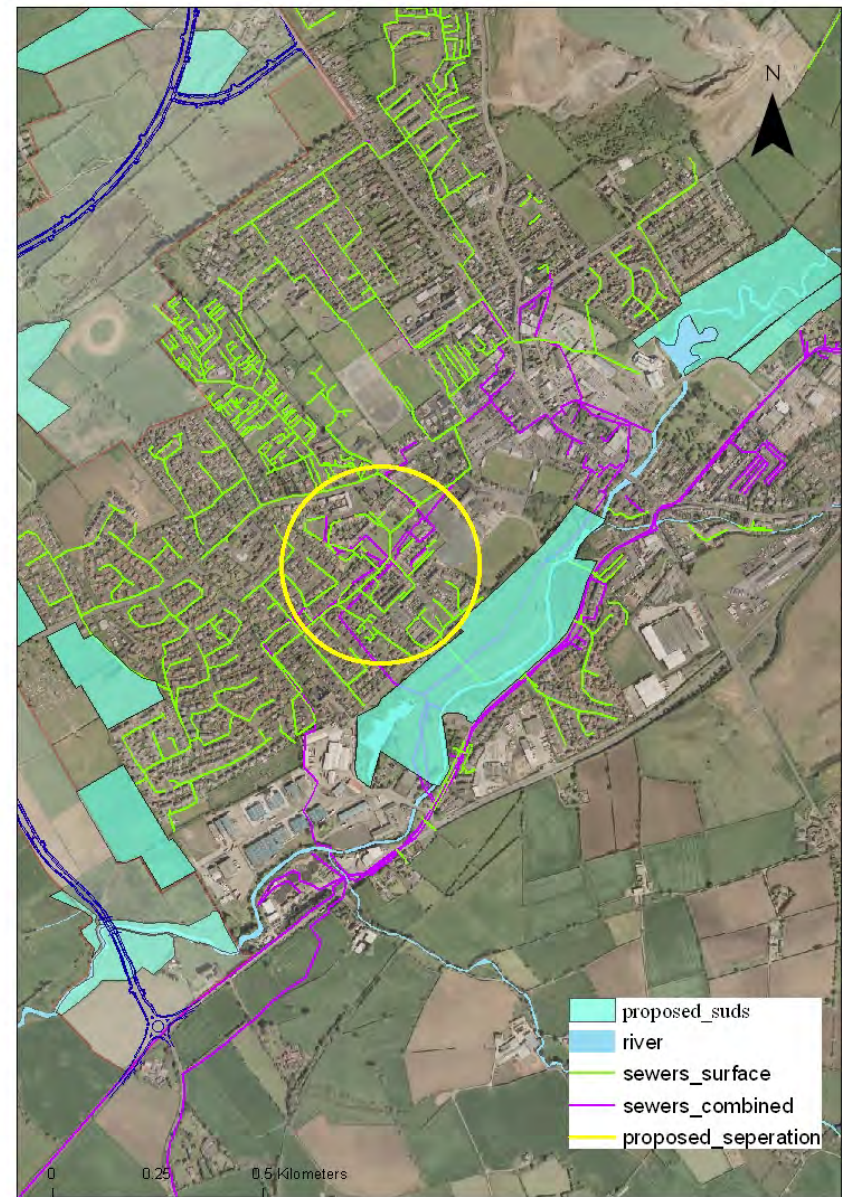


Ballyclare relief road & new development

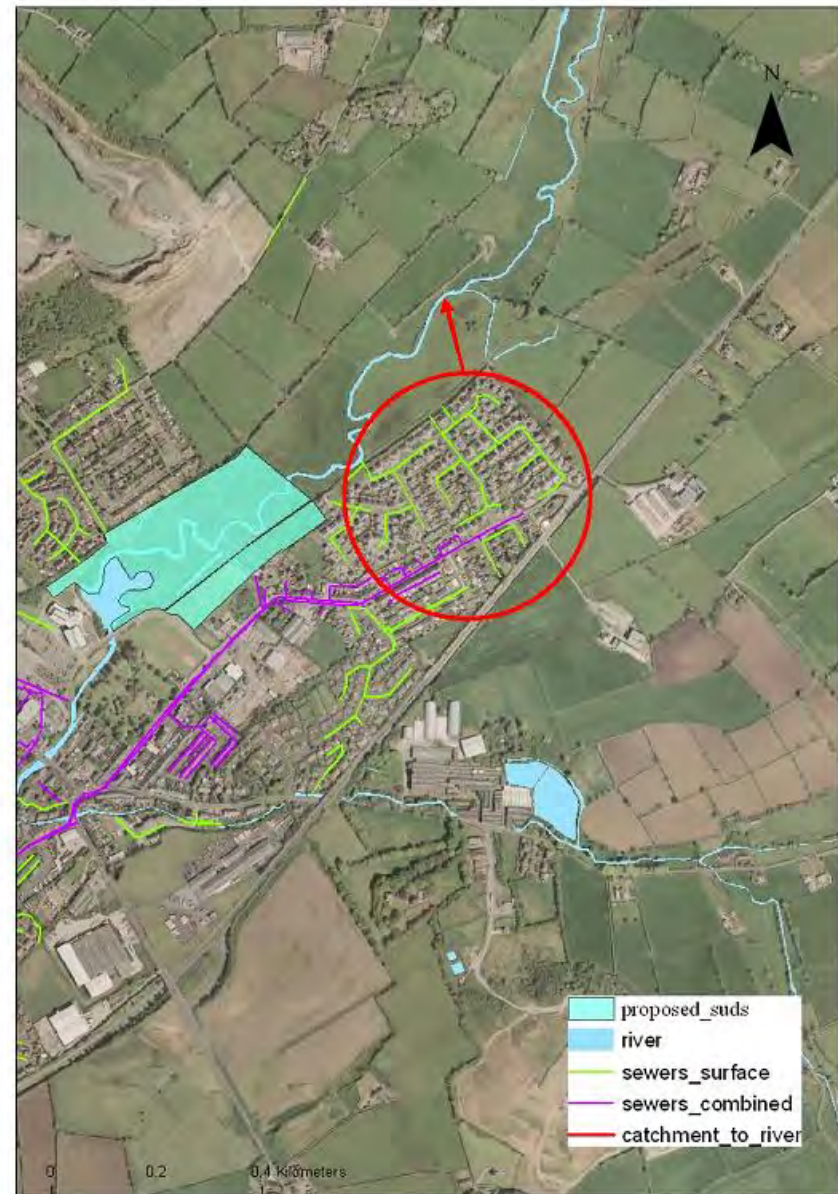
Potentials areas
where SuDS could
be implemented



Potentials areas
where combined
sewers could be
separated.

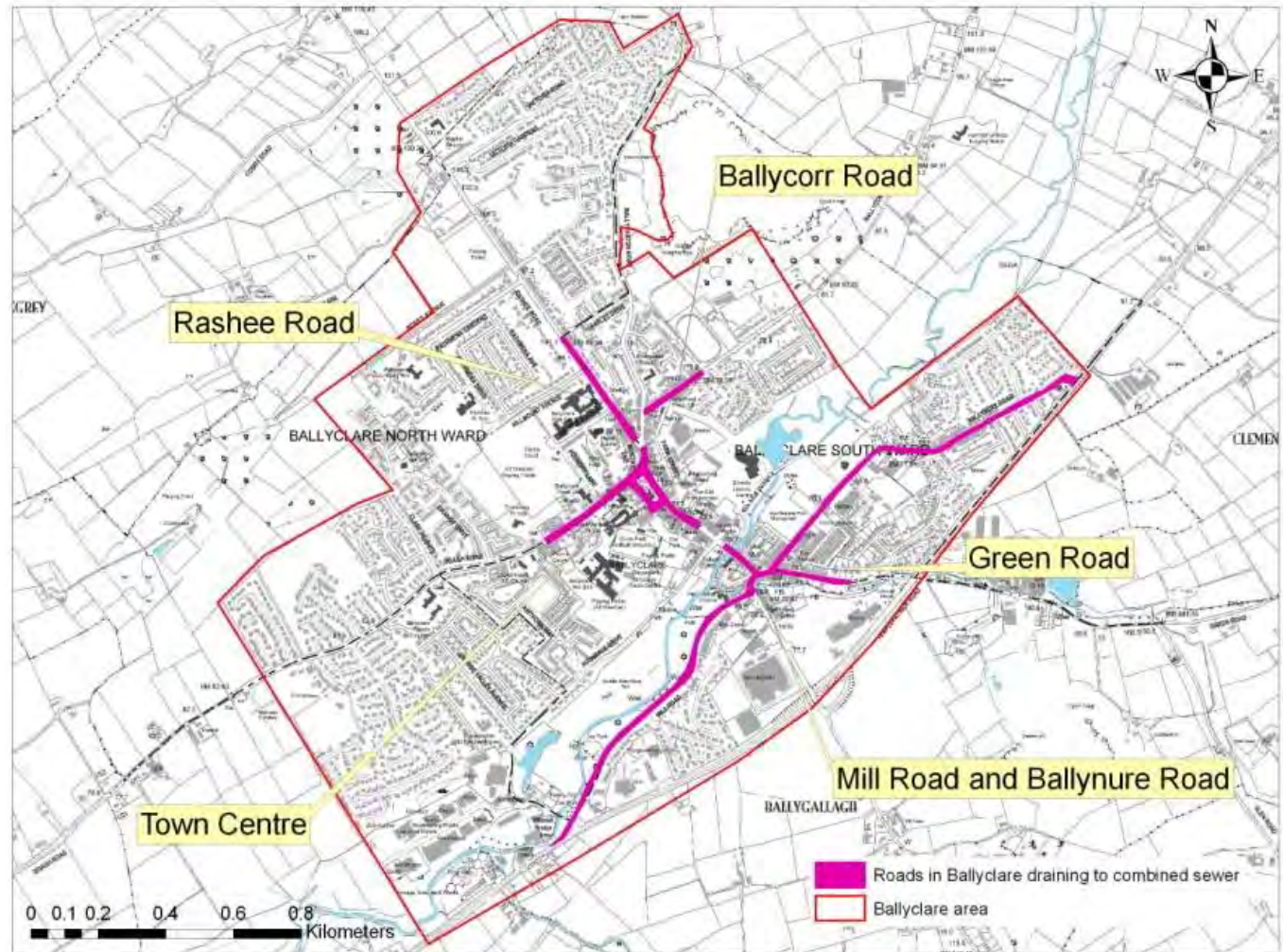


Potentials areas
where storm
sewers could be
diverted to river.

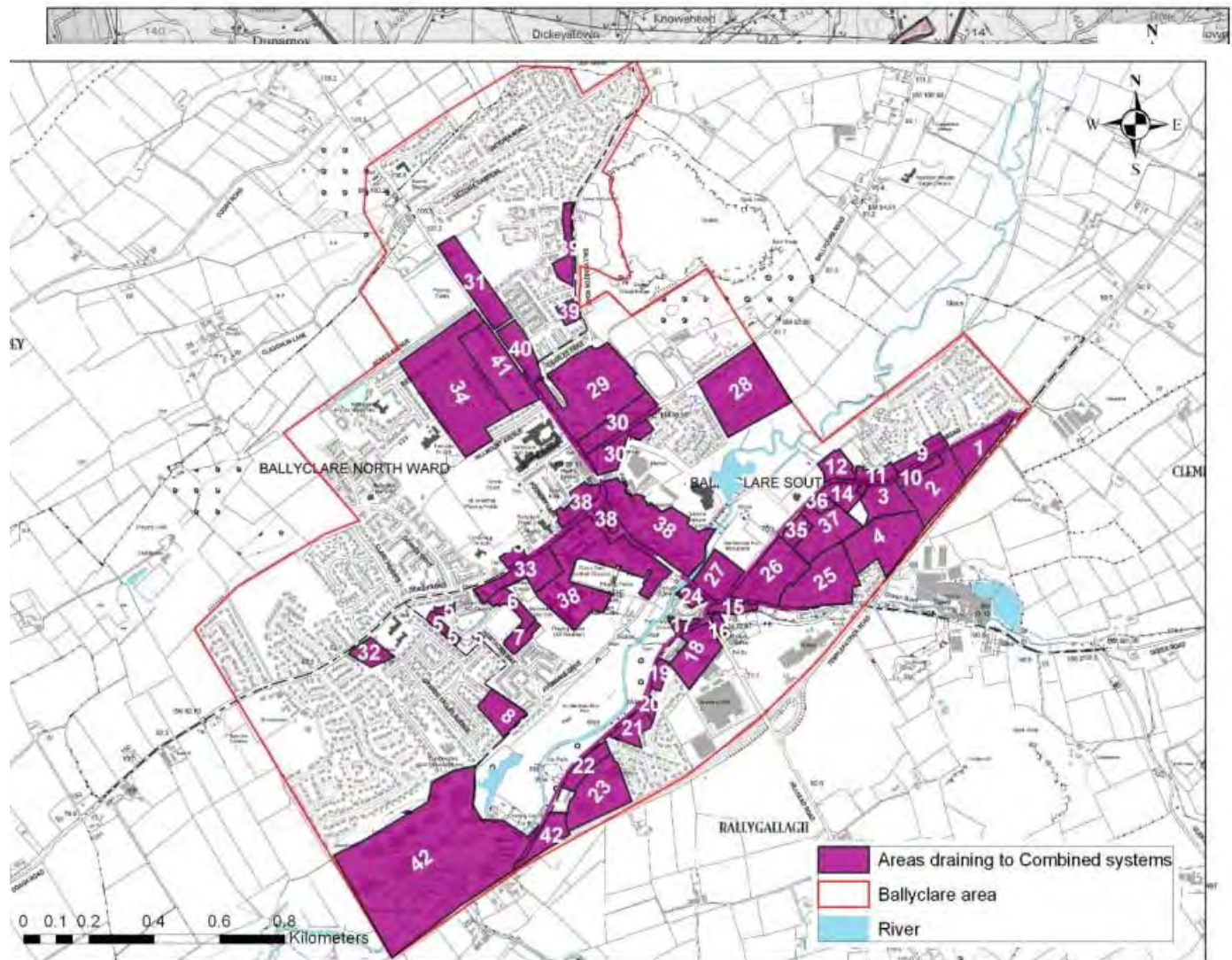


Scenario one - Roads

Ballyclare



Pumped combined sewers



Calculations - Impervious area

Ballyclare split into areas which have;

- High imperviousness - 80 %
- Medium - High imperviousness - 60 %
- Medium imperviousness - 50 %

64 m x 64 m grid used, all impervious surfaces digitised within random grid squares, in areas of Ballyclare which are combined.

Impervious area for surrounding satellite towns
= 50 %

Calculations - Runoff

- Approximation of surface runoff from impervious surfaces = 90 %

Evaluation of rational method “C” values. Joe Hill, 2002

<http://www.sdcountry.ca.gov/dpw/floodcontrol/floodcontrolpdf/hydro-evalcvalues.pdf>

- Approximation of surface runoff from roadways = 80 %

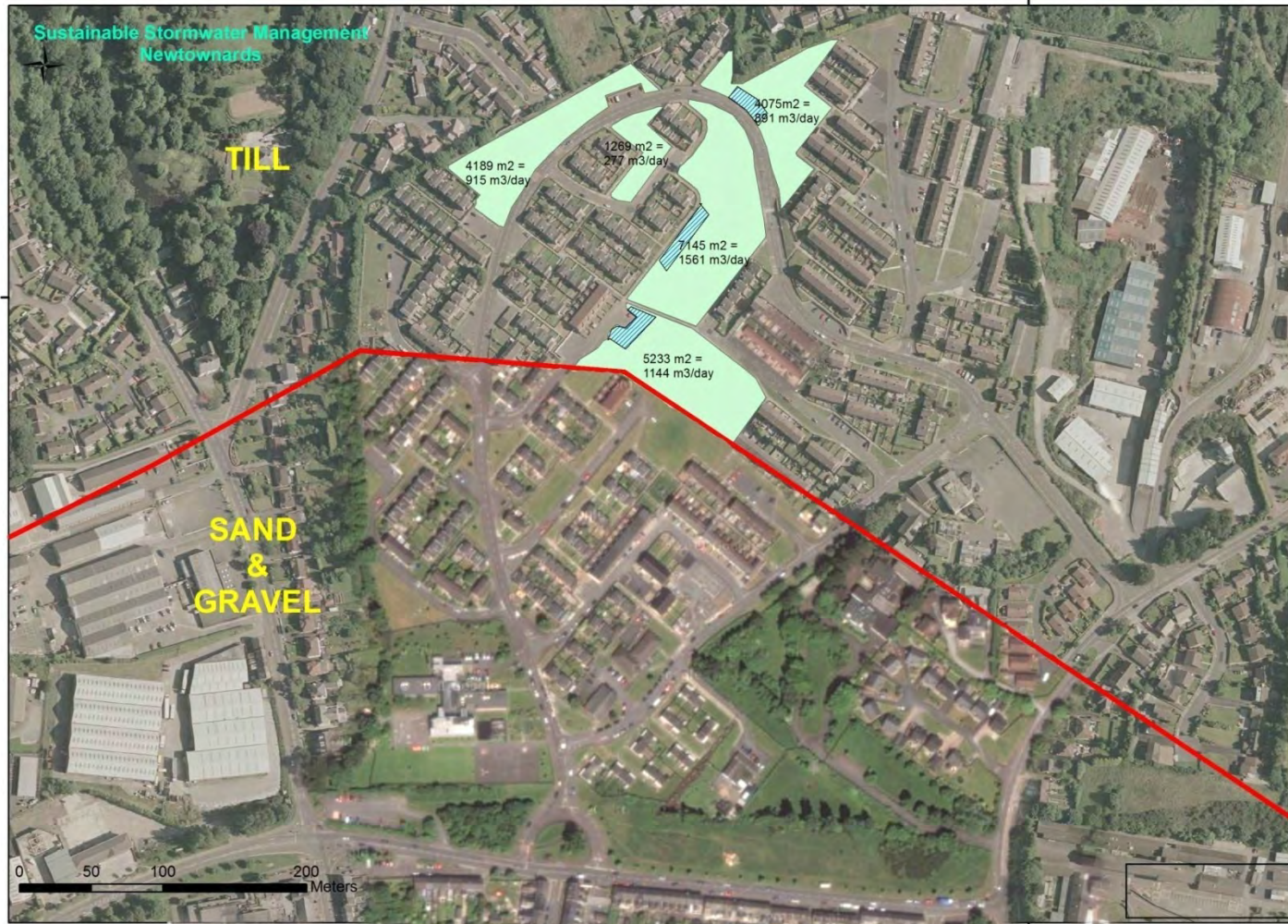
Water from Roads - A handbook for technicians and farmers on harvesting rainwater from roads, Erik Nissen-Petersen.

http://my.ewb-usa.org/theme/library/myewb-usa/project/resources/technical/water_from_roads.pdf

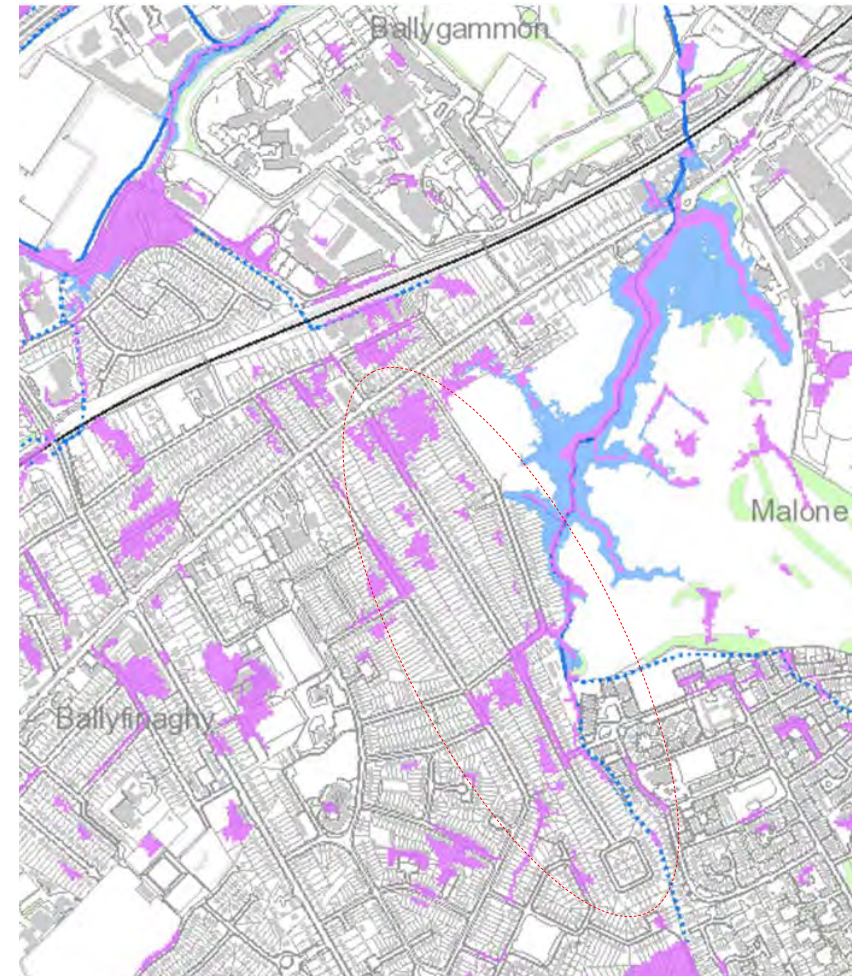
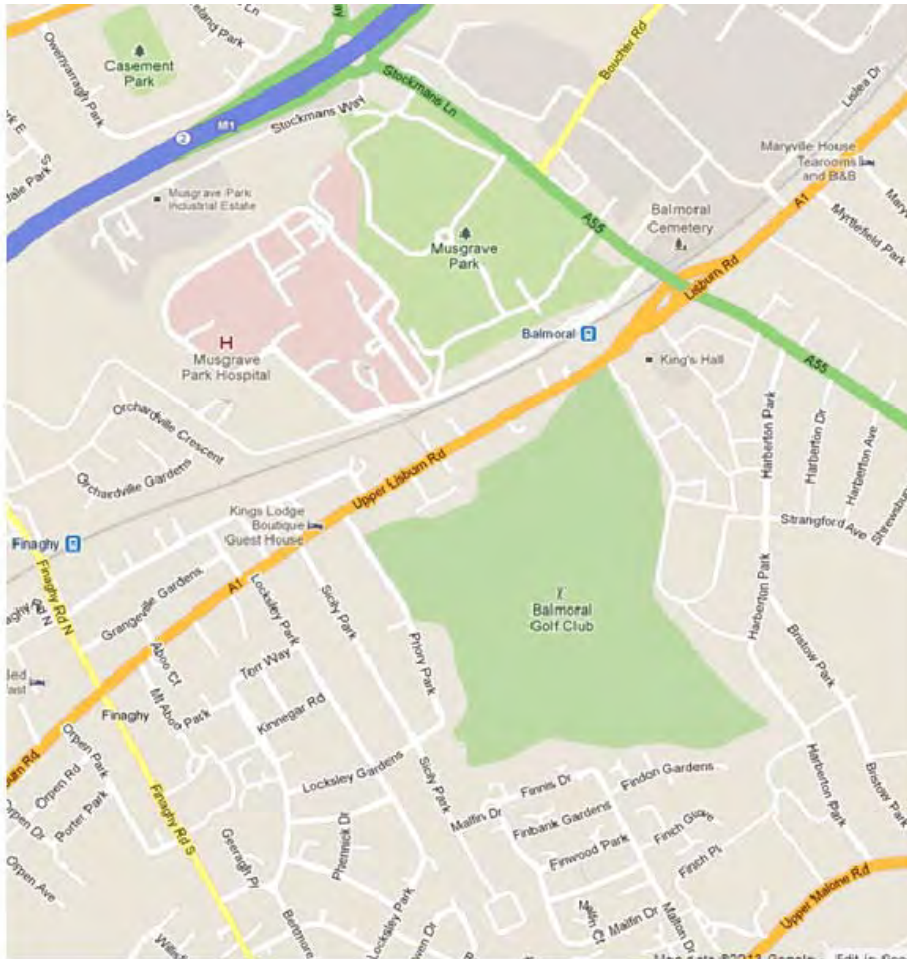
	Total Size (Square metres)	1 year return period – 6 hours (Cubic metres)	100 year return period – 6 hours (Cubic metres)
Ballyclare areas	867206	10456.73	28658.43
Road areas	64376	1102.11	3017.94
Satellite towns	325893	3138.35	8593.80
Overall total	1335809	15698	42986.12

Localised flooding – Glen Estate, Newtownards

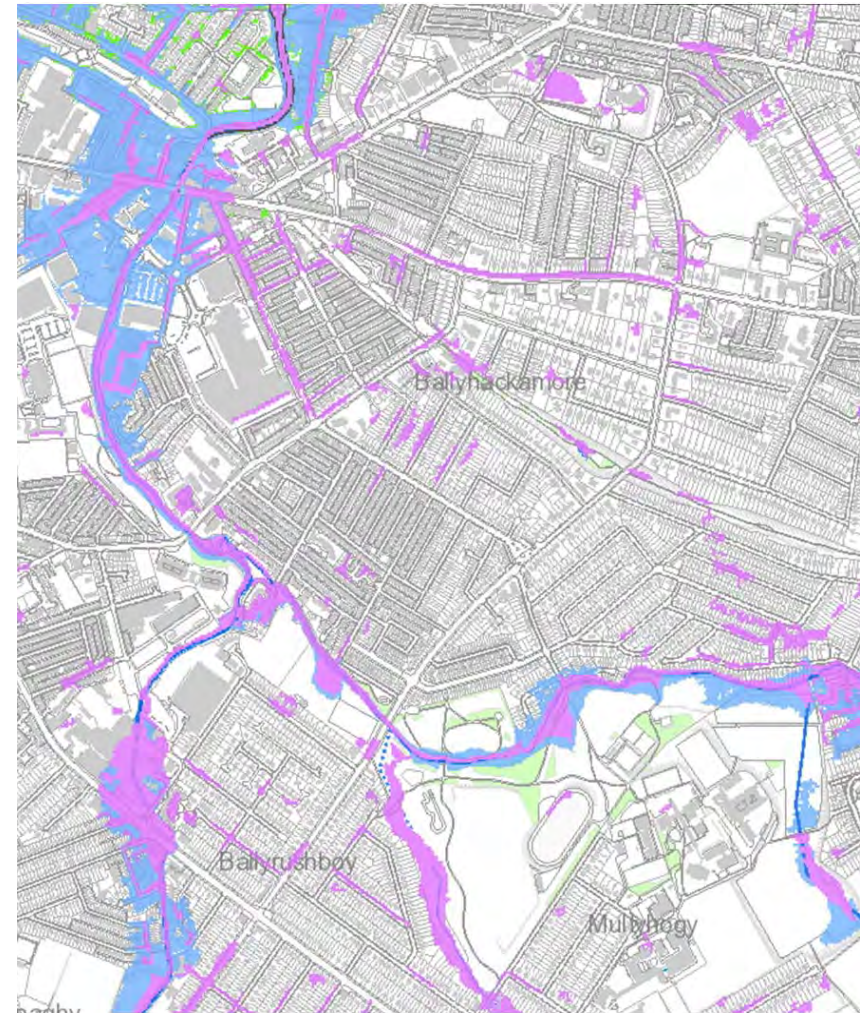
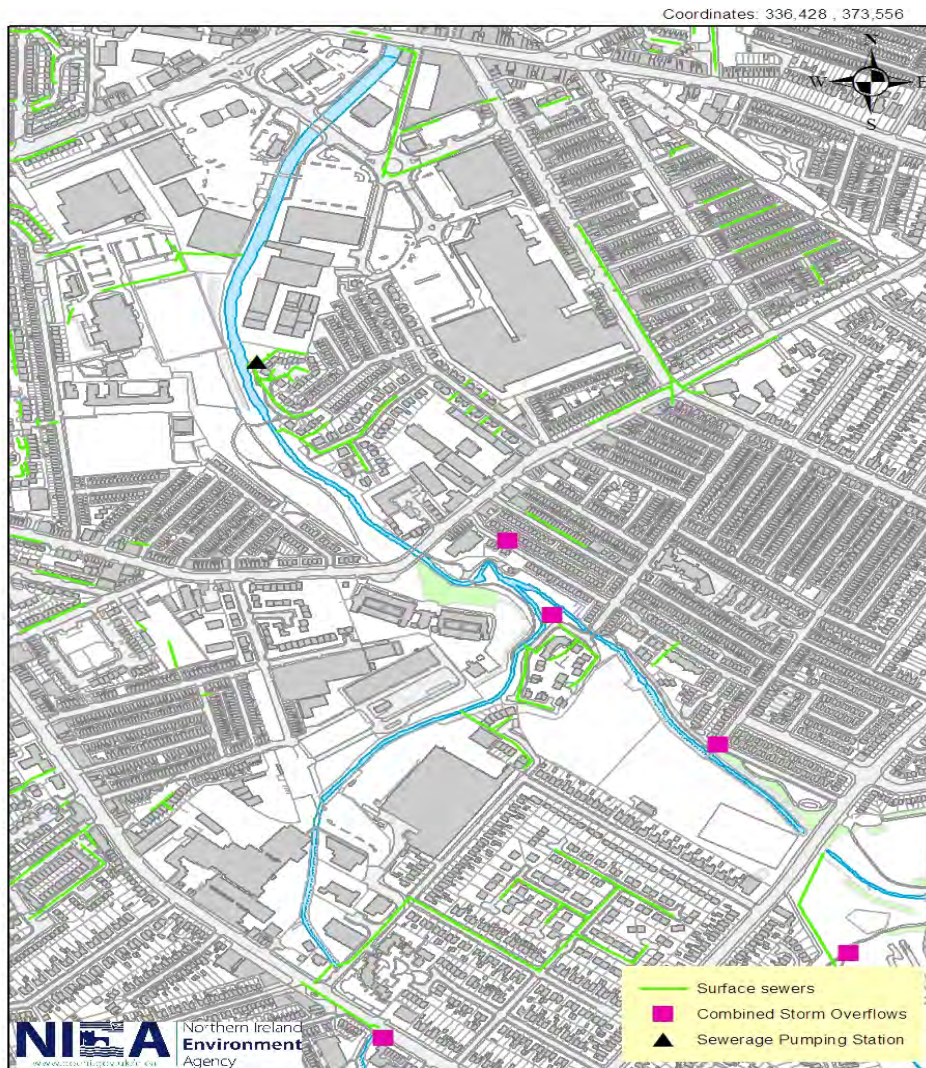
A groundwater solution.



Sicily Park - Belfast



East Belfast - Connswater River



Key Deliverables

- **Implementation Strategy** for Northern Ireland
- **Legislation** which will enforce stormwater management
- **Technical Guidance** for effective stormwater systems
- **Approval Body** which will assess and approve stormwater proposals for new & retrofit schemes
- **New companies / New Jobs** will be created to service the new stormwater systems

In conclusion - the benefits

- Cost less than conventional systems
- Reduce flood risk
- Help adaptation for climate change
- Improve water quality
- Reduce stormwater treatment costs and sewage treatment costs
- Improve aesthetics, bio-diversity and urban amenity
- Reduce pollution risk
- Promote and engineer increased groundwater recharge



THANK YOU