



# **Western River Basin District Measures and Standards**

## **Unsewered Wastewater Treatment Systems**

### **National Identification and Mapping of Sewered and Unsewered Areas**

**September 2008**

This is a report on the national identification and mapping of on-site Wastewater Treatment Systems (OSWTS) as part of the Western River Basin District Water Framework Directive Project. It documents the approach, data and information collected mapped over the course of the project. The Report has been developed in consultation with the Local Authorities and the Western River Basin District OSWTS Steering Group.

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## **1. BACKGROUND**

### **1.1 Development of Measures and Standards for On-Site Wastewater Treatment Systems – identification of National sewered areas.**

1.1.1 This is a data collection project in support of the Programme of Measures and Standards (POMS) for Onsite Wastewater Treatment Systems (OSWTS) under the Water Framework Directive (2000/60/EC). By definition these systems are not connected to a sewer system but treat wastewater using a septic tank and percolation or other proprietary wastewater treatment systems for single houses. It is concentrated on identifying and geo locating all sewered areas within the country thereby allowing the identification of unsewered properties served by OSWTS. These will be identified using the “An Post Geo-Directory”. A database of sewered areas with population equivalent (p.e.) greater than 2000 is already available through the National Urban Wastewater Study This data collection project will provide a database for sewered areas of less than 2000 p.e. and is being developed in conjunction with the local authorities in the country.

1.1.2 This data collection project forms part of the overall development of POMS for OSWTS to ensure water bodies comply with the Water Framework Directive status requirements. The database developed allows the identification of the magnitude and location of the pressure from onsite systems. This will be coupled with pathway susceptibility and receptor data to identify water bodies at risk of not achieving their status from on site wastewater systems pressure and also the measures required to mitigate the pressure.

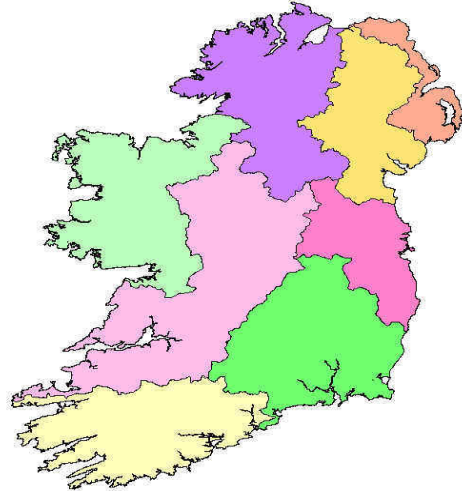
### **1.2 Water Framework Directive**

1.2.1 The WFD was agreed in September of 2000 introduced as part of the extensive restructuring of the EU Water Policy and Legislation. It was enacted through Irish legislation in December 2003. The Directive is being implemented by the local authorities in Ireland supported by river Basin District Projects which form the key Water Management Structure.

1.2.2 There are eight river basin districts in Ireland (see map below). Four of the RBDs are entirely within the republic, (Western, Southwest, Southeast and Eastern), three are International RBD's, (Northwest, Neagh-Bann and the Shannon, the latter by virtue of a small area which extends cross border), and one is entirely within Northern Ireland (North East).

### 1.2.3 The RBDs are outlined as follows:

- South Eastern RBD
- Shannon IRBD
- Western RBD
- Eastern RBD
- South Western RBD
- North Western IRBD
- Neagh Bann IRBD
- North-Eastern RBD



1.2.4 The implementation of the WFD is being undertaken using a Water Management Structure, in the form of separate River Basin Management Projects set up to support the implementation by the local authorities. The Department of the Environment, Heritage and Local Government promoted the establishment of these projects by the Local Authorities to address issues such as those related to inland and coastal waters.

*“The overall objective of river basin projects is to establish an integrated monitoring and management system for all waters within a RBD, to develop a dynamic programme of management measures and to produce a River Basin Management Plan, which will be continually updated. Plans must be presented to the public for consultation. To facilitate the implementation of the EU WFD The Department of the Environment, Heritage and Local Government is promoting the establishment by Local Authorities of river basin management projects for River Basin Districts in relation to all inland and coastal waters that will facilitate participation by all stakeholders, and lead to the identification and implementation of effective measures for improved water management. The overall objective of these projects is to develop a River Basin Management System, including a programme of measures designed to maintain and/or achieve at least good water status for all waters and to facilitate the preparations of River Basin Management Plans”.*

Extract taken from the WFD Ireland Website

## 1.3 Characterisation Report

1.3.1 Characterisation Reports were prepared for all River Basin Districts in line with the Water Framework Directive requirements. All potential sources of

pollution were reviewed during the initial stages of the river basin district characterisation report. The pollution in our rivers and streams comes from two sources, diffuse and point sources. Diffuse pollution is generally related to the loss of nutrients (such as Phosphorus and Nitrogen) and pesticides etc from agricultural land, whereas point sources originate from a single point.

1.3.2 An analysis of the pressures and impacts that human activities exert on water bodies was undertaken in the Characterisation Report. The purpose of the analysis is to identify water bodies at risk of failing the objectives of the directive. The pressures and impacts analysis is referred to as a risk analysis. The risk relates to the probability of a water body failing to achieve good status or suffering decline in water quality status. Four categories have been adopted to describe the water body's degree of risk, outlined as follows:

- 1a Water bodies at significant risk
- 1b Water bodies probably at significant risk
- 2a Water bodies probably not at significant risk
- 2b Water bodies not at significant risk

1.3.3 There are a large number of septic tanks located throughout the country for which there is a lack of detailed information with regard to their location and capacity (over 420,000 according to CSO 2006). Septic tanks and package treatment systems which are not correctly located, constructed, operated or maintained can result in public health and environmental problems.

1.3.4 Although a risk assessment was undertaken for the potential risk posed by OSWTS this was felt to be of low confidence due to the lack of data relating to locations of such systems, density, pathway factors and receptor sensitivity within water bodies. To adequately address the risk posed by OSWTS more comprehensive data needed to be obtained. In particular a Pressure layer of unsewered properties needed to be developed for GIS use and this is the focus of this sub project.

1.3.5 There is also an absence of information in respect of all sewered areas within the country with only limited data relating to towns with a Population Equivalent (PE) below 2000PE in relation to the extent of their sewer networks and also the level of wastewater treatment being provided.

## **2. GENERAL APPROACH AND METHODOLOGY**

### **2.1 Methodology**

2.1.1 The primary objective of the data collection project is to identify all sewered areas in the country and develop a GIS based database of information which could then be used to further identify unsewered areas and develop a pressure map of unsewered properties. Data in relation to large scale wastewater treatment plants and collection networks have been collected as part of the National Urban Wastewater study of 2000 published by DoEHLG. The Wastewater facilities of smaller towns and villages (below 2,000 PE) were not covered in the National Urban Wastewater study. The catchment area served by sewers of these small towns and villages were identified as part of this project.

2.1.2 The “An Post Geo-Directory” is a National Database prepared by “An Post” detailing all properties in terms of location, postal address and premise type (on a county by county basis). The Directory is available to the Local Authorities and it is updated on a quarterly basis to include all new postal addresses. Properties falling outside the sewered areas are assumed to be on onsite wastewater treatment systems

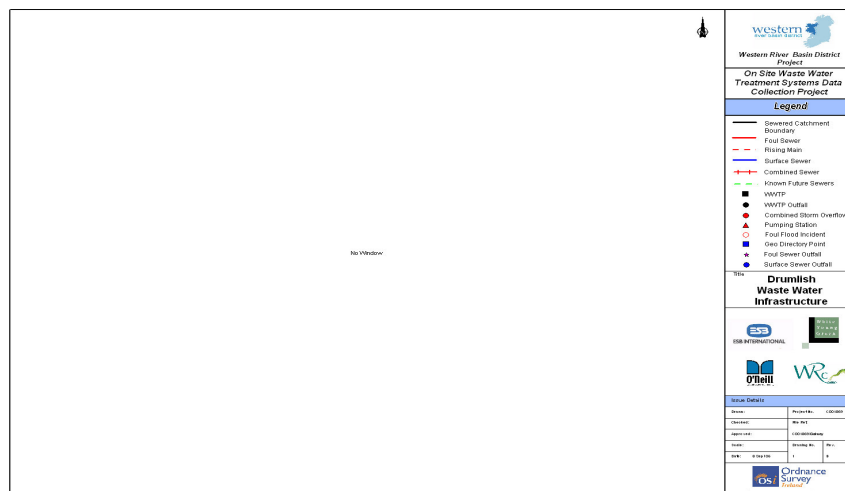
2.1.3 In addition to the identification of individual village sewer catchment boundaries other information was also captured in GIS format relating to rising mains, pump stations, treatment plants, the type of treatment process involved and the location of treated effluent outfalls. Details regarding storm sewers/combined sewers were also gathered where available and are included in the database

### **2.2 The Data Collection Activities**

2.2.1 An Introductory letter was sent to the Senior Engineer of each Local Authority and copied to the Director of Services. The Letter introduced the project and outlined an initial list of the towns and villages located within their County borders likely to be serviced by a sewer network (An example of the introductory letter can be found in Appendix A). The initial list of towns and villages for a given county were obtained from the “An Post” GIS database using post office locations (An example of An Post, post office locations can be found in Appendix B). In the latter stages of the project, it was noted that the data collection process was more efficient when the project was discussed over the telephone prior to emailing the “initial meeting letter”, the questionnaire and an example of a completed drawing.



- 2.2.2 An initial meeting was arranged with the Local Authority's Water Services Senior Engineer or delegated person(s) following issue of the letter and contact by telephone. At this meeting, the scope of the project was outlined in detail and any queries that the local authority may have had were answered. The initial town/village list was also refined to exclude any unsewered towns and also to include other sewered towns that may have been overlooked in the original list (no post offices), based on the Local authority expert knowledge.
- 2.2.3 Maps were produced for the final revised list of towns/villages with each town/village being mapped onto a workspace using vector tile data (An example of map workspace template can be found in Appendix C). Each map was produced using an appropriate scale, showing the road network where possible. Vector 2500 and Vector 5000 scales were used. It is noted that An Post Geo-Directory is a regularly updated national information database and new housing developments or clusters can be incorporated in the workspace as necessary.
- 2.2.4 The legend used for the maps comprised of the relevant fields as shown in the town/village workspace template (see below). The template also contains the OSI copyright/license number and the Ordnance Survey Ireland, ESB International, White Young Green, O'Neill Ground Water Engineering and WRC logos.



- 2.2.5 Maps for each of the towns/villages identified as being sewered along with a cover letter was issued to the Local Authorities Water Services Sections. The map package comprised of individual village maps and questionnaires including a list of all the towns and village mapped for that county.

- 2.2.6 Within two weeks of issuing the map package the county councils were again contacted to arrange for a second meeting. The second meeting allowed for the collection and review of the updated maps and questionnaire. Each Individual Map and questionnaire was checked at the meeting to ensure that they have been completed satisfactorily.
- 2.2.7 The hand-marked maps collected from the local authority were updated electronically and map drawings were raised to the next revision number. In the case where the data had been received by post the electronically marked up maps were sent back to the Local Authority for confirmation of the accuracy of the information displayed.

### **3. DATA ON SEWERED AREAS**

#### **3.1 Description of Datasets**

3.1.1 During the project information was gathered in relation to each of the sewered catchments, by means of the questionnaire attached to each map. The information was organised into twelve different data sets each corresponding with a heading on the drawing template as follows:

1. Catchment Boundary
2. Combined Sewer
3. Combined Storm Overflow
4. Foul Flood Incident
5. Foul Sewer Outfall
6. Known Future Sewers
7. Pumping Station
8. Sewer Network
9. Surface Sewer
10. Surface Sewer Outfall
11. WWTP
12. WWTP Outfall

3.1.2 The data sets are stored in two separate formats; 1. A graphical representation of the data (i.e. what is seen on the drawing) and 2. A database table, where all the information gathered from the questionnaire is stored. Information which is graphically represented on the completed maps has a corresponding field in the database table containing relevant information.

3.1.3 Each field in the data set has been given its own unique identifier or Catchment Area Ref. which is a specific reference identifier unique to that town. It was agreed that the county name should be incorporated within this identifier along with a numbering system e.g. Clare001 & Kilkenny005.

#### **3.2 Comments**

3.2.1 In some cases the Local Authorities had difficulty in providing information on smaller sewered areas but overall the level of cooperation was satisfactory allowing for the collection of detailed and accurate information.

3.2.2 Where direct information could not be obtained within the time scale of the project for some local authority areas, an estimate was made as to the identity and extent of the sewered areas. Estimates were made for the sewered areas of County Meath, North Cork and Wicklow. This was

undertaken by carrying out a review of ordnance maps, the water services investment programme and other relevant reports. Villages identified as having sewer networks were examined in further detail and an estimate as to the extents of the sewer networks was made, with maps and database information being completed.

## **4. OVERALL PROJECT OUTPUTS**

### **4.1 Data on Sewered Areas**

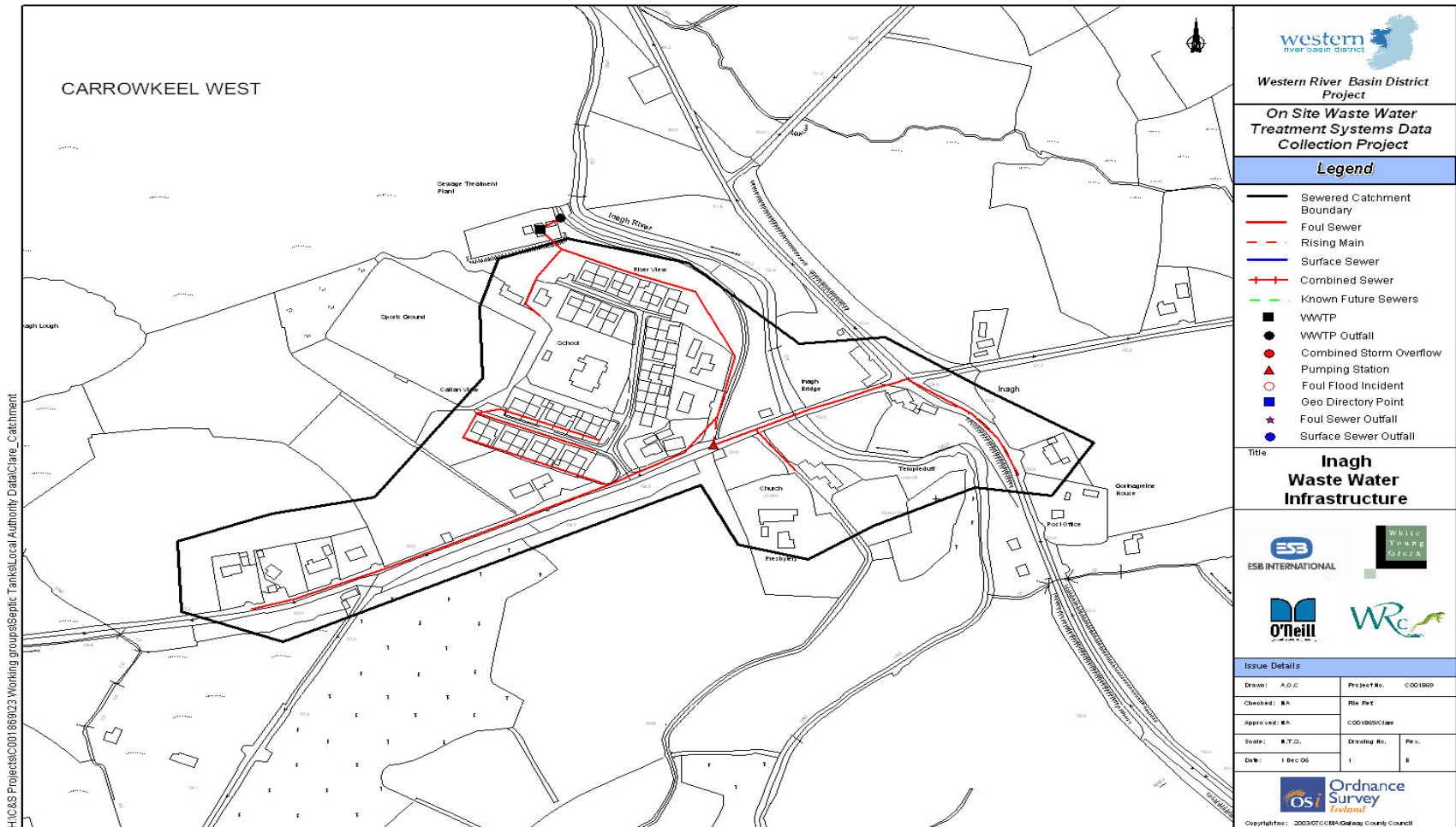
- 4.1.1 The information was collated in a data set and grouped in alphabetical order with a unique identifier for each town, on a county by county basis. An example of a Sewer Network table and Catchment Boundary Drawing are shown below. It is noted that the unique town identifier is contained in the Catchment Area Ref. and that additional information gathered from the questionnaire is contained within "Comments" table.

Client: ESBI  
 Project: On-Site Wastewater Treatment Systems  
 Title: National Identification and mapping of Sewered and Unsewered Areas

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**Table 1: Sewer Network Table**

County	Catchment Name	Catchment Area Ref.	Sewer Function	Sewer Transit	Data Source	Audit Name	Audit date	Comments
Clare	Doonbeg	Clare010	Foul Sewer	Gravity	Clare County Council	Andrew O'Connell	23/11/2006	Pipe Diameter upstream of WWTP 150mm
Clare	Doonbeg	Clare010	Foul Sewer	Rising Main	Clare County Council	Andrew O'Connell	23/11/2006	
Clare	Flagmount	Clare011	Foul Sewer	Gravity	Clare County Council	Andrew O'Connell	23/11/2006	
Clare	Inagh	Clare012	Foul Sewer	Rising Main	Clare County Council	Andrew O'Connell	23/11/2006	
Clare	Inagh	Clare012	Foul Sewer	Gravity	Clare County Council	Andrew O'Connell	23/11/2006	Pipe Diameter upstream of WWTP 225mm
Clare	Kildysert	Clare013	Foul Sewer	Gravity	Clare County Council	Andrew O'Connell	23/11/2006	Pipe Diameter upstream of WWTP 150mm at 1:282
Clare	Kilfenora	Clare014	Foul Sewer	Gravity	Clare County Council	Andrew O'Connell	23/11/2006	Pipe Diameter upstream of WWTP 125mm at 1:47



## **5. RECOMMENDATIONS**

5.1.1 The following recommendations are made with respect to the identification and mapping of seweraged and unsewered areas:

- The accuracy of the estimated areas of county Meath, North Cork and Wicklow be reviewed with the Local Authorities to finalise mapped areas and database information.
- There are a number of villages, where little information was established regarding their WWTP's. It is recommended that further information be sought to eliminate these information gaps.
- That further survey work be carried out to characterise the age, condition and nature of the on-site wastewater treatment systems identified.
- That the information collated in this survey be maintained by revision and updating as changes in the sewer networks and WWTP'S occur.



## 6. FINDINGS

6.1.1 A wide range of data was collected during the course of the project and is summarised below:

- Catchment Boundary: 687 sewered catchments identified with a total area of 24,855 hectares (excluding catchment areas in excess of 2,000 p.e.).
- Combined Sewer: 72 combined sewer networks identified.
- Combined Storm Overflow: 16 CSO's identified.
- Foul Sewer Outfall: 23 untreated foul sewer outfalls identified.
- Pumping Stations: 165 pumping stations identified.
- Sewer Networks: 473 separate foul sewer networks identified.
- Surface Water Sewers: 108 surface water sewer networks identified.
  
- Surface Water Sewer Outfall: 59 surface water sewer outfalls located.
- WWTP: 381 treatment plants located of which  
231 WWTP's classed as tertiary treatment  
72 septic tanks  
4 holding tanks  
4 tidal tanks  
69 unclassified methods of treatment.
- WWTP Outfall: 274 outfall locations identified.