

MANAGING STORMWATER

A Strategy for Promoting the Use of Sustainable
Drainage Systems (SuDS) within Northern
Ireland.

A CONSULTATION DOCUMENT

July 2009



An Agency within the Department of the
Environment
www.doeni.gov.uk



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Northern Ireland
Environment
Agency
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1 Consultation

- 1.1 This consultation paper seeks comments on proposals by the Northern Ireland Environment Agency (NIEA) to introduce a Strategy for promoting the use of sustainable drainage systems (SuDS) within Northern Ireland. In this document the Strategy for promoting the use of sustainable drainage systems (SuDS) within Northern Ireland will be referred to as 'the Strategy'.

Your Views

- 1.2 The purpose of this consultation paper is to seek your comments on proposals by the NIEA to introduce a Strategy for promoting the use of sustainable drainage systems (SuDS) within Northern Ireland. Your views will help to revise our proposals in the Strategy, which subject to the outcome of this consultation will result in a final Strategy document being published in 2009.
- 1.3 The draft Strategy has been screened for social, economic and environmental impacts and the need for a full impact assessment has been ruled out.
- 1.4 Section 75 of the Northern Ireland Act 1998 places a statutory obligation on public authorities in carrying out their various functions to have due regard to the need to promote equality of opportunity and to have regard to the desirability of promoting good relations between certain groups of people. The impact of the proposed Strategy on Section 75 groups has been analysed and the need for an Equality Impact Assessment (EQIA) has been screened out.

Where to send your views

- 1.5 Responses to the consultation can be emailed to NIEA, Water Management Unit at **managingstormwater@doeni.gov.uk** or can be posted to the address below:

**Maureen Green
Water Management Unit
Northern Ireland Environment Agency
17 Antrim Road
LISBURN
Co Antrim
Northern Ireland
BT28 3AL**

Responses can also be faxed to: 02892 623 120. For audio impaired users text responses can be sent to: 028 9054 0642.

Closing date for comments

- 1.6 Please note that responses to the consultation must reach the Department by **16th October 2009**. All responses received by this date will be considered before the Strategy is finalised.

Enquiries

- 1.7 Any enquiries relating to the consultation should be made to Maureen Green at the address set out in paragraph 1.5. You can contact us by telephone on (028) 92 623 146.

Additional copies

- 1.8 Additional copies of this consultation document are available online at <http://www.ni-environment.gov.uk/index/publications/consultations.htm> or can be obtained, free of charge, by contacting us at the address in paragraph 1.5. This document is available in alternative formats, please contact us to discuss your requirements.

Confidentiality of consultation responses

- 1.9 A summary of responses will be published following completion of the consultation process. If you would prefer your comments not to be published, please indicate this when responding. Requests for non-publication of responses will be respected, but in accordance with the Freedom of Information Act 2000 cannot be guaranteed.
- 1.10 We may also wish to publish individual responses to this consultation and may be required to disclose them under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004. Unless the respondent claims specifically that a response should be treated in whole or in part as confidential, it is assumed that there are no objections to the response being made public or disclosed as described. Full reasons for any claim of confidentiality must be given and where a claim is made, the respondent will be consulted before any disclosure is made. An automatic confidentiality disclaimer generated by your email system will not be regarded as binding.
- 1.11 For further information about the confidentiality of responses please contact the Information Commissioner's office, available online at www.informationcommissioner.gov.uk.

2 Executive Summary

- 2.1 This Strategy is produced by the Northern Ireland Sustainable Drainage Systems Working Party chaired by NIEA. Membership has included representatives of Northern Ireland Water Limited (NIW), Department of Regional Development (DRD) Roads Service, Department Of the Environment (DOE) Planning Service, Department of Agriculture and Rural Development (DARD) Rivers Agency, Northern Ireland Housing Executive (NIHE), DOE Planning and Environmental Policy Group (PEPG), Department of Finance and Personnel Central Procurement Directorate, the Agri-Food & Biosciences Institute (AFBI) and Belfast City Council. (See Appendix A for more information on the roles and responsibilities of each of the working party bodies).
- 2.2 The continual expansion of urban development raises the ratio of impermeable to permeable surfaces. There is also currently an automatic right to connect surface water run-off to a surface or combined public sewer, which is granted under Article 163 of the Water and Sewerage Services (Northern Ireland) Order 2006. When accompanied by the projected changes to rainfall intensity resulting from climate change, this will significantly increase the volume and flow rate of storm water produced and conveyed directly to watercourses. There is also an associated flood risk where existing infrastructure is unable to cope with this storm water. Untreated storm water may also adversely affect water quality.
- 2.3 A technique widely used in other parts of the United Kingdom and the European Union to address these problems is the use of Sustainable Drainage Systems (SuDS).

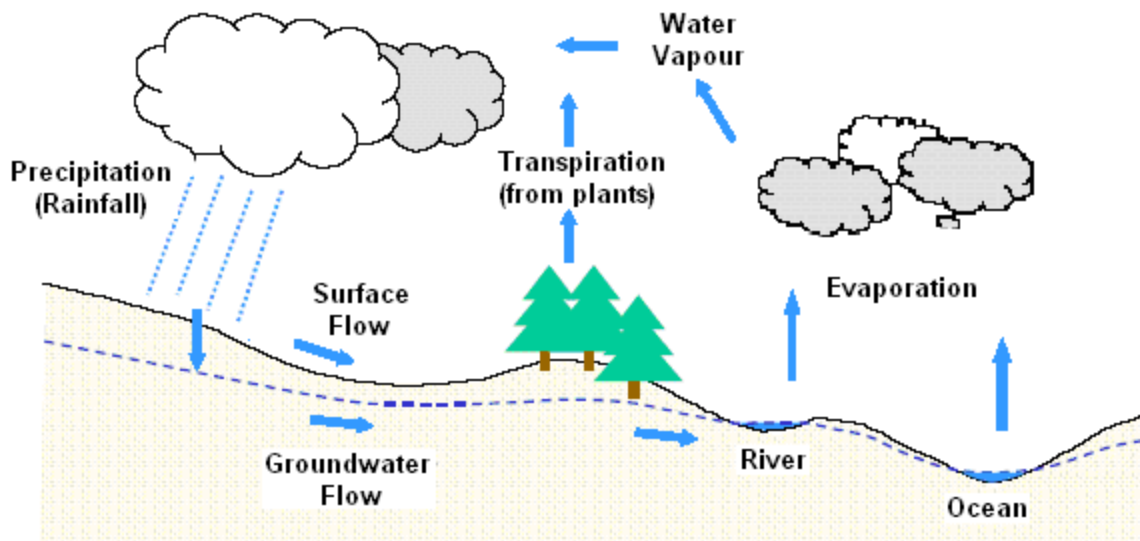
- 2.4 The ownership and regulation of storm drainage in Northern Ireland is split between several bodies (See Appendix A). This acts as an impediment to meeting policy and statutory requirements for flood risk and water quality.
- 2.5 The Working Party proposes that the Northern Ireland Executive establishes Sustainable Drainage Systems (SuDS) as the preferred approach for managing the storm water discharges which arise from the development of land. The Working Party suggests, as part of a number of recommendations, that ideally one organisation would have responsibility for assessing the flood control, water quality and amenity aspects of SuDS in new developments. However, under the existing legislation and governance arrangements NIEA and Rivers Agency both have a role. These organisations will cooperate to provide a joined up approach to the consenting process.
- 2.6 A full suite of Area Plans providing coverage for all of Northern Ireland should be available in 2011 and as a consequence developers will have greater certainty in relation to future development proposals. SuDS based solutions will therefore be promoted within this context.
- 2.7 Section 7 sets out the Working Party's recommendations for promoting the use of SuDS as the preferred method of storm drainage in Northern Ireland.

3 INTRODUCTION

3.1 Drainage Systems

3.1.1 During the Hydrological Cycle rain falling on a 'green field site' will:

- evaporate into the atmosphere
- be used by plants
- permeate into the ground water
- may run over the surface in extreme cases
- discharge into natural watercourses



3.1.2 This natural drainage cycle transports water through the system slowly helping to regulate storm water flows in extreme events, giving sediments time to settle or be filtered out and allowing many of the pollutants present to be broken down or neutralised.

- 3.1.3 Where the capacity of the natural drainage system is exceeded, for example in a severe rainstorm, flooding is the inevitable consequence. While it may be a result of natural causes, urbanisation also has a major role to play. The development and use of land, by replacing fields with hard surfaces changes the natural drainage regime reducing the amount of water infiltrating into the ground. Roofs, roads, pavements, car parks and other man made structures can radically alter the natural drainage pattern, increasing the volume and speed of surface water run-off and require the installation of drains in built up areas to remove excess water.
- 3.1.4 Traditionally excess water has been removed by installing underground pipes to convey water away as quickly as possible. Although this approach may prevent local flooding, often it can simply transfer a drainage problem to another part of the catchment.
- 3.1.5 Historically 'combined' sewerage systems were designed and constructed to collect both foul sewage and storm water from the urban environment and transport it to a treatment works.
- 3.1.6 In recent years however, practice has been to install separate drainage systems for new developments. Foul sewage is collected in a dedicated sewer for treatment, while storm water is generally piped to a convenient watercourse, but often with little or no treatment before it is discharged.
- 3.1.7 While separate systems are now the normal practice, many urban areas, particularly in the centres of towns, still rely on combined sewers designed to cope with significantly lower flows than those they are now expected to accommodate. They are therefore susceptible to flooding in severe weather and often only capable of being upgraded with significant expense and disruption.

3.2 Current Issues

- 3.2.1 Increasingly, reliance on traditional drainage systems is proving inadequate to address the issue of storm drainage, as they cannot alone cope with the demands made by new development and the more intense and increasingly unpredictable rainfall arising from climate change.
- 3.2.2 The loss of permeable surfaces which can absorb rainfall is both exacerbating existing drainage problems and creating new ones in the urban environment. Traditional piped systems are a valuable asset which will continue to play a key role. But there is a need for the adoption of a wider range of drainage techniques for new development, which can achieve the twin objectives of extending the life of existing infrastructure and dealing effectively with the issue of storm water drainage.
- 3.2.3 The limitations of the traditional approach have been uncovered by the impacts of climate change and the improvements demanded by the Water Framework Directive and the Floods Directive. Recent urban flash flooding and the resultant pollution problems experienced in a number of urban centres across Northern Ireland are evidence of a problem which it is now widely anticipated will only increase over time.
- 3.2.4 Similar flooding problems have been experienced in England. The Foresight Future Flooding report estimates that currently 80,000 properties in England are at a very significant risk from surface water flooding causing on average £270 million of damage each year.
- 3.2.5 The Department for Environment, Food and Rural Affairs (DEFRA) has identified, in the first Government response to the autumn 2004 'Making Space For Water' consultation exercise (March 2005), the need to address key issues associated with SuDS including:

- How to ensure that SuDS are given equal consideration to traditional drainage solutions as appropriate;
- How to ensure relevant codes of practice are followed as far as possible; and
- How to ensure that adoption, ownership and operational responsibility enable continued functionality.

3.2.6 DEFRA has published for consultation a draft of its forthcoming Flood and Water Management Bill, the provisions of which apply to England only, in which it is proposed to amend section 106 of the Water Industry Act 1991 to make the right to connect surface water run-off to public sewers conditional on meeting new standards for the construction and operation of SuDS.

3.2.7 In Northern Ireland, the automatic right to connect surface water run-off to a surface or combined public sewer granted under section 163 of the Water and Sewerage Services (Northern Ireland) Order 2006, is one of the reasons why there has been such a slow uptake of SuDS. In some circumstances there may be no alternative to connecting to a public sewer. However, many techniques can be used to manage and reduce the flow, before the connection to the sewer is made.

3.2.8 DEFRA has set out the UK Government's strategy for tackling water issues in England, including surface water drainage, in the document 'FUTURE WATER The Government's water strategy for England'. An associated consultation document was also published, entitled 'Improving surface water drainage – Consultation to accompany proposals set out in the Government's Water Strategy, Future Water'.

Question 1: Do you agree that traditional drainage systems are inadequate in dealing with the issue of storm drainage in new developments, especially the more intense and increasingly unpredictable rainfall arising from climate change?

Question 2: Do you agree that the loss of permeable surfaces which can absorb rainfall is both exacerbating existing drainage problems and creating new flooding problems in the urban environment?

Question 3: Taking account of the increase in flood risk arising from climate change do you agree that alternative options to traditional drainage systems need to be considered and that SuDS should be considered as one such viable option?

Question 4: Should the automatic right to connect to a public sewer be amended for new sites and redevelopments?

4 SuDS

4.1 What are Sustainable Drainage Systems?

4.1.1 Sustainable Drainage Systems (SuDS) is the generic name for a range of techniques which seek to deal in an integrated way with the issues of water quantity, water quality and amenity. They aim to manage storm water as near to source as possible, slow down run-off, treat it naturally and release good quality water to watercourses or groundwater. SuDS features mimic natural wetland systems. Wetlands act as nature's sponges, slowing the flow and improving water quality. Wetlands historically have been important Irish ecosystems because of the high rainfall experienced in many areas. SuDS use involves moving away from a reliance on traditional underground pipe drainage systems to engineering solutions that replicate natural drainage processes.

4.1.2 There is a wide range of sustainable drainage techniques available which can be applied, individually or in combination, to meet the particular drainage needs of a scheme. These include:

- **Source control techniques** that seek to counter increased discharge from development sites by dealing with run-off as close to source as possible and minimising the quantity discharged to watercourses; and
- **Permeable conveyance techniques** that slow the velocity of runoff to the receiving watercourse, allowing storage, filtering and some loss of water through evaporation and infiltration before discharge.

4.2 Benefits of and constraints on Sustainable Drainage Systems

4.2.1 Experience of SuDS in other countries indicates that they can help reduce flood risk. While the benefits of such systems are evident at the river-catchment scale, their use can make a significant contribution towards the sustainability of individual developments in:

- managing environmental impacts at source, rather than downstream; and
- managing water run-off rates thereby reducing the impact of development on flooding.

4.2.2 Such benefits depend on the identification and application of clear design and maintenance objectives tailored to local circumstances. It requires developers to work in partnership with a number of disciplines and agencies (planners, drainage engineers, architects, landscape architects, ecologists and hydrologists) from the earliest stages of the development process.

4.2.3 Surface water management using SuDS can be implemented at all scales. It may start with good housekeeping measures and soakaways for individual premises and progress through the use of infiltration devices, tank storage, basins and wetlands for development at a more significant scale.

4.2.4 At any scale, it can help to reduce the need for investment in flood management and protection works by mitigating the intrinsic additional flood risk that new development might otherwise generate. However there will be an increased cost associated with maintenance.

4.2.5 While there are tangible benefits to the use of SuDS, there are also constraints on the choice of system. The surface structures that may be needed can take more space than conventional systems although it is often possible for them to be integrated into the surrounding land use, e.g. in public open space or road verges. Other limitations to infiltration devices can occur where:

- the soil is not very permeable;
- the water table is shallow;
- the groundwater under the site may be put at risk; or
- infiltration of water into the ground, particularly if concentrated in a limited area, could adversely affect ground stability.

4.2.6 For example, infiltration from particular types of development may be prohibited in groundwater protection zones or be subject to the need for investigation and appropriate additional treatment prior to discharge. Particular care is needed in designing SuDS with appropriate capacity to handle run-off at their location.

4.2.7 Contingency measures may be required to ensure that problems are not made worse when the intensity and/or duration of rainfall creates a situation where the quantity of run-off exceeds that for which the system was designed.

4.2.8 In extreme events, sustainable drainage systems may, like other systems be overwhelmed because they will only deal with the rainfall event for which they are designed. However, in some instances, SuDS schemes can reduce the initial impact of extreme events.

- 4.2.9 Issues such as health and safety, aesthetic appearance and the disposal of accumulated waste products can be disadvantageous to the use of certain SuDS features. Such issues can be mitigated against, if taken into consideration at the design stage. However, it should be noted that although such issues can be mitigated, it may not be possible to completely eradicate them from certain SuDS features.
- 4.2.10 In the Government's Response to the Independent Flood Management Policy Review 'Living with Rivers and the Sea' it is stated that the Rivers Agency will administer discharge consents for SuDS systems under schedule 6 of the Drainage Order.
- 4.2.11 The introduction of an innovative drainage philosophy such as SuDS will require new approaches to ownership, regulation, maintenance and financing.
- 4.2.12 It will be possible to learn from the experience of other Devolved Administrations on how to take the process forward and in Northern Ireland DRD Roads Service has some experience in using SuDS to deal with road runoff. These systems have been designed, constructed and maintained by Roads Service and have achieved a measure of success in dealing with drainage issues (See example in Appendix B).
- 4.2.13 The benefits of SuDS have been demonstrated in Scotland where the Government is committed to their use, both in open spaces and within private curtilages and has given effect to this policy in the **Water Environment (Controlled Activities) (Scotland) Regulations 2005**. In Northern Ireland there are a number of examples of SuDS in use (See example in Appendix B). However, in general SuDS are relatively under utilised in Northern Ireland and there is a general need to promote the concept.

4.2.14 Significant changes in the process of regulating and the philosophy of managing storm drainage will be required to introduce SuDS as the preferred method of surface water drainage in Northern Ireland. However, embracing these changes and developing the techniques required to construct and maintain SuDS brings with it the opportunity to achieve important environmental and economic benefits through a more effective and sustainable model for the management of storm drainage.

Question 5: Do you agree that Sustainable Drainage Systems offer mitigation against the current flooding and water pollution problems caused by traditional drainage systems and exacerbated by the intense and increasingly unpredictable rainfall arising from climate change?

Question 6: Do you agree that a holistic approach involving developers working with a number of disciplines and agencies (planners, drainage engineers, architects, landscape architects, ecologists and hydrologists) from the earliest stage of the planning process can enable SuDS to be integrated into the design of the site thus maximising the flood alleviation and water pollution prevention benefits of SuDS?

Question 7: Do you agree that the benefits of SuDS outweigh the constraints of the system?

5 Policy and Legal Drivers

There is a range of policy and legislation which drives the various drainage stakeholders to consider the use of SuDS. These include:

5.1 Northern Ireland Sustainable Development Strategy

- This strategy represents a joined up approach to meet the challenges of climate change and finite resources which threaten well-being and future prosperity in Northern Ireland.
- Strategic Objective 2 of the Northern Ireland Sustainable Development Strategy imposes a requirement 'to protect and enhance the freshwater and marine environment'. An important step in achieving this Objective and its Key Targets is the promotion of Sustainable Drainage Systems in future developments.

5.2 EU Water Framework Directive 2000/60/EC (WFD)

- The overall aim of the Directive is to promote 'good status' in all water bodies by 2015. The core environmental objectives are to prevent deterioration of aquatic ecosystems and to restore polluted surface waters and groundwater to 'good status'. All water bodies, including rivers, coasts, estuaries, lakes, man-made features and groundwater are included.
- The Directive takes into account economic factors to ensure that planned improvements are not disproportionately expensive or technically impracticable.

- SuDS will help contribute to achieving compliance with the WFD. Control of both diffuse and point source pollution of surface water will be necessary to achieve compliance with this Directive.

5.3 The Northern Ireland Planning System

Development Plans

- A development plan defines the policy framework and land use proposals that will be used to guide development decisions within a specified area. The Department has a statutory power, laid down in Article 4 of the Planning (Northern Ireland) Order 1991, to make a development plan for any area. Development plans may be in the form of area plans, local plans or subject plans. A full suite of Area Plans providing coverage for all of Northern Ireland should be available in 2011 and as a consequence developers will have greater certainty in relation to future development proposals. SuDS based solutions will therefore be promoted within this context.

Planning Policy Statement 15 (PPS 15) – Planning and Flood Risk

- Flood risk is exacerbated by the hard surfaces of new developments. PPS 15 states that *'appropriately scaled and supported SuDS can, in the right circumstances, offer developers the opportunity to proceed with developments which would otherwise be refused because of the increased flood risk they would pose. However, where the use of SuDS would facilitate development that might otherwise be refused, consent will not be granted without appropriate guarantees on the management and maintenance necessary to ensure that they will function effectively for the life of the development proposed'*.

5.4 The European Directive on the Assessment and Management of Flood Risks (2007/60/EC of 23 October 2007) (the Floods Directive).

- The Floods Directive is designed to ensure Member States prevent and limit floods and their damaging effects on human health, the environment, infrastructure and property. The Directive requires Member States to produce flood risk management plans. These plans will focus on prevention, protection and preparedness.

5.5 Climate Change

- The final report on the Pitt review, highlights that Climate Change will bring changes in weather patterns, particularly intensifying rainfall, which may overload existing drainage systems increasing the risk of flooding. The report recommends that there should be increased action on 'mitigation and adaptation'.

Question 8: Do you agree that SuDS will be a useful tool in meeting the aims, objectives and requirements of the Policy and legal drivers? If you have indicated no please provide reasons.

6 Cost Implications

- 6.1 In Great Britain, planning agreements can include payments for the maintenance of drainage infrastructure. This has not traditionally been the case in Northern Ireland. However, developers contribute to other infrastructure costs where improvements are necessary to facilitate their developments and this could be extended to drainage infrastructure.
- 6.2 Where SuDS are a replacement for, and not over and above what would be required for a traditional drainage system, and an adequate SuDS system can be designed with maintenance costs similar to a conventional system, there should be no need for additional developer contributions. In this case, those who are currently responsible for maintaining the system would continue to do so.
- 6.3 If contributions are necessary, the use of Article 40 agreements, under the Planning (Northern Ireland) Order 1991, could be considered in order to secure a financial contribution. Provision for these agreements is provided in the Planning (Northern Ireland) Order 1991, where essentially it states that, *'the Department may enter into an agreement with any person who has an estate in land for the purpose of facilitating, regulating or restricting the development or use of the land...'* These agreements have been used to secure developer contributions towards landscaping, open space or transport issues associated with development proposals.
- 6.4 It should be noted that under the current approach, payment for surface water drainage is included in general taxation. If water charges should be introduced, it is likely that that the charges for surface water drainage will be included in the overall water charge. It is important that these charges are made clear and that, for example, people with SuDS do not pay both a

SuDS maintenance charge together with a Northern Ireland Water charge for surface water drainage.

Question 9: Do you consider that if SuDS are a replacement for existing traditional drainage systems that those who currently pay for the maintenance of those systems should continue to do so? Please state your reasons.

Question 10: Do you consider that if water charges are introduced a SuDS maintenance charge, instead of a charge for conventional drainage, should be a component of the bill for those customers served by SuDS systems? Please state your reasons.

7 Recommendations

The following recommendations will be incorporated into an implementation programme, to be generated by the SuDS Working Party, to promote the use of SuDS as the preferred method for storm drainage.

1. Steps should be taken by NIEA, NIW and Rivers Agency to raise the awareness of and expertise in the design and construction of SuDS systems in Northern Ireland e.g. producing awareness leaflets, hosting awareness seminars, placing appropriate signage on sites where SuDS are in operation.
2. Specific training should be carried out by the individual organisations involved to provide an understanding of the applicability, limitations and benefits of SuDS.
3. The Central Procurement Directorate (CPD) of the Department of Finance and Personnel should develop a Sustainable Procurement Action Plan for Northern Ireland and encourage all Government Departments to implement SuDS principles in all new and existing projects.
4. NIW should adopt and maintain approved 'hard engineered SuDS' within new developments in accordance with its sewer adoption policy and procedures.
5. Roads Service should continue to use the Design Manual for Roads and Bridges which includes guidance and direction on SuDS. All the organisations, should promote the CIRIA manual C697 as the design and construction standards for SuDS in new and existing developments.

6. SuDS should, as part of a drainage impact assessment, be promoted through the planning process. In the interim this should be carried out using existing legislation.
7. Planning Service should require Drainage Assessments and Management Agreements for SuDS in new developments.
8. Roads Service should continue to implement SuDS to control runoff from new significant road schemes.
9. Local Councils, post Review of Public Administration implementation, should be given responsibility for maintenance, subject to funding, of vegetative and soft engineered SuDS features meeting the criteria for adoption into the public realm.
10. NIEA and Rivers Agency should cooperate to present a joined up approach to the regulation of SuDS in respect of flood control, water quality and amenity aspects.
11. Where practicable, economically feasible and when criteria such as topography, soil permeability and groundwater tables permit, the Rivers Agency should require any storm water runoff from new developments to be broadly equivalent to 'green field' runoff .i.e. the new regime must mimic the characteristics of the natural runoff patterns that existed before the development was built.
12. A gap analysis should be carried out by the SuDS working party to determine what legislative changes are required to enable the realization of SuDS as a viable option for storm water management.

13. All organisations involved should introduce operational policy to facilitate the establishment of SuDS as the preferred method of surface water drainage for all new developments.
14. Developers should be required to include sustainable drainage, where practicable, in new developments, built to standards which reduce flood damage and improve water quality. Section 163 of the Water and Sewerage Services (Northern Ireland) Order 2006 should be amended to make the right to connect surface water run-off to public sewers conditional on meeting new standards. Responsibility for approving sustainable drainage systems in new developments should rest with the proposed SUDS approving body, NIEA or Rivers Agency.
15. Rivers Agency, NIW and Roads Service should retrofit SuDS on those existing surface water drainage systems which have a significant adverse effect on the environment, where it is practicable and economically viable.
16. The SuDS working party should monitor the uptake of SuDS.
17. The SuDS working party should monitor the effectiveness of SuDS in the short, medium and long term to enhance water quality, flood prevention and the protection of water resources.
18. The SuDS working party should review the implementation of the Strategy before the end of 2012.
19. The SuDS working party should establish a NI SuDS Research Group to examine Northern Ireland specific SuDS issues.

Question 11: Do you agree that the proposed recommendations, as set out in section 7, are a realistic way forward in the promotion of SuDS as the preferred method of storm drainage in Northern Ireland? Please identify any important measures we may have missed.

Question 12: Do you consider that we have identified the correct organisations responsible for each recommendation? Please give your reasons.

Question 13: What suggestions do you have to further develop SuDS in Northern Ireland?

Question 14: Can you suggest how SUDS features can be regulated so that they remain effective?

8 List of Questions Asked In Consultation Document

Question 1: Do you agree that traditional drainage systems are inadequate in dealing with the issue of storm drainage in new developments, especially the more intense and increasingly unpredictable rainfall arising from climate change?

Question 2: Do you agree that the loss of permeable surfaces which can absorb rainfall is both exacerbating existing drainage problems and creating new flooding problems in the urban environment?

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Question 4: Should the automatic right to connect to a public sewer be amended for new sites and redevelopments?

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design of the site thus maximising the flood alleviation and water pollution prevention benefits of SuDS?

Question 7: Do you agree that the benefits of SuDS outweigh the constraints of the system?

Question 8: Do you agree that SuDS will be a useful tool in meeting the aims, objectives and requirements of the Policy and legal drivers. If you have indicated no please provide reasons.

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Appendix A

STAKEHOLDERS: Roles and Responsibilities of Government Bodies relating to Drainage and Flood Regulation.

The following information provides a summary of the main Agencies with responsibilities relevant to the regulation of drainage and flood risk in Northern Ireland.

The Department of Agriculture & Rural Development, Rivers Agency

Under the provisions of the Drainage (Northern Ireland) Order 1973 the Department of Agriculture & Rural Development has discretionary powers to:

- maintain watercourses and sea defences that have been designated by the Drainage Council for Northern Ireland;
- construct and maintain flood defense structures;
- administer advisory and enforcement procedures to protect the drainage function of all watercourses; and
- charge developers for the cost of drainage infrastructure works necessary to facilitate new development;
- Rivers Agency also exercises all executive functions arising from DARD's statutory remit under the Drainage Order and
- exercises DARD's responsibilities in regard to the water levels in Lough Neagh and Lough Erne;
- Rivers Agency is the 'Competent Authority' for the 'Floods Directive'.

Northern Ireland Water Limited

Northern Ireland Water is a company owned by the Department for Regional Development as the sole shareholder. Responsibilities under the Water and Sewerage Services (Northern Ireland) Order 2006 include:

- the supply and distribution of drinking water;
- the provision of the collection system and treatment service for domestic sewage, surface water and trade effluent;
- the adoption, management and maintenance of public water mains and sewers; and
- operation of the Company's reservoirs, pumping stations and treatment works.

The Department for Regional Development, Roads Service

Roads Service is an executive agency within the Department for Regional Development. Its responsibilities include:

- taking measures to implement the Regional Transportation Strategy for Northern Ireland 2002-2012; and
- managing, maintaining and developing the public road network (including its drainage systems).

The Department of the Environment, Northern Ireland Environment Agency

Northern Ireland Environment Agency (NIEA) is an executive agency within the Department of the Environment. It has a duty under the Water (Northern Ireland) Order 1999 to promote the conservation of water resources in Northern Ireland having regard to the needs of industry and agriculture, the protection of fisheries, the protection of public health, the preservation of amenity and the conservation of flora and fauna. NIEA is also responsible for the implementation of the European Union Water Framework Directive (2000/60/EC) on the management of water quality.

Within NIEA, Water Management Unit has responsibility for the protection of the aquatic environment. Its responsibilities include:

- monitoring water quality;
- preparing water quality management plans;
- controlling effluent discharges;
- taking action to combat or minimise the effects of pollution; and
- supporting environmental research
- being the 'competent authority' under the Water Framework Directive.

The Department of the Environment, Planning Service

Planning Service is an executive agency within the Department of the Environment. The purpose of the planning system is to regulate development and land use in the public interest. The functions of planning are set out in the Planning (Northern Ireland) Order 1991 and Planning Service exercises this responsibility through the key actions of:

- the development control process which deals with individual planning applications and the enforcement of planning control;
- the preparation of development plans; and
- the formulation of planning policies for all of Northern Ireland.

Development and use of land carries with it the potential to impact upon the aquatic environment. It can adversely impact upon drainage and consequently may worsen flooding, in addition to being at direct risk of flooding if inappropriately located. Therefore, issues relating to drainage and flooding are material to planning decisions and a consideration for Planning Service in the execution of its responsibilities under the Planning (Northern Ireland) Order 1991.

Local Government

The Review of Public Administration was commenced by the Northern Ireland Executive with the objective of delivering wide-ranging reform and modernisation across the public sector. As part of the modernisation process, the 2007 Review of Local Government Aspects of the Review of Public Administration - Emerging Findings publication, recommended that a number of functions should be transferred from central to local government including responsibility for development planning and local roads public realm functions. Public realm functions proposed to transfer from the Department for Regional Development include pedestrian permits, alley-gating, street scaping, environmental improvements, maintenance of amenity areas, salting footways, local events on roads, grass cutting and weed spraying, gully emptying, off street car-parking and street lighting. Accordingly, this strategy proposes that local councils, post Review of Public Administration implementation, should be given responsibility for maintenance of public realm vegetative and soft engineered SuDS features.

Following the introduction of the Sustainable Development Strategy for Northern Ireland, the Office of the First and Deputy First Minister introduced a statutory duty upon public authorities, in relation to sustainable development, which commenced from 31 March 2007. The duty requires that 'a public authority must, in exercising its functions, act in the way it considers best calculated to contribute to the achievement of sustainable development in Northern Ireland, except to the extent that it considers that any such action is not reasonably practicable in all the circumstances of the case.' The duty is further expanded upon by the requirement for a public authority to have regard to any strategy or guidance relating to sustainable development issued by the Department of the Environment. Public authorities under the legislation are defined as district councils and Northern Ireland Departments.

Northern Ireland Housing Executive

As a comprehensive regional housing authority, under existing legislation the Executive's primary responsibilities are to:

- regularly examine housing conditions and housing requirements;
- draw up wide ranging programmes to meet these needs;
- effect the closure, demolition and clearance of unfit houses;
- effect the improvement of the condition of the housing stock;
- encourage the provision of new houses;
- establish housing information and advisory services;
- consult with District Councils and the Northern Ireland Housing Council;
- manage its own housing stock in Northern Ireland;

The Housing Executive is the Home Energy Conservation Authority for Northern Ireland.

Planning and Environmental Policy Group

Planning and Environmental Policy Group (PEPG) is part of the core within the Department of the Environment and is responsible for taking forward policy and legislation on environmental issues in Northern Ireland.

The main environmental areas are: water quality, waste management, air quality, biodiversity, nature conservation, the protection of the built heritage and climate change.

PEPG works closely with colleagues in various bodies including the NIEA within the DOE, Department of Environment, Food and Rural Affairs (Defra) and the devolved administrations in Scotland and Wales.

PEPG's Aim:-

To develop policy and legislation which will protect and enhance the natural and built environment and promote sustainable development.

PEPG has set out a number of key objectives, which will contribute to the achievement of its aims. These are to:-

- Develop integrated and effective environmental policies and legislation;
- Ensure the timely and effective transposition of EU environmental legislation;
- Provide high levels of environmental protection while taking account of social, economic and other factors;
- Promote sustainable development in Northern Ireland;
- Ensure effective engagement with stake holders; and
- Develop organisational management policies and practices that will encourage and support staff to achieve business objectives.

Central Procurement Directorate

Central Procurement Directorate (CPD) provides a procurement service to Northern Ireland Departments and other public sector bodies in respect of a wide range of supplies and service types ensuring best value for money, legal compliance and competitiveness.

CPD has established a Sustainable Construction Group for Northern Ireland which draws representation from the NI Centres of Procurement Expertise. CPD will promote SuDS within the Sustainable Construction Group with the intention of developing practical guidance on the application of SuDS on Government construction projects.

The Agri-Food & Biosciences Institute (AFBI)

The Agri-Food & Biosciences Institute (AFBI) was created on 1st April 2006 as an amalgamation of the Department of Agriculture and Rural Development (DARD) Science Service and the Agricultural Research Institute of Northern Ireland (ARINI). AFBI is a DARD Non-Departmental Public Body (NDPB).

AFBI carries out high technology research and development, statutory, analytical, and diagnostic testing functions for DARD and other Government departments, public bodies and commercial companies.

AFBI's NDPB status enables it to be innovative and entrepreneurial in its approach to business development. AFBI is forging new partnerships with other scientific institutes and research organisations and extending the range of services it offers. This enables AFBI's unique breadth of scientific capabilities in the areas of agriculture, animal health, food, environment and biosciences to be offered to a wider prospective national and international customer base. AFBI is managed by an independent Board which is also responsible for monitoring its performance.

Appendix B – CASE STUDIES

A5 Newtown Stewart Bypass

The £7 million project involved 2.6km of single carriageway trunk road bypass, some 900m of side roads and two composite bridges over the River Strule and incorporates the innovative use of a Sustainable Drainage System (SuDS).

The bypass crosses the scenic and environmentally sensitive Strule River valley and significant measures were adopted to integrate the road into the landscape and to mitigate environmental impacts both during construction and when the road is in service. With a fish farm a short distance downstream and as an important fishing river in its own right, protection of water quality in the Strule was a major factor from the design viewpoint. Therefore the use of SuDS techniques within the scheme was an important factor.



Incorporating SuDS within the scheme involved having no kerbs and an open stone filter with a perforated pipe at its base being installed along both sides of the road. Surface water is led from these drains to five detention basins. These are planted with reeds which can neutralise contaminants in normal flows. Water from the basins is discharged to the river via penstocks which can be closed in the event of a serious spillage.

Greenmount Campus, Northern Ireland

A large scale SuDS system based primarily on a constructed Wetland was established at Greenmount Campus, College of Agriculture, Food & Rural Enterprise (CAFRE) during 2004. The system provides a research facility in partnership with the Agri-Food and Biosciences Institute and NIEA to determine if a SuDS system based on large scale constructed wetlands could successfully treat dirty water from the Greenmount Campus Dairy Unit.



The Wetland consists of five ponds with a combined area of 1.2 hectares. In designing the Wetland, the scale of the system was deliberately kept large with the view to use the research findings to assess the scale of a system necessary for typical commercial dairy farming.

Based on results from the Greenmount Constructed Wetland to date, it is anticipated that a much smaller wetland footprint would therefore be adequate to treat dirty water from a 180 cow dairy unit. The critical factor in terms of water quality is the length of the storage period required for holding dirty water before release to the aquatic environment.

In summary, the research has shown that a SuDS system based on a constructed wetland system would represent an annual saving of £4,365 for a Dairy Unit, of this size, compared to a conventional storage and land spreading system.

Appendix C

Background Information on SuDS

- 1 CIRIA, Sustainable Urban drainage systems, available online at: www.ciria.org/SuDS (last accessed March 2009).
- 2 DEFRA, Making Space for Water, available online at: www.defra.gov.uk/environ/fcd/policy/strategy.htm (last accessed March 2009)
- 3 Infiltration Drainage – CIRIA R156
- 4 Model Agreements for SuDS – CIRIA C625
- 5 SNIFFER, Scotland and Northern Ireland Forum for Environmental Research, available on line at: www.sniffer.org.uk (last accessed March 2009)
- 6 Source Control Using Pervious Pavements – CIRIA C582.
- 7 SuDS an Introduction – booklet by EA/ SEPA/ EHS
- 8 SuDS Design Manual for Scotland and Northern Ireland Booklet from CIRIA C 521
- 9 SuDS- hydraulic, structural and water quality advice – CIRIA C609
- 10 SuDS Manual – CIRIA 697

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(last accessed March 2009)

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GLOSSARY

‘Vegetative engineered’ SuDS features

Filter strips are smooth grass slopes, usually alongside roads or car parks that take sheet-flow runoff from the hard surface. They operate by slowing flow and allowing solids to settle.

Swales are shallow, broad, grassed ditches with a very gentle gradient. They may have a small filter trench in the base to help them dry out and a soakaway outlet and even a surface water outlet. The latter will only operate in extreme rainfall and the former in unusual conditions. They operate as infiltration features but can also act as storage and ultimately will provide conveyance to a waterway. They should normally be dry and apart from allowing settlement of solids they also provide some biological treatment for organic matter. They may provide attenuation.



Bioretention areas are ‘super swales’ which provide lots of biological treatment.

Constructed wetlands are shallow ponds with dense vegetation. They provide more treatment than other SuDS features and are sometimes used as ‘end of pipe’ solutions.



‘Soft Engineered’ SuDS features

Infiltration trenches are trenches filled with broken stone and have a perforated pipe above the floor of the trench. The pipe will provide conveyance in extreme conditions but generally the feature acts by infiltration. There is attenuation.

Detention Ponds are usually dry. They collect water in extreme conditions as substitute floodplains and allow settlement of solids and infiltration through the base. They also may allow controlled discharge to a waterway. They are good for attenuation and may be sacrificial features like playing fields or parks.



Retention Ponds have permanent standing water and discharge to a waterway through a flow controlling device. They are very good for settlement and attenuation and provide considerable biological treatment. They are good wildlife sites with aesthetic appeal. They may need to be lined.

'Hard Engineered' examples:

Permeable pavement includes a wide range of materials including special tarmac, concrete or paviors with gaps. It is laid on a broken stone base which provides storage and treatment and generally lots of evaporation. It can discharge by infiltration through the base or if the base is sealed by piped discharge. It can provide lots of attenuation and considerable treatment. There is not much by way of aesthetic appeal but it can provide lots of storage (rainwater harvesting) for irrigation or even as a 'Sandoz' basin.

Gravel and other surfaces can similarly provide infiltration.



Geocellular systems are plastic boxes that provide lots of subsurface storage. They may discharge to ground but are particularly suited to 'Rainwater Harvesting'.

Oversized sewers with discharge control are used for storage. They complement traditional drainage systems and where installed in new development sites they may be offered for adoption to Northern Ireland Water as part of the development drainage system.