

WWTW Discharges and the EC Urban Waste Water Treatment Directive

The EC Urban Waste Water Treatment Directive (UWWTD, 91/271/EEC) sets down minimum standards for the discharge of treated effluent from waste water treatment works (WWTWs). The Directive was transposed into legislation in Northern Ireland in March 1995 by the Urban Waste Water Treatment Regulations (NI) 1995, which are implemented and regulated by EHS. The Regulations have already led to the cessation of the disposal of sewage sludge to sea from 1 January 1999.

The Regulations require that all significant discharges of sewage be treated whether the discharge is to inland surface waters, groundwater, estuaries or coastal waters. Significant discharges are those to freshwaters or to estuaries serving communities with a population equivalent (PE) of more than 2000 and coastal waters serving communities of more than 10,000 PE. The standards to be met depend on the size of population served and whether the receiving waters are classified as normal, sensitive or less sensitive. There are no longer any waters classified as less sensitive in Northern Ireland. The 'normal' classification is an assumed class to describe those waters that are not classified as sensitive or less sensitive. The treatment considered appropriate for freshwaters, estuaries and coastal waters where the PE is greater than 10,000 is secondary (biological), as specified in the Directive.

WWTW discharges to waters classified as 'normal' must have in place secondary treatment by 31st December 2000 for discharges greater than 15,000 PE for all receiving waters. Such works have therefore to meet the requirements of the Directive by 1st January 2001. Discharges to inland and estuarine waters of between 2000 and 15,000 PE and those between 10,000 and 15,000 PE to coastal waters must receive secondary treatment by 31st December 2005. All WWTW discharges less than 2000 PE must receive 'appropriate treatment' by the end of 2005, as must discharges with PE between 2,000 and 10,000 to coastal waters.

Waste Water Treatment Works

In Northern Ireland all WWTWs with PE's greater than 2000 discharging to freshwaters already have secondary treatment, although some older ones will require upgrading. Considerable investment has been and will be required for some coastal and estuarine discharges.

In 1995 the Department identified the Lough Erne and Lough Neagh catchments as sensitive to eutrophication under the UWWTD. As a result, nutrient removal (specifically phosphorus) in addition to secondary treatment (Table 2) was required at the 15 WWTWs serving PEs greater than 10,000 in these catchments by the end of 1998 (Table 1). The Department has recently (January 2002) designated Inner Belfast Lough, the Tidal Lagan and the Quoile Pondage as sensitive in relation to nitrogen. Nitrogen removal has

already been incorporated into the design of the two major WWTWs which serve the Greater Belfast area.

Table 1: WWTWs discharging into sensitive areas where UWWTD Standards applied from 1st January 1999.

WWTW	
Antrim	Enniskillen
Armagh	Lisnaskea
Ballyclare	Magherafelt
Ballymena	Moygashel
Ballynacor	Seagoe
Banbridge	Tandragee
Bullay's Hill	Tullaghgarley
Cookstown	

Table 2: Standard Applying to WWTWs PE>10,000 to Sensitive Areas

PARAMETER	95 PERCENTILE LIMIT	AVERAGE LIMIT	UPPER TIER LIMIT	MIN. % REDn.
Biochemical Oxygen Demand	25 mg/l O ₂		50 mg/l O ₂	70 %
Chemical Oxygen Demand	125 mg/l O ₂		250 mg/l O ₂	75%
Total Phosphorus		2 mg/l P		80 %

Compliance with the UWWTD Standards

Compliance with the requirements of the UWWT Regulations is assessed by EHS based on monitoring data supplied by Water Service according to a sample programme agreed with EHS before the compliance year commences. Details of the sampling requirements, analysis procedures, analytical quality control criteria and compliance assessment are set out in the guideline notes to the UWWT Regulations published by EHS. They can be summarised as follows.

The UWWT Regulations require that compliance is assessed using 24-hour composite samples. This requires that a representative sample of the discharge is taken every hour over a 24-hour period. The individual hourly samples are then combined to create the 24-hour composite sample. The number of samples to be provided are stipulated in the Regulations and depends upon the population served by the works. For works of less than 50,000 PE, assessment is made on 12 samples per year while 24 samples

are required for larger PEs. Where percentage reduction is to be assessed influent and effluent samples must be provided.

The UWWTD sets 95%-ile standards and upper-tier standards for BOD and COD (chemical oxygen demand) and these are set out in the Regulations. The 95%-ile standard applied may be a numerical limit (i.e. 25 mg/l O₂ BOD) or a minimum percentage reduction figure (i.e. the BOD of the effluent must be at least 70 % less than the BOD of the influent). When determining compliance under the UWWT Regulations, compliance with the percentage reduction criteria is assessed in the first instance. Only when the sample results exceed the percentage reduction standard or it cannot be determined due to lack of influent data, is compliance assessed against the 95%-ile limit value and the upper tier standard. In assessing compliance each parameter is assessed separately and the overall compliance is based on the parameter giving the worst performance.

For a works to fail the UWWTD standards it must:

1. Fail to comply with the upper tier standard and the percentage reduction standard for the same sample, for BOD or COD at least once in the year. (If percentage reduction cannot be assessed then failure is by exceedence of the upper tier alone);

or

2. Exceed the 95%ile limit standard and the percentage reduction standard in the same sample for BOD or COD on more than the permitted number occasions in the year. (more than twice for 12 samples and more than three times for 24 samples);

or

3. Fail to meet the annual average total phosphorus / nitrogen standard and the annual average percentage reduction (where nutrient standards are applicable).

UWWT Regulation performance for 1999 to 2000

Compliance for the period 1 January 1999 to 31 December 2000 has been assessed for the 15 works that discharge to sensitive waterways and are required to provide nutrient reduction.

Table 3 summarises the works that have complied during 1999 and 2000.

Table 3: List of Compliant UWWTD Works

UWWTD Compliant Works	
1999	2000
Seagoe Antrim Moygashel Magherafelt Tullagherley Bullay's Hill Ballymena Tandragee	Seagoe Antrim Moygashel Magherafelt Tullagherley Enniskillen Banbridge Armagh

For both years there is a 53% compliance rate and although there is some variation in the actual works that fail, Ballyclare, Cookstown, Ballynacor and Lisnaskea have been non-compliant in both years.

The monitoring results have been submitted to DEFRA in London for onward submission to the EC.