

Chapter 11 Water Services

11.1 Water Services

The provision of a high quality and efficient water supply and drainage infrastructure will ensure the long-term physical, environmental, social and economic development of the county. A high standard of water and wastewater infrastructure and services are pre-requisites in facilitating new, orderly and sustainable development.



Over the period of the previous Plan, the county has experienced very significant development pressure which has placed serious strain on the capacity of existing water supply and drainage infrastructure.

In many settlements there have been and remain significant capacity issues in terms of both water supply and waste water treatment. Key objectives include;

- The improvement of water and wastewater services in those areas of the county where deficiencies exist at present, subject to the availability of resources and appropriate statutory approvals.
- Measures to address deficiencies in existing water and wastewater infrastructure, so as to ensure compliance with regulatory requirements and the objectives of the *Water Framework Directive*.
- The preservation and development of water and wastewater infrastructure in order to facilitate the growth of settlements, in a structured sequential manner.
- The implementation of adequate surface water drainage measures and the prohibition of unsuitable development in flood susceptible areas, such that risk of flooding of existing or proposed developments is minimised.

11.2 Context

The provision and operation of water services infrastructure is a key element in supporting economic growth and providing a satisfactory quality of life for existing and future residents within the county through sustaining environmental quality. In particular, water infrastructural capacity is a pre-requisite to allow for new development within the county.

Whilst universal access to these services is an ideal, the reality is that there are limitations on available resources. This stems from a combination of organisational capacity, environmental, planning and other constraints coupled with economic reality,

all of which dictate that resources must be focused in a manner to maximise potential benefit to the county.

The *Water Services Act 2007* provides the legislative context, governing functions, standards, obligations and practice in relation to the planning management and delivery of water services. Legislation broadly covers water and wastewater “in the pipe” as distinct from broader water resources and quality issues.

The *Drinking Water Regulations 2007* set out the standards, requirements and procedures relating to the maintenance of a quality supply of water to consumers. The regulations also empower the Environmental Protection Agency (EPA) in a supervisory and monitoring role over local authority operations. This has major implications in how the council operates and manages its facilities and may impact on the resource requirement needed to operate and upgrade existing facilities to comply with these regulations.

The *Wastewater Discharge Regulations 2007* set out requirements relating to the licensing of wastewater treatment plants and other discharges from wastewater infrastructure and empower the EPA to licence and regulate council facilities. Licences specify both quantum and quality of discharges permissible from plants and may, where environmental constraints exist, limit the council’s scope for expansion of facilities and thus prevent further development in an area. They may then require significant investment to ameliorate the impacts of existing developments.

Nitrates, Habitats, Urban wastewater and Shellfish Directives emanating from the EU directly impact on the council’s capacity to both harness existing water resources for use, and the capacity to treat and dispose of wastewater and associated bio-solids. In particular, they will impact on the Council’s capacity to increase overall outputs, ability to upgrade existing plants and to limit operational costs of plants.

Louth County Council’s Assessment of Needs was carried out to cover the period from 2007-2014 and sets out a strategic investment program of some €169.4 million with prioritised projects, based on objective assessment criteria. This in turn informs the Department of Environment, Heritage and Local Government in drawing up the *Water Services Investment Program*. Prioritisation and advancement of projects therein will depend on department approvals and resource availability. A key constraint on such projects is the requirement that the council fund a significant element of project costs in accordance with the implementation of the Water Pricing Policy.

The council will be required to draw up a *Water Services Strategic Plan* during the course of the Plan. The adoption of the *Water Services Strategic Plan* is a reserved function for the county’s elected members. The plan will set out a strategy for the provision of water services in the county taking cognisance of sustainable development, affordability, environmental constraints, service quality and regulatory criteria.

The council has a primary role in the providing and facilitating the provision of water services. However other bodies also have a role to play. These include private group schemes, developers and private individuals who are also involved in their provision.

Policy

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| WS 1 | To ensure the provision of a high quality water and wastewater infrastructure to support both existing and future developments within the county, consistent with sustainability principles and the availability of financial resources whilst prioritising those centres where serious deficiencies are in evidence or where further sustainable development can be reasonably anticipated. |
| WS 2 | To ensure appropriate assessments are carried out on development proposals in respect of flood risk. |
| WS 3 | To require developers to submit sustainable urban drainage systems (SUDS) based designs for the management of surface water from new developments. |
| WS 4 | To ensure that the provision and operation of water and wastewater treatment facilities is undertaken in accordance with EU policies and directives, relevant national legislation, national and regional policies. |
| WS 5 | To ensure that satisfactory arrangements that have the capacity necessary to service proposed developments are in place prior to any proposals for developments being considered. The council where deemed appropriate may require developers to provide water services or enter into binding legal agreement to supply them either wholly by themselves, or in partnership with other developers and/ or the council, prior to granting of permission and subject to conditions as set down by the council. |
| WS 6 | To require developers to provide water services infrastructure in excess of that which they require, in the interests of integrated long term development of the area where appropriate. |
| WS 7 | To implement the <i>Water Services Strategic Plan</i> when completed. |
| WS 8 | To undertake measures recommended in <i>the River Basin Management Plans</i> relevant to County Louth to mitigate the impacts of water abstraction and discharges of treated effluent from wastewater plants and storm drains, on a prioritised basis, subject to affordability. |
| WS 9 | To ensure that the scale of provision of water services reflect the scale of envisaged settlement sizes in accordance with the settlement strategy, whilst reflecting realistic provision in the context of overall projected population growth in the county for the period of the Plan. |
| WS 10 | To fully integrate the provision of water services in County Louth under the aegis of Louth County Council in accordance with provisions of Local Government Act 2001. |

11.3 Water Supply

Water demand has increased significantly over the course of the previous plan. This has been driven by growth in the number of households, lifestyle changes and lower unit occupancy. Domestic water usage in Ireland at circa 160litres per head per day is amongst the highest in Europe, reflecting the absence of domestic water charges based on consumption. Furthermore it is likely that that implementation of the *Water Framework Directive* measures will curtail our capacity to significantly increase abstractions from rivers and groundwater resources, which are in any case limited.

11.3.1 Capital Investment Program: Water

A substantial capital program is being pursued. The Water Pricing Policy will present a significant challenge to council finances in respect of funding capital schemes. As such, the strategic approach adopted is to develop large integrated schemes which can be implemented in a piecemeal manner as demand arises, focusing initially on addressing shortfalls in existing quality and supply arrangements, thus minimising costs. The following water schemes are progressing as part of the council's capital investment programme.

Table 11.1: Capital Investment Programmes

Project	Description	Status
Cooley Regional Water Supply Stage 2	• Provision of new supply to Omeath • Upgrade of existing facilities in Cooley scheme • Subject to identifying additional resources extending supply to adjacent unserved areas in north Louth	Preliminary report
Mid-Louth Regional Water Supply Scheme	• Upgrading of existing piped infrastructure and storage along eastern side of county from Dundalk to Drogheda • Develop a new treatment plant abstracting water from the Rivers Dee and Glyde • Single supply source for Ardee, Dunleer Louth and Greenmount schemes.	Preliminary report contract documentation procurement
East Meath, South Louth and Drogheda Water Supply Improvement Scheme	• Upgrading of Staleen wastewater treatment plant WTP • Development of new groundwater sources • Peripheral trunk main around Drogheda and increased storage • Provision of additional supplies and key network assets to Drogheda environs and south Louth area	Preliminary report contract
Dundalk and Environs Strategic water Study	• Strategic study of demands, supply options, asset renewal and investment program required to provide supplies to the Dundalk area and its environs over a 20 year horizon	Final report
North Drogheda	• Provision of trunk water mains • Development of groundwater sources	Contract documentation

11.3.2 Water Supply: Current Status

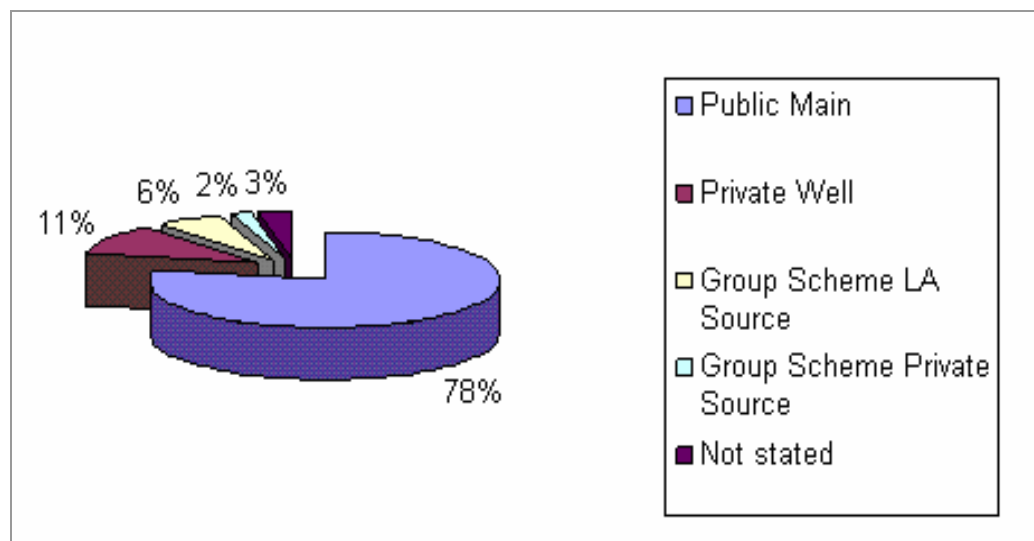
County Louth operates twenty public supply schemes. A number of group schemes are also supplied from public mains and these are in effect operated by the council. A further seven private group schemes operate within the county and are supported through the Rural Water Programme. The remaining properties are serviced by individual wells or other private sources of supply.

Public and private group schemes are to be licensed and regulated under the Water Services Act by the Environmental Protection Agency in the case of public schemes. Private group schemes will be overseen by the council once relevant regulations are enacted. Commercial private supplies using water as part of their activities are also regulated by the council.



Figure 11.1 illustrates the types of water supply in the county. Almost 80% of supplies are by public main and the remainder by group schemes and private wells.

Figure 11.1: Types of Water Supply



The council supports the continued operation and development of the private group scheme sector and sees this sector as providing a very effective mechanism of developing piped services in currently unserved areas. Table 11.2 outlines existing public schemes, their source of supply, existing demand and deployable yield. Details of private group schemes and their extent are contained in table 11.3.

Table 11.2: Public Water Schemes

Scheme	Source	Volume Supplied (m ³ /day)	Scheme Capacity (m ³)	Comments
Ardee	River Dee and wells	3113	3800	Plant to be upgraded to address quality issues. Ultimately to be supplied from Mid Louth scheme
Greenmount	River Dee	1992	2500	Integrated into Mid Louth Scheme
Tallanstown	River Glyde	902	1000	Ultimately to be supplied from Mid Louth scheme
Carlingford	Surface spring	300	300	To be integrated into Cooley scheme—source to be abandoned
Greenore	Surface spring	200	200	To be upgraded as part of Cooley scheme
Omeath	Lislea River and wells	325	325	Existing sources to be abandoned. To be integrated into Cooley Scheme
Cooley	Bored wells	1745	2500	Scheme to be upgraded
Jeninstown		100		Scheme integrated into Cooley
Carrickcarnan	DOE NI	10		Supplied by DoE NI Water services
Dunbin	River Fane	753	900	Connected to Cavanhill supply
Sheelagh/Courtbane	River Fane	115	150	Connected to Cavanhill supply
Dunleer	River Dee	245	400	Integrated into Greenmount
Clogherhead/Termonfeckin	River Boyne	1100		Supplied from Drogheda, augmented by well source. Capacity dependent on Drogheda supply
Collon	Bored wells	1407		Capacity variable depending on well yield.
Kilineer	Bored wells	4	5	
Drybridge	Bored wells	350		
Cavanhill	River Fane	20,000	34,000	Currently being upgraded
Castletown	Annaskeagh			Decommissioned. Industrial usage only.
Staleen	River Boyne	28,000	30,000	Currently being upgraded. 15,000 of the capacity is extracted to Meath.
Rosehall	Barnattan/Mattock Rivers	2,250	2,250	To be decommissioned when Staleen capacity is augmented.

Table 11.3: Private Group Water Schemes

Scheme	Source	No. of Domestic Connections	Volume Supplied /day (m³)	Comment
Ballymakenny	Bored wells	601	1200	
Drybridge/ Waterunder	Bored wells	56	81	
Tullyallan	Bored wells	163	135	Limited further capacity
Grangebellew	Bored wells	23	20	Limited further capacity
Mountain Park	Spring source	51	50	No further capacity
Tinure	Bored well	23	24	Taken in charge by council. Supplied from Collon public water supply.
Sheepgrange	Bored well	56	38	New well and reservoir developed
Killanny Reaghstown	Moynalty Lough	500	400	Serves Monaghan and Louth. Figures reflect services in Louth
Ardaghy	Surface stream	20	20	Disbanded

Policy

- WS 11** To ensure adequacy of public water supplies consistent with sustainability principles and within the limits of cost effectiveness and availability of finance.
- WS 12** To ensure the quality of water supplied complies with *Drinking Water Regulations* and to address issues that impact on same in a prompt and appropriate manner.
- WS 13** To promote and support the development and proper management of Group Water Schemes.
- WS 14** To improve and expand water supplies consistent with the *Louth County Council Assessment of Needs Strategy* and *Water Services Investment Programme*.
- WS 15** To promote the conservation of water through the continuance of our active water conservation programme and the utilisation of best practice in the maintenance and operation distribution networks and development of appropriate public awareness programmes.
- WS 16** To implement a policy of metering all existing and new developments to effectively manage water demand and in the case of non-domestic developments, to facilitate charging for services in accordance with Article 9 of the *EU Water Framework Directive*.
- WS 17** To protect existing surface and groundwater resources and in particular those that supply drinking water or offer the potential to be harnessed for supply of drinking water and to implement measures identified in *Groundwater Source Protection Plan* once finalised.

11.4 Wastewater

Legislation is in place to the effect that the council would be committing an offence were it to grant permissions where the total treatment capacity allocated in any centre is in excess of actual treatment capacity available, unless the council can ensure that facilities can be expanded before loading arises from the new developments. This arises from EPA licensing under Wastewater Discharge Regulations.



Implementation of measures arising from *River Basin Management Plans* will also impact significantly on both existing plants and future plants, including private treatment plants. The requirement to have all water bodies meeting 'good status' by 2015 will be extremely challenging.

Future development will be contingent on provision of adequate wastewater treatment facilities which produce high quality effluent.

Extensions to existing plants and new plants, if permitted, must be commensurate in scale with proposed size and densities of development that can reasonably be permitted in such centres. Development envelopes must in turn be such as to allow the economical provision of collection systems if new centres are to be serviced.

In the case of individual and communal private treatment systems cognisance of impact of discharges on groundwater and surface water must be taken, in particular the magnified impact of concentrations of such units in a locality discharging to aquifers.

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In order to ensure compliance with the Dangerous Substances Directive, significant additional monitoring of discharges from the non-domestic sector will have to be undertaken along with the licensing of discharges.

11.4.1 Capital Investment Programme

In addition to the Water Services Investment Programme funded works, a significant programme is being funded through the council's own resources, augmented by the Serviced Land Initiative funding and private sector participation. Key constraints on developments are the large element of local authority funding required. This is often in excess of 60% in respect of treatment facilities, and environmental constraints which physically limit the size of facility that can be provided and operated at reasonable cost. The latter factor will have a greater impact as the implementation of River Basin plans progress over the course of the Plan. An additional consideration will be that EPA discharge licensing requirements will become clearer during the life of the Plan. This may constrain expansion as considerable resources will have to be diverted to upgrading of existing plants and networks.

Table 11.4: Wastewater Capital Investment Programme

Project	Description	Status
Ardee Sewerage Scheme	• Rehabilitation of existing network • Preliminary design of extensions to network • Expansion of treatment facilities and enhancement of treatment levels	Preliminary stage/EIS
Tallanstown, Collon, Knockbridge, Louth Village Sewerage Schemes	• Expansion of existing wastewater treatment facilities • Enhancement of treatment levels	Construction stage
Drogheda Sewerage Scheme Stage 3	• Upgrading of wastewater treatment plant capacity from 67,000 PE to 101,000 PE • Possible increase in capacity to 125,000 PE through process enhancement • Network study	Completion and contract
Blackrock Sewerage and South and East Drainage	• Rehabilitation of existing network • Preliminary design of extensions to network in Blackrock • Provision of pump station and associated network in area to west of Dublin Road. • Examination of treatment options	Preliminary design construction
Castlebellingham sewerage	• Provision of separate surface water drainage • Upgrading of treatment facilities	Design
Clogherhead Sewerage	• Upgrading of storm overflow facilities • Upgrading of treatment facilities	Feasibility study
Omeath Sewerage	• Provision of treatment	Feasibility study
North Drogheda Environs	• Provision of trunk sewer	Contract documentation

11.4.2 Wastewater Schemes: Current Status

The council directly operates fourteen public sewerage schemes. The Dundalk and Drogheda schemes are operated under an operation and maintenance contract by a contractor. Secondary treatment is provided at all schemes save Omeath and Greenore where sewage is discharged untreated. Table 11.5 outlines loads on schemes as estimated in early 2008, the total load committed including existing planning permissions, the current capacity of plants where applicable, and proposed capacity where plant is likely to be extended within life of the Plan. A comment is

appended as to feasibility of further expansion and constraints that have been identified.

Table 11.5: Wastewater Schemes: Current Status

	Current Pop. served (PE)*	Total Load Committed (PE)	Current Capacity (PE)	Proposed Capacity (PE)	Comments
Annagassan	328	412	500	500	Potential exists to expand capacity subject to additional land being acquired. Designation of Dundalk Bay may impact as discharges are to Dee/Glyde transition waters.
Carlingford	1724	1990	1500	1500	Design capacity allocated
Castlebellingham /Kilsaran	1603	1603	1700	Up to 3000	Constrained by potential water abstraction which may be located downstream and limited dilution
Clogherhead	1805	1838	2000	2200	Significant seasonal loading. Process improvements may increase capacity to 2200.
Collon	1113	1360	500	1200	Plant expansion under construction Completion due in 2009. Commercial load may be overestimated.
Dromiskin	1253	1471	1200	3000	Plant will require upgrade during life of the Plan.
Knockbridge	654	959	500	1000	Plant expansion under construction. Completion due in 2009
Louth Village	749	821	700	1000	Plant expansion under construction. Completion due in 2009.
Omeath	1063	1231	0		No treatment at present.
Greenore	200				No treatment at present
Tallanstown	862	974	400	1000	Plant expansion under construction. Completion due in 2009
Baltray/ Termonfeckin	1734	2241	-	-	Sewage pumped to Drogheda
Tinure	504	504	500	-	Plant will require upgrade during life of the Plan
Tullyallen	1251	1259	1500	-	Upgraded in 2005

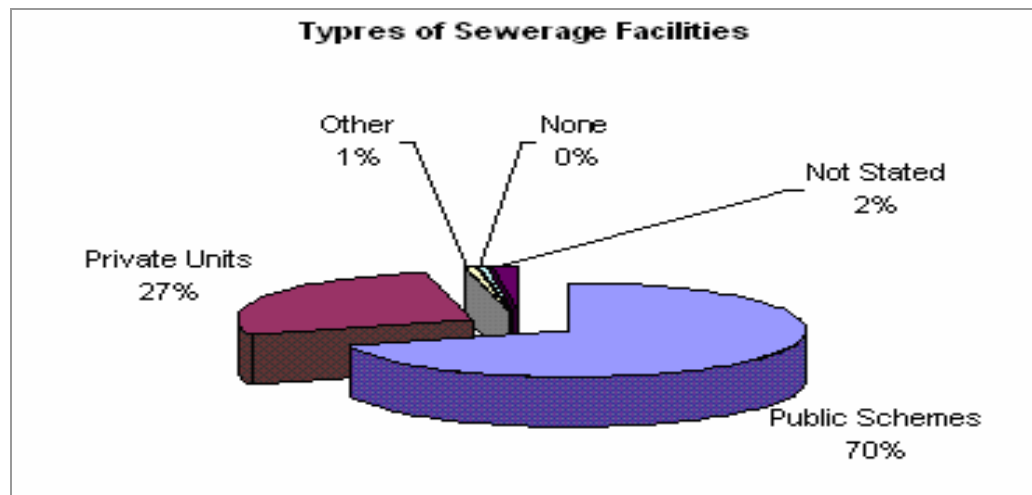
**PE Population equivalent*

11.4.3 Private Wastewater Treatment Systems

A significant number of houses are catered for by individual on site treatment plants. The requirements relating to the siting and operation of these individual waste water treatment systems are dealt with in chapter 10, Environment. A limited number of non domestic developments are also serviced by private treatment plants.

Figure 11.2 details types of sewerage facilities in the county. The majority of the facilities, some 70% are public schemes.

Figure 11.2: Types of Sewerage Facilities



Policy

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| WS 18 | To ensure that all Category I and II Settlements have adequate wastewater facilities with adequate capacity to cater for existing loadings and projected sustainable growth taking due cognisance of environmental, financial and value for money considerations. |
| WS 19 | To adopt an incremental approach to provision of additional treatment capacity. This shall relate both to the scale of existing developments, and appropriate growth at these locations. Availability of services shall not be a precursor to large scale growth in inappropriate locations. |
| WS 20 | To ensure that the siting and operation of all treatment plants and systems have regard to the impact on quality of receiving groundwater and surface waters. |
| WS 21 | To extend the licensing of all discharges to sewers. This will apply to all discharges in excess of 5 m ³ per day or where the discharge warrants same due to specific characteristics. |
| WS 22 | To minimise the impact of storm overflows on receiving water quality through implementation of programmed upgrade of units and networks. |
| WS 23 | To prohibit the use of pump stations for conveyance of sewage unless the proposed pump station will cater for a significant catchment of zoned development lands that otherwise cannot be drained. Where deemed appropriate by the council, temporary pumping arrangements may be considered as an interim measure, pending the provision of more permanent arrangements within a reasonable timeframe. In such |

WS 24

instances the full cost of providing operating and decommissioning interim arrangements shall be paid in advance by developer along with normal development levies.

To ensure that all developments will have regard for policies expressed in the *Greater Dublin Strategic Drainage Study* with particular reference to:

- a) Infiltration and exfiltration
- b) Climate Change
- c) Basements
- d) New developments
- e) Environment
- f) Surface water

11.5 Water Conservation

The National Water Conservation Programme states that local authorities should actively assess its needs for water conservation on a countywide basis. To obtain the optimum value from investment in water conservation, Louth Local Authorities Water Conservation and Network Management Project is implementing a three phase programme. Nationally, some 50% of treated water is unaccounted for. It is a target to reduce this to between 20% and 30%. Phase 1 of the project established ninety district metered areas (DMA). The establishment of these district areas included the installation of bulk flow meters and loggers to record flow and pressure into the water schemes throughout the county. By understanding the input flow, population, number of houses and the non domestic metered usage in an area, the volume of unaccounted water can be calculated. Unaccounted water usage arise from leakage and irresponsible usage and wastage.

Phase 2 of the project which is currently underway addresses active leakage detection and leak repair in each of the DMA. To date this has resulted in the saving of some six million litres of water daily, equivalent to almost 13% of water production between 2006 and end of 2008. Phase 3 comprises the targeted rehabilitation of mains and refurbishment of networks which are in poor condition. These works will be ongoing over the period of the Plan. In addition this project will initiate an education programme on the value and need for water conservation and sustainable water supply development including water harvesting.

Future developments should have regard to the need to conserve water and as a means of addressing this may include the following measures:

- Sensor taps
- Pressure and flow regulations on fittings
- Appropriately sized meters
- Prohibition on direct feeds to heating and appliances
- Low flush toilets
- Rainwater harvesting and reuse
- Installation of meters to non domestic premises



- Installation of meters to housing developments
- Replacement of old boundary boxes/stop cocks
- Programme for replacement combined connections

Policy

WS 25 To implement the *Water Conservation Programme* in order to conserve valuable resources by reducing wastage, in both distribution systems and on individual consumer connections.

WS 26 To promote public awareness and involvement in water conservation measures by households, businesses and industries.

11.6 Surface Water Drainage and Flooding

11.6.1 Surface Water Drainage

As new developments are constructed less rainfall is absorbed into the ground and an increased volume of water (up to 10-15 times pre-development volumes) runs to drains at increased rates of flow. This has the potential to cause localised flooding in streams and piped drains, as well as bringing surface contaminants such as dog waste, and spillages directly into watercourses, causing pollution. Thus new developments can lead to flooding problems for existing upstream and downstream developments as well as impacting on overall water quality, particularly in respect of dangerous substance contamination, habitat deterioration and deterioration of river and stream channels. Furthermore, a number of Louth's existing collection networks are partially combined and are operating near or at capacity.

Policy

WS 27 To ensure that the incorporation of Sustainable Urban Drainage Systems measures in all settlements is mandatory. An integrated approach to drainage will be adopted and all development proposals shall be accompanied by a comprehensive SUDS assessment which will address runoff quantity, runoff quality and impacts on habitat and water quality. Best practice guidance is available from the *Greater Dublin Strategic Drainage Study* surface water issues and submissions will be required to meet with design criteria (adjusted to reflect local conditions) and material designs therein.

WS 28 To prevent excessive discharges of untreated sewage from overflows and to maximize the utility of piped services, new developments shall preferentially provide or connect to separate surface water drainage systems.

WS 29 To ensure that all discharges shall be attenuated to green field levels whereby both flow rate and volume of discharge of runoff from developments shall mimic in so far as possible pre development levels.

WS 30 To ensure that when developers are master planning areas within and adjacent to settlements that sustainable drainage will be adequately addressed. Master plans will identify appropriate aerial features for example ponds and basins based within the overall plan area that can provide both amenity and surface water management facilities for the full area rather than a large collection of small development based units.

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| WS 31 | To ensure that all new developments shall incorporate appropriate measures to protect and treat runoff. In particular discharges from car parks shall be appropriately treated so as to remove pollutant materials. |
| WS 32 | To ensure that all new developments shall be provided with separated drainage systems. |

11.6.2 Flooding

Climate change coupled with changes in river catchments will significantly impact upon flooding during the course of the Plan and beyond. Both urbanisation and changes in agricultural activities can significantly modify flows in streams, rivers drains and piped conduits. Climate change will impact significantly on peak river flows and tide levels.

Significant tracts of coastal lands in Louth are considered to be at risk from flooding as are areas adjacent to rivers and streams. Some areas located upstream of constrained open channels where streams have been culverted or outfalls tide locked, may be at risk of flooding and further development of these areas also may pose a significant risk to downstream lands. Constriction of flows arising from new developments, may pose risk to upstream developments.

11.6.3 Sequential Approach to Flood Risk

In light of the very substantial areas of lands not at risk of flooding within the county the council will adopt the view that development on lands which might be at risk of flooding or cause flood risk to other lands is unnecessary and not only puts life and property at risk, but also imposes an ongoing cost associated with maintenance of flood defence works that might otherwise not be required. As such, the sequential approach will be applied in assessing applications to be considered for development in respect of flood risk. Thus developments will not be considered on lands at risk of flooding or with potential to cause flooding if other lands are available in the general area that could accommodate the development and that are considered to be at a lower risk of flooding or causing flooding.

Exceptions will be made in regards appropriate developments, which are not sensitive to the effects of flooding. Examples might include sports pitches, parks, extensions and warehousing designed to be flood resistant. Such developments may be appropriate provided that they do not reduce the floodplain area nor have potential to otherwise restrict flow or lead to of pollution of water, and that the development is appropriately protected.

Detailed mapping of all flood risk areas will become available during the course of the Plan. In the interim, the council will take cognisance of historic flood data, Office of Public Works data, Department of Marine, Natural and Communication Resources data and local knowledge, in determining areas that may be at risk and will apply precautionary approach in doing so.

Of particular importance in managing both surface water and flooding is the retention of natural morphological features that attenuate flows. As such the council will strongly resist the infilling of areas such as wetlands and natural hollows. that have a detrimental effect on flooding.

Policy

- WS 33** To assess planning applications for development in accordance with the provisions of *The Planning System and Flood Risk Management Guidelines*. Applications will be assessed in the context of Louth County Council's and the Office of Public Works (OPW) strategic flood risk assessment. The sequential approach detailed in the guidelines will be applied to all development and, if deemed necessary, the justification test required by the guidelines will also be applied with respect to any proposed development.
- WS 34** To minimise the impact of developments on watercourses by requiring flood impact assessments to be undertaken where appropriate and to ensure that these assessments be carried out by competent persons and development proposals in flood risk areas shall be accompanied by a certificate from a competent person confirming that development will not impact on flooding.
- WS 35** To ensure that within the period of the Plan indicative flood risk mapping for the county shall be made available for the purposes of land use planning
- WS 36** To establish where feasible riparian corridors* free from development along all significant water courses and to retain an adequate corridor along all open water courses consistent with habitat protection, maintenance access requirements and flood alleviation requirements.
- WS 37** To retain and protect existing morphological features including wetlands, bogs, natural hollows, drains and streams which contribute to the attenuation of surface water runoff.
- WS 38** To ensure that permeable materials be utilised for paved surfaces where appropriate in all new developments.
- WS 39** To maintain a presumption against culverting of rivers, streams and drains. Where culverting is permitted the minimum size of culvert shall be 900mm, with adequate access and suitable headwalls and screening.
- WS 40** To require sediment and pollution control plans to be implemented in conjunction with any development works.

*** Riparian Corridors**

A riparian corridor is the land directly adjacent to or surrounding a natural or artificial waterway, including:

- *Major and secondary rivers*
- *Intermittent, or permanent creeks and streams*
- *Gullies and drainage lines where surface water collects*
- *Wetlands*
- *Lakes*

Riparian land extends from the edge of the waterway onto adjacent terrestrial land. The width of a riparian zone may range from very narrow through to a wide, densely vegetated corridor. The width is dependent on location within the catchment (valley or floodplain) and the adjacent land use (agriculture, forestry, park or urban development). Riparian corridors provide a crucial link between terrestrial and stream ecosystems and form a unique and distinct unit within the surrounding landscape. A healthy riparian corridor usually has a diverse range of plant species.

