

This is a draft document and is subject to revision.



Waste Water Discharge Licence Application Form

EPA Ref. N^o:
(Office use only)

Environmental Protection Agency
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Tracking Amendments to Draft Application Form

Version No.	Date	Amendment since previous version	Reason
V. 1.	11/10/07	N/A	
V. 2.	18/10/07	Inclusion of a Note 1 superscript for Orthophosphate in Tables D.1(i)(b) & D.1(ii)(b).	To highlight the requirement for filtered samples in measurement of O-Phosphate for waste water discharges.
V.3.	13/11/07	Amend wording of Section F.2 to include 'abstraction'. Amend wording of Checklist in Annex to reflect wording of Regulation 16(5) of S.I. No. 684 of 2007. Inclusion of unique point code for each point of discharge and storm water overflow.	To accurately reflect the information required To accurately reflect the Regulations and to obtain the application documentation in appropriate format. To aid in cross-referencing of application documentation.
V.4	18/04/08	Inclusion of requirement to provide name of agglomeration to which the application relates. Amend wording of Section B.7. (iii) to reflect the title of Water Services Authority. Addition of new Section B.9 (ii) in order to obtain information on developments yet to contribute to the waste water works. Addition of sub-sections C.1.1 & C.1.2 in order to clarify information required for Storm water overflow and pumping stations within the works. Amend Section D.1 to include a requirement for monitoring data for influent	To accurately determine the agglomeration to be licensed. To accurately reflect the Water Services Act, 2007. To obtain accurate population equivalent figures for the agglomeration. To obtain accurate information on design and spill frequency from these structures. To acquire information on the population loading onto the plant and to provide information on performance rates within

		to waste water treatment plants, where available. Amend wording of Section E.1 to request information on composite sampling/flow monitoring provisions.	the plant. To acquire accurate information on the sampling and monitoring provisions for discharges from the works.
V.5	07/07/2008	Amend wording of B.7 (iii) to include reference to Water Services Authorities. Amend Section G.1 to include Shellfish Waters Directive.	To accurately reflect the Water Services Act, 2007 requirements.
V.6	26/08/2007	Amendments to Section D to reflect new web based reporting. Amended requirements for reporting on discharges under E.1 Waste Water Discharge Frequency and Quantities. Amendment to Section F.1 to specify the type of monitoring and reporting required for the background environment. Removal of Annexes to application form.	To clarify the reporting requirements. To streamline reporting requirements. To clarify the reporting requirements for ambient monitoring. To reflect the new web based reporting requirements.

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Environmental Protection Agency
Application for a Waste Water Discharge Licence
Waste Water Discharge (Authorisation) Regulations 2007.

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ABOUT THIS APPLICATION FORM

This form is for the purpose of making an application for a Waste Water Discharge Licence under the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007) or for the review of an existing Waste Water Discharge licence.

The Application Form **must** be completed in accordance with the instructions and guidance provided in the *Waste Water Discharge Licensing Application Guidance Note*. The Guidance Note gives an overview of Waste Water Licensing, outlines the licence application process (including the number of copies required) and specifies the information to be submitted as part of the application. The Guidance Note and application form are available to download from the Licensing page of the EPA's website at www.epa.ie.

A valid application for a Waste Water Discharge Licence must contain the information prescribed in the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007). Regulation 16 of the Regulations sets out the statutory requirements for information to accompany a licence application. The application form is designed in such a way as to set out these questions in a structured manner and not necessarily in the order presented in the Regulations. In order to ensure a legally valid application in respect of Regulation 16 requirements, please complete the Regulation 16 Checklist provided in Annex 2.

This Application Form does not purport to be and should not be considered a legal interpretation of the provisions and requirements of the Waste Water Discharge (Authorisation) Regulations, 2007. While every effort has been made to ensure the accuracy of the material contained in the Application Form, the EPA assumes no responsibility and gives no guarantee, or warranty concerning the accuracy, completeness or up-to-date nature of the information provided herein and does not accept any liability whatsoever arising from any errors or omissions.

Should there be any contradiction between the information requirements set out in the Application Form and any clarifying explanation contained in the accompanying Guidance Note, then the requirements in this Application Form shall take precedence.

PROCEDURES

The procedure for making and processing of applications for waste water discharge licences, and for the processing of reviews of such licences, appear in the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007) and is summarised below. The application fees that shall accompany an application are listed in the Third Schedule to the Regulations.

Prior to submitting an application the applicant must publish in a newspaper circulating in the area, and erect at the point nearest to the waste water treatment plant concerned or, if no such plant exists, at a location nearest the primary discharge point, a notice of intention to apply. An applicant, not being the local authority in whose functional area the relevant waste water discharge, or discharges, to which the relevant application relates, takes place or is to take place, must also notify the relevant Local Authority, in writing, of their intention to apply.

An application for a licence must be submitted on the appropriate form (available from the Agency) with the correct fee, and should contain relevant supporting documentation as attachments. The application should be based on responses to the form and include supporting written text and the appropriate use of tables and drawings. Where point source emissions occur, a system of unique reference numbers should be used to denote each discharge point. These should be simple, logical, and traceable throughout the application.

The application form is divided into a number of sections of related information. The purpose of these divisions is to facilitate both the applicant and the Agency in the provision of the information and its assessment. **Please adhere to the format as set out in the application form and clearly number each section and associated attachment, if applicable, accordingly.** Attachments should be clearly numbered, titled and paginated and must contain the required information as set out in the application form. Additional attachments may be included to supply any further information supporting the application. Any references made should be supported by a bibliography.

All questions should be answered. Where information is requested in the application form, which is not relevant to the particular application, the words "not applicable" should be clearly written on the form. The abbreviation "N/A" should not be used.

Additional information may need to be submitted beyond that which is explicitly requested on this form. Any references made should be supported by a bibliography. The Agency may request further information if it considers that its provision is material to the assessment of the application. Advice should be sought from the Agency where there is doubt about the type of information required or the level of detail.

Information supplied in this application, including supporting documentation will be put on public display and be open to inspection by any person.

Applicants should be aware that a contravention of the conditions of a waste water discharge licence is an offence under the Waste Water Discharge (Authorisation) Regulations, 2007.

The provision of information in an application for a waste water discharge licence which is false or misleading is an offence under Regulation 35 of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007).

Note: Drawings. The following guidelines are included to assist applicants:

- *All drawings submitted should be titled and dated.*
- *All drawings should have a unique reference number and should be signed by a clearly identifiable person.*
- *All drawings should indicate a scale and the direction of north.*
- *All drawings should, generally, be to a scale of between 1:20 to 1:500, depending upon the degree of detail needed to be shown and the size of the facility. Drawings delineating the boundary can be to a smaller scale of between 1:1000 to 1:10560, but must clearly and accurately present the required level of detail. Drawings showing the waste water treatment plant location, if such a plant exists, can be to a scale of between 1:50 000 to 1:126 720. All drawings should, however, be A3 or less and of an appropriate scale such that they are clearly legible. Provide legends on all drawings and maps as appropriate.*
- *In exceptional circumstances, where A3 is considered inadequate, a larger size may be requested by the Agency.*

It should be noted that it will not be possible to process or determine the application until the required documents have been provided in sufficient detail and to a satisfactory standard.

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SECTION A: NON-TECHNICAL SUMMARY

Advice on completing this section is provided in the accompanying Guidance Note.

A non-technical summary of the application is to be included here. The summary should identify all environmental impacts of significance associated with the discharge of waste water associated with the waste water works. This description should also indicate the hours during which the waste water works is supervised or manned and days per week of this supervision.

The following information must be included in the non-technical summary:

A description of:

- the waste water works and the activities carried out therein,
- the sources of emissions from the waste water works,
- the nature and quantities of foreseeable emissions from the waste water works into the receiving aqueous environment as well as identification of significant effects of the emissions on the environment,
- the proposed technology and other techniques for preventing or, where this is not possible, reducing emissions from the waste water works,
- further measures planned to comply with the general principle of the basic obligations of the operator, i.e., that no significant pollution is caused;
- measures planned to monitor emissions into the environment.

Supporting information should form **Attachment N° A.1**

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SECTION A: NON-TECHNICAL SUMMARY

Dromahane is a village located 5km southeast of Mallow town. The village has developed around a crossroads and has experienced substantial construction and population growth in recent years.

The Waste Water Works and the Activities Carried Out Therein

The wastewater in Dromahane is collected in a partially combined foul and separate foul sewerage drainage network. The wastewater from both the village gravitates to the wastewater treatment plant.

Dromahane WWTP is designed for a Population Equivalent (PE) of 1,000, which was commissioned in 1998. Activated Sludge is the process employed at the Dromahane waste water treatment plant. Influent initially gravitates into a circular GPR inlet sump, from where the effluent is pumped to a steel circular aeration tank. The effluent then flows into the hopper bottomed settling tank. The solids settle while the supernatant flows over the weir and discharges to the river. Sludge may be returned from the settling tank to the aeration tank and excess sludge is removed from the settling tank as required and removed off site for disposal.

In the event of high storm flows effluent may bypass the plant via the baffle plate at the inlet manhole. During normal storm periods, effluent overflows at the sump to the storm holding tank, which gravitates back to the sump after the sump level reduces. In the event of the storm tank fill the screened effluent discharges via the outlet pipe.

Currently the WWTP is receiving flows ranging from 200m³/d to 600m³/d, with an average DWF of 230m³/d entering the plant. Based average hydraulic load of 200l/d/p, the PE equates to 1,150.

Dromahane WWTP is operated by Cork County Council. The plant is operated by a caretaker who duties also involves the maintenance of a number of other small WWTP's in the area. The caretaker is on duty from 8.00am to 5.30pm Monday – Saturday.

The sources of emissions from the waste water works

The pollution load for the Dromahane agglomeration arises from the following areas:

- Domestic population
- Commercial premises
- School & crèches
- Infiltration

The sewerage from all commercial premises is collected via the public sewer and treated in conjunction with the domestic waste at the WWTP.

Currently the WWTP is receiving flows ranging from 200m³/d to 600m³/d, with an average DWF of 230m³/d entering the plant.

The nature and quantities of foreseeable emissions from the waste water works into the receiving aqueous environment as well as identification of significant effects of the emissions on the environment

The final effluent is discharged to the Clyda River, which is adjacent to the wastewater treatment plant site. The maximum flow to the existing WWTP is in the order of 200m³/d to 600m³/d.

The proposed technology and other techniques for preventing or, where this is not possible, reducing emissions from the waste water works

Technology

The WWTP has a sufficient number of standby pumps, automatic sample facilities, etc is provided to ensure continuation of the wastewater treatment.

The treatment works consists of the following elements:

- Inlet Works
- Forward Feed Sump
- Aeration Tank
- Settling Tank
- Storm Tank
- Sludge Holding Tank
- Outfall to Clyda River

Techniques

The new WWTP shall be operated and managed in accordance with the Performance Management System, developed by the Water Service National Training Group (WSMTG).

Further measures planned to comply with the general principle of the basic obligations of the operator, i.e. that no significant pollution is caused

An automatic screen is due to be installed in early 2009, which will cater for 6DWF through the plant. A manual bypass shall also be incorporated into the installation of the screen.

Recently a bored well was drilled to provide a reliable supply of water to the wastewater treatment plant.

The provision of an automatic screen and water supply to the plant shall ensure that the basic obligations of the operator are being adhered to.

Measures planned to monitor emissions into the environment

The Cork County Council Environmental Laboratory carries out sampling of the influent and effluent biannually. Sampling, Monitoring and analysis of the wastewater sludge is also undertaken by the Environmental Laboratory.

The Cork County Council Environmental Department located in Inniscarra takes samples from the River Bride upstream and downstream of the wastewater treatment plant approximately 6 times per year. Samples of the influent and effluent are also taken at these times.

The new wastewater treatment plant shall be equipped with automatic samplers on the inlet, overflow and outlet lines.

The EU Water Framework Directive Monitoring Programme is to be fully operational by the year 2012. This monitoring programme was prepared by the EPA to meet the requirements of the EU Water Framework Directive (2000/60/EC) and National Regulations implementing the Water Framework

Directive (S.I. No. 722 of 2003) and National Regulations implementing the Nitrates Directive (S.I. No. 788 of 2005).

List of Attachments include the following:

- | | |
|-------------------------------|---------------------|
| • Location Map Scale 1:50,000 | Attachment A1 Map 1 |
| • Site Location Map of WWTP | Attachment A1 Map 2 |
| • Site Layout | Attachment A1 Map 3 |

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SECTION B: GENERAL

Advice on completing this section is provided in the accompanying Guidance Note.

B.1 Agglomeration Details

Name of Agglomeration: Dromahane & Environs
--

Applicant's Details

Name and Address for Correspondence

Only application documentation submitted by the applicant and by the nominated person will be deemed to have come from the applicant.

Provide a drawing detailing the agglomeration to which the licence application relates. It should have the boundary of the agglomeration to which the licence application relates clearly marked in red ink.

Name*:	Cork County Council
Address:	Northern Division
	Annabella
	Mallow
	Co. Cork
Tel:	022 21123
Fax:	022 21983
e-mail:	Frank.cronin@corkcoco.ie

*This should be the name of the water services authority in whose ownership or control the waste water works is vested.

*Where an application is being submitted on behalf of more than one water services authority the details provided in Section B.1 shall be that of the lead water services authority.

Name*:	Frank Cronin
Address:	Northern Division
	Annabella
	Mallow
	Co. Cork
Tel:	022 21123
Fax:	022 21983
e-mail:	Frank.cronin@corkcoco.ie

*This should be the name of person nominated by the water services authority for the purposes of the application.

Co-Applicant's Details

Name*:	Not Applicable
Address:	Not Applicable
Tel:	Not Applicable
Fax:	Not Applicable
e-mail:	Not Applicable

*This should be the name of a water services authority, other than the lead authority, where multiple authorities are the subject of a waste water discharge (authorisation) licence application.

Design, Build & Operate Contractor Details

Name*:	Not Applicable
Address:	Not Applicable
Tel:	Not Applicable
Fax:	Not Applicable
e-mail:	Not Applicable

*Where a design, build & operate contract is in place for the waste water works, or any part thereof, the details of the contractor should be provided.

Attachment B.1 should contain appropriately scaled drawings / maps ($\leq A3$) of the agglomeration served by the waste water works showing the boundary clearly marked in red ink. These drawings / maps should also be provided as geo-referenced digital drawing files (e.g., ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. These drawings should be provided to the Agency on a separate CD-Rom containing sections B.2, B.3, B.4, B.5, C.1, D.2, E.3 and F.2.

Attachment included	Yes	No
	√	

B.2 Location of Associated Waste Water Treatment Plant(s)

Give the location of the waste water treatment plant associated with the waste water works, if such a plant or plants exists.

Name*:	Pat Walsh
Address:	Dromahane WWTP
	Dromore
	Mallow
	Co. Cork
Grid ref (6E, 6N)	153724E 096162N
Level of Treatment	Secondary
Primary Telephone:	022-30400
Fax:	022-21983
e-mail:	Pat.walsh@corkcoco.ie

*This should be the name of the person responsible for the supervision of the waste water treatment plant.

Attachment B.2 should contain appropriately scaled drawings / maps ($\leq A3$) of the site boundary and overall site plan, including labelled discharge, monitoring and sampling points. These drawings / maps should also be provided as geo-referenced digital drawing files (e.g., ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. These drawings should be provided to the Agency on a separate CD-Rom containing sections B.1, B.3, B.4, B.5, C.1, D.2, E.3 and F.2.

Attachment included	Yes	No
	√	

B.3 Location of Primary Discharge Point

Give the location of the primary discharge point, as defined in the Waste Water Discharge (Authorisation) Regulation, associated with the waste water works.

Type of Discharge	225mm diameter outfall pipe from wastewater treatment plant. Open pipe
Unique Point Code	SW - 01 DROM
Location	WWTP site Dromore, Dromahane
Grid ref (6E, 6N)	153738E, 096171N

Attachment B.3 should contain appropriately scaled drawings / maps ($\leq A3$) of the discharge point, including labelled monitoring and sampling points associated with the discharge point. These drawings / maps should also be provided as geo-referenced digital drawing files (e.g. ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. This data should be provided to the Agency on a separate CD-Rom containing the drawings and tabular data requested in sections B.1, B.2, B.4, B.5, C.1, D.2, E.3 and F.2.

Attachment included	Yes	No
	√	

B.4 Location of Secondary Discharge Point(s)

Give the location of **all** secondary discharge point(s) associated with the waste water works. Please refer to Guidance Note for information on Secondary discharge points.

Type of Discharge	Not Applicable
Unique Point Code	Not Applicable
Location	Not Applicable
Grid ref (6E, 6N)	Not Applicable

Attachment B.4 should contain appropriately scaled drawings / maps ($\leq A3$) of the discharge point(s), including labelled monitoring and sampling points associated with the discharge point(s). These drawings / maps should also be provided as geo-referenced digital drawing files (e.g. ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. This data should be provided to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.5, C.1, D.2, E.3 and F.2.

Attachment included	Yes	No
		√

B.5 Location of Storm Water Overflow Point(s)

Give the location of **all** storm water overflow point(s) associated with the waste water works.

Type of Discharge	Not Applicable
Unique Point Code	Not Applicable
Location	Not Applicable
Grid ref (6E, 6N)	Not Applicable

Attachment B.5 should contain appropriately scaled drawings / maps ($\leq A3$) of storm water overflow point(s) associated with the waste water works, including labelled monitoring and sampling points associated with the discharge point(s). These drawings / maps should also be provided as geo-referenced digital drawing files (e.g. ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. This data should be provided to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.4, C.1, D.2, E.3 and F.2.

Attachment included	Yes	No
		√

B.6 Planning Authority

Give the name of the planning authority, or authorities, in whose functional area the discharge or discharges take place or are proposed to take place.

Name:	Cork County Council
Address:	Planning Department
	County Hall
	Carriagrohane Road
	Cork
Tel:	021 4276891
Fax:	021 4867007
e-mail:	Planninginfo@corkcoc.ie

Planning Permission relating to the waste water works which is the subject of this application:- (tick as appropriate)

has been obtained		is being processed	
is not yet applied for		is not required	√

Local Authority Planning File Reference N^o:	Not Applicable
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Attachment B.6 should contain **the most recent** planning permission, including a copy of **all** conditions, and where an EIS was required, copies of any such EIS and any certification associated with the EIS, should also be enclosed.

Where planning permission is not required for the development, provide reasons, relevant correspondence, etc.

Attachment included	Yes	No

B.7 Other Authorities

B.7 (i) Shannon Free Airport Development Company (SFADCo.) area

The applicant should tick the appropriate box below to identify whether the discharge or discharges are located within the Shannon Free Airport Development Company (SFADCo.) area.

Attachment B.7(i) should contain details of any or all discharges located within the SFADCo. area.

Within the SFADCo Area	Yes	No
		√

B.7 (ii) Health Services Executive Region

The applicant should indicate the **Health Services Executive Region** where the discharge or discharges are or will be located.

Name:	Health Service Executive
Address:	North Cork Area Headquarters Gouldhill Mallow, Co. Cork
Tel:	022 30200
Fax:	022 30211
e-mail:	Gerry.oconnell.ie

B.7 (iii) Other Relevant Water Services Authorities

Regulation 13 of the Waste Water Discharge (Authorisation) Regulations, 2007 requires all applicants, not being the water services authority in whose functional area the relevant waste water discharge or discharges, to which the relevant application relates, takes place or is to take place, to notify the relevant water services authority of the said application.

Name:	Not Applicable
Address:	Not Applicable
Tel:	Not Applicable
Fax:	Not Applicable
e-mail:	Not Applicable

Relevant Authority Notified	Yes	No
		√

Attachment B.7(iii) should contain a copy of the notice issued to the relevant local authority.

Attachment included	Yes	No
		√

B.8 Notices and Advertisements

Regulations 10 and 11 of the Waste Water Discharge (Authorisation) Regulations, 2007 require all applicants to advertise the application in a newspaper and by way of a site notice. See *Guidance Note*.

Attachment B.8 should contain a copy of the site notice and an appropriately scaled drawing ($\leq A3$) showing its location. **The original application must include the original page of the newspaper in which the advertisement was placed.** The relevant page of the newspaper containing the advertisement should be included with the original and two copies of the application.

Attachment included	Yes	No
	√	

B.9 (i) Population Equivalent of Agglomeration

TABLE B.9.1 POPULATION EQUIVALENT OF AGGLOMERATION

The population equivalent (p.e.) of the agglomeration to be, or being, served by the waste water works should be provided and the period in which the population equivalent data was compiled should be indicated.

Population Equivalent	1,200
Data Compiled (Year)	2008
Method	Hydraulic Flow

B.9 (ii) Pending Development

Where planning permission has been granted for development(s), but development has not been commenced or completed to date, within the boundary of the agglomeration and this development is being, or is to be, served by the waste water works provide the following information;

- information on the calculated population equivalent (p.e.) to be contributed to the waste water works as a result of those planning permissions granted,
- the percentage of the projected p.e. to be contributed by the non-domestic activities, and
- the ability of the waste water works to accommodate this extra hydraulic and organic loading without posing an environmental risk to the receiving water habitat.

The current population equivalent being treated at Dromahane WWTP is 1,150 which based on DWF being measured magnetic meter recording the pumped flow from the plant.

All developments with granted planning permission and all developments under construction have been included in the agglomeration. The additional p.e. due

to the granted planning permissions is estimated at 50. There are currently no planning permissions granted in relation no non domestic activities.

At present Dromahane Wastewater Treatment Plant, is operating at above its design capacity. However laboratory results indicate that the plant is operating without posing additional environmental risk to the receiving habitat.

B.9 (iii) FEES

State the relevant Class of waste water discharge as per Column 1 of the Second Schedule, and the appropriate fee as per Columns 2 or 3 of the Third Schedule of the Waste Water Discharges (Authorisation) Regulations 2007, S.I. No. 684 of 2007.

Class of waste water discharge	Fee (in €)
	€15,000

Appropriate Fee Included	Yes	No
	√	

B.10 Capital Investment Programme

State whether a programme of works has been prioritised for the development of infrastructure to appropriately collect, convey, treat and discharge waste water from the relevant agglomeration. If a programme of works has been prioritised provide details on funding (local or national), allocated to the capital project. Provide details on the extent and type of work to be undertaken and the likely timeframes for this work to be completed.

Upgrade Works

An automatic screen is due to be installed in early 2009, which will cater for 6DWF through the plant. A manual bypass shall also be incorporated into the installation of the screen. This work is being under taken under the Small Schemes Programme.

Recently a bored well was drilled to provide a reliable supply of water to the wastewater treatment plant.

The provision of an automatic screen and water supply to the plant shall ensure that the basic obligations of the operator are being adhered to.

The upgrade works at Dromahane is being funded by Council Finances.

Attachment B.10 should contain the most recent development programme, including a copy of any approved funding for the project and a timeframe for the completion of the necessary works to take place.

Attachment included	Yes	No
		√

B.11 Significant Correspondence

Provide a summary of any correspondence resulting from a Section 63 notice issued by the Agency in relation to the waste water works under the Environmental Protection Agency Acts, 1992 and 2003, as amended by Section 13 of Protection of the Environment Act, 2003.

Attachment B.11 should contain a summary of any relevant correspondence issued in relation to a Section 63 notice.

Attachment included	Yes	No
		√

B.12 Foreshore Act Licences.

Provide a copy of the most recent Foreshore Act licence issued in relation to discharges from the waste water works issued under the Foreshore Act 1933.

Attachment B.12 should contain the most recent licence issued under the Foreshore Act 1933, including a copy of **all** conditions attached to the licence and any monitoring returns for the previous 12 month period, if applicable.

Attachment included	Yes	No
		√

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SECTION C: INFRASTRUCTURE & OPERATION

Advice on completing this section is provided in the accompanying Guidance Note.

C.1 Operational Information Requirements

Provide a description of the plant, process and design capacity for the areas of the waste water works where discharges occur, to include a copy of such plans, drawings or maps, (site plans and location maps, process flow diagrams), and such other particulars, reports and supporting documentation as are necessary to describe all aspects of the area of the waste water works discharging to the aquatic environment. Maps and drawings must be no larger than A3 size.

C.1.1 Storm Water Overflows

For each storm water overflow within the waste water works the following information shall be submitted:

- An assessment to determine compliance with the criteria for storm water overflows, as set out in the DoEHLG *'Procedures and Criteria in Relation to Storm Water Overflows'*, 1995 and any other guidance as may be specified by the Agency, and
- Identify whether any of the storm water overflows are to be decommissioned, and identify a date by which these overflows will cease, if applicable.

C.1.2 Pumping Stations

For each pump station operating within the waste water works, provide details of the following:

- Number of duty and standby pumps at each pump station;
- The measures taken in the event of power failure;
- Details of storage capacity at each pump station;
- Frequency and duration of activation of emergency overflow to receiving waters. Clarify the location where such discharges enter the receiving waters.

General Description of the WWTP

The WWTP at Dromahane is based on the activated sludge process using a Aqua Turbo Floating Aerator. The plant is sized to a 1,000 population equivalent at 3DWF, however the PE that is being catered for is in the order of 1,150.

The treatment works includes the following:

- Inlet Works
- Aeration Tank
- Settlement Tanks
- Sludge Holding Tank
- Flow Measurement & Automatic Sampler
- Outfall to Clyda River

The plant operates as follows:

1. The incoming sewerage gravities from the village agglomeration via a 225mm concrete sewerage network to a manhole at the WWTP site. A high level storm overflow system is located at this manhole. Storm effluent which cannot be catered for by the inlet sump of storm holding tank can overflow the stainless baffle plate at the manhole and discharge via the outlet pipe work.
2. From this manhole the incoming effluent enters the forward feed sump, which consists of 2 Nr Sarlin SB V1 Submersible Pumps. The GRP type Sump is cased in concrete with dimensions of 1,500mm in diameter and 2,650 deep.
3. Storm effluent in excess of 3 DWF overflows the inlet sump into a retro fitted 4,000gallon precast concrete holding tank adjacent to the sump. When the storm abates storm effluent in the tank, returns to the sump via gravity by the flap valve in the inlet sump. In the event of the storm flows exceeding the capacity of the storm holding tank, the effluent overflows via a baffle plate to the outlet pipe.
4. From the inlet sump, the sewerage is forwarded to the Aeration Tank. The over ground Concrete Aeration Tank has dimensions of 10236mm in diameter and 3500mm in height, with a TWL of 2,790mm. The Aeration Tank is equipped with a Aqua Turbo Floating Aerator. The return activated sludge (RAS) is returned via 50mm Sludge Line to the Aeration Tank from the Clarifier. Following aeration the effluent overflows the outlet baffle and gravitates to the Settlement Tank.
5. Effluent arrives via an 2 Nr 150mm diameter pipes to the 3 Nr Hopper Bottomed Steel Settlement Tanks. Each Settlement Tank has dimensions of 3500mm x 3500mm x 3,785mm in height. Within each hopper bottomed settlement tank a TV3 07 Submersible Sludge Pump is fitted. Returned Activated Sludge is pumped back to the Aeration Tank or alternatively Waste Activated Sludge (WAS) is pumped via 50mm pipework to the adjacent Sludge Holding Tank. Following Settlement the effluent overflows the weir and discharges via the Flow Measurement Chamber and Automatic Sampling point to the outlet pipe.
6. The Steel Sludge Holding Tank is 4,200mm in height and 4,268mm in diameter. The Sludge Holding Tank has a capacity for 3 – 4 weeks of sludge storage. Supernatant from the tank is returned via the decant

pipework to the Inlet Sump, while Sludge for removal is decanted via the Bauer Connection at the bottom of the Tank.

7. The treated effluent is discharged to the Clyda River which runs adjacent to the WWTP Site. The effluent is discharged via 225mm concrete pipework.
8. Pump Controls are located in an adjacent kiosk, while a Store House and Sanitary Facilities are provided in a blockwork constructed 3m square house. Recently a bored well was drilled on the WWTP Site to provide water for the cleaning of equipment and for sanitary provision.

Pumping Stations:

All influent to Dromahane WWTP flows by gravity to the site, and therefore there is no Pumping Station in the Dromahane Agglomeration.

Attachment C.1 should contain supporting documentation with regard to the plant and process capacity, systems, storm water overflows, emergency overflows, etc., including flow diagrams of each with any relevant additional information. These drawings / maps should also be provided as geo-referenced digital drawing files (e.g. ESRI Shapefile, MapInfo Tab, AutoCAD or other upon agreement) in Irish National Grid Projection. This data should be provided to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.4, B.5, D.2, E.3 and F.2.

Attachment included	Yes	No
	√	

C.2 Outfall Design and Construction

Provide details on the primary discharge point & secondary discharge points and storm overflows to include reference, location, design criteria and construction detail.

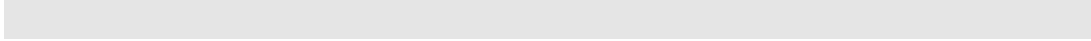
Primary Discharge Point, SW01-Rathcormack

Type of Discharge	225mm diameter concrete outfall pipe from wastewater treatment plant. Open Pipe
Unique Point Code	SW01-DROM
Location	Approximately 1km south of the village centre, off the R639
Grid ref (6E, 6N)	153738E, 0096171N

The primary discharge point, SW01-DROM, is the main outlet from Dromahane Wastewater Treatment Plant. The concrete outfall runs in a southerly direction approximately 65m from the outlet manhole across to the river. The point of discharge is an open pipe, which discharges directly to the river.

Attachment C.2 should contain any supporting documentation on the design and construction of any and all discharge outfalls, including stormwater overflows, from the waste water works.

Attachment included	Yes	No
		√



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SECTION D: DISCHARGES TO THE AQUATIC ENVIRONMENT

Advice on completing this section is provided in the accompanying Guidance Note.

Give particulars of the source, location, nature, composition, quantity, level and rate of discharges arising from the agglomeration and, where relevant, the period or periods during which such emissions are made or are to be made.

Details of all discharges of waste water from the agglomeration should be submitted via the following web based link: http://78.137.160.73/epa_wwd_licensing/. The applicant should address in particular all discharge points where the substances outlined in Tables D.1(i), (b) & (c) and D.1(ii), (b) & (c) of Annex 1 are emitted.

Where it is considered that any of the substances listed in Annex X of the Water Framework Directive (2000/60/EC) or any of the Relevant Pollutants listed in Annex VIII of the Water Framework Directive (2000/60/EC) are being discharged from the waste water works or are seen to be present in the receiving water environment downstream of a discharge from the works (as a result of any monitoring programme, e.g., under the Water Framework Directive Programme of Measures) the applicant shall screen the discharge for the relevant substance.

D.1 Discharges to Surface Waters

Details of all discharges of waste water from the agglomeration should be supplied via the following web based link: http://78.137.160.73/epa_wwd_licensing/. Tables D.1(i)(a), (b) & (c), should be completed for the primary discharge point from the agglomeration and Tables D.1(ii)(a), (b) & (c) should be completed for **each** secondary discharge point, where relevant. Table D.1(iii)(a) should be completed for **each** storm water overflow. Individual Tables must be completed for each discharge point.

Where monitoring information is available for the influent to the plant this data should also be provided in response to Section D.1.

Supporting information should form **Attachment D.1**

Attachment included	Yes	No

D.2 Tabular Data on Discharge Points

Applicants should submit the following information for each discharge point:

Table D.2:

PT_CD	PT_TYPE	LA_NAME	RWB_TYPE	RWB_NAME	DESIGNATION	EASTING	NORTHING
SW 01-DROM	Primary	Cork County Council	River	Clyda River		153738	096171

An individual record (i.e. row) is required for each discharge point. Acceptable file formats include Excel, Access or other upon agreement with the Agency. A standard Excel template can be downloaded from the EPA website at www.epa.ie. This data should be submitted to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.4, B.5, C.1, E.3 and F.2.

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SECTION E: MONITORING

Advice on completing this section is provided in the accompanying Guidance Note.

E.1 Waste Water Discharge Frequency and Quantities – Existing & Proposed

Provide an estimation of the quantity of waste water likely to be emitted in relation to all primary and secondary discharge points applied for. This information should be included in Table E.1(i) via the following web based link: http://78.137.160.73/epa_wwd_licensing/.

Provide an estimation of the quantity of waste water likely to be emitted in relation to all storm water overflows within the agglomeration applied for. This information should be included in Table E.1(ii) via the following web based link: http://78.137.160.73/epa_wwd_licensing/.

Indicate if composite sampling or continuous flow monitoring is in place on the primary or any other discharge points. Detail any plans and timescales for the provision of composite sampling and continuous flow meters.

E.2. Monitoring and Sampling Points

Programmes for environmental monitoring should be submitted as part of the application. These programmes should be provided as Attachment E.2.

Reference should be made to, provision of sampling points and safe means of access, sampling methods, analytical and quality control procedures, including equipment calibration, equipment maintenance and data recording/reporting procedures to be carried out in order to ensure accurate and reliable monitoring.

In determining the sampling programme to be carried out, the variability of the emission and its effect on the receiving environment should be considered.

Details of any accreditation or certification of analysis should be included.

Attachment E.2 should contain any supporting information.

Attachment included	Yes	No
	√	

E.3. Tabular data on Monitoring and Sampling Points

Applicants should submit the following information for each monitoring and sampling point:

PT_CD	PT_TYPE	MON_TYPE	EASTING	NORTHING	VERIFIED
SW01	Primary	Sampling	153724	096162	N
aSW01u	u/s	Sampling	154294	095915	N
aSW01d	d/s	Sampling	153911	097471	N

An individual record (i.e., row) is required for each monitoring and sampling point. Acceptable file formats include Excel, Access or other upon agreement with the Agency. A standard Excel template can be downloaded from the EPA website at www.epa.ie. This data should be submitted to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.4, B.5, C.1, D.2 and F.2.

E.4 Sampling Data

Regulation 16(1)(h) of the Waste Water Discharge (Authorisation) Regulations 2007 requires all applicants in the case of an existing waste water treatment plant to specify the sampling data pertaining to the discharge based on the samples taken in the 12 months preceding the making of the application.

Regulation 16(1)(l) of the regulations requires applicants to give details of compliance with any applicable monitoring requirements and treatment standards.

Attachment E.4 should contain any supporting information.

Attachment included	Yes	No
	√	

SECTION F: EXISTING ENVIRONMENT & IMPACT OF THE DISCHARGE(S)

Advice on completing this section is provided in the accompanying Guidance Note.

Detailed information is required to enable the Agency to assess the existing receiving environment. This section requires the provision of information on the ambient environmental conditions within the receiving water(s) upstream and downstream of any discharge(s).

Where development is proposed to be carried out, being development which is of a class for the time being specified under Article 24 (First Schedule) of the Environmental Impact Assessment Regulations, the information on the state of the existing environment should be addressed in the EIS. **In such cases, it will suffice for the purposes of this section to provide adequate cross-references to the relevant sections in the EIS.**

F.1. Assessment of Impact on Receiving Surface or Ground Water

- Give summary details and an assessment of the impacts of any existing or proposed emissions on the environment, including environmental media other than those into which the emissions are to be made.
- Details of all monitoring of the receiving water should be supplied via the following web based link: http://78.137.160.73/epa_wwd_licensing/. Tables F.1(i)(a) & (b) should be completed for the primary discharge point. Surface water monitoring locations upstream and downstream of the discharge point shall be screened for those substances listed in Tables F.1(i)(a) & (b). Monitoring of surface water shall be carried out at not less than two points, one upstream from the discharge location and one downstream.
- For discharges from secondary discharge points Tables F.1(ii)(a) & (b) should be completed. Furthermore, provide summary details and an assessment of the impacts of any existing or proposed emissions on the surface water or ground (aquifers, soils, sub-soils and rock environment), including any impact on environmental media other than those into which the emissions are to be made.
- Provide details of the extent and type of ground emissions at the works. For larger discharges to groundwaters, e.g., from Integrated Constructed Wetlands, large scale percolation areas, etc., a comprehensive report must be completed which should include, inter alia, topography, meteorological data, water quality, geology, hydrology, and hydrogeology. The latter must in particular present the aquifer classification and vulnerability. The Geological Survey of Ireland Groundwater Protection Scheme Dept of the Environment and Local Government, Geological Survey of Ireland, EPA (1999) methodology should be used for any such classification. This report should also identify all surface water bodies and water wells that may be at risk as a result of the ground discharge.
- Describe the existing environment in terms of water quality with particular reference to environmental quality standards or other

legislative standards. Submit a copy of the most recent water quality management plan or catchment management plan in place for the receiving water body. Give details of any designation under any Council Directive or Regulations that apply in relation to the receiving water.

- Provide a statement as to whether or not emissions of main polluting substances (as defined in the *Dangerous Substances Regulations S.I. No. 12 of 2001*) to water are likely to impair the environment.
- In circumstances where water abstraction points exist downstream of any discharge describe measures to be undertaken to ensure that discharges from the waste water works will not have a significant effect on faecal coliform, salmonella and protozoan pathogen numbers, e.g., Cryptosporidium and Giardia, in the receiving water environment.
- Indicate whether or not emissions from the agglomeration or any plant, methods, processes, operating procedures or other factors which affect such emissions are likely to have a significant effect on –
 - (a) a site (until the adoption, in respect of the site, of a decision by the European Commission under Article 21 of Council Directive 92/43/EEC for the purposes of the third paragraph of Article 4(2) of that Directive) –
 - (i) notified for the purposes of Regulation 4 of the Natural Habitats Regulations, subject to any amendments made to it by virtue of Regulation 5 of those Regulations,
 - (ii) details of which have been transmitted to the Commission in accordance with Regulation 5(4) of the Natural Habitats Regulations, or
 - (iii) added by virtue of Regulation 6 of the Natural Habitats Regulations to the list transmitted to the Commission in accordance with Regulation 5(4) of those Regulations,
 - (b) a site adopted by the European Commission as a site of Community importance for the purposes of Article 4(2) of Council Directive 92/43/EEC¹ in accordance with the procedures laid down in Article 21 of that Directive,
 - (c) a special area of conservation within the meaning of the Natural Habitats Regulations, or
 - (d) an area classified pursuant to Article 4(1) or 4(2) of Council Directive 79/409/EEC²;

¹Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ No. L 206, 22.07.1992)

²Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (OJ No. L 103, 25.4.1979)

- Describe, where appropriate, measures for minimising pollution over long distances or in the territory of other states.
- This section should also contain full details of any modelling of discharges from the agglomeration. Full details of the assessment and any other relevant information on the receiving environment should be submitted as **Attachment F.1.**

The plant is performing satisfactorily at present and operating within the requirements of the following legislation. There are no improvements planned at present for the Dromahane Wastewater Treatment Plant, other than the installation of the automatic screen at the inlet works.

Water Quality Standards

The Water Framework Directive (WFD) aims to establish an integrated approach to water protection, improvement and sustainable use. In order to achieve the requirements of the WFD, Ireland has been divided into a number of River Basin Districts or management units. The South Western River Basin District (SWRBD) comprises substantially the counties of Cork and Kerry, all of Cork City, and also parts of counties Limerick, South Tipperary and Waterford.

The Clyda River is included in the SWRBD. The overall objectives of the SWRBD project include the following:

- Strengthen compliance with EU Directives and national legislation
- Collect and analyse information to determine water quality and identify possible threats to water status
- Prevent further deterioration and protect/enhance water quality
- Develop a programme of measures to address all significant pressures and sources of impact on aquatic ecosystems and groundwater
- Encourage and facilitate public participation including the maintenance of a project website
- Promote sustainable water use

In order to achieve these objectives the following project tasks have been identified:

- Identify pressures on water bodies and assess risk of not achieving compliance with the Water Framework Directive
- Prepare a Characterisation Report
- Identify Heavily Modified (HMWB) and Artificial Water Bodies (AWB)
- Establish risk to waters from Hazardous Substances
- Establish data management system and GIS
- Prepare programme of measures
- Review of monitoring needs
- Design monitoring programme
- Prepare River Basin Management Strategy
- Assist public participation in the project
- Prepare printed reports
- Assist capacity building

The SWRBD has proposed water quality standards for the Clyda River under a water quality / catchments management plan. The Clyda River is classified as Moderate ecological quality status on the ground of biological quality data. Note also this is located in a *Margaritifera margaritifera* (freshwater pearl mussel) which is a protected area and for such sites the water quality standards that need to be achieved will be higher than for other areas as these are a species of

high conservation importance. As a result of this the Q-value monitoring indicates the river is of Good Status however this defaults to Moderate due to the freshwater pearl mussel.

The River Basin Management System currently being developed will include a programme of measures and a River Basin Management Strategy, designed to achieve at least good status for all waters by 2015, and to maintain high status where it exists. Therefore discharges from Dromahane Wastewater Treatment Plant cannot cause deterioration in good water quality under the Water Framework Directive at present.

The Clyda River is not a designated Shellfish area under the Shellfish Waters Regulations, S.I.200 of 1994. The River Blackwater, into which the Clyda River flows, is also not designated under these regulations.

The Clyda River is not designated a Salmonid Water under Salmonid Water Regulations, S.I. 293 of 1988, however the River Blackwater which the Clyda River joins, is designated Salmonid Water under Salmonid Water Regulations, S.I. 293 of 1988.

The Clyda River is not designated a Bathing Water under the Bathing Water Regulations, S.I. 178 of 1998 as amended.

The Clyda River is not a designated Sensitive Area under the Urban Wastewater Treatment Regulations 2001 (S.I. 254 of 2001). The River Blackwater downstream of Mallow Railway to Ballyduff Bridge is a designated Sensitive Area. This is not within 2km of any discharge point from Dromahane Wastewater Treatment wastewater works.

Downstream of the discharge points, the Clyda River traverses close Dromahane village. Water is not abstracted from the Clyda River for this village. However Mallow Public Water Supply abstracts water from the Clyda upstream of the discharge point of Dromahane WWTP by approximately 550m at Dromore Bridge.

Areas of Conservation

The Department of the Environment, Heritage and Local Government is responsible for the designation of conservation sites in Ireland. It is required under European law and national laws to conserve habitats and species, through designation of conservation areas under Special Areas of Conservation, Natural Heritage Areas and Special Protected Areas.

Special Areas of Conservation

Candidate Special Areas of Conservation (cSACs) are protected under the European Union (EU) Habitats Directive (92/43/EEC), as implemented in Ireland by the European Communities (Natural Habitats) Regulations, 1997.

The Blackwater River cSAC (Site Code: 002170) is very large, extending from the tidal estuary of the river at Youghal Co. Cork to the upper tributaries and their flood plains, in Cos. Cork Kerry, Limerick, Tipperary and Waterford, including the Clyda River is a designated Special Area of Conservation.

The cSAC is designated on the basis of the presence of a large number of EU Habitats Directive Annex 1 habitats and Annex 2 species. Many of these are estuarine habitats and species found only in the lower reaches of the River

Blackwater, however a number may be present in the Clyda River section of the cSAC including, for example the Annex 1 habitats, 'alluvial wet woodlands', 'floating river vegetation', and 'old oak woodlands'; and the Annex 2 species sea lamprey, river lamprey, brook lamprey, Atlantic salmon, freshwater pearl-mussel and otter.

The Blackwater River Site Synopsis is included in this attachment.

Natural Heritage Areas

The Clyda River does not flow through a Natural Heritage Areas (NHA). Natural Heritage Areas are the basic designation for wildlife. An NHA is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection.

Under the Wildlife Amendment Act 2000, NHAs are legally protected from damage from the date they are formally proposed for designation.

Special Protected Areas

Special Protection Areas (SPAs) are designated in order to safeguard certain habitats pursuant to EU Directive requirements. The EU Birds Directive (79/409/EEC) requires designation of SPAs for listed rare and vulnerable species, migratory species and wetlands.

No designated special protected areas are located along the Clyda River. There are areas of the River Blackwater that are designated SPAs, however these are located downstream of Fermoy and therefore greater than 2km from all discharge points.

Receiving Water Quality Requirement

Water Quality analysis data for the Clyda River was obtained from Cork County Council. The EPA also takes samples from a number of locations along the Clyda River. In the vicinity of the treatment plant, two nr monitoring stations are relevant to Dromahane WWTP. These stations are the flowing:

- Clyda Bridge – upstream of Dromahane WWTP discharge point by approximately 550m
- Br u/s of Blackwater River Confluence – downstream of Dromahane WWTP discharge point by approximately 1.6km

Table F1-1: Biological Quality Rating for Clyda River – Upstream & Downstream of Discharge

Sampling Location	EPA Biological Quality Rating (Q values)			
	1995 -1997	2001 – 2003	2006	Target
Clyda Bridge	4-5	N/D	N/D	4-5
Br u/s of Blackwater River Confluence	3-4	4	4	4

The Royal Commission in its report on Water Quality Guidelines recommends that "in all circumstances effluent discharges which are calculated to raise the BOD of the receiving water, outside the mixing zone, by more than 1 mg/l should be discouraged". The average existing background level for BOD is estimated at 1mg/l. Therefore the receiving water limiting value for BOD for this river is 2mg/l.

The standard water quality requirements for dangerous substances are based on the Water Quality (Dangerous Substances) Regulations 2001.

Hence, the principal receiving water quality requirements are given in Table 3 below: -

Table F1-2: Receiving Water Quality Limiting Values

Parameter	Water Quality Standard (mg/l)
Chromium	30
Copper	30
Lead	10
Nickel	50
Zinc	100

Based on Hardness of receiving waters >100mg/l CaCO3

Effluent Standards

The treated effluent quality requirements shown in the table below are determined with respect to the EC Urban Wastewater Directive, given effect in Irish Law by S.I.254 of 2001.

Table F1-3: Minimum Effluent Standards based on S.I.254 of 2001 and Recorded Effluent Concentrations

Parameter	Effluent Standards (mg/l)	Actual Concentrations* (mg/l)
Biological Oxygen Demand (BOD)	25	8.1
Suspended Solids (SS)	35	17.91

*Actual Concentration is the average effluent concentrations recorded at the outlet of the WWTP by Cork County Council Wastewater Laboratory during the period Feb '07 to Nov '08.

From Table 4 above, it is evident that treated effluent from the Dromahane wastewater treatment plant is compliant with the quality of effluent standards set out in the above legislation.

Assimilative Capacity of the Receiving Water

a) **Mass Balance Equation for Orthophosphate:**

Median flow of River = 2.12 m³/sec
 Median oPO₄-P in River (upstream) = 0.05 mg/L

Average volume of discharge = 0.003 m³/sec
 Median value for oPO₄-P in discharge = 2.905 mg/L

$$C_{\text{final}} = \frac{(2.12 \times 0.05) + (0.003 \times 2.905)}{2.12 + 0.003}$$

$$C_{\text{final}} = 0.054 \text{ mg/L oPO}_4\text{-P}$$

The increase in Orthophosphate due to the discharge of Dromahane WWTP is 4 $\mu\text{g/L}$.

b) **Mass Balance Equation for BOD:**

Flow of River (95%) = 0.24m³/sec
 Average BOD in River (upstream) = 1.6mg/L

Average volume of discharge = 0.003 m³/sec
 Average BOD in discharge = 8.1 mg/L

$$C_{\text{final}} = \frac{(0.24 \times 1.6) + (0.003 \times 8.1)}{0.24 + 0.003}$$

$$C_{\text{final}} = 1.68 \text{ mg/L BOD}$$

The increase in BOD due to the discharge of Dromahane WWTP is 0.08 mg/L.

c) **Mass Balance Equation for Suspended Solids:**

Flow of River (95%) = 0.24 m³/sec
 Average Suspended Solids in River (upstream) = 2.5 mg/L

Average volume of discharge = 0.003 m³/sec
 Average Suspended Solids in discharge = 13mg/L

$$C_{\text{final}} = \frac{(0.24 \times 2.5) + (0.003 \times 17.91)}{0.24 + 0.003}$$

$$C_{\text{final}} = 2.69 \text{ mg/L Suspended Solids}$$

The increase in Suspended Solids due to the discharge of Dromahane WWTP is 0.19 mg/L.

d) **Mass Balance Equation for Total Phosphate:**

50% Median flow of River = 2.12 m³/sec
 Median TPO₄-P in River (upstream) = 0.2 mg/L

Average volume of discharge = 0.003 m³/sec
 Median TPO₄-P in discharge = 3.47 mg/L

$$C_{\text{final}} = \frac{(2.12 \times 0.2) + (0.003 \times 3.47)}{2.12 + 0.003}$$

C_{final} = 0.21 mg/L TPO₄-P

The increase in Total Phosphate due to the discharge of Dromahane WWTP is 10 µg/L.

e) **Mass Balance Equation for Total Nitrogen:**

Flow of River (95%) = 0.24 m³/sec
 Average Total Nitrogen in River (upstream) = 6 mg/L

Average volume of discharge = 0.003 m³/sec
 Average Total Nitrogen in discharge = 7.3mg/L

$$C_{\text{final}} = \frac{(0.24 \times 6) + (0.003 \times 7.3)}{0.24 + 0.003}$$

C_{final} = 6.02 mg/L Total Nitrogen

The increase in Total Nitrogen due to the discharge of Dromahane WWTP is 0.02 mg/L.

f) **Mass Balance Equation for Sulphate:**

Flow of River (95%) = 0.24 m³/sec
 Average Sulphate in River (upstream) = 30 mg/L

Average volume of discharge = 0.003 m³/sec
 Average Sulphate of discharge = 32.99 mg/L

Average Sulphate in River (downstream) = 30 mg/L

$$C_{\text{final}} = \frac{(0.24 \times 30) + (0.003 \times 32.99)}{0.24 + 0.003}$$

$C_{\text{final}} = 30.04 \text{ mg/L Sulphate}$

The increase in Sulphate due to the discharge of Dromahane WWTP is 0.04mg/L.

g) **Mass Balance Equation for Ammonia-N:**

Flow of River (95%) = 0.24 m³/sec
 Average Ammonia-N in River (upstream) = 0.1 mg/L

Average volume of discharge = 0.003 m³/sec
 Average Ammonia-N in discharge = 1.89mg/L

Average Ammonia-N in River (downstream) = 0.1mg/L

$$C_{\text{final}} = \frac{(0.24 \times 0.1) + (0.003 \times 1.89)}{0.24 + 0.003}$$

$C_{\text{final}} = 0.12 \text{ mg/L Ammonia}$

The increase in Ammonia due to the discharge of Dromahane WWTP is 0.02 mg/L.

Assimilative Capacity Calculations were not performed for the following parameters, as the substances were below the limit of detection in the upstream samples, in the discharge samples and in the downstream samples:

- (a) Chromium
- (b) Copper
- (c) Lead
- (d) Nickel
- (e) Cadmium
- (f) Barium
- (g) Boron
- (h) Zinc
- (i) Fluoride

Discharges in proximity of Wastewater Works

Water quality analysis data presented in Tables 5 & 6 below was recorded by Cork County Council wastewater laboratory and covers a sampling period from April 2008 to Nov 2008.

Table F1-5: Upstream Water Quality

Parameter	Upstream Monitoring Station			
	10/04/08	09/10/08	23/10/08	27/11/08
Ph	-	-	-	7.3
BOD	<1.0	-	<0.1	<1.0
SS	<2.5	-	-	<2.5
Ammonia	<0.1	-	<0.1	<0.1
Ortho-Phosphate	<0.05	<0.05	<0.05	0.06

Table F1-6: Downstream Water Quality

Parameter	Upstream Monitoring Station			
	10/04/08	09/10/08	23/10/08	27/11/08
Ph	-	-	-	7.6
BOD	<1.0	-	-	<1.0
SS	<2.5	-	-	<2.5
Ammonia	<0.1	-	<0.1	<0.1
Ortho-Phosphate	<0.05	0.13	<0.05	0.06

The data in the above tables confirms the wastewater discharge has little effect on the overall river quality given adequate flow in the river and dispersion time.

Attachment included	Yes	No
	√	

F.2 Tabular Data on Drinking Water Abstraction Point(s)

Applicants should submit the following information for each downstream or downgradient drinking water abstraction point. The zone of contribution for the abstraction point should be delineated and any potential risks from the waste water discharge to the water quality at that abstraction point identified.

ABS_CD	AGG_SERVED	ABS_VOL	PT_CD	DIS_DS	EASTING	NORTHING	VERIFIED
Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

Note: Attach any risk assessment that may have been carried out in relation to the abstraction point(s) listed.

An individual record (i.e. row) is required for each abstraction point. Acceptable file formats include Excel, Access or other upon agreement with the Agency. A standard Excel template can be downloaded from the EPA website at www.epa.ie. This data should be submitted to the Agency on a separate CD-Rom containing sections B.1, B.2, B.3, B.4, B.5, C.1, D.2 and E.3.

There are no drinking water abstraction points downstream or downgradient of the discharge point.

Attachment F.2 should contain any supporting information.

SECTION G: PROGRAMMES OF IMPROVEMENTS

Advice on completing this section is provided in the accompanying Guidance Note.

G.1 Compliance with Council Directives

Provide details on a programme of improvements to ensure that emissions from the agglomeration or any premises, plant, methods, processes, operating procedures or other factors which affect such emissions will comply with, or will not result in the contravention of the;

- Dangerous Substances Directive 2006/11/EC,
- Water Framework Directive 2000/60/EC,
- Birds Directive 79/409/EEC,
- Groundwater Directives 80/68/EEC & 2006/118/EC,
- Drinking Water Directives 80/778/EEC,
- Urban Waste Water Treatment Directive 91/271/EEC,
- Habitats Directive 92/43/EEC,
- Environmental Liabilities Directive 2004/35/EC,
- Bathing Water Directive 76/160/EEC, and
- Shellfish Waters Directive (79/923/EEC).

The plant is operating satisfactory at present and is operating within the requirements of the relevant legislation outlined above. Recent improvements include the installation of a new Automatic Screen at the inlet works and the provision of bored well water supply.

Water Framework Directive 2000/60/EC

The Water Framework Directive (WFD) aims to establish an integrated approach to water protection, improvement and sustainable use. In order to achieve the requirements of the WFD, Ireland has been divided into a number of River Basin Districts or management units. The South Western River Basin District (SWRBD) comprises substantially the counties of Cork and Kerry, all of Cork City, and also parts of counties Limerick, South Tipperary and Waterford.

The overall objectives of the South Western River Basin District project include the following:

- Strengthen compliance with EU Directives and national legislation
- Collect and analyse information to determine water quality and identify possible threats to water status
- Prevent further deterioration and protect/enhance water quality
- Develop a programme of measures to address all significant pressures and sources of impact on aquatic ecosystems and groundwater
- Encourage and facilitate public participation including the maintenance of a project website
- Promote sustainable water use

In order to achieve these objectives the following project tasks have been identified:

- Identify pressures on water bodies and assess risk of not achieving compliance with the Water Framework Directive
- Prepare a Characterisation Report
- Identify Heavily Modified (HMWB) and Artificial Water Bodies (AWB)
- Establish risk to waters from Hazardous Substances
- Establish data management system and GIS
- Prepare programme of measures
- Review of monitoring needs
- Design monitoring programme
- Prepare River Basin Management Strategy
- Assist public participation in the project
- Prepare printed reports
- Assist capacity building

The EPA also takes samples from one location along the Clyda River downstream (d/s) of the WWTP (prior to discharge of confluence of the Clyda River and Blackwater River). This is located at the following:

- Br u/s of Blackwater River Confluence 1.6km d/s of discharge

Table G1-1: Upstream Water Quality

Parameter	Upstream Monitoring Station			
	10/04/08	09/10/08	23/10/08	27/11/08
Ph	-	-	-	7.3
BOD	<1.0	-	<0.1	<1.0
SS	<2.5	-	-	<2.5
Ammonia	<0.1	-	<0.1	<0.1
Ortho-Phosphate	<0.05	<0.05	<0.05	0.06

Table G1-2: Downstream Water Quality

Parameter	Upstream Monitoring Station			
	10/04/08	09/10/08	23/10/08	27/11/08
Ph	-	-	-	7.6
BOD	<1.0	-	-	<1.0
SS	<2.5	-	-	<2.5
Ammonia	<0.1	-	<0.1	<0.1
Ortho-Phosphate	<0.05	0.13	<0.05	0.06

The data in the above tables confirms the wastewater discharge has little effect on the overall river quality given adequate flow in the river and dispersion time.

Birds Directive 79/409/EEC

Special Protection Areas (SPAs) are designated in order to safeguard certain habitats pursuant to EU Directive requirements. The EU Birds Directive (79/409/EEC) requires designation of SPAs for listed rare and vulnerable species, migratory species and wetlands.

No designated special protected areas are located along the Clyda River. There are areas of the River Blackwater which are designated SPAs however these are located downstream of Fermoy and therefore, greater than 2km from all discharge points.

Groundwater Directives 2006/118/EC

The Groundwater Directive 2006/118/EC has been developed in response to the requirements of Article 17 of the Water Framework Directive: Strategies to prevent and control pollution to groundwater. Groundwater Quality standards are to be established by the end of 2008.

There are no PWS close to the discharge area that utilise ground water for medium sized water supplies.

With the proper mitigation measures in place the operation of the wastewater treatment plant does not have any significant negative impacts on the existing groundwater.

Drinking Water Directives 80/778/EEC

There are no areas along the ClydaRiver or River Blackwater downstream of Dromahane WWTP designated for the abstraction of water intended for human consumption.

Upstream of the discharge point, water is abstracted from the Clyda River at Clyda Bridge for Mallow PWS.

Urban Waste Water Treatment Directive 91/271/EEC

The Urban Wastewater Treatment Regulations (S.I. 254 of 2001) gives effect to provisions of the Urban Wastewater Treatment Directive (91/271/EEC). The 2001 Irish Regulations cover the various requirements in relation to the collection and treatment of urban wastewater.

Article 4(1)(c) states that "In the case of urban wastewater entering collecting systems, a sanitary authority shall provide treatment plants, which provide for secondary treatment or an equivalent treatment by 31 December 2005 in respect of all discharges to freshwaters and estuaries from agglomerations with a population equivalent of between 2,000 and 10,000."

The Dromahane Wastewater Treatment Plant was commissioned in 2000 and was designed to treat effluent to a 25/35ppm standard.

The Second Schedule (Part 1) of the 2001 Regulations states that effluent should be treated to the following standards.

Table G1-3: Minimum Effluent Standards based on SI 254 of 2001

Parameter	Conc. (mg/l)	Minimum Percentage of Reduction
Biochemical Oxygen Demand (BOD)	25	70 - 90
Chemical Oxygen Demand (COD)	125	75
Suspended Solids	35	90

The aeration and clarifying plant at the Dromahane wastewater treatment plant is treating effluent to a high standard. Efficiencies of BOD, COD and SS removal for the plant is typically in excess of 85%. The effect of the discharges on the quality of the receiving waters is assessed in Attachment F1.

The Third Schedule of the 2001 Regulations gives a list of Sensitive areas.

Article 4(2)(a) states that all discharges into Sensitive Areas require more stringent treatment than secondary treatment. The Clyda River is not a designated Sensitive Area. The River Blackwater downstream of Mallow Railway Bridge to Ballyduff Bridge is designated a Sensitive Area. This is not within 2km of any discharge point from the Dromahane wastewater treatment works.

The Fifth Schedule of the 2001 Regulations gives a methodology for monitoring the final effluent from the wastewater treatment plant. Item 3 states "The minimum annual number of samples shall be determined according to the size of the treatment plant and be collected at regular intervals during the year." For a PE of between 2000-9999 4 samples should be taken each year. Cork County Council wastewater laboratory carries out regular testing at the outlet of the treatment plant.

Shellfish Directive 79/923/EEC

The Clyda River is not a designated Shellfish Area under the Shellfish Waters Regulations, S.I. 200 of 1994. The River Blackwater, into which the Clyda River flows is also not designated under these regulations.

Habitats Directive 92/43/EEC

Candidate Special Areas of Conservation (cSACs) are protected under the European Union (EU) Habitats Directive (92/43/EEC), as implemented in Ireland by the European Communities (Natural Habitats) Regulations, 1997.

The Blackwater River cSAC (Site Code: 002170) is very large, extending from the tidal estuary of the river at Youghal Co. Cork to the upper tributaries and their flood plains, in Cos. Cork Kerry, Limerick, Tipperary and Waterford.

The cSAC is designated on the basis of the presence of a large number of EU Habitats Directive Annex 1 habitats and Annex 2 species.

The Blackwater River Site Synopsis is included in this attachment.

Environmental Liabilities Directive 2004/35/EC

The Environmental Liability Directive is about preventing and remedying environmental damage. It aims to hold operators whose activities have caused environmental damage financially liable for remedying this damage, and it aims to hold those whose activities have caused an imminent threat of environmental damage liable for taking preventive actions.

Cork County Council Wastewater Laboratory carries out monitoring of the effluent from the wastewater treatment plant on a regular basis.

Failure to meet the specified treated effluent standards may result in final penalties to Cork County Council. As a result, the risk of environmental pollution from the treatment plant may be reduced.

Bathing Water Directive 76/160/EEC

The Clyda River is not designated a Bathing Water under the Bathing Water Regulations, S.I. 178 of 1998 as amended.

Dangerous Substances Directive 2006/11/EC

The level of dangerous substances in both the effluent discharged from Buttevant wastewater treatment plant and the river itself is significantly lower than the concentration limits set in the directive.

Attachment G.1 should contain the most recent programme of improvements, including a copy of any approved funding for the project and a timeframe for the completion of the necessary works to take place.

Attachment included	Yes	No
	√	

G.2 Compliance with Water Quality Standards for Phosphorus Regulations (S.I. No. 258 of 1998).

Provide details on a programme of improvements, including any water quality management plans or catchment management plans in place, to ensure that improvements of water quality required under the Water Quality Standards for Phosphorous Regulations (S.I. No. 258 of 1998) are being achieved. Provide details of any specific measures adopted for waste water works specified in Phosphorus Measures Implementation reports and the progress to date of those measures. Provide details highlighting any waste water works that have been identified as the principal sources of pollution under the P regulations.

Receiving Water Quality Requirement based on Phosphorus Regulations 2008

The effluent arising from the WWTP is discharge to the Clyda River, which flows adjacent to the WWTP site boundary. The Clyda River is a tributary of the Blackwater River (Munster).

The EPA have a number stations on the Clyda River, upstream along the Clyda the Q value of the river is 4-5, while downstream of the River the Q value is 4.

Effluent Standards

The treated effluent quality requirements are determined with respect to the EC Urban Wastewater Directive, given effect in Irish Law by S.I.254 of 2001. The wastewater treatment processes should reduce nutrients in the final effluent. The minimum effluent standard based on S.I.254 of 2001 for Phosphorus in wastewater effluent is 2mg/l.

As a natural consequence of secondary treatment, there will be an uptake of phosphorous for biomass synthesis at the wastewater treatment plant in

Dromahane This is evident from Tables 3 &4 below showing the uptake of phosphorus through the wastewater treatment plant.

Table G2-3: Phosphorus Levels in Influent to WWTP

Parameter	Inlet Monitoring Station	
	23/10/08	27/11/08
Ortho-Phosphate	-	4.02

Table G2-4: Phosphorus Levels in Effluent from WWTP

Parameter	Outlet Monitoring Station	
	23/10/08	27/11/08
Ortho-Phosphate	0.61	3.36

From above, it is evident that treated effluent from the Dromahane wastewater treatment plant is compliant with the quality of effluent standards set out in the Urban Waste Water Directive criteria for discharges to sensitive water even though this designation does not apply for this area.

Attachment G.2 should contain the most recent programme of improvements and any associated documentation requested under Section G.3 of the application.

Attachment included	Yes	No
		√

G.3 Impact Mitigation

Provide details on a programme of improvements to ensure that discharges from the agglomeration will not result in significant environmental pollution.

An automatic screen is due to be installed in early 2009, which will cater for 6DWF through the plant. A manual bypass shall also be incorporated into the installation of the screen.

Recently a bored well was drilled to provide a reliable supply of water to the wastewater treatment plant.

The provision of an automatic screen and water supply to the plant shall ensure that the basic obligations of the operator are being adhered to.

The upgrade works at Dromahane is being funded by Council Finances.

With these recent improvements to the collection system and WWTP it will ensure that discharges from the agglomeration will not result in significant environmental pollution.

Attachment G.3 should contain the most recent programme of improvements, including a copy of any approved funding for the project and a timeframe for the completion of the necessary works to take place.

Attachment included	Yes	No
		√

G.4 Storm Water Overflow

Provide details on a programme of improvements to ensure that discharges other than the primary and secondary discharges comply with the definition of 'storm water overflow' as per Regulation 3 of the Waste Water Discharge (Authorisation) Regulations, 2007.

There are no overflows within the agglomeration other than those from the primary overflow.

Attachment G.4 should contain the most recent programme of improvements, including a copy of any approved funding for the project and a timeframe for the completion of the necessary works to take place.

Attachment included	Yes	No
		√

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SECTION H: DECLARATION

Declaration

I hereby make application for a waste water discharge licence/revised licence, pursuant to the provisions of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007).

I certify that the information given in this application is truthful, accurate and complete.

I give consent to the EPA to copy this application for its own use and to make it available for inspection and copying by the public, both in the form of paper files available for inspection at EPA and local authority offices, and via the EPA's website.

This consent relates to this application itself and to any further information or submission, whether provided by me as Applicant, any person acting on the Applicant's behalf, or any other person.

Signed by : _____ **Date :** _____
(on behalf of the organisation)

Print signature name: _____

Position in organisation: _____

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SECTION I: JOINT DECLARATION

Joint Declaration ^{Note1}

I hereby make application for a waste water discharge licence/revised licence, pursuant to the provisions of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007).

I certify that the information given in this application is truthful, accurate and complete.

I give consent to the EPA to copy this application for its own use and to make it available for inspection and copying by the public, both in the form of paper files available for inspection at EPA and local authority offices, and via the EPA's website.

This consent relates to this application itself and to any further information or submission whether provided by me as Applicant, any person acting on the Applicant's behalf, or any other person.

Lead Authority

Signed by : _____ **Date :** _____
(on behalf of the organisation)

Print signature name: _____

Position in organisation: _____

Co-Applicants

Signed by : _____ **Date :** _____
(on behalf of the organisation)

Print signature name: _____

Position in organisation: _____

Signed by : _____ **Date :** _____
(on behalf of the organisation)

Print signature name: _____

Position in organisation: _____

Note 1: In the case of an application being lodged on behalf of more than a single water services authority the following declaration must be signed by all applicants.

Agglomeration details

Leading Local Authority	Cork County Council
Co-Applicants	
Agglomeration	Dromahane
Population Equivalent	1200
Level of Treatment	Secondary
Treatment plant address	Dromore, Dromahane, Co. Cork
Grid Ref (12 digits, 6E, 6N)	153724 / 096162
EPA Reference No:	

Contact details

Contact Name:	Frank Cronin
Contact Address:	Water Services North, Cork County Council, Anabella, Mallow, Co. Cork
Contact Number:	022-21123
Contact Fax:	022-21983
Contact Email:	Frank.cronin@corkcoco.ie

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Table D.1(i)(a): EMISSIONS TO SURFACE/GROUND WATERS (Primary Discharge Point)

Discharge Point Code: SW-1

Local Authority Ref No:	SW01-DROM	
Source of Emission:	Dromahane Wastewater Treatment Plant	
Location:	Dromore, Dromahane. Co. Cork	
Grid Ref (12 digits, 6E, 6N)	153738 / 096171	
Name of Receiving waters:	Clyda	
Water Body:	River Water Body	
River Basin District	South Western RBD	
Designation of Receiving Waters:	U/S of a Salmoid Water	
Flow Rate in Receiving Waters:	0.11	m ³ .sec ⁻¹ Dry Weather Flow
	0.24	m ³ .sec ⁻¹ 95% Weather Flow
Additional Comments (e.g. commentary on zero flow or other information deemed of value)		

Emission Details:

(i) Volume emitted			
Normal/day	264 m ³	Maximum/day	1584 m ³
Maximum rate/hour	66 m ³	Period of emission (avg)	60 min/hr 24 hr/day 365 day/yr
Dry Weather Flow	0.00305 m ³ /sec		

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Table D.1(i)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Primary Discharge Point)

Discharge Point Code: SW-1

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
pH	pH	24 hr composite	> 9	
Temperature	°C	24 hr composite	< 30	
Electrical Conductivity (@ 25°C)	µS/cm	24 hr composite	= 1000	
Suspended Solids	mg/l	24 hr composite	= 35	55.44
Ammonia (as N)	mg/l	24 hr composite	= 0	0
Biochemical Oxygen Demand	mg/l	24 hr composite	= 25	39.6
Chemical Oxygen Demand	mg/l	24 hr composite	= 125	198
Total Nitrogen (as N)	mg/l	24 hr composite	= 50	79.2
Nitrite (as N)	mg/l	24 hr composite	= 0	0
Nitrate (as N)	mg/l	24 hr composite	= 0	0
Total Phosphorous (as P)	mg/l	24 hr composite	= 8	12.7
OrthoPhosphate (as P)	mg/l	24 hr composite	= 6	9.5
Sulphate (SO ₄)	mg/l	24 hr composite	= 0	0
Phenols (Sum)	µg/l	24 hr composite	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

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Table D.1(i)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of The Emission (Primary Discharge Point)

Discharge Point Code: SW-1

Substance	As discharged			
	Unit of Measurement	Sampling Method	Max Daily Avg.	kg/day
Atrazine	µg/l	24 hr composite	= 0	0
Dichloromethane	µg/l	24 hr composite	= 0	0
Simazine	µg/l	24 hr composite	= 0	0
Toluene	µg/l	24 hr composite	= 0	0
Tributyltin	µg/l	24 hr composite	= 0	0
Xylenes	µg/l	24 hr composite	= 0	0
Arsenic	µg/l	24 hr composite	= 0	0
Chromium	µg/l	24 hr composite	= 0	0
Copper	µg/l	24 hr composite	= 0	0
Cyanide	µg/l	24 hr composite	= 0	0
Flouride	µg/l	24 hr composite	= 0	0
Lead	µg/l	24 hr composite	= 0	0
Nickel	µg/l	24 hr composite	= 0	0
Zinc	µg/l	24 hr composite	= 0	0
Boron	µg/l	24 hr composite	= 0	0
Cadmium	µg/l	2 hr composite	= 0	0
Mercury	µg/l	2 hr composite	= 0	0
Selenium	µg/l	24 hr composite	= 0	0
Barium	µg/l	24 hr composite	= 0	0

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper

For Phenols: USEPA Method 604, AWWA Standard Method 6246, or equivalent.

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TABLE E.1(i): WASTE WATER FREQUENCY AND QUANTITY OF DISCHARGE – Primary and Secondary Discharge Points

Identification Code for Discharge point	Frequency of discharge (days/annum)	Quantity of Waste Water Discharged (m ³ /annum)
SW-1	365	96360

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TABLE E.1(ii): WASTE WATER FREQUENCY AND QUANTITY OF DISCHARGE – Storm Water Overflows

Identification Code for Discharge point	Frequency of discharge (days/annum)	Quantity of Waste Water Discharged (m ³ /annum)	Complies with Definition of Storm Water Overflow
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TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING

Primary Discharge Point

Discharge Point Code:	SW-1
MONITORING POINT CODE:	aSW-1d
Grid Ref (12 digits, 6E, 6N)	153911 / 097471

Parameter	Results (mg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	10/04/08	09/10/08	23/10/08	27/11/08			
pH				= 7.6	Grab	2	Electrochemical
Temperature					Grab	0	Electrochemical
Electrical Conductivity (@ 25°C)	= 174			= 177	Grab	0.5	Electrochemical
Suspended Solids	< 2.5			< 2.5	Grab	0.5	Gravimetric
Ammonia (as N)	< 0.1		< 0.1	< 0.1	Grab	0.02	Colorimetric
Biochemical Oxygen Demand	< 1			< 1	Grab	0.06	Electrochemical
Chemical Oxygen Demand				< 21	Grab	8	Digestion & Colorimetric
Dissolved Oxygen					Grab	0	ISE
Hardness (as CaCO ₃)					Grab	0	Titrimetric
Total Nitrogen (as N)				= 6	Grab	0.5	Digestion & Colorimetric
Nitrite (as N)				= 0.0054	Grab	0	Colorimetric
Nitrate (as N)				= 3.93	Grab	0.5	Colorimetric
Total Phosphorous (as P)	< 0.2		< 0.2	< 0.2	Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)	< 0.05	= 0.13	< 0.05	< 0.05	Grab	0.02	Colorimetric
Sulphate (SO ₄)			< 30	< 30	Grab	30	Turbidimetric
Phenols (Sum)				< 0.1	Grab	0.1	GC-MS 2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper
 For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	
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Parameter	Results (mg/l)			Sampling method	Limit of Quantitation	Analysis method / technique
	01/01/09	07/01/09	21/01/09			
pH		= 75	= 73	Grab	2	Electrochemical
Temperature	= 0			Grab	0	Electrochemical
Electrical Conductivity (@ 25°C)		= 196	= 182	Grab	0.5	Electrochemical
Suspended Solids		< 1	= 6	Grab	0.5	Gravimetric
Ammonia (as N)		< 0.05	< 0.05	Grab	0.02	Colorimetric
Biochemical Oxygen Demand		< 2	< 2	Grab	0.06	Electrochemical
Chemical Oxygen Demand		< 5	= 11	Grab	8	Digestion & Colorimetric
Dissolved Oxygen	= 0			Grab	0	ISE
Hardness (as CaCO ₃)	= 0			Grab	0	Titrimetric
Total Nitrogen (as N)		= 5	= 4.1	Grab	0.5	Digestion & Colorimetric
Nitrite (as N)				Grab	0	Colorimetric
Nitrate (as N)				Grab	0.5	Colorimetric
Total Phosphorous (as P)		= 0.08	< 0.05	Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)		= 0.06	< 0.05	Grab	0.02	Colorimetric
Sulphate (SO ₄)				Grab	30	Turbidimetric
Phenols (Sum)				Grab	0.1	GC-MS 2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper
 For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	
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TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)

Primary Discharge Point

Discharge Point Code:	SW-1
MONITORING POINT CODE:	aSW-1d
Grid Ref (12 digits, 6E, 6N)	153911 / 097471

Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	23/10/08	27/11/08	01/01/09	07/01/09			
Atrazine		< 0.01			Grab	0.96	HPLC
Dichloromethane		< 1			Grab	1	GC-MS1
Simazine		< 0.01			Grab	0.01	HPLC
Toluene		< 1			Grab	0.02	GC-MS1
Tributyltin			= 0		Grab	0.02	GC-MS1
Xylenes		< 1			Grab	1	GC-MS1
Arsenic		< 0.96			Grab	0.96	ICP-MS
Chromium	< 20	< 20		< 20	Grab	20	ICP-OES
Copper	< 20	< 20		< 20	Grab	20	ICP-OES
Cyanide		< 5			Grab	5	Colorimetric
Flouride		= 31			Grab	100	ISE
Lead	< 20	< 20		< 20	Grab	20	ICP-OES
Nickel	< 20	< 20		< 20	Grab	20	ICP-OES
Zinc	< 20	< 20		< 20	Grab	20	ICP-OES
Boron	< 20	< 20		< 20	Grab	20	ICP-OES
Cadmium	< 20	< 20		< 20	Grab	20	ICP-OES
Mercury		< 0.2			Grab	0.2	ICP-MS
Selenium		= 1.5			Grab	0.74	ICP-MS
Barium	< 20	= 33		< 20	Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn no analysis for TBT as the discharge is to freshwaters
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Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	21/01/09						
Atrazine					Grab	0.96	HPLC
Dichloromethane					Grab	1	GC-MS1
Simazine					Grab	0.01	HPLC
Toluene					Grab	0.02	GC-MS1
Tributyltin					Grab	0.02	GC-MS1
Xylenes					Grab	1	GC-MS1
Arsenic					Grab	0.96	ICP-MS
Chromium	< 20				Grab	20	ICP-OES
Copper	< 20				Grab	20	ICP-OES
Cyanide					Grab	5	Colorimetric
Flouride					Grab	100	ISE
Lead	< 20				Grab	20	ICP-OES
Nickel	< 20				Grab	20	ICP-OES
Zinc	< 20				Grab	20	ICP-OES
Boron	< 20				Grab	20	ICP-OES
Cadmium	< 20				Grab	20	ICP-OES
Mercury					Grab	0.2	ICP-MS
Selenium					Grab	0.74	ICP-MS
Barium	< 20				Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn no analysis for TBT as the discharge is to freshwaters
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TABLE F.1(i)(a): SURFACE/GROUND WATER MONITORING

Primary Discharge Point

Discharge Point Code:	SW-1
MONITORING POINT CODE:	aSW-1u
Grid Ref (12 digits, 6E, 6N)	154294 / 095915

Parameter	Results (mg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	10/04/08	09/10/08	23/10/08	27/11/08			
pH				= 7.3	Grab	2	Electrochemical
Temperature					Grab	0	Electrochemical
Electrical Conductivity (@ 25°C)	= 173			= 173	Grab	0.5	Electrochemical
Suspended Solids	< 2.5			< 2.5	Grab	0.5	Gravimetric
Ammonia (as N)	< 0.1		< 0.1	< 0.1	Grab	0.02	Colorimetric
Biochemical Oxygen Demand	< 1			= 2.2	Grab	0.06	Electrochemical
Chemical Oxygen Demand				< 21	Grab	8	Digestion & Colorimetric
Dissolved Oxygen					Grab	0	ISE
Hardness (as CaCO ₃)					Grab	0	Titrimetric
Total Nitrogen (as N)				= 6	Grab	0.5	Digestion & Colorimetric
Nitrite (as N)				= 268	Grab	0	Colorimetric
Nitrate (as N)				= 3.77	Grab	0.5	Colorimetric
Total Phosphorous (as P)	< 0.2		< 0.2	< 0.2	Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)	< 0.05	< 0.05	< 0.05	< 0.05	Grab	0.02	Colorimetric
Sulphate (SO ₄)			< 30	< 30	Grab	30	Turbidimetric
Phenols (Sum)				< 0.1	Grab	0.1	GC-MS 2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper
 For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	
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WWD Licence Application Annex I

Parameter	Results (mg/l)			Sampling method	Limit of Quantitation	Analysis method / technique
	01/01/09	07/01/09	21/01/09			
pH		= 7.5	= 7.3	Grab	2	Electrochemical
Temperature	= 0			Grab	0	Electrochemical
Electrical Conductivity (@ 25°C)		= 191	= 180	Grab	0.5	Electrochemical
Suspended Solids		< 1	= 4	Grab	0.5	Gravimetric
Ammonia (as N)		< 0.05	< 0.05	Grab	0.02	Colorimetric
Biochemical Oxygen Demand		< 2	< 2	Grab	0.06	Electrochemical
Chemical Oxygen Demand				Grab	8	Digestion & Colorimetric
Dissolved Oxygen	= 0			Grab	0	ISE
Hardness (as CaCO ₃)	= 0			Grab	0	Titrimetric
Total Nitrogen (as N)		= 5.4	= 4.1	Grab	0.5	Digestion & Colorimetric
Nitrite (as N)				Grab	0	Colorimetric
Nitrate (as N)				Grab	0.5	Colorimetric
Total Phosphorous (as P)		= 0.06	< 0.05	Grab	0.2	Digestion & Colorimetric
OrthoPhosphate (as P)		= 0.06	< 0.05	Grab	0.02	Colorimetric
Sulphate (SO ₄)				Grab	30	Turbidimetric
Phenols (Sum)				Grab	0.1	GC-MS 2

For Orthophosphate: this monitoring should be undertaken on a sample filtered on 0.45µm filter paper
 For Phenols: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

Additional Comments:	
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TABLE F.1(i)(b): SURFACE/GROUND WATER MONITORING (Dangerous Substances)

Primary Discharge Point

Discharge Point Code:	SW-1
MONITORING POINT CODE:	aSW-1u
Grid Ref (12 digits, 6E, 6N)	154294 / 095915

Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	10/04/08	23/10/08	27/11/08	01/01/09			
Atrazine			< 0.1		Grab	0.96	HPLC
Dichloromethane			< 1		Grab	1	GC-MS1
Simazine			< 0.01		Grab	0.01	HPLC
Toluene			< 1		Grab	0.02	GC-MS1
Tributyltin				= 0	Grab	0.02	GC-MS1
Xylenes			< 1		Grab	1	GC-MS1
Arsenic			< 0.96		Grab	0.96	ICP-MS
Chromium	< 20	< 20	< 20		Grab	20	ICP-OES
Copper	< 20	< 20	< 20		Grab	20	ICP-OES
Cyanide			< 5		Grab	5	Colorimetric
Flouride			= 31		Grab	100	ISE
Lead	< 20	< 20	< 20		Grab	20	ICP-OES
Nickel	< 20	< 20	< 20		Grab	20	ICP-OES
Zinc	< 20	< 20	< 20		Grab	20	ICP-OES
Boron	< 20	< 20	< 20		Grab	20	ICP-OES
Cadmium	< 20	< 20	< 20		Grab	20	ICP-OES
Mercury			= 0.2		Grab	0.2	ICP-MS
Selenium			= 0.9		Grab	0.74	ICP-MS
Barium	< 20	< 20	= 34		Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn TBT analysis not required as discharge is to fresh waters
----------------------	--

WWD Licence Application Annex I

Parameter	Results (µg/l)				Sampling method	Limit of Quantitation	Analysis method / technique
	07/01/09	21/01/09					
Atrazine					Grab	0.96	HPLC
Dichloromethane					Grab	1	GC-MS1
Simazine					Grab	0.01	HPLC
Toluene					Grab	0.02	GC-MS1
Tributyltin					Grab	0.02	GC-MS1
Xylenes					Grab	1	GC-MS1
Arsenic					Grab	0.96	ICP-MS
Chromium	< 20	< 20			Grab	20	ICP-OES
Copper	< 20	< 20			Grab	20	ICP-OES
Cyanide					Grab	5	Colorimetric
Flouride					Grab	100	ISE
Lead	< 20	< 20			Grab	20	ICP-OES
Nickel	< 20	< 20			Grab	20	ICP-OES
Zinc	< 20	< 20			Grab	20	ICP-OES
Boron	< 20	< 20			Grab	20	ICP-OES
Cadmium	< 20	< 20			Grab	20	ICP-OES
Mercury					Grab	0.2	ICP-MS
Selenium					Grab	0.74	ICP-MS
Barium	< 20	= 20			Grab	20	ICP-OES

Additional Comments:	TBT value is 0.02ug/l as Sn TBT analysis not required as discharge is to fresh waters
----------------------	--

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Annex 2: Check List For Regulation 16 Compliance

Regulation 16 of the waste water discharge (Authorisation) Regulations 2007 (S.I. No. 684 of 2007) sets out the information which must, in all cases, accompany a discharge licence application. In order to ensure that the application fully complies with the legal requirements of regulation 16 of the 2007 Regulations, all applicants should complete the following.

In each case, refer to the attachment number(s), of your application which contains(s) the information requested in the appropriate sub-article.

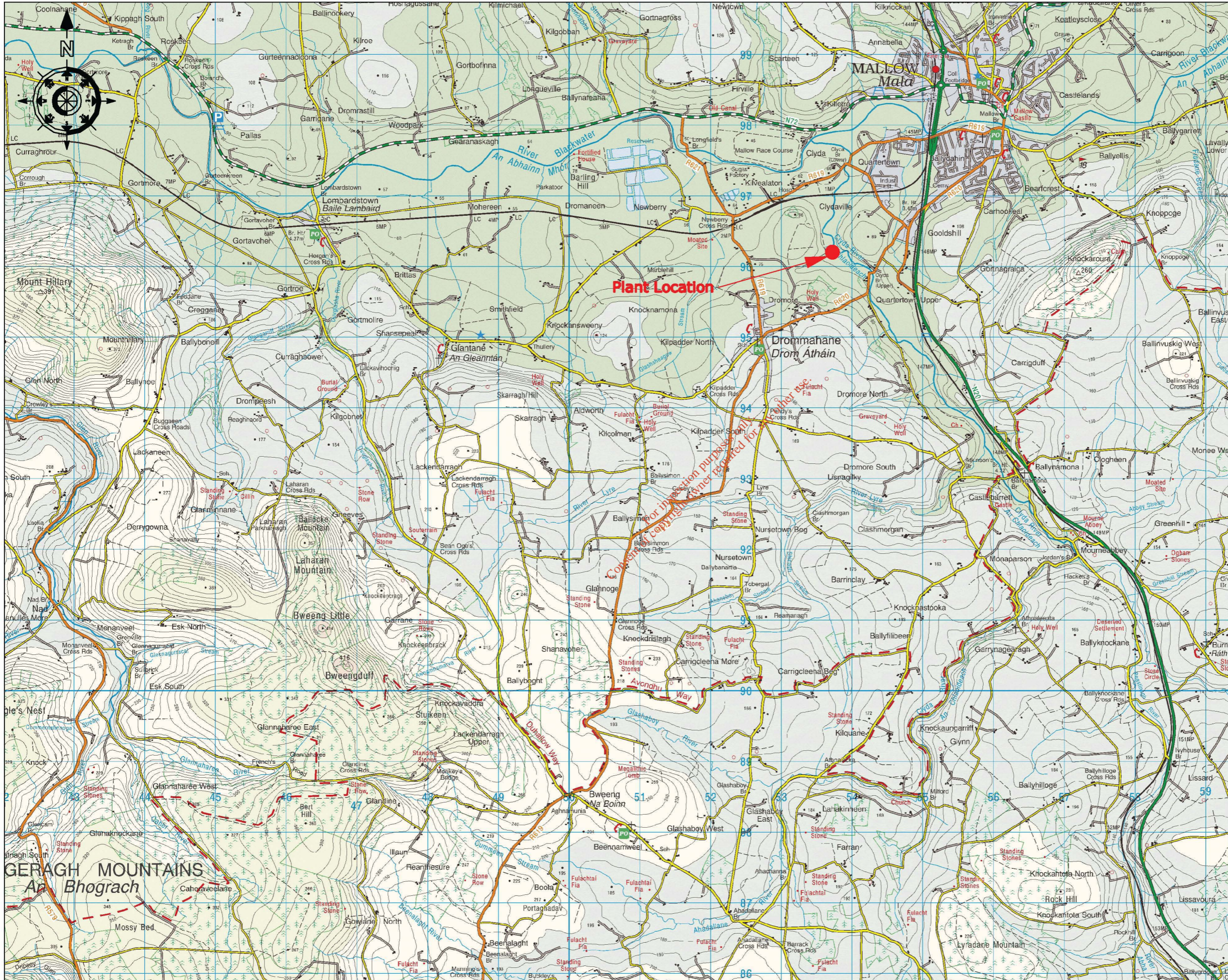
Regulation 16(1) In the case of an application for a waste water discharge licence, the application shall -		Attachment Number	Checked by Applicant
(a)	give the name, address, telefax number (if any) and telephone number of the applicant (and, if different, of the operator of any treatment plant concerned) and the address to which correspondence relating to the application should be sent and, if the operator is a body corporate, the address of its registered office or principal office,	B.1	Yes
(b)	give the name of the water services authority in whose functional area the relevant waste water discharge takes place or is to take place, if different from that of the applicant,	Not Applicable	Yes
(c)	give the location or postal address (including where appropriate, the name of the townland or townlands) and the National Grid reference of the location of the waste water treatment plant and/or the waste water discharge point or points to which the application relates,	B.2	Yes
(d)	state the population equivalent of the agglomeration to which the application relates,	B.9	Yes
(e)	specify the content and extent of the waste water discharge, the level of treatment provided, if any, and the flow and type of discharge,	C,D	Yes
(f)	give details of the receiving water body, including its protected area status, if any, and details of any sensitive areas or protected areas or both in the vicinity of the discharge point or points likely to be affected by the discharge concerned, and for discharges to ground provide details of groundwater protection schemes in place for the receiving water body and all associated hydrogeological and geological assessments related to the receiving water environment in the vicinity of the discharge.	F.1	Yes
(g)	identify monitoring and sampling points and indicate proposed arrangements for the monitoring of discharges and, if Regulation 17 does not apply, provide details of the likely environmental consequences of any such discharges,	E.3	Yes
(h)	in the case of an existing waste water treatment plant, specify the sampling data pertaining to the discharge based on the samples taken in the 12 months preceding the making of the application,	E.4	Yes
(i)	describe the existing or proposed measures, including emergency procedures, to prevent unintended waste water discharges and to minimise the impact on the environment of any such discharges,	G.3	Yes
(j)	give particulars of the nearest downstream drinking water abstraction point or points to the discharge point or points,	Not Applicable	Yes
(k)	give details, and an assessment of the effects, of any existing or proposed emissions on the environment, including any environmental medium other than those into which the emissions are, or are to be made, and of proposed measures to prevent or eliminate or, where that is not practicable, to limit any pollution caused in such discharges,	F.1	Yes
(l)	give detail of compliance with relevant monitoring requirements and treatment standards contained in any applicable Council Directives of Regulations,	E1, E4	Yes
(m)	give details of any work necessary to meet relevant effluent discharge standards and a timeframe and schedule for such work.	G1	Yes
(n)	Any other information as may be stipulated by the Agency.	Not Applicable	Yes
Regulation 16(3) Without prejudice to Regulation 16 (1) and (2), an application for a licence shall be accompanied by -		Attachment Number	Checked by Applicant
(a)	a copy of the notice of intention to make an application given pursuant to Regulation 9,	B8	Yes
(b)	where appropriate, a copy of the notice given to a relevant water services authority under Regulation 13,	Not Applicable	Yes
(c)	Such other particulars, drawings, maps, reports and supporting documentation as are necessary to identify and describe, as appropriate -	B.3	Yes
(c) (i)	the point or points, including storm water overflows, from which a discharge or discharges take place or are to take place, and	E.3	Yes
(c) (ii)	the point or points at which monitoring and sampling are undertaken or are to be undertaken,	E.3	Yes
(d)	such fee as is appropriate having regard to the provisions of Regulations 38 and 39.	B.9 (iii)	Yes

Regulation 16(4) An original application shall be accompanied by 2 copies of it and of all accompanying documents and particulars as required under Regulation 16(3) in hardcopy or in an electronic or other format as specified by the Agency.		Attachment Number	Checked by Applicant
1	An Original Application shall be accompanied by 2 copies of it and of all accompanying documents and particulars as required under regulation 16(3) in hardcopy or in electronic or other format as specified by the agency.		Yes
Regulation 16(5) For the purpose of paragraph (4), all or part of the 2 copies of the said application and associated documents and particulars may, with the agreement of the Agency, be submitted in an electronic or other format specified by the Agency.		Attachment Number	Checked by Applicant
1	Signed original.		Yes
2	2 hardcopies of application provided or 2 CD versions of application (PDF files) provided.		Yes
3	1 CD of geo-referenced digital files provided.		Yes
Regulation 17 Where a treatment plant associated with the relevant waste water works is or has been subject to the European Communities (Environmental Impact Assessment) Regulations 1989 to 2001, in addition to compliance with the requirements of Regulation 16, an application in respect of the relevant discharge shall be accompanied by a copy of an environmental impact statement and approval in accordance with the Act of 2000 in respect of the said development and may be submitted in an electronic or other format specified by the Agency		Attachment Number	Checked by Applicant
1	EIA provided if applicable	Not Applicable	Yes
2	2 hardcopies of EIS provided if applicable.	Not Applicable	Yes
3	2 CD versions of EIS, as PDF files, provided.	Not Applicable	Yes

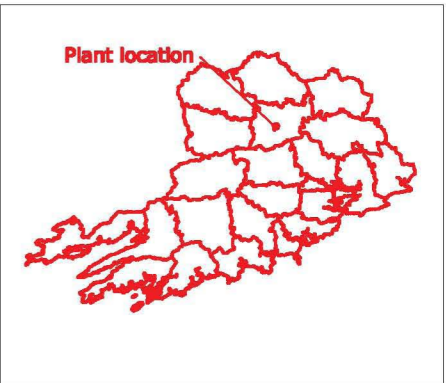
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ANNEX 1: TABLES / ATTACHMENT

Attachment	Description
A1 Map 1	1:50,000 Location Map
A1 Map 2	Site Location of WWTP
A1 Map 3	Wastewater Treatment Plant – Site Layout
B1 Map 4	Agglomeration
B2 Map 5	Layout of Waste Water Treatment Plant
B3 Map 6	Location of Primary Discharge Point SW01 DROM
B3 Map 7	Location of Sampling Points
B4	Not Applicable
B5	Not Applicable
B6	Not Applicable
B7	Not Applicable
B8 Map 8	Location of Site Notice
B8	Notice & Advertisement
B10	WSIP Programme
B 11	Not Applicable
B 12	Not Applicable
C1 Map 9	Layout Wastewater Treatment Plant
C1 Drg 1	Schematic of Wastewater Treatment Plant
C2	Not Applicable
D1	Influent Results
Section D2	Discharge Points
E2	
Section E3	Monitoring & Sampling Points
E4	
F1	Laboratory Test Results SAC Blackwater River Site Synopsis
F2	Not Applicable
G1	SAC Blackwater River Site Synopsis WSIP Programme
G2	WSIP Programme Laboratory Test Results
G3	WSIP Programme
G4	Not Applicable




- NOTES**
1. Dimensions are not to be scaled from drawing. For any discrepancies found consult with the design office.
 2. This drawing is to be read in conjunction with the Specification.
 3. This drawing is to be read in conjunction with all other contract drawings.



Key Map

No.	Date	Drawn/Checked	Revision Description

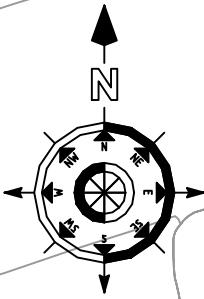
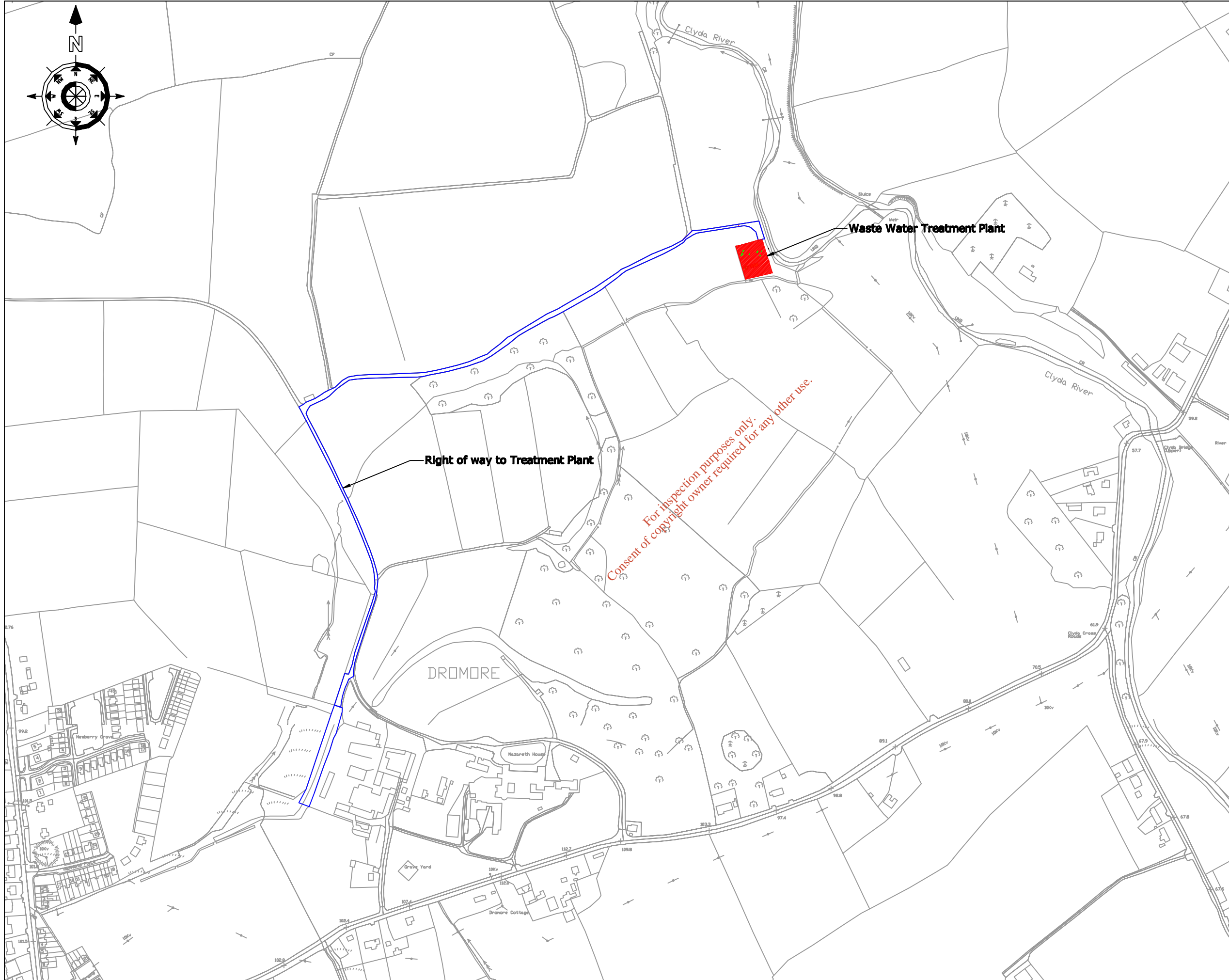
Cork County Council,
Northern Division.

 N. O'KEEFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CORK.

Job Title:
**Drommahane & Environs
Wastewater Discharge
Licence Application**

Drawing Title:
**Location Map
Scale - 1:50,000
Attachment A1 - Map 1**

Scales: 1:50,000 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: A1 - Map 1	Rev:	-



NOTES

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2. This drawing is to be read in conjunction with the Specification.
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No.	Date	Drawn	Survey	Checked	Revision Description

Cork County Council,
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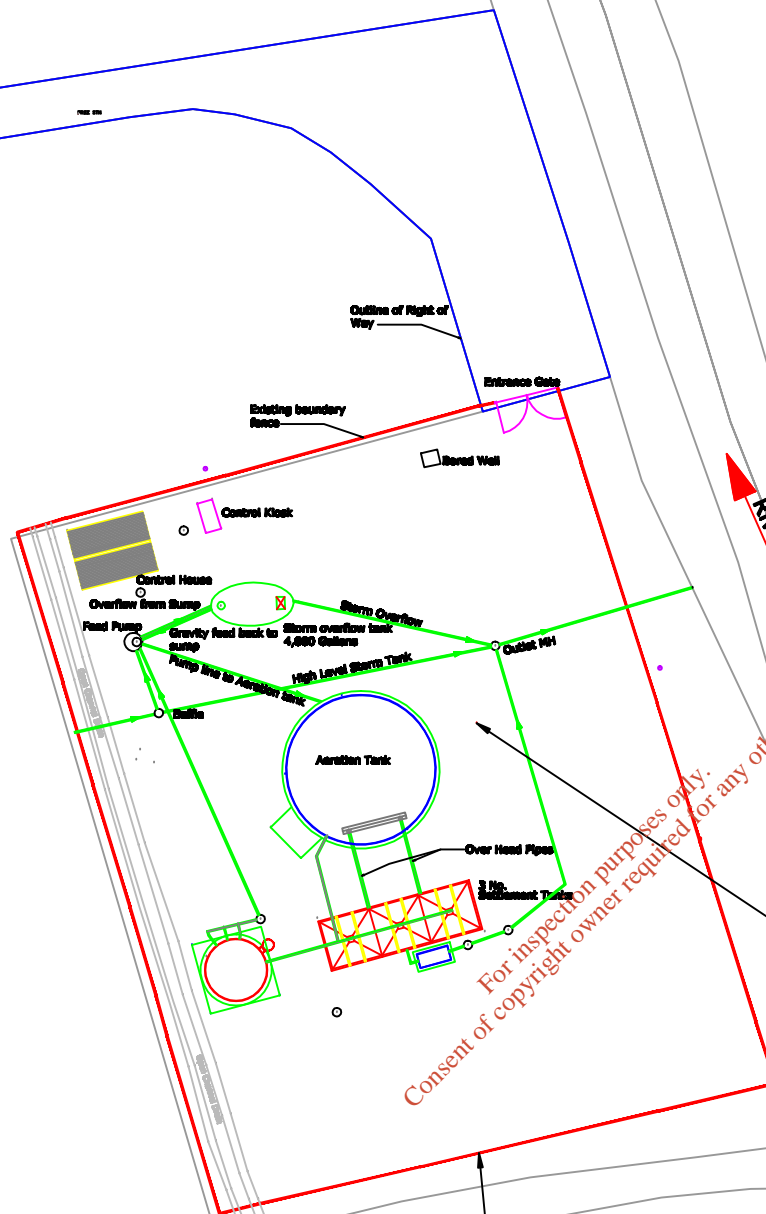
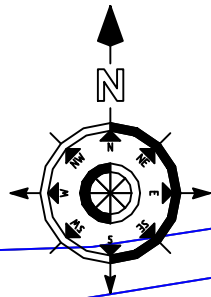


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COUNTY HALL,
CDRK.

Job Title:
**Dromahane & Environs
Waste Water Discharge
Licence Application**

Drawing Title:
**Site Locations of W.W.T.P.
Attachment A1 - Map 2**

Scales: 1:5,000 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: A1-Map2	Rev: -	

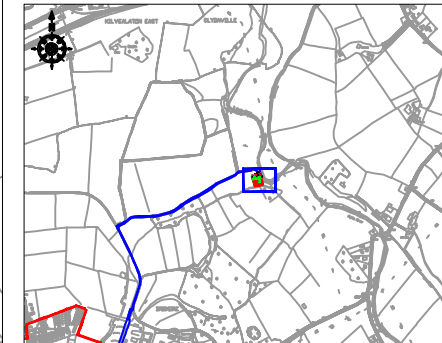


Waste Water Treatment Plant
(153724E, 096162N)

Plant Boundary

NOTES

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2. This drawing is to be read in conjunction with the Specification.
3. This drawing is to be read in conjunction with all other contract drawings.



KEY PLAN

No.	Date	Drawn	Survey	Checked	Revision Description

Cork County Council,
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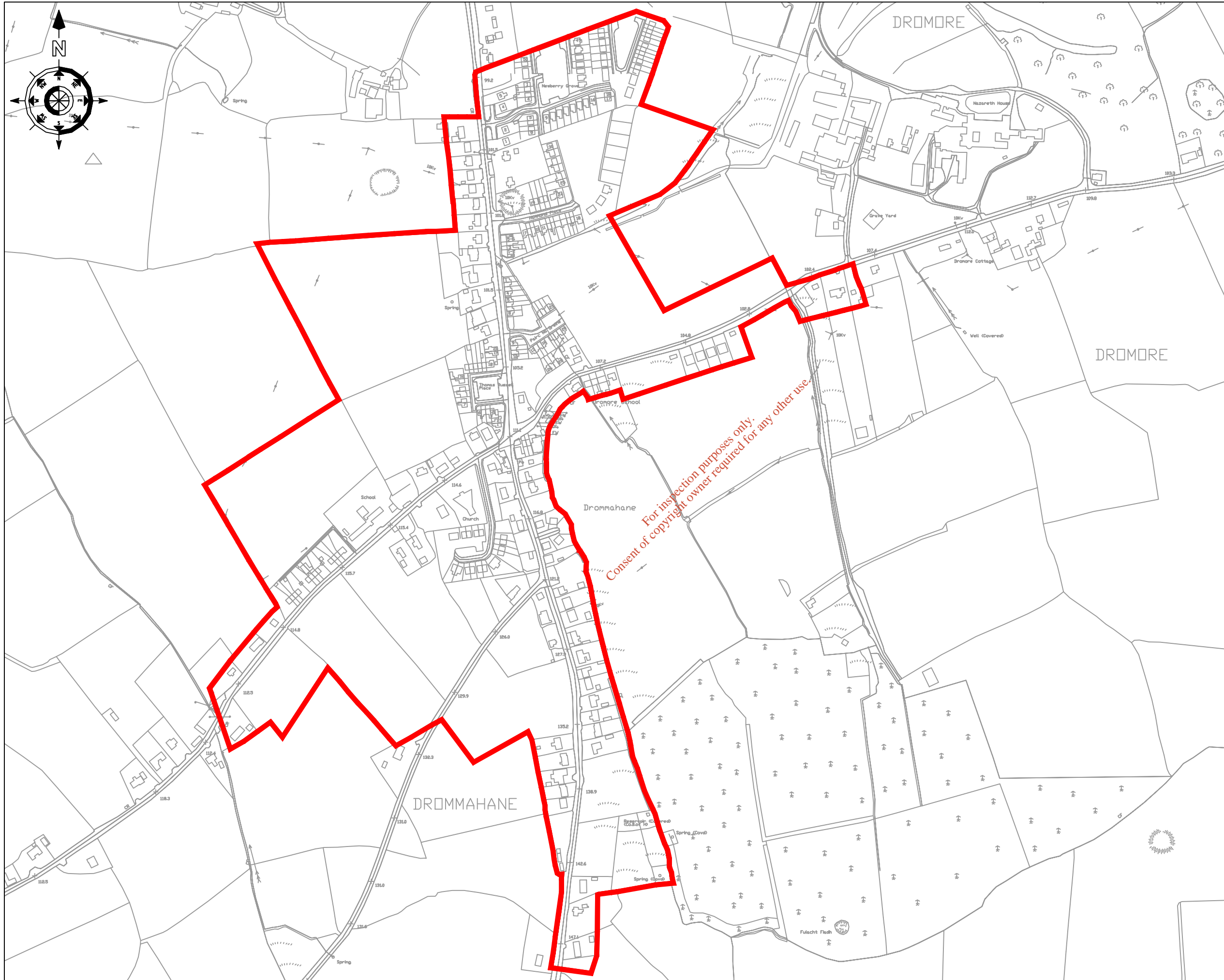


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COUNTY HALL,
CORK.

Job Title:
**Dromahane & Environs
Wastewater Discharge
Licence Application**

Drawing Title:
**Waste Water Treatment Plant
Site Layout
Attachment A1 - Map 3**

Scales: 1:500 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: A1 - Map 3	Rev:	-



NOTES

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No.	Date	Drawn	Survey	Checked	Revision	Description

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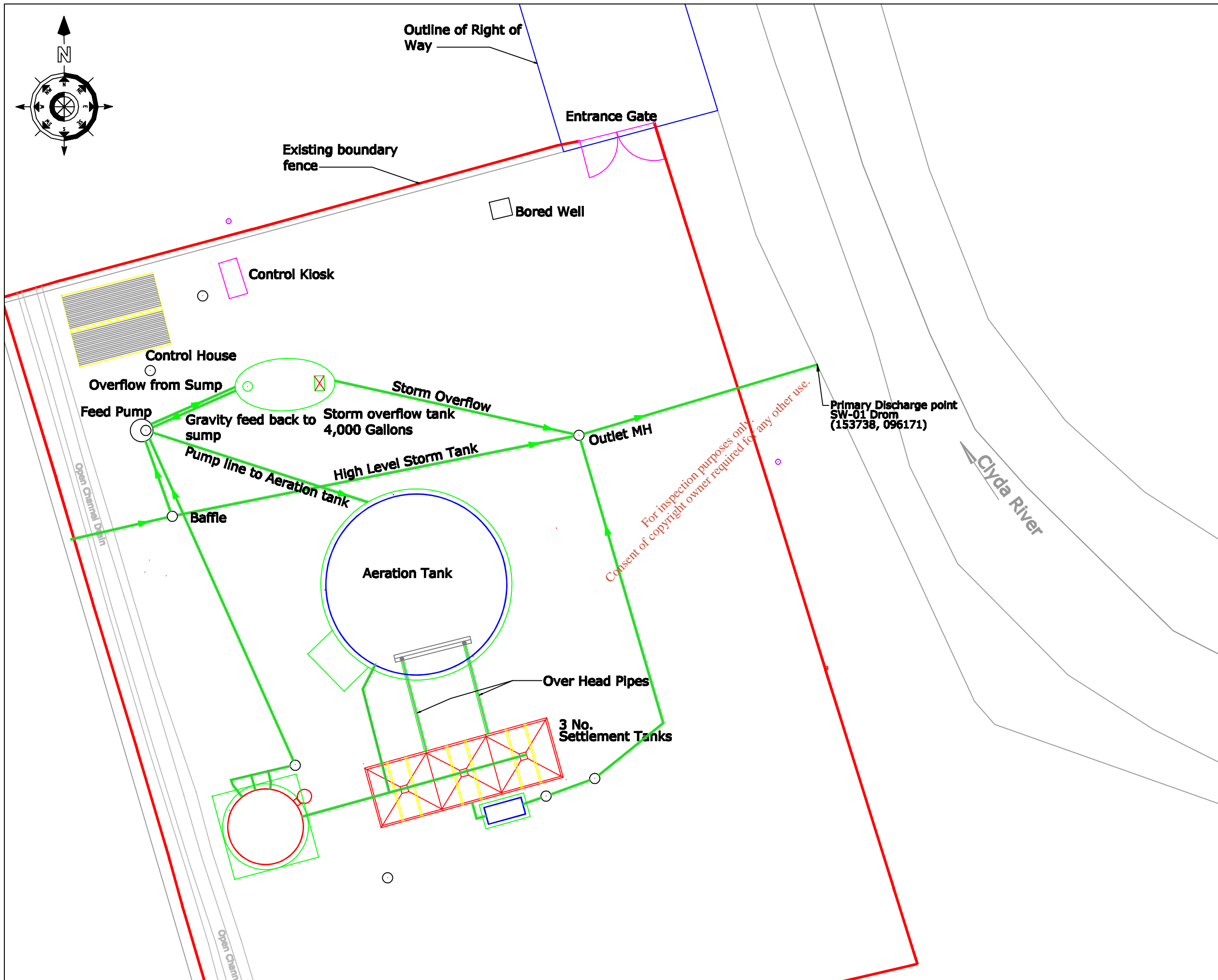
Job Title:

**Dromahane & Environs
Wastewater Discharge
Licence Application**

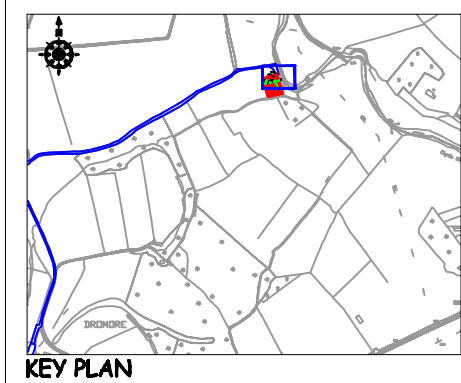
Drawing Title:

**Agglomeration Boundary
Attachment B1 - Map 4**

Scales: 1:5,000 @ A3	Surveyed by: DL	Drawn by: DL
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: B1 - Map 4	Rev: -	




- NOTES**
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No.	Date	Drawn	Surv	Chk'd	Revision	Description

Cork County Council,
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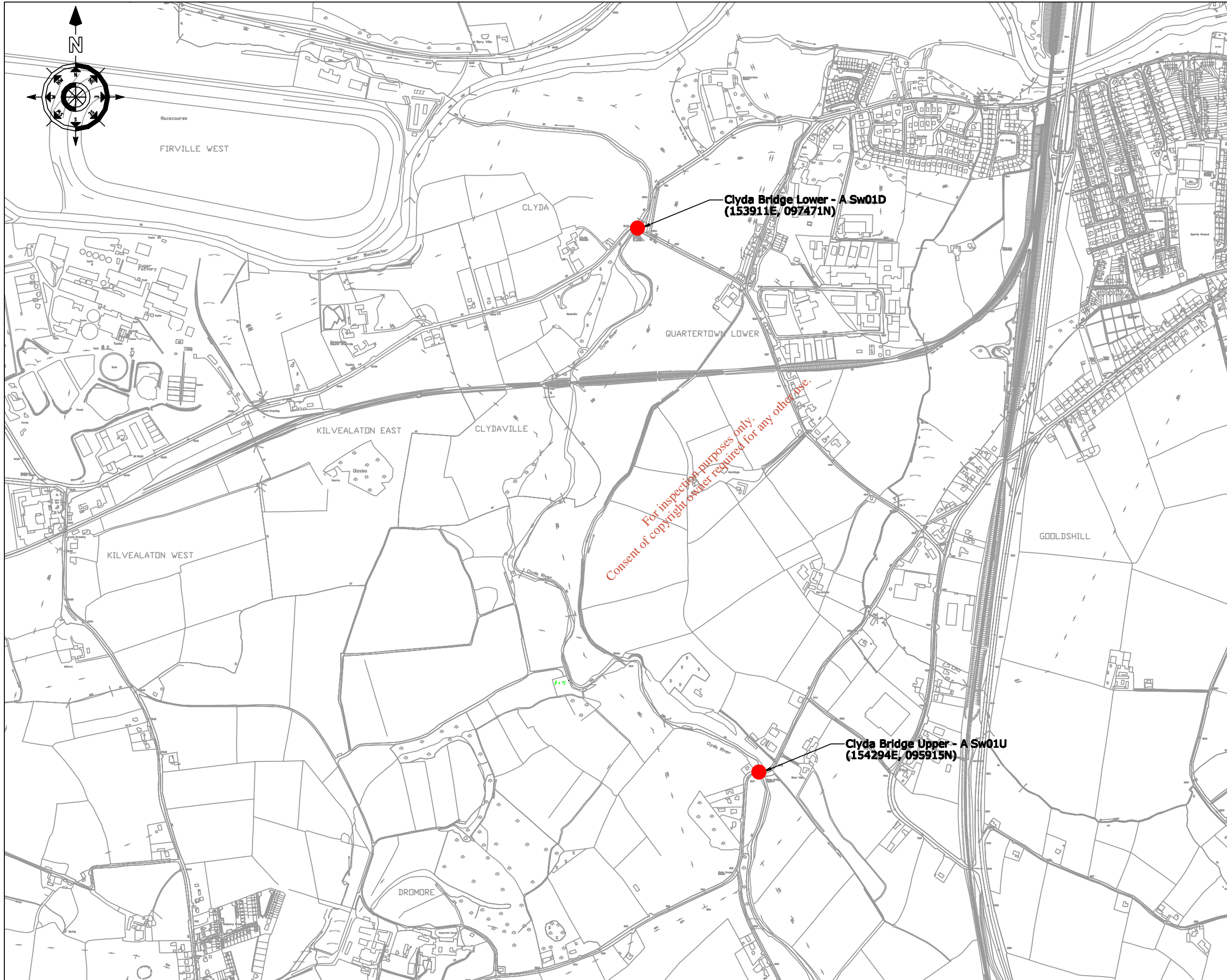


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COUNTY ENGINEER,
COUNTY HALL,
CDRK.

Job Title:
**Dromahane & Environs
Wastewater Discharge
Licence Application**

Drawing Title:
**Location of Primary Discharge
Point SW01 - Drom
Attachment B3 - Map 6**

Scales: 1:200 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: B3 - Map 6	Rev:	-



NOTES

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2. This drawing is to be read in conjunction with the Specification.
3. This drawing is to be read in conjunction with all other contract drawings.

No.	Date	Drawn	Survey	Checked	Revision	Description

Cork County Council,
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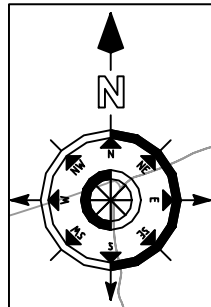
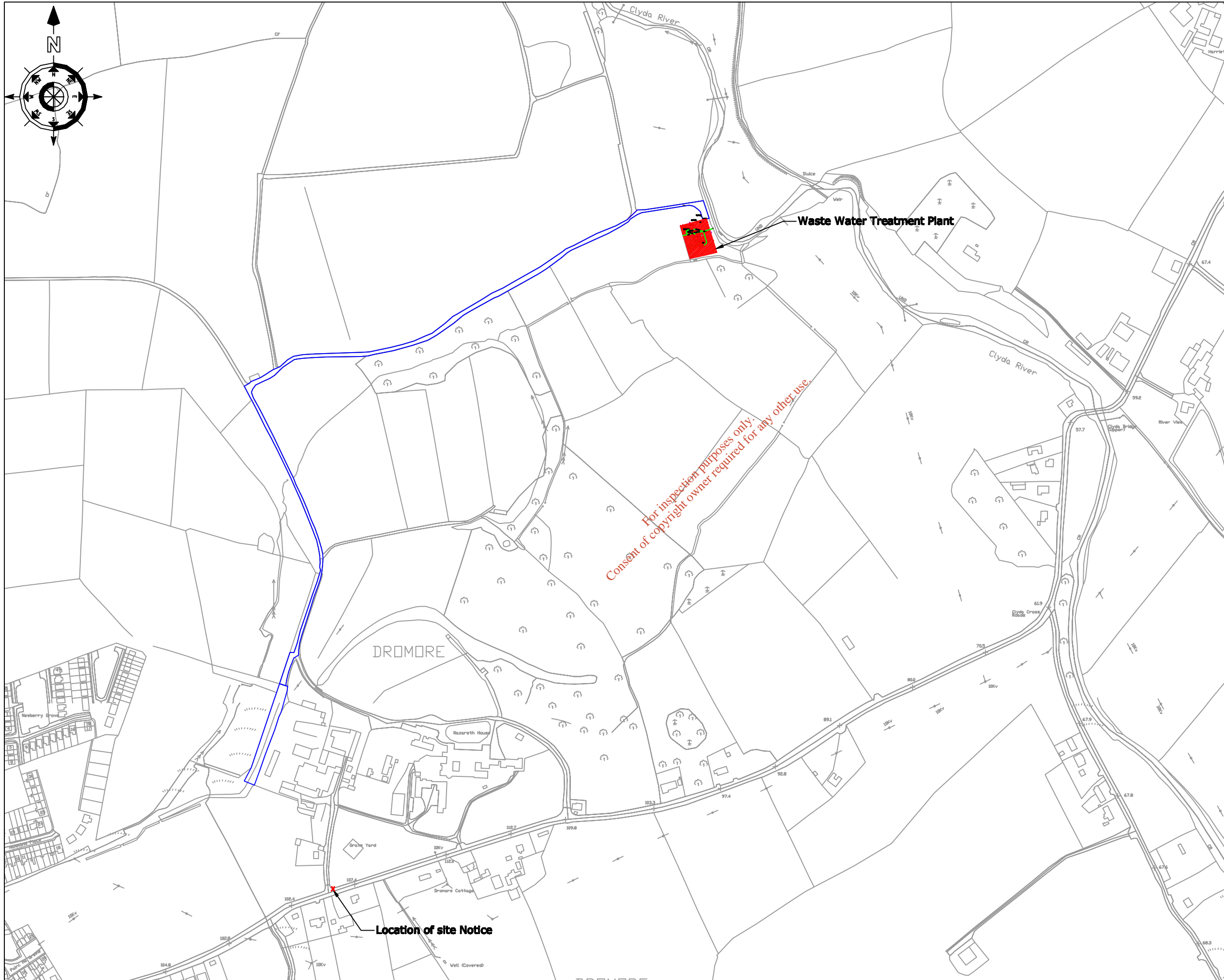


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COUNTY ENGINEER,
COUNTY HALL,
CDRK.

Job Title:
**Dromahane & Environs
Waste Water Discharge
Licence Application**

Drawing Title:
**Locations of Sampling points
Attachment B3 - Map 7**

Scales: 1:10,000 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: B3 - Map 7	Rev:	-



NOTES

1. Dimensions are not to be scaled from drawing. For any discrepancies found consult with the design office.
2. This drawing is to be read in conjunction with the Specification.
3. This drawing is to be read in conjunction with all other contract drawings.

No.	Date	Drawn	Survey	Checked	Revision	Description

Cork County Council,
Northern Division.



N. O'KEEFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CDRK.

Job Title:
**Dromahane & Environs
Wastewater Discharge
Licence Application**

Drawing Title:
**Location of Site Notice
Attachment B8 - Map 8**

Scales: 1:5000 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: B8 - Map 8	Rev:	-



CORK COUNTY COUNCIL

SITE NOTICE

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Waste Water Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow is applying to the Environmental Protection Agency for a Waste Water Discharge Licence for the Agglomeration of Dromahane at the following locations:

Plant Name	Location	National Grid Ref.
Dromahane WWTP	Dromore, Dromahane	E153724 N096162

Discharge	Function	Townland	Receptor	Grid Reference
Primary	Main	Dromore	Clyda	E153738 N096171

A copy of the application for the Waste Water Discharge Licence and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall as soon as is practicable after receipt by the Agency be available for inspection or purchase at the

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335599 Telephone: 053-9160600 Fax: 053-9160699 Email: info@epa.ie

and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Telephone: 022-21123 Fax: 022-21983

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

Cork County Council Northern Division

**APPLICATION TO THE ENVIRONMENTAL
PROTECTION AGENCY FOR A WASTEWATER
DISCHARGE LICENCE**

In accordance with the Waste Water Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow is applying to the Environmental Protection Agency for a Waste Water Discharge Licence for the Agglomeration of Dromahane at the following locations:

Plant Name	Location	National Grid Ref.
Dromore WWTP	Dromore, Dromahane	E153724 N096162

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and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Telephone: 022-21123 Fax: 022-21893.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork. Tel: 022-21123; Fax: 022-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Doneraile at the following locations:

Plant Name	Location	National Grid Ref.
Doneraile WWTP	Demesne, Doneraile	E160189 N107464

Discharge	Function	Townland	Receptor	Grid Ref.
Primary	Main	Demesne	Awbeg	E160254 N107485

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Tel: 022-21123; Fax: 022-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Northern Division, Cork County Council, Annabella, Mallow, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Dromahane at the following locations:

Plant Name	Location	National Grid Ref.
Dromahane WWTP	Dromore, Dromahane	E153724 N096162

Discharge	Function	Townland	Receptor	Grid Ref.
Primary	Main	Dromore	Clyda	E153738 N096171

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

- Cork County Council Offices, Annabella, Mallow, Co. Cork, Tel: 022-21123; Fax: 022-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

- Cork County Council Offices, Water Services South, County Hall, Carrigrohane Road, Co. Cork, Tel: 021-4276891; Fax: 021-4276321.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Southern Division of Cork County Council, Carrigrohane Road, Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Ballymakeera & Ballyvourney at the following locations:

Plant Name	Location	National Grid Ref.
Ballymakeera WWTP	Fair Green, Ballymakeera	E121370 N076407

Discharge	Function	Townland	Receptor	Grid Ref.
Primary	Main	Ballymakeera	Sullane	E121490 N076158

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

- Cork County Council Offices, Water Services South, County Hall, Carrigrohane Road, Co. Cork, Tel: 021-4276891; Fax: 021-4276321.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Southern Division of Cork County Council, Carrigrohane Road, Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Cloughduv at the following locations:

Plant Name	Location	National Grid Ref.
Cloughduv WWTP	Coolmucky, Cloughduv	E145395 N066630

Discharge	Function	Townland	Receptor	Grid Ref.
Primary	Main	Coolmucky	River Brouen	E145099 N066702
Primary (Proposed)	Main	Ryecourt	River Bride	E145318 N067565

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

- Cork County Council Offices, Water Services South, County Hall, Carrigrohane Road, Co. Cork, Tel: 021-4276891; Fax: 021-4276321.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

- Cork County Council Offices, Water Services South, County Hall, Carrigrohane Road, Co. Cork, Tel: 021-4276891; Fax: 021-4276321.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

WESTERN DIVISION

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, Water Services Western Division of Cork County Council, Courthouse, Skibbereen, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Castletownbere at the following locations:

Discharge	Function	Townland
Primary	Major	Foildarrig
Secondary	Minor	Derrymill West
Secondary	Minor	Derrymill West
Secondary	Minor	Camtring
Secondary	Minor	Drom North
Secondary	Minor	Foildarrig

A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

- Cork County Council Water Services, County Hall, Carrigrohane Road, Co. Cork, Tel: 028-21299; Fax: 028-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.

APPLICATION TO THE ENVIRONMENTAL PROTECTION AGENCY FOR A WASTEWATER DISCHARGE LICENCE

In accordance with the Wastewater Discharge (Authorisation) Regulations 2007, S.I. No. 684 of 2007 (Western Division), Cork County Council, Co. Cork is applying to the Environmental Protection Agency for a Wastewater Discharge Licence for the Agglomeration of Meenvane at the following locations:

Discharge	Function	Townland
Primary	Major	Meenvane
Secondary	Minor	Skull

Cork County Council proposes to permit the discharge of effluent from a plant at Meenvane, Schull, Co. Cork (S.I. No. 031613N). It is proposed to discharge this effluent into Long Island Channel. The details of the discharge are detailed in the table below:

Discharge	Function	Townland
Primary	Major	Colla

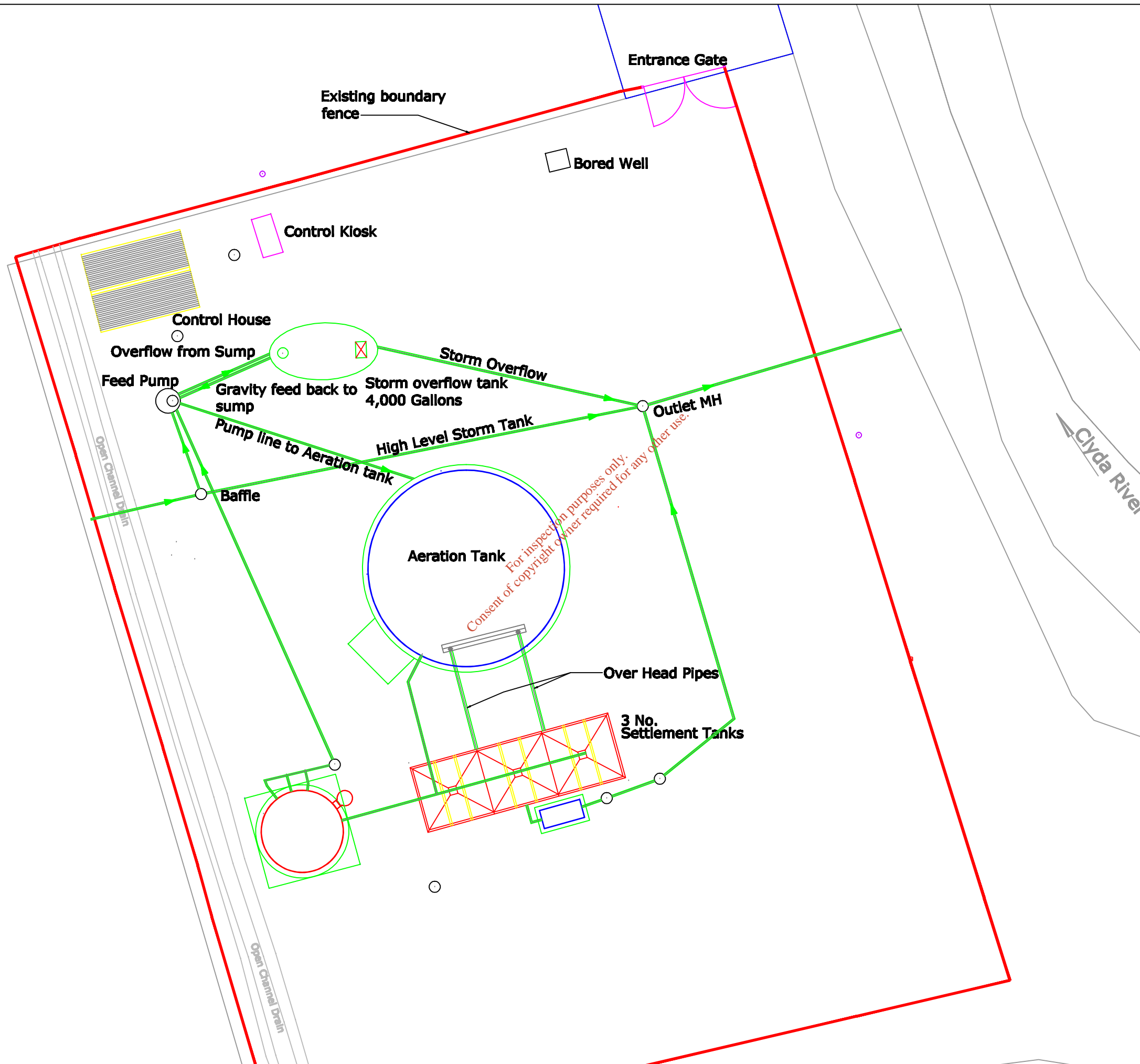
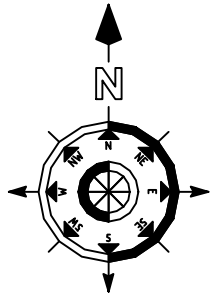
A copy of the application for the Wastewater Discharge Licence, and such further information relating to the application as may be furnished to the Agency in the course of the Agency's consideration of the Application shall, as soon as is practicable after receipt by the Agency, be available for inspection or purchase at the:

- Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Co. Wexford, Lo Call 1890 335 599; Tel: 053-9160600; Fax: 053-9160699; Email: info@epa.ie

and at

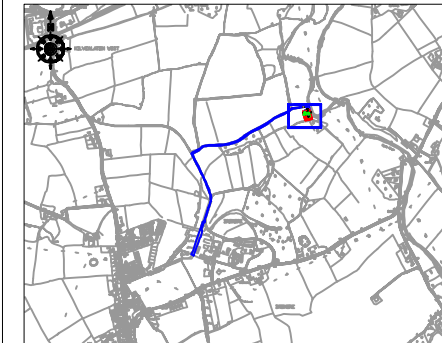
- Cork County Council Water Services, County Hall, Carrigrohane Road, Co. Cork, Tel: 028-21299; Fax: 028-21983.

Submissions in relation to the application may be made to the Environmental Protection Agency at its headquarters described above.



NOTES

1. Dimensions are not to be scaled from drawing. For any discrepancies found consult with the design office.
2. This drawing is to be read in conjunction with the Specification.
3. This drawing is to be read in conjunction with all other contract drawings.



KEY PLAN

No.	Date	Drawn	Surv	Chk'd	Revision Description

Cork County Council,
Northern Division.



N. O'KEEFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CDRK.

Job Title:

**Dromahane & Environs
Wastewater Discharge
Licence Application**

Drawing Title:

**Layout of Waste Water
Treatment Plant
Attachment C1 - Map 9**

Scales: 1:200 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: C1 - Map 9	Rev:	-

Inlet MH

Baffle

Inlet sump

Storm Tank

Aeration Tank

Outlet MH

Sludge Holding Tank

Clarifier

Flow Measurement & Sampling

Outlet MH

Outlet to River

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NOTES

- 1. Dimensions are not to be scaled from drawing. For any discrepancies found consult with the design office.
- 2. This drawing is to be read in conjunction with the Specification.
- 3. This drawing is to be read in conjunction with all other contract drawings.

No.	Date	Drawn/Checked	Revision Description

Cork County Council,
Northern Division.

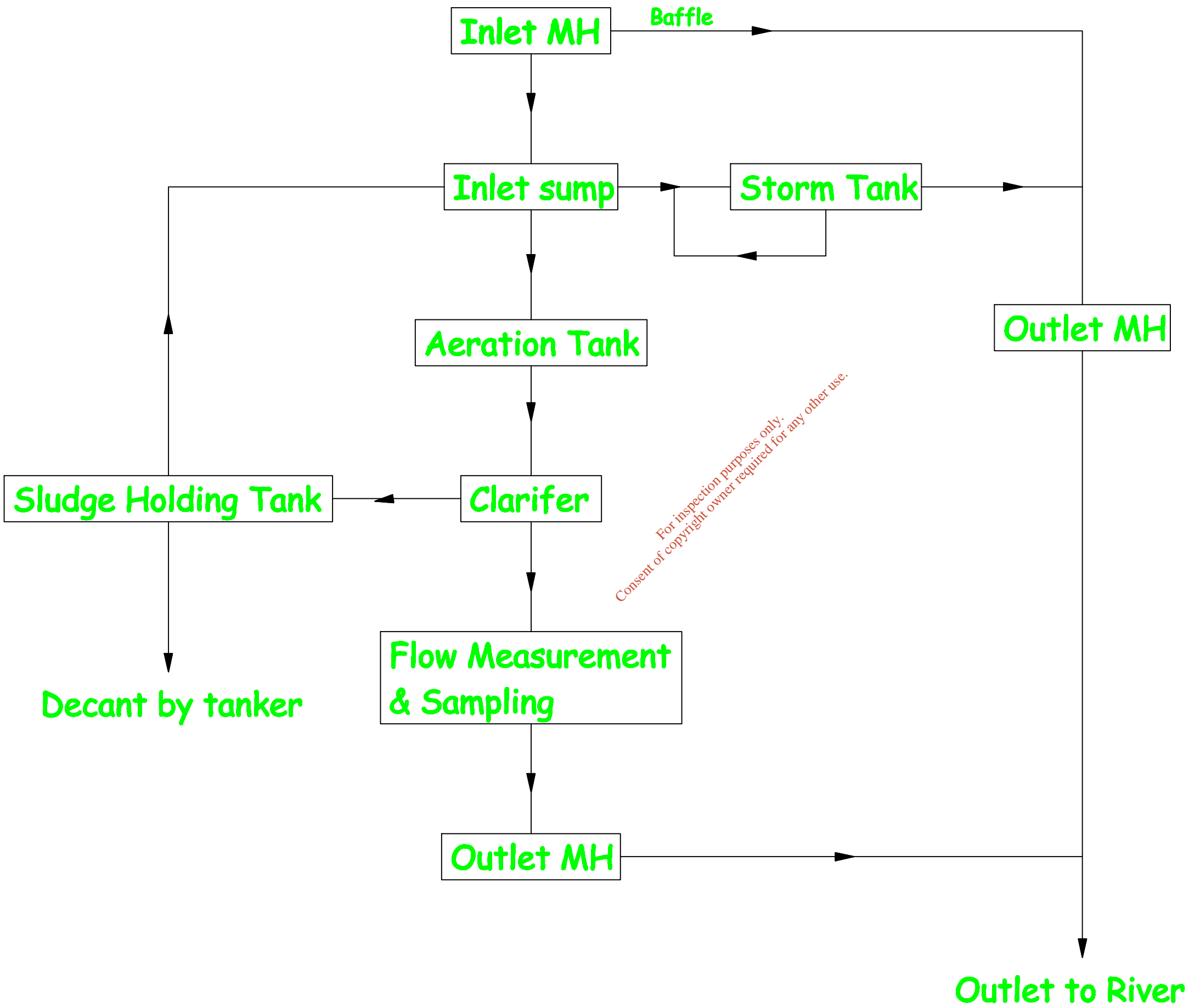


N. O'KEEFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CORK.

Job Title:
**Dromahane & Environs
Wastewater Discharge
Licence Application**

Drawing Title:
**Schematic showing Existing
Treatment Plant Process
Attachment C1 - Drawing 1**

Scales:		Drawn by:	DL
1:5000 @ A3	DL	Checked by:	DL
Designed by:	F.J.	Date:	August 2008
Drawing number:	C1 - Drawing 1	Rev:	-



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NOTES

1. Dimensions are not to be scaled from drawing. For any discrepancies found consult with the design office.
2. This drawing is to be read in conjunction with the Specification.
3. This drawing is to be read in conjunction with all other contract drawings.

No.	Date	Drawn	Surv	Chk'd	Revision Description

Cork County Council,
Northern Division.

N. O'KEEFFE, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CDRK.

Job Title:
**Dromahane & Environs
Wastewater Discharge
Licence Application**

Drawing Title:
**Schematic showing Existing
Treatment Plant Process
Attachment C1 - Drawing 1**

Scales: 1:5000 @ A3	Surveyed by: D.L.	Drawn by: D.L.
Designed by: F.J.	Checked by: F.C.	Date: August 2008
Drawing number: C1 - Drawing 1	Rev: -	

Attachment E4 Dromahane Inlet Table E4

Sample Date	27/11/2008	07/01/2009	21/01/2009			
Sample	Influent	Influent	Influent	Average	Kg/Day	Kg/year
Sample Code	GS1272	GT021	GT090	mg/L		
Flow M ³ /Day	*	*	*	1584		
pH	7.5	8	6.9	7.4667		
Temperature °C	*	*	*	*		
Cond 20°C	650	801	507	652.6667		
SS mg/L	165	218	86	156.3333	247.632	90385.68
NH ₃ mg/L	24.9	32	6	20.9667	33.2112	12122.088
BOD mg/L	166	360	180	235.3333	372.768	136060.32
COD mg/L	403	901	203	502.3333	795.696	290429.04
TN mg/L	37	45	14	32.0000	50.688	18501.12
Nitrite mg/L	0.345	*	*	0.3450	0.54648	199.4652
Nitrate mg/L	0.761	*	*	0.7610	1.205424	439.97976
TP mg/L	5.8	12	2.5	6.7667	10.7184	3912.216
O-PO ₄ -P mg/L	4.02	5.3	1.5	3.6067	5.71296	2085.2304
SO ₄ mg/L	46.8	*	*	46.8	74.1312	27057.888
Phenols µg/L	12.082	*	*	0.012082	0.01913789	6.98532912
Atrazine µg/L	<0.01	*	*	<0.00001	<0.00001584	<0.0057816
Dichloromethane µg/L	<1	*	*	<0.001	<0.001584	<0.57816
Simazine µg/L	<0.01	*	*	<0.00001	<0.00001584	<0.0057816
Toluene µg/L	<1	*	*	<0.001	<0.001584	<0.57816
Tributyltin µg/L	*	*	*	*	*	*
Xylenes µg/L	<1	*	*	<0.001	<0.001584	<0.57816
Arsenic µg/L	<0.96	*	*	<0.00096	<0.00152064	<0.5550336
Chromium mg/L	<0.02	<0.02	<0.02	<0.02	<0.03168	<11.5632
Copper mg/L	<0.02	0.189	0.022	0.074	0.117216	42.78384
Cyanide µg/L	<5	*	*	<0.005	<0.00792	<2.8908
Fluoride µg/L	40	*	*	0.04	0.06336	23.1264
Lead mg/L	<0.02	<0.02	<0.02	<0.02	<0.03168	<11.5632
Nickel mg/L	<0.02	<0.02	<0.02	<0.02	<0.03168	<11.5632
Zinc mg/L	<0.02	0.159	0.023	0.064	0.101376	37.00224
Boron mg/L	<0.02	1.51	<0.02	0.051	0.080784	29.48616
Cadmium mg/L	<0.02	<0.02	<0.02	<0.02	<0.03168	<11.5632
Mercury µg/L	<0.2	*	*	<0.0002	<0.0003168	<0.115632
Selenium µg/L	1.3	*	*	0.0013	0.0020592	0.751608

Maximum Flow

<0.01
<1
<0.01
<1
*
<1
<0.96
<0.02
0.074
<5
40
<0.02
<0.02
0.064
0.051
<0.02
<0.2
1.3

Barium mg/L	<0.02	0.071	<0.02	0.074	0.117216	42.78384
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0.074



values recorded as 1/2 of LOD for statistical purposes

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Attachment E4 Dromahane Discharge Outlet Table E4

Sample Date	01/02/2007	03/05/2007	21/08/2007	27/09/2007	13/12/2007	14/02/2008	28/02/2008	10/04/2008	19/06/2008	09/10/2008	23/10/2008	27/11/2008	07/01/2009	21/01/2009	Average	Kg/Day	Kg/year
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent			
Sample Code						GS099	GS124	GS309	GS563	GS1055	GS1117	GS1271	GT022	GT091			
Flow M ³ /Day	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1584		
pH	7.4	7.3	7.7	7.5	7.4	7.4	7.3	*	7.4	7.5	7.4	7.4	7.3	7.2	7.4		
Temperature °C	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
Cond 20°C	*	*	*	*	*	*	*	524	430	*	*	479	546	450	485.8		
SS mg/L	18	7	4	6	7	98	20	10	17	7	9	11	3	10	16.21429	25.68343	9374.451429
NH ₃ mg/L	*	*	5.6	4	*	2.2	0.7	1.2	2.2	0.3	0.7	0.4	0.6	1.2	1.736364	2.7504	1003.896
BOD mg/L	21	3	3.2	4.51	3.46	19	16	4.84	3.94	3.49	5.28	5.3	7	9	7.787143	12.33483	4502.214514
COD mg/L	75	30	22	27	28	110	67	33	49	22	<21	34	25	39	40.82	64.65888	23600.4912
TN mg/L	*	4.85	3.5	7.7	7.4	18.1	6.22	*	12.7	4	7	7	5.3	9.8	7.7975	12.35124	4508.2026
Nitrite mg/L	*	*	*	*	*	*	*	*	*	*	*	0.228	*	*	0.228	0.361152	131.82048
Nitrate mg/L	*	*	*	*	*	*	*	*	*	*	*	3.5	*	*	3.5	5.544	2023.56
TP mg/L	3.03	5.55	4.78	1.7	1.25	11.8	2.03	1.75	1.02	0.9	1.5	3.9	3.3	0.6	3.079286	4.877589	1780.319829
O-PO ₄ -P mg/L	*	*	3.47	1.56	1.12	10	1.73	*	0.51	1.39	0.61	3.36	2.6	0.4	2.431818	3.852	1405.98
SO ₄ mg/L	*	*	30.6	43.2	<30	<30	31.5	*	*	<30	<30	38.6	*	*	25.49	40.37616	14737.2984
Phenols µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.10	*	*	<0.0001	<0.000158	<0.057816
Atrazine µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.01	*	*	<0.00001	<0.000015	<0.0057816
Dichloromethane	*	*	*	*	*	*	*	*	*	*	*	<1	*	*	<0.001	<0.001584	<0.57816
Simazine µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.01	*	*	<0.00001	<0.000015	<0.0057816
Toluene µg/L	*	*	*	*	*	*	*	*	*	*	*	<1	*	*	<0.001	<0.001584	<0.57816
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	*	*	*	*	*	<1	*	*	<0.001	<0.001584	<0.57816
Arsenic µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.96	*	*	<0.00096	<0.001520	<0.5550336
Chromium mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03168	<11.5632
Copper mg/L	*	*	*	*	*	0.044	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.014	0.022176	8.09424
Cyanide µg/L	*	*	*	*	*	*	*	*	*	*	*	<5	*	*	<0.005	<0.00792	<2.8908
Fluoride µg/L	*	*	*	*	*	*	*	*	*	*	*	32	*	*	0.032	0.050688	18.50112
Lead mg/L	*	*	*	*	*	0.024	0.032	0.023	<0.02	*	<0.02	<0.02	<0.02	<0.02	0.016	0.025344	9.25056
Nickel mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03168	<11.5632
Zinc mg/L	*	*	*	*	*	0.063	<0.02	0.027	<0.02	0.2	0.026	<0.02	<0.02	<0.02	0.041	0.064944	23.70456
Boron mg/L	*	*	*	*	*	0.029	0.116	0.061	0.051	0.243	0.326	0.116	0.254	0.143	0.148778	0.235664	86.01736
Cadmium mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03168	<11.5632
Mercury µg/L	*	*	*	*	*	*	*	*	*	*	*	<0.2	*	*	<0.0002	<0.000316	<0.115632
Selenium µg/L	*	*	*	*	*	*	*	*	*	*	*	1.4	*	*	0.0014	0.002218	0.809424
Barium mg/L	*	*	*	*	*	0.0253	<0.02	<0.02	0.02	0.026	0.024	0.024	0.021	0.024	0.0204	0.032314	11.794464

values recorded as 1/2 of LOD for statistical purposes

Maximum Flow

<0.10
<0.01
<1
<0.01
<1
*
<1
<0.96
<0.02
0.014
<5
32
0.016
<0.02
0.041
0.148778
<0.02
<0.2
1.4
0.0204

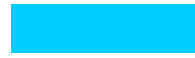
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Attachment E4 Dromahane Upstream Table E4

Sample Date	10/04/2008	09/10/2008	23/10/2008	27/11/2008	07/01/2009	21/01/2009	
Sample	River	River	River	River	River	River	Average
Sample Code	GS308	GS1054	GS1116	GS1273	GT023	GT092	
Flow M ³ /Day	*	*	*	*	*	*	
pH	*	*	*	7.3	7.5	7.3	7.366667
Temperature °C	*	*	*	*	*	*	*
Cond 20°C	173	*	*	173	191	180	179.25
SS mg/L	<2.5	*	*	<2.5	<1	4	1.75
NH ₃ mg/L	<0.1	*	<0.1	<0.1	<0.05	<0.05	0.04
BOD mg/L	<1.0	*	*	2.2	<2	<2	1.12
COD mg/L	*	*	*	<21	<5	7	
TN mg/L	*	*	*	6	5.4	4.1	5.166667
Nitrite mg/L	*	*	*	0.0268	*	*	0.0268
Nitrate mg/L	*	*	*	3.77	*	*	3.77
TP mg/L	<0.20	*	<0.2	<0.20	0.06	<0.05	0.077
O-PO ₄ -P mg/L	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	0.0308
SO ₄ mg/L	*	*	<30	<30	*	*	<30
Phenols µg/L	*	*	*	<0.10	*	*	<0.10
Atrazine µg/L	*	*	*	<0.01	*	*	<0.01
Dichloromethane	*	*	*	<1	*	*	<1
Simazine µg/L	*	*	*	<0.01	*	*	<0.01
Toluene µg/L	*	*	*	<1	*	*	<1
Tributyltin µg/L	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	<1	*	*	<1
Arsenic µg/L	*	*	*	<0.96	*	*	<0.96
Chromium mg/L	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02
Copper mg/L	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02
Cyanide µg/L	*	*	*	<5	*	*	
Fluoride µg/L	*	*	*	31	*	*	
Lead mg/L	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel mg/L	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc mg/L	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02
Boron mg/L	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02
Cadmium mg/L	<0.02	*	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury µg/L	*	*	*	<0.2	*	*	<0.2
Selenium µg/L	*	*	*	0.9	*	*	0.9
Barium mg/L	<0.02	*	<0.02	0.034	<0.02	<0.02	0.0148

0.01
0.01
0.01
0.01
0.034
0.0148

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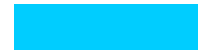
values recorded as 1/2 of LOD for statistical purposes

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Attachment E4 Dromahane Downstream Table E4

Sample Date	10/04/2008	09/10/2008	23/10/2008	27/11/2008	07/01/2009	21/01/2009	
Sample	River	River	River	River	River	River	Average
Sample Code	GS310	GS1056	GS1115	GS1274	GT024	GT093	
Flow M ³ /Day	*	*	*	*	*	*	
pH	*	*	*	7.6	7.5	7.3	7.466667
Temperature °C	*	*	*	*	*	*	
Cond 20°C	174	*	*	177	196	182	182.25
SS mg/L	<2.5	*	*	<2.5	<1	6	2.25
NH ₃ mg/L	<0.1	*	<0.1	<0.1	<0.05	<0.05	0.044
BOD mg/L	<1.0	*	*	<1.0	<2	<2	0.75
COD mg/L	*	*	*	<21	<5	11	8
TN mg/L	*	*	*	6	5	4.1	5.033333
Nitrite mg/L	*	*	*	0.00541	*	*	0.00541
Nitrate mg/L	*	*	*	3.93	*	*	3.93
TP mg/L	<0.20	*	<0.2	<0.20	0.08	<0.05	0.081
O-PO ₄ -P mg/L	<0.05	0.13	<0.05	<0.05	0.06	<0.05	0.048
SO ₄ mg/L	*	*	<30	<30	*	*	<30
Phenols µg/L	*	*	*	<0.10	*	*	<0.10
Atrazine µg/L	*	*	*	<0.01	*	*	<0.01
Dichloromethane	*	*	*	<1	*	*	<1
Simazine µg/L	*	*	*	<0.01	*	*	<0.01
Toluene µg/L	*	*	*	<1	*	*	<1
Tributyltin µg/L	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	<1	*	*	<1
Arsenic µg/L	*	*	*	<0.96	*	*	<0.96
Chromium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02
Copper mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02
Cyanide µg/L	*	*	*	<5	*	*	<5
Fluoride µg/L	*	*	*	31	*	*	31
Lead mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02
Boron mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02
Cadmium mg/L	*	*	<0.02	<0.02	<0.02	<0.02	<0.02
Mercury µg/L	*	*	*	<0.2	*	*	<0.2
Selenium µg/L	*	*	*	1.5	*	*	1.5

Barium mg/L	*	*	<0.02	0.033	<0.02	<0.02	0.016
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values recorded as 1/2 of LOD for statistical purposes

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Project	Location	Location R	Location E	Location N	Sample Te	Sample Re	Sample Dat	Sample Tir
Ballyclougl East Br.	RS18B080	RS18B080	149516	101994	WFD Oper 2008/0639	10-Apr-08	09:30	
Ballyclougl East Br.	RS18B080	RS18B080	149516	101994	WFD Oper 2008/1030	21-May-08	14:55	
Ballyclougl East Br.	RS18B080	RS18B080	149516	101994	WFD Oper 2008/2016	28-Aug-08	09:40	
Ballyclougl East Br.	RS18B080	RS18B080	149516	101994	Phosphate 2008/2026	28-Aug-08	11:05	
Ballyclougl East Br.	RS18B080	RS18B080	149516	101994	WFD Oper 2008/2726	15-Oct-08	09:55	
Ballyclougl East Br.	RS18B080	RS18B080	149516	101994	Phosphate 2008/3528	17-Dec-08	10:15	

Ballyclougl u/s BW.coi	RS18B080	RS18B080	150615.8	98197.2	WFD Oper 2008/0635	10-Apr-08	09:10
Ballyclougl u/s BW.coi	RS18B080	RS18B080	150615.8	98197.2	WFD Oper 2008/1031	21-May-08	14:40
Ballyclougl u/s BW.coi	RS18B080	RS18B080	150615.8	98197.2	WFD Oper 2008/2015	28-Aug-08	09:30
Ballyclougl u/s BW.coi	RS18B080	RS18B080	150615.8	98197.2	WFD Oper 2008/2727	15-Oct-08	10:10
Ballyclougl u/s BW.coi	RS18B080	RS18B080	150615.8	98197.2	Phosphate 2008/3529	17-Dec-08	10:25

Bandon-bie Blackwater bridge					WFD Oper 2008/0353	05-Mar-08	11:05
Bandon-bie Blackwater bridge					WFD Oper 2008/1146	04-Jun-08	11:35
Bandon-bie Blackwater bridge					WFD Oper 2008/2111	03-Sep-08	11:55
Bandon-bie Blackwater bridge					WFD Oper 2008/2941	05-Nov-08	13:30

Blackwater 1.5 d/s Mal	RS18B021	RS18B021	157400	98200	Salmonoid 2008/0091	16-Jan-08	13:10
Blackwater 1.5 d/s Mal	RS18B021	RS18B021	157400	98200	Salmonoid 2008/0308	28-Feb-08	13:20
Blackwater 1.5 d/s Mal	RS18B021	RS18B021	157400	98200	Salmonoid 2008/0502	27-Mar-08	13:10
Blackwater 1.5 d/s Mal	RS18B021	RS18B021	157400	98200	Salmonoid 2008/1006	21-May-08	09:15
Blackwater 1.5 d/s Mal	RS18B021	RS18B021	157400	98200	Salmonoid 2008/1229	18-Jun-08	09:20
Blackwater 1.5 d/s Mal	RS18B021	RS18B021	157400	98200	Salmonoid 2008/2029	28-Aug-08	09:30
Blackwater 1.5 d/s Mal	RS18B021	RS18B021	157400	98200	Salmonoid 2008/3099	19-Nov-08	13:25

Blackwater Ballyhooly	RS18B022	RS18B022	172913	98740	Salmonoid 2008/0083	16-Jan-08	12:15
Blackwater Ballyhooly	RS18B022	RS18B022	172913	98740	Salmonoid 2008/0310	28-Feb-08	12:20
Blackwater Ballyhooly	RS18B022	RS18B022	172913	98740	Salmonoid 2008/0504	27-Mar-08	12:20

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Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/0743	24-Apr-08	11:00
Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/1008	21-May-08	10:50
Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/1231	18-Jun-08	10:45
Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/1505	17-Jul-08	13:55
Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/2031	28-Aug-08	13:05
Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/2259	17-Sep-08	13:05
Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/2708	15-Oct-08	13:15
Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/3101	19-Nov-08	12:00
Blackwater Ballyhooly	RS18B022	172913	98740	Salmonoid	2008/3469	17-Dec-08	13:45

Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/0094	16-Jan-08	10:25
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/0305	28-Feb-08	10:15
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/0496	27-Mar-08	10:30
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/0753	23-Apr-08	10:05
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/1022	21-May-08	14:15
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/1226	18-Jun-08	13:35
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	Salmonoid	2008/1487	17-Jul-08	13:35
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/2019	28-Aug-08	10:30
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/2270	17-Sep-08	14:55
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/2723	15-Oct-08	14:40
Blackwater Ballymaqui	RS18B021	138218.9	98793.7	WFD Oper	2008/3088	18-Nov-08	13:50

Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/0086	16-Jan-08	11:00
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/0313	28-Feb-08	11:10
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/0507	27-Mar-08	11:05
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/0746	24-Apr-08	12:00
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/1011	21-May-08	12:55
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/1234	18-Jun-08	11:40
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/1502	17-Jul-08	12:50
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/2034	28-Aug-08	12:20
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/2262	17-Sep-08	12:00
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/2717	15-Oct-08	12:25
Blackwater Kilmurry	RS18B022	187510.7	99613.9	Salmonoid	2008/3104	19-Nov-08	10:10
Blackwater Kilmurry	RS18B022	187510.7	99613.9	WFD Oper	2008/3472	17-Dec-08	13:00

Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/0093	16-Jan-08	09:55
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/0306	28-Feb-08	10:00
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/0495	27-Mar-08	10:10
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/0751	23-Apr-08	09:30
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/1019	21-May-08	10:25

Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/1227	18-Jun-08	10:20
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/1489	17-Jul-08	09:45
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/2017	28-Aug-08	10:00
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/2269	17-Sep-08	11:25
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/2724	15-Oct-08	10:20
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/3087	18-Nov-08	10:30
Blackwater Lombardst	RS18B021	146408	96918	Salmonoid	2008/3517	17-Dec-08	12:00

Blackwater Mallow Br				Salmonoid	2008/1491	17-Jul-08	09:15
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Blackwater N.E.Ballym	RS18B021	159473	99156	Phosphate	2008/1492	17-Jul-08	09:30
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Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/0095	16-Jan-08	11:30
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/0300	28-Feb-08	11:30
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/0497	27-Mar-08	12:00
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/0754	23-Apr-08	11:30
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/1027	21-May-08	12:00
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/1221	18-Jun-08	11:30
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/1482	17-Jul-08	11:25
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/2020	28-Aug-08	12:00
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/2271	17-Sep-08	13:00
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/2718	15-Oct-08	12:20
Blackwater New Quart	RS18B020	115246	100838	WFD Oper	2008/3093	18-Nov-08	12:30

Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/0096	16-Jan-08	11:45
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/0301	28-Feb-08	11:45
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/0498	27-Mar-08	12:20
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/0755	23-Apr-08	11:45
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/1026	21-May-08	12:25
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/1222	18-Jun-08	11:45
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/1483	17-Jul-08	11:50
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/2021	28-Aug-08	12:10
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/2272	17-Sep-08	13:15
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/2719	15-Oct-08	12:30
Blackwater Nohoval Br	RS18B020	117269	94264	WFD Oper	2008/3092	18-Nov-08	12:45

Blackwater Roskeen B RS18B021	144272	98875	WFD Oper 2008/0752	23-Apr-08	09:45
Blackwater Roskeen B RS18B021	144272	98875	WFD Oper 2008/1020	21-May-08	10:45
Blackwater Roskeen B RS18B021	144272	98875	Salmonoid 2008/1488	17-Jul-08	10:00
Blackwater Roskeen B RS18B021	144272	98875	WFD Oper 2008/2018	28-Aug-08	10:15
Blackwater Roskeen B RS18B021	144272	98875	WFD Oper 2008/2731	15-Oct-08	10:40

Blackwater Ten Arches RS18B021	155036	97894	WFD Oper 2008/0092	16-Jan-08	09:30
Blackwater Ten Arches RS18B021	155036	97894	WFD Oper 2008/0307	28-Feb-08	09:40
Blackwater Ten Arches RS18B021	155036	97894	WFD Oper 2008/0494	27-Mar-08	09:50
Blackwater Ten Arches RS18B021	155036	97894	WFD Oper 2008/0740	24-Apr-08	09:15
Blackwater Ten Arches RS18B021	155036	97894	WFD Oper 2008/1021	21-May-08	09:55
Blackwater Ten Arches RS18B021	155036	97894	WFD Oper 2008/1228	18-Jun-08	09:45
Blackwater Ten Arches RS18B021	155036	97894	WFD Oper 2008/2028	28-Aug-08	09:10
Blackwater Ten Arches RS18B021	155036	97894	WFD Oper 2008/2268	17-Sep-08	10:50
Blackwater Ten Arches RS18B021	155036	97894	Salmonoid 2008/2705	15-Oct-08	09:20
Blackwater Ten Arches RS18B021	155036	97894	Salmonoid 2008/3086	18-Nov-08	10:10

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Parameter	Temperature	Dissolved O2	pH	BOD	Nitrite	Molybdate	Ammonium	Nitrate
		O2		O2	NO2	P	NH4	NO3
Max.	--	15	Varies	Varies	0.05	Varies	Varies	Varies
Target	--	--	--	--	--	--	--	--
Min.	--	5	Varies	--	--	--	--	--
Comments	Degrees C	mg/l	pH units	mg/l	mg/l	mg/l	mg/l	mg/l
upstream	9.2	11.6	8	< 0.1	0.028	0.007	0.04	28.4
	11.3	9.8	8.2	1	0.021	0.022	0.061	5.6
	12.9	7.8	8	0.3	0.054	0.017	< 0.026	22.8
	14.8	7.6	7.6		0.016	0.017	0.026	
	10.6	9.5	7.8	1.1	0.07	0.037	0.178	16.3
	6.7	11.1			0.022	0.026	0.031	25.32
Sample Count	6	6	5	4	6	6	6	5
Maximum	14.8	11.6	8.2	1.1	0.07	0.037	0.178	28.4
Minimum	6.7	7.6	7.6	< 0.1	0.016	0.007	< 0.026	5.6
Mean	10.9	9.57	7.92	0.612	0.035	0.021	0.058	19.7
Median	11	9.65	8	0.65	0.025	0.02	0.036	22.8
Std. Deviator	2.83	1.64	0.228	0.517	0.022	0.01	0.061	9.04
sampled at Longuille H	7.8	11.6	8.2	0.5	0.032	0.009	0.064	25.6
	11.6	10.5	8.4	0.9	0.035	0.037	0.043	5.1
	13.6	7.7	8.2	0.3	0.028	0.035	< 0.026	19.6
	10.7	9.7	7.9	1.5	0.06	0.063	0.099	12.9
	6.7	11.6			0.029	0.032	0.04	20.66
Sample Count	5	5	4	4	5	5	5	5
Maximum	13.6	11.6	8.4	1.5	0.06	0.063	0.099	25.6
Minimum	6.7	7.7	7.9	0.3	0.028	0.009	< 0.026	5.1
Mean	10.1	10.2	8.18	0.8	0.037	0.035	0.052	16.8
Median	10.7	10.5	8.2	0.7	0.032	0.035	0.043	19.6
Std. Deviator	2.82	1.62	0.206	0.529	0.013	0.019	0.032	7.94
	6.8	10.1	7.6	< 0.1				
	13.3	9.3	7.5	0.9	0.027	0.024	< 0.026	11.7
	14	10.3	7.7	0.8	0.013	0.025	0.042	9
	10	11.2	7.7	0.2	0.017	0.023	< 0.026	13.1
	Sample Count	4	4	4	4	3	3	3
Maximum	14	11.2	7.7	0.9	0.027	0.025	0.042	13.1
Minimum	6.8	9.3	7.5	< 0.1	0.013	0.023	< 0.026	9
Mean	11	10.2	7.62	0.488	0.019	0.024	0.023	11.3
Median	11.6	10.2	7.65	0.5	0.017	0.024	< 0.026	11.7
Std. Deviator	3.31	0.781	0.096	0.425	0.007	0.001	0.017	2.08
	7.2	11.3	7.5	1.1	0.028	< 0.006	0.073	
	7.9	11.6	7.9	< 1	0.021	0.021	0.055	12.4
	8.2	11.5	8	< 1	0.019	0.014	< 0.026	9.3
	12.6	9.6	7.9	1.2	0.051	0.007	0.076	
	14.3	10.2	7.8	2	0.014	< 0.006	< 0.026	
	15	9.7	7.7	< 1	0.023	0.026	< 0.026	
			7.6	< 1	0.025	0.024	0.03	8.3
Sample Count	6	6	7	7	7	7	7	3
Maximum	15	11.6	8	2	0.051	0.026	0.076	12.4
Minimum	7.2	9.6	7.5	< 1	0.014	< 0.006	< 0.026	8.3
Mean	10.9	10.6	7.77	0.9	0.026	0.014	0.039	10
Median	10.4	10.8	7.8	< 1	0.023	0.014	0.03	9.3
Std. Deviator	3.5	0.924	0.18	0.574	0.012	0.01	0.029	2.14
	7.4	10.9	7.7	< 1	0.035	0.006	0.052	
	8	11.2	8	< 1	0.023	0.02	0.055	16.3
	8.3	11.4	8.3	< 1	0.022	0.014	< 0.026	12.4

	10.7	11.7	8.1	< 1	0.021	0.008	< 0.026	
	12.6	9.6	7.9	< 1	0.052	0.014	0.049	
	14.2	9.2	8	1.6	0.024	0.006	< 0.026	
	15.2	9.7	8	< 1	0.025	0.035	0.04	12.5
	15.8	9.7	7.9	< 1	0.02	0.03	< 0.026	
	12.7	10.1	7.8	< 1	0.022	0.024	< 0.026	
	11.6	10.5	7.4	2.7	0.042	0.06	0.058	
			7.9	< 1	0.025	0.023	< 0.026	
	7.4	13.7	7.9	< 1	0.034	0.027	0.036	9.6
Sample Coun	11	11	12	12	12	12	12	4
Maximum	15.8	13.7	8.3	2.7	0.052	0.06	0.058	16.3
Minimum	7.4	9.2	7.4	< 1	0.02	0.006	< 0.026	9.6
Mean	11.3	10.7	7.91	0.775	0.029	0.022	0.031	12.7
Median	11.6	10.5	7.9	0.5	0.024	0.022	0.024	12.4
Std. Deviator	3.14	1.29	0.219	0.684	0.01	0.015	0.019	2.75
	6.8	8.1	7.3	0.2	0.024	0.006	0.094	8
	7.5	8.3	7.6	< 0.1	0.022	0.018	0.031	8.6
	6.4	12.5	7.9	0.4	0.017	0.013	0.027	6
	10.5	8.3	7.9	0.6	0.018	0.006	< 0.026	1.8
	12.7	10.4	7.9	1.5	0.033	< 0.006	0.032	< 1.8
	14.4	9.6	7.8	1.2	0.028	0.008	< 0.026	7.3
		8.2	7.7	2.8	0.025	0.044	0.026	8.2
	14.7	7.9	7.5	0.5	0.019	0.024	0.037	8
	13.8	10.3	7.6	0.6	0.018	0.021	< 0.026	7.2
	11.1	10.1	7.2	1.2	0.032	0.036	0.07	3.8
	9.9	10.3	7.5	0.4	0.022	0.03	< 0.026	6.1
Sample Coun	10	11	11	11	11	11	11	11
Maximum	14.7	12.5	7.9	2.8	0.033	0.044	0.094	8.6
Minimum	6.4	7.9	7.2	< 0.1	0.017	< 0.006	< 0.026	< 1.8
Mean	10.8	9.45	7.63	0.859	0.023	0.019	0.034	5.99
Median	10.8	9.6	7.6	0.6	0.022	0.018	0.027	7.2
Std. Deviator	3.13	1.43	0.241	0.786	0.006	0.013	0.026	2.67
	7.6	11.3	7.7	< 1	0.035	0.006	0.079	
	8.1	11.8	8	< 1	0.025	0.024	0.049	18.1
	8.6	11.5	8.4	< 1	0.023	0.027	< 0.026	15
	11.5	12.7	8.4	< 1	0.026	0.011	< 0.026	
	13.4	10.9	8.2	< 1	0.057	0.017	0.034	
	14.6	10.9	8.3	1	0.035	0.072	< 0.026	
	15.7	9.9	8	< 1	0.031	0.04	< 0.026	13.6
	15.4	9.9	7.9	< 1	0.024	0.036	< 0.026	
	12.7	10.5	7.9	1.3	0.025	0.025	0.042	
flooded are	11.9	10.6	7.4	3.7	0.045	0.066	0.084	
	10.1	11.1	7.9	< 1	0.039	0.029	0.032	
	7.3	14.1	7.9	0.2	0.031	0.027	0.03	12
Sample Coun	12	12	12	12	12	12	12	4
Maximum	15.7	14.1	8.4	3.7	0.057	0.072	0.084	18.1
Minimum	7.3	9.9	7.4	0.2	0.023	0.006	< 0.026	12
Mean	11.4	11.3	8.01	0.85	0.033	0.032	0.035	14.7
Median	11.7	11	7.95	0.5	0.031	0.027	0.031	14.3
Std. Deviator	3.05	1.19	0.294	0.941	0.01	0.02	0.025	2.59
	7.1	8.6	7.5	< 1	0.026	0.008	0.073	
	7.6	8.1	7.9	< 1	0.024	0.02	0.052	10.9
	6.9	12.1	8	< 1	0.019	0.012	< 0.026	7.3
	10.2	9.8	8	< 1	0.021	0.009	< 0.026	
	12.7	10	8.1	1	0.046	0.011	0.061	

	14	9.6	7.9	1.9	0.019	< 0.006	< 0.026	8
		9.8	7.9	3.2	0.028	0.066	0.034	9.3
	14.5	7.1	7.7	< 1	0.026	0.024	< 0.026	
	13.6	10.4	7.6	1	0.025	0.023	< 0.026	
	10.7	9.9	7.2	2.4	0.04	0.049	0.09	
	9.8	10.3	7.7	< 1	0.027	0.025	< 0.026	
	6.5	11.9	7.7	< 1	0.031	0.026	0.042	6.1
Sample Coun	11	12	12	12	12	12	12	5
Maximum	14.5	12.1	8.1	3.2	0.046	0.066	0.09	10.9
Minimum	6.5	7.1	7.2	< 1	0.019	< 0.006	< 0.026	6.1
Mean	10.3	9.8	7.77	1.08	0.028	0.023	0.036	8.32
Median	10.2	9.85	7.8	0.5	0.026	0.022	0.024	8
Std. Deviator	3.03	1.42	0.253	0.918	0.008	0.018	0.028	1.85
	14.3	9.7	7.9	< 1	0.025	0.028	< 0.026	10.8
Sample Coun	1	1	1	1	1	1	1	1
Maximum	14.3	9.7	7.9	< 1	0.025	0.028	< 0.026	10.8
Minimum	14.3	9.7	7.9	< 1	0.025	0.028	< 0.026	10.8
Mean	14.3	9.7	7.9	0.5	0.025	0.028	0.013	10.8
Median	14.3	9.7	7.9	<1	0.025	0.028	<0.026	10.8
Std. Deviator	0	0	0	0	0	0	0	0
	14.3	9.9			0.027	0.054	0.05	11.15
Sample Coun	1	1	0	0	1	1	1	1
Maximum	14.3	9.9			0.027	0.054	0.05	11.15
Minimum	14.3	9.9			0.027	0.054	0.05	11.15
Mean	14.3	9.9			0.027	0.054	0.05	11.2
Median	14.3	9.9			0.027	0.054	0.05	11.2
Std. Deviator	0	0			0	0	0	0
	6.4	8.8	6.8	0.8	0.014	< 0.006	0.047	2.1
	6.5	8.8	7.3	0.5	0.017	0.01	0.135	2.3
	6.5	13.1	7.6	0.5	< 0.013	0.007	0.034	1.8
	9.6	9.6	7.6	1	< 0.013	< 0.006	< 0.026	
	11.8	10.9	7.6	0.9	0.02	< 0.006	0.044	< 1.8
	12.9	9.6	7.7	0.9	0.03	0.006	< 0.026	2.2
		9.7	7.8	1.2	0.025	0.013	0.059	2.2
	14.7	7.9	7.1	0.7	0.022	0.018	0.038	2.7
	12.3	10.3	7.3	0.6	0.017	0.013	0.062	3.3
	10.4	10.4	6.9	0.7	0.022	0.014	0.061	< 1.8
	9.5	10.5	7.1	0.5	0.018	0.018	0.034	2.1
Sample Coun	10	11	11	11	11	11	11	10
Maximum	14.7	13.1	7.7	1.2	0.03	0.018	0.135	3.3
Minimum	6.4	7.9	6.8	0.5	< 0.013	< 0.006	< 0.026	< 1.8
Mean	10.1	9.96	7.3	0.755	0.018	0.01	0.049	2.05
Median	10	9.7	7.3	0.7	0.018	0.01	0.044	2.15
Std. Deviator	2.93	1.36	0.303	0.23	0.007	0.006	0.033	0.731
	6.6	8.3	6.9	0.7	0.017	< 0.006	0.096	4.2
	6.8	8.9	7.4	0.4	0.016	0.011	0.041	4.4
	6.2	13	7.6	0.1	0.013	0.009	0.029	3.2
	9.8	9.7	7.7	1	0.014	< 0.006	< 0.026	< 1.8
	12.3	11.4	7.8	0.5	0.016	< 0.006	0.026	< 1.8
	13.5	9.4	7.7	1.6	0.057	0.011	0.034	4.5
		9.9	7.4	2.5	0.024	0.028	< 0.026	4.9
	15.3	7.9	7.2	0.5	0.021	0.024	0.028	4.9
	12.6	10.3	7.3	0.9	0.017	0.014	< 0.026	4.8
	10.4	10.4	7	1.2	0.025	0.025	0.039	3
	9.8	10.4	7.2	0.3	0.018	0.02	< 0.026	3.5

Sample Coun	10	11	11	11	11	11	11	11
Maximum	15.3	13	7.8	2.5	0.057	0.028	0.096	4.9
Minimum	6.2	7.9	6.9	0.1	0.013	< 0.006	< 0.026	< 1.8
Mean	10.3	9.96	7.38	0.882	0.022	0.014	0.031	3.56
Median	10.1	9.9	7.4	0.7	0.017	0.011	0.028	4.2
Std. Deviator	3.12	1.43	0.296	0.69	0.012	0.009	0.024	1.47
	10.4	10.7	8	0.5	0.022	0.009	< 0.026	2
	12.6	9.8	8	1.2	0.046	0.011	0.051	1.8
		9.9	7.7	1.2	0.027	0.046	0.047	9.3
	14.7	7.8	7.6	0.4	0.029	0.028	< 0.026	9.2
	10.6	10	7.3	2	0.039	0.047	0.093	4.1
Sample Coun	4	5	5	5	5	5	5	5
Maximum	14.7	10.7	8	2	0.046	0.047	0.093	9.3
Minimum	10.4	7.8	7.3	0.4	0.022	0.009	< 0.026	1.8
Mean	12.1	9.64	7.72	1.06	0.033	0.028	0.043	5.28
Median	11.6	9.9	7.7	1.2	0.029	0.028	0.047	4.1
Std. Deviator	2.01	1.09	0.295	0.647	0.01	0.018	0.033	3.74
	7	9.4	7.4	0.9	0.027	< 0.006	0.088	12.2
	7.6	8.4	7.8	0.1	0.021	0.018	0.034	12.5
	7.2	12	8.1	< 0.1	0.017	0.011	0.029	9.5
	10.5	11	8	1	0.021	< 0.006	0.045	2.5
	12.8	10.2	8.1	0.9	0.041	0.006	< 0.026	2.4
	14.6	9.2	7.8	2.2	< 0.013	< 0.006	0.028	10.4
	14.6	9.6	7.6	0.7	0.026	0.022	0.04	11.5
	13.3	10.2	7.7	1.1	0.025	0.022	0.048	10.7
	11.1	9.6	7.5	2.9	0.044	0.066	0.094	3.6
	9.8	10.2	7.9	< 1	0.019	0.024	< 0.026	8.6
Sample Coun	10	10	10	10	10	10	10	10
Maximum	14.6	12	8.1	2.9	0.044	0.066	0.094	12.5
Minimum	7	8.4	7.4	< 0.1	< 0.013	< 0.006	< 0.026	2.4
Mean	10.8	9.98	7.79	1.04	0.025	0.018	0.043	8.39
Median	10.8	9.9	7.8	0.9	0.023	0.014	0.037	9.95
Std. Deviator	2.94	1	0.242	0.889	0.011	0.019	0.028	4.02

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Dissolved (Hardness	Alkalinity	Appearanc	Chloride	Dissolved (Suspende	Zn	Colour
	CaCO3	CaCO3		Cl			Zn	Hz
--	--	--	--	--	150	--	500	Varies
--	--	--	--	--	--	--	--	--
--	--	--	--	--	50	--	--	--
µg/l	mg/l	mg/l	Descriptive	mg/l	% O2	mg/l	µg/l	Hazen
	259	250		26.9	102			17
		254	cloudy	23.3	91			
			clear		74			14
			clear		75			
	209	180		20.4	86			85
			clear		93			
0	2	3	-	3	6	0	0	3
	259	254	-	26.9	102			85
	209	180	-	20.4	74			14
	234	228	-	23.5	86.8			38.7
	234	250	-	23.3	88.5			17
	35.4	41.6	-	3.26	10.9			40.2
	270	238		25.2	100			22
		244	cloudy	24.7	98			
		230	clear		74			29
	175	162		20.2	88			122
			clear		96			
0	2	4	-	3	5	0	0	3
	270	244	-	25.2	100			122
	175	162	-	20.2	74			22
	222	218	-	23.4	91.2			57.7
	222	234	-	24.7	96			29
	67.2	38.1	-	2.75	10.6			55.8
	74	50	clear		81			28
	73	64	clear	19.2	90			
	70	60		18.6	102			32
	69	60		16.7	99			19
0	4	4	-	3	4	0	0	3
	74	64	-	19.2	102			32
	69	50	-	16.7	81			19
	71.5	58.5	-	18.2	93			26.3
	71.5	60	-	18.6	94.5			28
	2.38	5.97	-	1.31	9.49			6.66
	75	42	Turbid		96	9	< 25	111
		70	clear		97	< 1	< 25	54
	68	58			100	< 1	< 25	44
	101	90			91	1	< 25	
< 5	105	104	clear		102	2	< 25	
	78	61	clear		96	1		61
			clear	16		2		97
1	5	6	-	1	6	7	5	5
< 5	105	104	-	16	102	9	< 25	111
< 5	68	42	-	16	91	< 1	< 25	44
2.5	85.4	70.8	-	16	97	2.29	12.5	73.4
<5	78	65.5	-	16	96.5	1	<25	61
0	16.5	22.6	-	0	3.8	3.03	0	29
	106	78			93	2	< 25	71
		124	clear		94	< 1	< 25	48
	109	88			98	< 1	< 25	38

	138	132	clear		105	1		
	160	142			91	1	< 25	
< 5	168	152	clear		92	2	< 25	
					97	2		
	120	108	clear		97	2		49
	115	102	clear		94	4		77
	62	48			95	24		326
						3		
			clear		114	6		
1	8	9	-	0	11	12	5	6
< 5	168	152	-		114	24	< 25	326
< 5	62	48	-		91	< 1	< 25	38
2.5	122	108	-		97.3	4	12.5	102
<5	118	108	-		95	2	<25	60
0	33.6	33.3	-		6.72	6.49	0	111
	58	34	clear	18.3	74			104
	55	44	Clear		76			68
	43	32		22.7	102			61
	54	46	clear	18.4	77			
	62	54	clear	16.2	99	2.3		
	62	64	CLear	17.1	96			
	51	64		16.3	100			
	49	42	ht brown co	14.6	78			73
	48	40	clear	15.7	99			80
	39	30		12.7	92			221
	43	40		14.6	91	4.5		126
0	11	11	-	10	11	2	0	7
	62	64	-	22.7	102	4.5		221
	39	30	-	12.7	74	2.3		61
	51.3	44.5	-	16.7	89.5	3.4		105
	51	42	-	16.2	92	3.4		80
	7.75	11.7	-	2.75	11	1.56		56.1
	120	84			98	4	< 25	59
		130	clear		98	< 1	< 25	45
	126	106			95	< 1	< 25	32
	148	130	clear		118	< 1		
< 5	160	142			106	2	< 25	
	169	150	clear		109	1	< 25	
	118	148			100	2		
	12	100	clear		98	1		43
	113	100	clear		97	3		63
	46	44			98	38		346
	104	90	clear		97	5		97
	97	90	clear		117	5		50
1	11	12	-	0	12	12	5	8
< 5	169	150	-		118	38	< 25	346
< 5	12	44	-		95	< 1	< 25	32
2.5	110	110	-		103	5.21	12.5	91.9
<5	118	103	-		98	2	<25	54.5
0	46.6	31.5	-		8.04	10.5	0	105
	63	42	Clear		79	10	< 25	101
		62	CLear		72	2	< 25	64
	55	46			101	1	< 25	55
	73	66	clear		89	1		
	88	82	clear		95	2	< 25	

< 5	94	94		Clear	95	2	< 25	
	64	70			120	6		
	65	54		ht brown colour	72	1		64
	59	54		coloured	100	2		83
	40	34			89	14		284
	56	50			89	2		111
	50	182		clear	97	6		121
1	11	12	-		0	12	5	8
< 5	94	182	-			120	14	< 25
< 5	40	34	-			72	1	< 25
2.5	64.3	69.7	-			91.5	4.08	12.5
<5	63	58	-			92	2	<25
0	15.8	39.2	-			13.4	4.17	0
					17.8	96	2	
0	0	0	-		1	1	1	0
			-		17.8	96	2	
			-		17.8	96	2	
			-		17.8	96	2	
			-		17.8	96	2	
			-		0	0	0	
					94			
0	0	0	-		0	1	0	0
			-			94		
			-			94		
			-			94		
			-			94		
			-			0		
	43	16		Clear	16.1	80		153
	28	20		ht brown colour	25.8	80		134
	28	16			18.5	108		74
	40	32		clear	18.5	87		
	58	34		algae	17	103		
	34	44		Clear	16.5	100		
	27	42			15.5	119		
	26	24		ht brown co	13.1	79		179
	26	26		clear	14.5	96		161
	23	16			11.2	95		230
	21	30			13.1	92		140
0	11	11	-		10	11	0	7
	58	44	-		25.8	119		230
	21	16	-		11.2	79		74
	32.2	27.3	-		16.1	94.5		153
	28	26	-		15.8	95		153
	10.9	10.1	-		4.02	12.7		47.3
	44	20		Clear	16.4	77		180
	55	26		Clear		80		106
	32	18			9.4	108		76
	36	32		clear	19.8	90		
	41	30		algae	209	108	1.2	
	46	62		Clear	22.2	93		
	35	48			18.5	126		
	35	30		ht brown co	16.8	80		145
	31	26		clear	16.2	98		134
	27	20			12.9	95		224
	26	26			14.3	92		137

0	11	11	-	10	11	1	0	7
	55	62	-	209	126	1.2		224
	26	18	-	9.4	77	1.2		76
	37.1	30.7	-	35.6	95.2	1.2		143
	35	26	-	16.6	93	1.2		137
	8.72	13.2	-	61	14.6	0		48.1
	79	68	clear	19.3	96			
	87	82	clear	19.5	93			
	63	76		16.7	123			
	62	50	ht brown co	14.7	78			71
	41	42		13.3	90			273
0	5	5	-	5	5	0	0	2
	87	82	-	19.5	123			273
	41	42	-	13.3	78			71
	66.4	63.6	-	16.7	96			172
	63	68	-	16.7	93			172
	17.7	17.1	-	2.75	16.6			143
	80	46	Clear	18.6	86			84
	87	68	Clear		76			55
	70	52		21.3	101			43
	88	80	clear 0.7m	19.2	100			
	103	84	clear	19.6	97			
	105	94	Clear	19.2	92			
	76	66	clear	14.9	94			58
	68	58	coloured	16.2	97			74
	43	62		12.4	89			315
	62	56		15.4	89	4		103
0	10	10	-	9	10	1	0	7
	105	94	-	27.3	101	4		315
	43	46	-	12.4	76	4		43
	78.2	66.6	-	17.4	92.1	4		105
	78	64	-	18.6	93	4		74
	18.8	15.2	-	2.84	7.52	0		94.9

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Conductivity	Mg	Ca	Copper (Diss. Cu.)	Odour	Total Zinc
	Mg	Ca	Diss. Cu.		
--	--	--	--	--	--
--	--	--	--	--	--
--	--	--	--	--	--
µS/cm	mg/l	mg/l	mg/l	Descriptive	mg/l

549
570
562

418

4	0	0	0	-	0
570				-	
418				-	
525				-	
556				-	
71.7				-	

501
541
504
360

4	0	0	0	-	0
541				-	
360				-	
476				-	
502				-	
79.8				-	

189	3.7	24			
194					
182					
184					

4	1	1	0	-	0
194	3.7	24		-	
182	3.7	24		-	
187	3.7	24		-	
186	3.7	24		-	
5.38	0	0		-	

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< 0.004

252 < 0.004 < 0.025

165

2	0	0	2	-	1
252			< 0.004	-	< 0.025
165			< 0.004	-	< 0.025
208			0.002	-	0.012
208			0.002	-	<0.025
61.5			0	-	0

< 0.004

344 0.005 < 0.025

250

2	0	0	2	-	1
344			0.005	-	< 0.025
250			< 0.004	-	< 0.025
297			0.004	-	0.012
297			0.004	-	<0.025
66.5			0.002	-	0

129

149 3.9 16

149

157

166

168

149

142

142

103

125

11	1	1	0	-	0
168	3.9	16		-	
103	3.9	16		-	
144	3.9	16		-	
149	3.9	16		-	
18.9	0	0		-	

< 0.004

385 0.005 < 0.025

260

2	0	0	2	-	1
385			0.005	-	< 0.025
260			< 0.004	-	< 0.025
322			0.004	-	0.012
322			0.004	-	<0.025
88.4			0.002	-	0

< 0.004

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235 0.005 < 0.025

167

2	0	0	2	-	1
235			0.005	-	< 0.025
167			< 0.004	-	< 0.025
201			0.004	-	0.012
201			0.004	-	<0.025
48.1			0.002	-	0

188

1	0	0	0	-	0
188				-	
188				-	
188				-	
188				-	
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SITE SYNOPSIS

SITE NAME: BLACKWATER RIVER (CORK/WATERFORD)

SITE CODE: 002170

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which includes the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The extent of the Blackwater and its tributaries in this site, flows through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Towns along, but not in the site, include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

The Blackwater rises in boggy land of east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeraghs before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

The site is a candidate SAC selected for alluvial wet woodlands and Yew wood, both priority habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for floating river vegetation, estuaries, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, perennial vegetation of stony banks and old Oak woodlands, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter and the plant, Killarney Fern.

Wet woodlands are found where river embankments, particularly on the River Bride, have broken down and where the channel edges in the steep-sided valley between Cappoquin and Youghal are subject to daily inundation. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almond-leaved Willow (*Salix alba* and *S. triandra*) with isolated Crack Willow (*S. fragilis*) and Osier (*S. viminalis*). Grey Willow (*S. cinerea*) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (*Lycopus europaeus*), Guelder Rose (*Viburnum opulus*), Bittersweet (*Solanum dulcamara*) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (*Taxus baccata*) woodland, a rare habitat in Ireland and the EU, occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore, Beech and Douglas Fir (*Pseudotsuga menziesii*). However, the future prospect for this Yew wood is good as the site is proposed for restoration under a Coillte EU Life Programme. Owing to its rarity, Yew woodland is listed with priority status on Annex I of the EU Habitats Directive.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (*Phragmites australis*) is ubiquitous and is harvested for thatching. There is also much Marsh Marigold (*Caltha palustris*) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (*Carex riparia* and *C. acutiformis*). Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Reed Canary-grass (*Phalaris arundinacea*), Meadowsweet (*Filipendula ulmaria*), Nettle (*Urtica dioica*), Purple Loosestrife (*Lythrum salicaria*), Marsh Valerian (*Valeriana officinalis*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*).

At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the watertable and several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed about with Grey Willows, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (*Lysimachia nemorum*) with locally abundant Starwort (*Callitriche stagnalis*) and Marsh Ragwort (*Senecio palustris*). One of the depressions has Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Crab Apple (*Malus sylvestris*) and a little Oak (*Quercus robur*) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive and includes Pond Water-crowfoot (*Ranunculus peltatus*), Water-crowfoot (*Ranunculus* spp.), Canadian Pondweed (*Elodea canadensis*), Broad-leaved Pondweed (*Potamogeton natans*), Pondweed (*Potamogeton* spp.), Water Milfoil (*Myriophyllum* spp.), Common Club-rush (*Scirpus*

lacustris), Water-starwort (*Callitriche* spp.), Lesser Water-parsnip (*Berula erecta*) particularly on the Awbeg, Water-cress (*Nasturtium officinale*), Hemlock Water-dropwort, Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica*.

The grassland adjacent to the rivers of the site is generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow-flag (*Iris pseudacorus*), Meadow-sweet, Meadow Buttercup (*Ranunculus acris*) and rushes (*Juncus* spp.) occur occasionally. Extensive fields of wet grassland also occur at Annagh Bog on the Awbeg. These fields are dominated by Tufted Hair-grass (*Deschampsia cespitosa*) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech (*Fagus sylvatica*) and a few conifers, and sometimes of Rhododendron (*Rhododendron ponticum*) and Laurel. Oak woodland is well developed on sandstone about Ballinatrav, with the acid Oak woodland community of Holly (*Ilex aquifolium*), Bilberry (*Vaccinium myrtillus*), Greater Woodrush (*Luzula sylvatica*) and Buckler Ferns (*Dryopteris affinis*, *D. aemula*) occurring in one place. Irish Spurge (*Euphorbia hyberna*) continues eastwards on acid rocks from its headquarters to the west but there are many plants of richer soils, for example Wood Violet (*Viola reichenbachiana*), Goldilocks (*Ranunculus auricomus*), Broad-leaved Helleborine (*Epipactis helleborine*) and Red Campion (*Silene dioica*). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana. The spread of Rhododendron is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (*Brachypodium sylvaticum*) and Early-purple Orchid (*Orchis mascula*).

In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of Oak with Downy Birch (*Betula pubescens*), Holly and Hazel (*Corylus avellana*) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the Oak on the shallower slopes and here both Rhododendron and Cherry Laurel (*Prunus laurocerasus*) have invaded the woodland.

The Oak wood community in the Lismore and Glenmore valleys is of the classical upland type, in which some Rowan (*Sorbus aucuparia*) and Downy Birch occur. Honeysuckle (*Lonicera periclymenum*) and Ivy (*Hedera helix*) cover many of the trees while Greater Woodrush, Bluebell (*Hyacinthoides non-scripta*), Wood Sorrel (*Oxalis acetosella*) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (*Blechnum spicant*), Male Fern (*Dryopteris filix-mas*), Buckler Ferns (*D. dilatata*, *D. aemula*) and Lady Fern (*Athyrium filix-femina*). There are many mosses present and large species such as *Rhytidiadelphus* spp., *Polytrichum formosum*, *Mnium hornum* and *Dicranum* spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (*Lobaria* spp.) is the most conspicuous and is widespread.

The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (*Prunus avium*) and Goat Willow (*Salix caprea*). The ground flora is relatively rich with Pignut (*Conopodium majus*), Wild Garlic (*Allium ursinum*), Garlic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobanche hederæ*), a local species within Ireland, suggests that the woodland, along with its attendant Ivy is long established.

Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore (*Acer pseudoplatanus*), Ash and Horse-chestnut (*Aesculus hippocastanum*). In places the alien invasive species, Cherry Laurel, dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash with Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europæa*) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (*Salix* spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (*Geum urbanum*), Ivy and Soft Shield-fern (*Polystichum setiferum*), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (*Carex remota*) and Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*).

In places along the upper Bride, scrubby, semi-natural deciduous woodland of Willow, Oak and Rowan occurs with abundant Great Woodrush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss and fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (*Osmunda regalis*) and Eared Willow (*Salix aurita*) and between them there is a sheet of Bottle Sedge (*Carex rostrata*), Marsh Cinquefoil (*Potentilla palustris*), Bogbean (*Menyanthes trifoliata*), Marsh St. John's-wort (*Hypericum elodes*) and the mosses *Sphagnum auriculatum* and *Aulacomnium palustre*. The cover is a scraw with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Marsh Orchid (*Dactylorhiza incarnata*).

The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (*Veronica montana*), Wood Anemone (*Anemone nemorosa*), Enchanter's Nightshade (*Circaea lutetiana*), Barren Strawberry (*Potentilla sterilis*) and Shield Fern occur. There is some Wild Garlic, Three-nerved Sandwort (*Moehringia trinervia*) and Early-purple Orchid (*Orchis mascula*) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle in wet places. A Hazel stand at the base of the Glenakeeffe valley shows this community well.

The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow (*Salix cinerea* subsp. *oleifolia*) and Downy Birch. The ground in the clearings is heathy with Heather (*Calluna vulgaris*), Slender St John's-wort (*Hypericum pulchrum*) and the occasional Broom (*Cytisus scoparius*) occurring.

The estuary and the other Habitats Directive Annex I habitats within it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site with the best examples at Kinsalebeg in Co. Waterford and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater and large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green algae (filamentous, *Ulva* species and *Enteromorpha* sp.) occur in places, while fucoid algae are common on the more stony flats even as high upstream as Glenassy or Coneen.

The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (*Puccinellia maritima*), small amounts of Greater Sea-spurrey (*Spergularia media*), Glasswort (*Salicornia* sp.), Sea Arrowgrass (*Triglochin maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Purslane (*Halimione portulacoides*) - the latter a very recent coloniser - at the edges. Some Sea Aster (*Aster tripolium*) occurs, generally with Creeping Bent (*Agrostis stolonifera*). Sea Couch-grass (*Elymus pycnanthus*) and small isolated clumps of Sea Club-rush (*Scirpus maritimus*) are also seen. On the Tourig River additional saltmarsh species found include Lavender (*Limonium* spp.), Sea Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvy-grass (*Cochlearia officinalis*) and Sea Plantain (*Plantago maritima*). Oraches (*Atriplex* spp.) are found on channel edges.

The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well developed and diverse flora. At the lowest part, Sea Beet (*Beta vulgaris*), Curled Dock (*Rumex crispus*) and Yellow-horned Poppy (*Glaucium flavum*) occur with at a slightly higher level Sea Mayweed (*Tripleurospermum maritimum*), Cleavers (*Galium aparine*), Rock Samphire (*Crithmum maritimum*), Sandwort (*Honkenya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glabriuscula*). Other species present include Sea Rocket (*Cakile maritima*), Herb Robert (*Geranium robertianum*), Red Fescue (*Festuca rubra*) and Kidney Vetch (*Anthyllis vulneraria*). The top of the spit is more vegetated and includes lichens and bryophytes (including *Tortula ruraliformis* and *Rhytidiadelphus squarrosus*).

The site supports several Red Data Book plant species, i.e. Starved Wood Sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis*), Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The first three of these are also protected under the

Flora (Protection) Order 1999. The following plants, relatively rare nationally, are also found within the site: Toothwort (*Lathraea squamaria*) associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (*Leucojum aestivum*) and Flowering Rush (*Butomus umbellatus*) on the Blackwater; Common Calamint (*Calamintha ascendens*), Red Campion (*Silene dioica*), Sand Leek (*Allium scorodoprasum*) and Wood Club-rush (*Scirpus sylvaticus*) on the Awbeg.

The site is also important for the presence of several Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl-mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers.

The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by mighty pools, lovely streams, glides and generally, a good push of water coming through except in very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is very highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fermoy and some of the tributaries are more associated with grilse fishing.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, are to be seen feeding along the river, roosting under the old bridges and in old buildings.

Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket, *Metrioptera roselii* (Orthoptera: Tettigoniidae), has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (*Anodonta cygnea*), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 35, 1994/95-95/96) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater Estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute max. 2141, 1994/95). Staging Terns visit the site annually (Sandwich Tern (>300) and Arctic/Common Tern (>200), average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland White-fronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at

least 30 pairs of Kingfisher. Little Egret now breed at the site (12 pairs in 1997, 19 pairs in 1998) and this represents about 90% of the breeding population in Ireland.

The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2752), Teal (average peak 1316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 +10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1680), Knot (150), Dunlin (2293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4000) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig Estuary on the Co. Cork side.

The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers - 2 or 3 pairs at Dromana Rock; c. 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and c. 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in County Cork.

Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it is known to nearby to the south of Youghal. Dipper occurs on the rivers.

Landuse at the site is mainly centred on agricultural activities. The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of Habitats Directive Annex II animal species within it. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the Blackwater and its tributaries and there are a number of Angler Associations, some with a number of

beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. Other recreational activities such as boating, golfing and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, overgrazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively; furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

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13.09.2006

SITE SYNOPSIS

SITE NAME: BLACKWATER RIVER (CORK/WATERFORD)

SITE CODE: 002170

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which includes the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The extent of the Blackwater and its tributaries in this site, flows through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Towns along, but not in the site, include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

The Blackwater rises in boggy land of east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeraghs before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

The site is a candidate SAC selected for alluvial wet woodlands and Yew wood, both priority habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected as a candidate SAC for floating river vegetation, estuaries, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, perennial vegetation of stony banks and old Oak woodlands, all habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive - Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter and the plant, Killarney Fern.

Wet woodlands are found where river embankments, particularly on the River Bride, have broken down and where the channel edges in the steep-sided valley between Cappoquin and Youghal are subject to daily inundation. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almond-leaved Willow (*Salix alba* and *S. triandra*) with isolated Crack Willow (*S. fragilis*) and Osier (*S. viminalis*). Grey Willow (*S. cinerea*) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (*Lycopus europaeus*), Guelder Rose (*Viburnum opulus*), Bittersweet (*Solanum dulcamara*) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (*Taxus baccata*) woodland, a rare habitat in Ireland and the EU, occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore, Beech and Douglas Fir (*Pseudotsuga menziesii*). However, the future prospect for this Yew wood is good as the site is proposed for restoration under a Coillte EU Life Programme. Owing to its rarity, Yew woodland is listed with priority status on Annex I of the EU Habitats Directive.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (*Phragmites australis*) is ubiquitous and is harvested for thatching. There is also much Marsh Marigold (*Caltha palustris*) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (*Carex riparia* and *C. acutiformis*). Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Reed Canary-grass (*Phalaris arundinacea*), Meadowsweet (*Filipendula ulmaria*), Nettle (*Urtica dioica*), Purple Loosestrife (*Lythrum salicaria*), Marsh Valerian (*Valeriana officinalis*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*).

At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the watertable and several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed about with Grey Willows, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (*Lysimachia nemorum*) with locally abundant Starwort (*Callitriche stagnalis*) and Marsh Ragwort (*Senecio palustris*). One of the depressions has Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Crab Apple (*Malus sylvestris*) and a little Oak (*Quercus robur*) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive and includes Pond Water-crowfoot (*Ranunculus peltatus*), Water-crowfoot (*Ranunculus* spp.), Canadian Pondweed (*Elodea canadensis*), Broad-leaved Pondweed (*Potamogeton natans*), Pondweed (*Potamogeton* spp.), Water Milfoil (*Myriophyllum* spp.), Common Club-rush (*Scirpus*

lacustris), Water-starwort (*Callitriche* spp.), Lesser Water-parsnip (*Berula erecta*) particularly on the Awbeg, Water-cress (*Nasturtium officinale*), Hemlock Water-dropwort, Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica*.

The grassland adjacent to the rivers of the site is generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow-flag (*Iris pseudacorus*), Meadow-sweet, Meadow Buttercup (*Ranunculus acris*) and rushes (*Juncus* spp.) occur occasionally. Extensive fields of wet grassland also occur at Annagh Bog on the Awbeg. These fields are dominated by Tufted Hair-grass (*Deschampsia cespitosa*) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech (*Fagus sylvatica*) and a few conifers, and sometimes of Rhododendron (*Rhododendron ponticum*) and Laurel. Oak woodland is well developed on sandstone about Ballinatrav, with the acid Oak woodland community of Holly (*Ilex aquifolium*), Bilberry (*Vaccinium myrtillus*), Greater Woodrush (*Luzula sylvatica*) and Buckler Ferns (*Dryopteris affinis*, *D. aemula*) occurring in one place. Irish Spurge (*Euphorbia hyberna*) continues eastwards on acid rocks from its headquarters to the west but there are many plants of richer soils, for example Wood Violet (*Viola reichenbachiana*), Goldilocks (*Ranunculus auricomus*), Broad-leaved Helleborine (*Epipactis helleborine*) and Red Campion (*Silene dioica*). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana. The spread of Rhododendron is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (*Brachypodium sylvaticum*) and Early-purple Orchid (*Orchis mascula*).

In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of Oak with Downy Birch (*Betula pubescens*), Holly and Hazel (*Corylus avellana*) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the Oak on the shallower slopes and here both Rhododendron and Cherry Laurel (*Prunus laurocerasus*) have invaded the woodland.

The Oak wood community in the Lismore and Glenmore valleys is of the classical upland type, in which some Rowan (*Sorbus aucuparia*) and Downy Birch occur. Honeysuckle (*Lonicera periclymenum*) and Ivy (*Hedera helix*) cover many of the trees while Greater Woodrush, Bluebell (*Hyacinthoides non-scripta*), Wood Sorrel (*Oxalis acetosella*) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (*Blechnum spicant*), Male Fern (*Dryopteris filix-mas*), Buckler Ferns (*D. dilatata*, *D. aemula*) and Lady Fern (*Athyrium filix-femina*). There are many mosses present and large species such as *Rhytidiadelphus* spp., *Polytrichum formosum*, *Mnium hornum* and *Dicranum* spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (*Lobaria* spp.) is the most conspicuous and is widespread.

The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (*Prunus avium*) and Goat Willow (*Salix caprea*). The ground flora is relatively rich with Pignut (*Conopodium majus*), Wild Garlic (*Allium ursinum*), Garlic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobanche hederæ*), a local species within Ireland, suggests that the woodland, along with its attendant Ivy is long established.

Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore (*Acer pseudoplatanus*), Ash and Horse-chestnut (*Aesculus hippocastanum*). In places the alien invasive species, Cherry Laurel, dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash with Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europæa*) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (*Salix* spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (*Geum urbanum*), Ivy and Soft Shield-fern (*Polystichum setiferum*), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (*Carex remota*) and Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*).

In places along the upper Bride, scrubby, semi-natural deciduous woodland of Willow, Oak and Rowan occurs with abundant Great Woodrush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss and fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (*Osmunda regalis*) and Eared Willow (*Salix aurita*) and between them there is a sheet of Bottle Sedge (*Carex rostrata*), Marsh Cinquefoil (*Potentilla palustris*), Bogbean (*Menyanthes trifoliata*), Marsh St. John's-wort (*Hypericum elodes*) and the mosses *Sphagnum auriculatum* and *Aulacomnium palustre*. The cover is a scraw with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Marsh Orchid (*Dactylorhiza incarnata*).

The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (*Veronica montana*), Wood Anemone (*Anemone nemorosa*), Enchanter's Nightshade (*Circaea lutetiana*), Barren Strawberry (*Potentilla sterilis*) and Shield Fern occur. There is some Wild Garlic, Three-nerved Sandwort (*Moehringia trinervia*) and Early-purple Orchid (*Orchis mascula*) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle in wet places. A Hazel stand at the base of the Glenakeeffe valley shows this community well.

The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow (*Salix cinerea* subsp. *oleifolia*) and Downy Birch. The ground in the clearings is heathy with Heather (*Calluna vulgaris*), Slender St John's-wort (*Hypericum pulchrum*) and the occasional Broom (*Cytisus scoparius*) occurring.

The estuary and the other Habitats Directive Annex I habitats within it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site with the best examples at Kinsalebeg in Co. Waterford and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater and large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green algae (filamentous, *Ulva* species and *Enteromorpha* sp.) occur in places, while fucoid algae are common on the more stony flats even as high upstream as Glenassy or Coneen.

The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (*Puccinellia maritima*), small amounts of Greater Sea-spurrey (*Spergularia media*), Glasswort (*Salicornia* sp.), Sea Arrowgrass (*Triglochin maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Purslane (*Halimione portulacoides*) - the latter a very recent coloniser - at the edges. Some Sea Aster (*Aster tripolium*) occurs, generally with Creeping Bent (*Agrostis stolonifera*). Sea Couch-grass (*Elymus pycnanthus*) and small isolated clumps of Sea Club-rush (*Scirpus maritimus*) are also seen. On the Tourig River additional saltmarsh species found include Lavender (*Limonium* spp.), Sea Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvy-grass (*Cochlearia officinalis*) and Sea Plantain (*Plantago maritima*). Oraches (*Atriplex* spp.) are found on channel edges.

The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well developed and diverse flora. At the lowest part, Sea Beet (*Beta vulgaris*), Curled Dock (*Rumex crispus*) and Yellow-horned Poppy (*Glaucium flavum*) occur with at a slightly higher level Sea Mayweed (*Tripleurospermum maritimum*), Cleavers (*Galium aparine*), Rock Samphire (*Crithmum maritimum*), Sandwort (*Honkenya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glabriuscula*). Other species present include Sea Rocket (*Cakile maritima*), Herb Robert (*Geranium robertianum*), Red Fescue (*Festuca rubra*) and Kidney Vetch (*Anthyllis vulneraria*). The top of the spit is more vegetated and includes lichens and bryophytes (including *Tortula ruraliformis* and *Rhytidiadelphus squarrosus*).

The site supports several Red Data Book plant species, i.e. Starved Wood Sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis*), Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The first three of these are also protected under the

Flora (Protection) Order 1999. The following plants, relatively rare nationally, are also found within the site: Toothwort (*Lathraea squamaria*) associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (*Leucojum aestivum*) and Flowering Rush (*Butomus umbellatus*) on the Blackwater; Common Calamint (*Calamintha ascendens*), Red Campion (*Silene dioica*), Sand Leek (*Allium scorodoprasum*) and Wood Club-rush (*Scirpus sylvaticus*) on the Awbeg.

The site is also important for the presence of several Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl-mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers.

The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by mighty pools, lovely streams, glides and generally, a good push of water coming through except in very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is very highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fermoy and some of the tributaries are more associated with grilse fishing.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, are to be seen feeding along the river, roosting under the old bridges and in old buildings.

Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket, *Metrioptera roselii* (Orthoptera: Tettigoniidae), has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (*Anodonta cygnea*), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 35, 1994/95-95/96) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater Estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute max. 2141, 1994/95). Staging Terns visit the site annually (Sandwich Tern (>300) and Arctic/Common Tern (>200), average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland White-fronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at

least 30 pairs of Kingfisher. Little Egret now breed at the site (12 pairs in 1997, 19 pairs in 1998) and this represents about 90% of the breeding population in Ireland.

The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2752), Teal (average peak 1316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 +10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1680), Knot (150), Dunlin (2293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4000) and Lesser Black-backed Gull (172). The greatest numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig Estuary on the Co. Cork side.

The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers - 2 or 3 pairs at Dromana Rock; c. 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and c. 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in County Cork.

Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it is known to nearby to the south of Youghal. Dipper occurs on the rivers.

Landuse at the site is mainly centred on agricultural activities. The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of Habitats Directive Annex II animal species within it. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the Blackwater and its tributaries and there are a number of Angler Associations, some with a number of

beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. Other recreational activities such as boating, golfing and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, overgrazing within the woodland areas, and invasion by non-native species, for example Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and of populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively; furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

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