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Administration,
Environmental Licensing Programme,
Office of Climate, Licensing & Resource Use,
Environmental Protection Agency,
Regional Inspectorate,
Inniscarra,
County Cork.

30th September 2010 D0301-01

Re: Notice in accordance with Regulation 18(3)(b) of the Waste Water Discharge (Authorisation) Regulations 2007

Dear Mr Huskisson,

With reference to the notice received for the Killeagh Waste Water Discharge Licence Application on the 2nd of June last and Cork County Council's response of the 24th June seeking a revised submission date of the 30th of September 2010 please find our response attached.

Yours Faithfully

Patricia Power
Director of Services,
Area Operations South,
Floor 5,
County Hall,
Cork.

Wastewater Discharge Licence Application: D0301-01 Killeagh

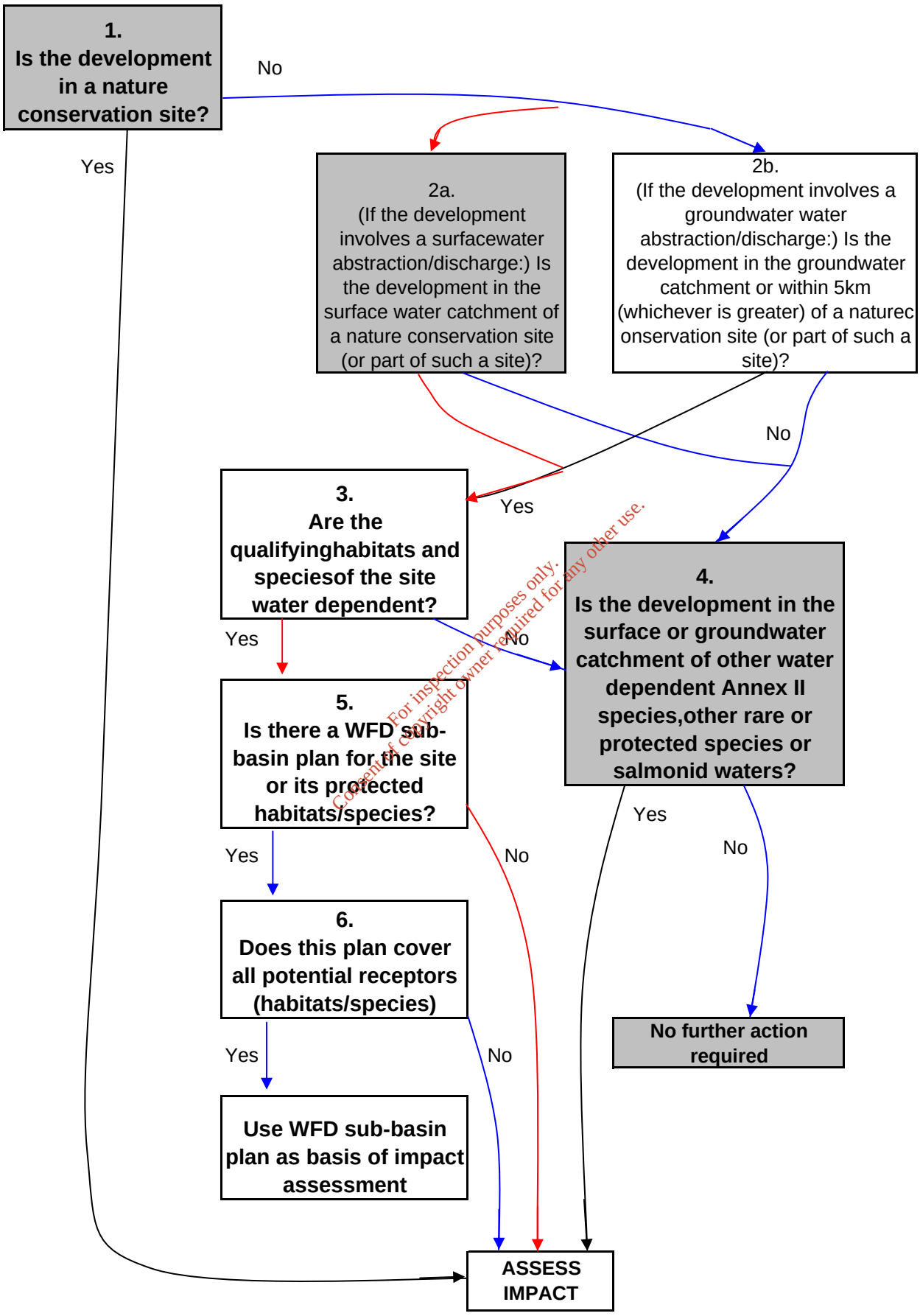
Circular L8/08 2 September 2008
Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments

APPENDIX 1
Water Services Schemes - Natural Heritage Checklist for Local Authorities

What projects must be screened?

For new projects and significant changes to any existing operations, if the answer is 'yes' to any of the following, the project (i.e. construction, operation and maintenance) must be screened for its impacts:	
1. Is the development in or on the boundary of a nature conservation site NHA/SAC/SPA?	No
2. Will nationally protected species be directly impacted? Wildlife Acts (1976 and 2000), Flora Protection order (S.I. 94 of 1999)?	No
3. Is the development a surface water discharge or abstraction in the surface water catchment, or immediately downstream of a nature conservation site with water dependant qualifying habitats/ species?	yes
4. Is the development a groundwater discharge or abstraction in the ground water catchment or within 5 km of a nature conservation site with water-dependant qualifying habitats/species2?	No
5. Is the development in the surface water or groundwater catchment of salmonid waters?	No
6. Is the treatment plant in an active or former floodplain or flood zone of a river, lake, etc?	No
7. Is the development a surface discharge or abstraction to or from marine waters and within 3km of a marine nature conservation site?	No
8. Will the project in combination with other projects (existing and proposed) or changes to such projects affect the hydrology or water levels of sites of nature conservation interest or the habitats of protected species?	No

Flow Diagram with Question relating to the Agglomeration of Killeagh Shaded Red



Conclusion: An appropriate assessment is required for Killeagh

Habitats Directive Assessment (Screening Report) in respect of

Application by Cork County Council to the EPA

for discharge license in respect of the

Killeagh Waste Water Treatment Plant.

August, 2010

1 Introduction

1.1 Killeagh is located approximately 10 kilometres west of Youghal and 14 kilometres east of Midleton and is situated on the N25 National Primary Route and former rail line connecting Youghal and Cork.

The Waste Water Treatment Plant is located on the boundary of a housing estate south of the N25 which runs through the village.The original WWTP was designed to treat waste for a 1000 population equivalent. Current figures indicate the plant is treating waste of a PE of 1100-1200 approximately. An upgrade of the WWTP has just been completed. The new plant has the capacity to treat waste of up to 2400 population equivalent. Phosphorous and Nitrogen removal are now also included in the treatment process.

The original WWTP was hydraulically overloaded though it continued to treat the effluent to within the required standard. Massive infiltration was discovered within the WWTP while being upgraded so the new WWTP is operating to much reduced flows.

The WWTP has just completed its commissioning phase and therefore there has not been sufficient body of data yet collected on flows etc. The weather has also been very dry and settled. However flows through the plant seem to be of the order of 260cu.m/day.

1.2 The plant discharges into the Dissour River. The Dissour is a tributary of the Womanagh River which flows into Youghal Bay at the site of the Clonpriest/Ballymacoda SPA/SAC. This is a designated site under the **EU Birds Directive (79/409/EEC)** as transposed into Irish Law under the European Union (Natural Habitats) Regulations SI 94/1997. As this is the case, and in accordance with requirements under this Directive, the potential impacts of proposed developments that have the potential to impact on Special Protection Areas must be assessed. The procedure to do this is called a **Habitats Directive Assessment**. The purpose of such an assessment is to identify whether there may be potential for elements of the project to have a significant impact on nature conservation sites within its impact zone, and if so, to predict the potential for such impacts to affect the overall integrity of such nature conservation sites. The European Union has provided guidance as to how to make a Habitats Directive Assessment which identifies four main stages in the process as follows:

Stage One: Screening
The process which identifies the likely impacts upon a Natura 2000 site of a project or plan, wither alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant.

Stage Two: Appropriate assessment
The consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts.

Stage Three: Assessment of alternative solutions
The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain.
An assessment of compensatory measures, where in the light of an assessment of imperative reasons of overriding public interest, it is deemed that the project or plan should proceed.

1.3 This document brings together all of the information necessary to make determination as to whether there are likely to be significant impacts arising from the Killeagh Waste Water Treatment Plant on the Clonpriest/Ballymacoda SPA/SAC and represents the first stage of this process (Screening).

Step 1:
Provide a description of the plan and other plans and projects that, in combination, have the potential to have significant effects on Natura 2000 sites within the potential impact zone;

Step 2:
Identify Natura 2000 sites which may be impacted by the plan, and compile information on their qualifying interests and conservation objectives;

Step 3:
Determine whether the plan needs to be screened for potential impacts on Natura 2000 sites;

Step 4 :
Carry out an assessment of likely effects – direct, indirect and cumulative – undertaken on the basis of available information as a desk study or field survey or primary research as necessary;

Step 5:
Assess the significance of any such effects on the Natura 2000 sites within the impact zone.

1.4 The assessment has been prepared in accordance with the following guidance:

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the Habitats Dreictive 92/43/EEC.

European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habtiats Directive 92/43/EEC.

Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Environment, Heritage and Local Government, 2009.

2 Appropriate Assessment Screening Matrix

2.1 Description of project	
Location	Killeagh WWTP, Killeagh, East Cork. See location maps section A of original application.
Description of the key components of the project	Killeagh WWTP was upgraded in 2009/2010 and now consists of an inlet screen and sump where the inorganic debris is removed from the system. . The effluent is dosed with ferric sulphate to reduce the phosphorous content in the waste before being pumped forward into the SBR's for secondary treatment. Treatment including denitrification occurs within the SBR (Sequencing batch Rotator). The treated effluent is decanted from the SBR and is further treated to a tertiary standard by filtering through a sand filter before discharging to the Dissour River. The upgraded WWTP is designed to treat the waste to a much stricter standard than that imposed by the Urban Wastewater treatment Regulations. The standards imposed are BOD 10mg/l, SS 10mg/l COD 50mg/l,TP 1mg/l and TN 15mg/l
Distance from designated sites in potential impact zone*	Approx. 5.4Km

2.2 Description of the Natura 2000 sites within the potential impact zone[1]	

[1] Natura 2000 sites within the potential impact zone of the proposed development have been identified in accordance with guidance provided in the NPWS circular L8/08.

Name	Ballymacoda/Clonpriest Special Protection Area/Special Area of Conservation
Site Code	000077 (SAC)/004023 (SPA)
Site Description	The site comprises the estuary of the Womanagh River, a substantial river which drains a large agricultural catchment. Part of the tidal section of the river is included in the site and, on the seaward side of the boundary, the site extends to the low tide mark. The inner part of the estuary is well sheltered by a stabilised sandy peninsula (Ring peninsula).
Qualifying Interests of Ballymacoda SPA/SAC	**SAC** The macro invertebrate fauna of the intertidal flats is well developed, with the following species occurring: *Corophium volutator,Hediste diversicolor, Arenicola marina, Macoma balthica, Scrobicularia plana, Cerastoderma edule and Lanice conchilega*. In the more sheltered areas the intertidal flats are colonised by mats of green algae (mostly *Enteromorpha* spp), with brown seaweeds occurring on the rocky shores of the shingle spits. Common Cord-grass (*Spartina anglica*) has spread within the estuary since the 1970's The main channel is flanked by salt marshes and wet fields, much of the latter being improved for agriculture. The salt marshes are mainly classified as Atlantic salt meadows, with such species as Sea Purslane (*Halimione portulacoides*), Sea Lavender (*Limonium humile*)band Sea Milkworth (*Glaux maritime*) Glassworth (*Salicornia* spp) and Sea Blite (*Suaeda maritima*) can also be found on the lower levels of the marshes **SPA** The main interests of the site are waterfowl with up to 20,000 regularly present during winter. Golden Plover, Bar-tailed Godwit, Teal, Ringed Plover,Grey Plover, Lapwing, Sanderling,Dunlin, Curlew, Knot, Redshank, Black-tailed Godwit and Turnstone
Other Notable Features of Ballymacoda SPA/SAC	Ballymacoda is one of the most important bird sites in the country and supports a higher number of waders than any other Cork estuary of its size. The salt marshes at the site are of particular note as they are of the scarce "lagoon" type. They are also of good quality and parts of them are in active growth. See appendix 4 for bird count data for Ballymacoda
Conservation Objectives	To avoid deterioration of the habitats of the qualifying species and species of special conservation interest, or significant disturbance to these species, thus ensuring that the integrity of the site is maintained. To ensure for the qualifying species and species of special conservation interest that the following are maintained in the long-term. o the population of the species as a viable

	component of the site; o the distribution and extent of habitats supporting the species; o the structure, function and supporting processes of habitats supporting the species;

2.3 Assessment Criteria	
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	**Discharge from Killeagh WWTP:** *Treated effluent from Killeagh Waste Water Treatment Plant is discharged to the Dissour River. The Dissour is a tributary of the Womanagh River which flows into Youghal Bay. The estuary of the Womanagh forms part of the Ballymacoda SPA.* The WWTP has just completed being upgraded from a 1000 pe plant to a 2400 pe plant. Though the original WWTP was hydraulically overloaded it still produced effluent that met the standards set down by the Urban Wastewater Treatment regulations. The new WWTP is in full operation since March 2010 and is designed to produce a treated effluent that meets even higher standards than the UWW treatment regs for BOD,SSandCOD. It also produces an effluent that has a TP of no greater than 1mg/l and TN of 15mg/l or less. These are the standards the Urban wastewater lays down for sensitive waters (in the case of TN) and even higher than the 2mg/l standard that is set for *TP* though the Dissour or Womanagh are not classed as sensitive waters. **Other Discharges in the vicinity of the SPA/SAC:** *Ballymacoda Septic Tank which serves the village of Ballymacoda(approx pop 200) discharges to a tributary of the Womanagh which joins the main river approx 0.5 km upstream of the estuary.* *Ladysbridge WWTP (PE 2000) discharges into the Womanagh river approx 6.5km upstream of its confluence with the Dissour.*
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site taking into account the following: o Size and scale o Land-take o Distance from the Natura 2000 site or key features of the site: o Resource	Untreated discharges could give rise to elevated nutrients entering the Womanagh estuary. However if this was to occur at Killeagh the available dilutions in both the Dissour and the Womanagh upstream of the estuary would greatly reduce the overall impact on the estuary itself. Though increased nutrient levels may impact on the ecology of an area by changing the composition of floral communities and reducing the ability of less robust plants to survive there is no evidence to date that this has occurred at this site. Increased nutrient levels may also result in increasing the invertebrate populations in the estuary, thereby increasing bird population levels. However the potential for the treatment plant discharge to result in elevated nutrients within the SPA/SAC is reduced by four main factors:

requirements (water abstraction etc.) o Emissions (disposal to land, water or air) o Excavation Requirements o Transportation Requirements o Duration of construction, operation, decommissioning o Other.	1. The standard of treated effluent is high. 2. From the monitoring carried out upstream and downstream of the Killeagh discharge point there is no evidence of deterioration in water quality in the Dissour from the discharge. **3.** The treated effluent enters the SPA after receiving dilution in both the Dissour and Womanagh rivers. **4.** The WWTP has been recently upgraded and the discharge now has Phosphorous and Nitrogen limits as well as stricter than UWW standards for the other parameters. (See attached for effluent results since March 2010 when new plant entered commissioning phase) 1 **The standard of treated effluent is high.** Treated effluent from Killeagh WWTP is monitored by the operator on a weekly basis and by CCC six times per year. Effluent testing demonstrates that treated effluent consistently meets standards set out in the Urban Wastewater Treatment Regulations and with the new WWTP the standard is even higher. **Note 1:** See appendix 2 for effluent quality results from upgraded WWTP. **2 No deterioration in water quality in Dissour River** According to the upstream and downstream monitoring already carried out as part of the WWDL application process, there is no deterioration in water quality associated with the Killeagh discharge. **3 Available dilution capacity** The treated effluent is discharged into the Dissour River where under max discharge/ low river flow conditions the available dilution is 1:10. This flow then enters the Womanagh river the available dilution is in the order of 1/70 using the 95%ile flow and in the order of 1/200 using the recommended median flow figure. **4 Upgrading of WWTP** The river quality data submitted as part of the application showed no deterioration in the Dissour due to the Killeagh discharge. Since then the WWTP has been upgraded and now discharges effluent to an even higher standard with treatment for removal of Nitrogen and Phosphorous now taking place which could not be done in old WWTP.
Describe any likely changes to the site arising as a result of:	**Reduction in habitat area:** Treated effluent complies with standards laid down in the Urban Waste Water Treatment Regulations and is discharging into the SPA via a large well-exchanged body of

o Reduction in habitat area o Disturbance to key species o Habitat or species fragmentation o Reduction in species density o Changes in key indicators of conservation value (water quality etc) o Climate Change	water where dilution and dispersion potential is high. No significant impacts are evident or predicted on habitats within the SPA/SAC arising from the operation of this facility. **Disturbance to key species:** There is no evidence that the operation of the WWTP causes any disturbance to species within the SPA. **Habitat or species fragmentation:** There is no evidence that habitat fragmentation has been caused as a result of the operation of this facility. **Reduction in species density:** Treated effluent complies with standards laid down in the Urban Waste Water Treatment Regulations and is discharging to a large well-exchanged body of water where dilution and dispersion potential is high. No significant impacts are evident or predicted on species for which the site is designated. **Changes in key indicators of conservation value eg water quality:** Cork County Council carried out limited monitoring of the Dissour upstream and downstream of the Killeagh discharge location prior to submitting the licence application. The results showed no obvious impacts on water quality. EPA monitoring and River Basin District reports show the water quality to have deteriorated in 2008 from a Q of 4 (2005)to 3-4. Though the u/s and d/s samples taken don't indicate that the old WWTP was a major contributor to this, the new WWTP will only improve matters.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: o Interference with the key relationships that define the structure of the site o Interference with key relationships that define the function of the site	**Interference with the key relationships that define the structure of the site:** *The structure of the SPA/SAC is not impacted by the operation of this facility.* **Interference with key relationships that define the function of the site:** *The function of the SPA/SAC is not impacted by the operation of this facility.*
Describe from the above those elements of the project of plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	No significant impacts are predicted.

3. Finding of No Significant Effects Report Matrix

Name of project or plan	Killeagh WWTP discharge
Name and location of Natura 2000 site	Ballymacoda Special protection Area
Description of the project or plan	Killeagh WWTP discharges into the Dissour River approx 5.4 km upstream of where the Womanagh river flows into the Ballymacoda SPA. The Dissour is a tributary of the Womanagh. Killeagh WWTP has been upgraded in 2010 and is now treating the influent received so as to reduce the phosphorous and nitrogen content before discharging to the river.
Is the project or plan directly connected with or necessary to the management of the site (provide details)?	No
The assessment of significance of effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 Site.	In a worst case scenario if untreated waste was discharged from the Killeagh plant at a time when flows in the Dissour and Womanagh were at their lowest then the likelihood of the discharge having an impact would increase. This impact would be of the nature of increasing the nutrient levels in the water flowing into the SPA/SAC which though in itself may not have a negative effect on the protected bird population may have an effect on the many protected species that are found there. As there is also a discharge from a septic tank in Ballymacoda much closer to the Natura site this effluent in conjunction with the Killeagh situation described above would provide the worst possible case scenario for the Natura Site.
Explain why these effects are not considered significant.	The treated effluent discharged from Killeagh meets a very strict standard. It is discharged into the Dissour River where the available dilution is greater than the 1:8 minimum recommended (using 95%ile flow figure) or 1:200 using the median flow figure for the Dissour.. The Dissour in turn flows into the Womanagh which means that by the time the discharge flow meets the SPA it has been diluted in a large well exchanged body of water.
List of agencies consulted: provide contact name and telephone or email address	National Parks and Wildlife Service – Natureconservation@environ.ie, cyril.saich@environ.ie devapp@ environ.ie Birdwatch Ireland – Data request.
Response to consultation	Cyril Saich acknowledged request and recommended rerouting through devapp@environ.ie

	Birdwatch Ireland sent on Bird count data.

Data collected to carry out the assessment			
Who carried out the assessment	**Sources of data**	**Level of assessment completed**	**Where can the full results of the assessment be accessed and viewed**
Madeleine Healy, Cork County Council	IWebs Bird Data supplied by BirdWatch Ireland; Water Quality Monitoring Data CCC;	Desktop review of cited data.	This report.

Appendix 1: Ecological Data

1 SITE SYNOPSIS

SITE NAME: BALLYMACODA BAY SPA

SITE CODE: 004023

This coastal site stretches north-east from Ballymacoda to within several kilometres north-east of Youghal, Co. Cork. It comprises the estuary of the Womanagh River, a substantial river which drains a large agricultural catchment. Part of the tidal section of the river is included in the site and on the seaward side the boundary extends to the low tide mark. The inner part of the estuary is well sheltered by the Ring peninsula, a stabilised sand spit with sand dunes at its northern end and salt marshes on the landward side. Sediment types vary from muds to muddy sands in the inner part to fine rippled sands in the outer exposed part. The macro-invertebrate fauna of the intertidal flats is well-developed, with the following species occurring: Ragworm (*Hediste diversicolor*), the crustacean *Corophium volutator*, Lugworm (*Arenicola marina*), Baltic Tellin (*Macoma balthica*), Peppery Furrow-shell (*Scrobiculariaplana*), Common Cockle (*Cerastoderma edule*) and the tubeworm *Lanice conchilega*.In the more sheltered areas the intertidal flats are colonised by mats of green algae (mostly *Enteromorpha* spp.), with brown seaweeds occurring on the rocky shores of the shingle spits. Common Cord-grass (*Spartina anglica*) has spread within the estuary since the late 1970s. The main channel is flanked by salt marshes and wet fields, much of the latter being improved for agriculture. The site is of high ornithological importance, supporting an excellent diversity of wintering waterfowl. The habitats present provide both important feeding and roosting areas for the birds. The site qualifies for international importance on the basis that it regularly supports in excess of 20,000 birds (mean of 23,388 in 5 winters 1994/95 to 1998/99). It also qualifies for international importance for its population of Black-tailed Godwit (899). In addition, it supports nationally important populations of a further 15 species (all figures are average peaks for 5 winters 1995/96 to 1999/2000): Shelduck (150), Wigeon (1,232), Teal (1,170), Ringed Plover (236), Golden Plover (14,480), Grey Plover (688), Lapwing (5,893), Knot (378), Sanderling (147), Dunlin (4,410), Bar-tailed Godwit (792), Curlew (1,621), Redshank (511), Greenshank (24) and Turnstone (191). The presence of large flocks of Golden Plover and Bar-tailed Godwit is of particular note as these species are listed on Annex I of the E.U. Birds Directive. A number of other species occur in populations of regional or local importance, including Brent Goose (100), Shoveler (29) and Oystercatcher (682). The site is also notable for supporting large concentrations of gulls in autumn and winter. Principal species are Black-headed Gull (2,320), Common Gull (1,220), Lesser Black-backed Gull (6,285), Herring Gull (128) and Great Black-backed Gull (455). A total of 107 wetland species were recorded from this site between 1971 and 1988.

Much of the land adjacent to the estuary has been reclaimed and is subject to intensive agriculture, with cattle grazing and silage being the most common land uses.

Ballymacoda Bay SPA is one of the most important sites in the country for wintering waterfowl. It qualifies for international importance on the basis of regularly exceeding 20,000 wintering birds but also for its Black-tailed Godwit population. In addition, it supports nationally important populations of a further 15 species and also is an important site for gulls. Two of the species which occur, Golden Plover and Bar-tailed Godwit, are listed on Annex I of the E.U. Birds Directive. The site has been well-studied, with detailed counts extending back to 1971.

6.10.2004

SITE SYNOPSIS
SITE NAME: BALLYMACODA (CLONPRIEST AND PILLMORE)
SITE CODE: 000077

This coastal site stretches north-east from Ballymacoda to within about 6 km of Youghal, Co. Cork. Though moderate in size, it has a good diversity of coastal habitats, including several listed on Annex I of the E.U. Habitats Directive. The site comprises the estuary of the Womanagh River, a substantial river which drains a large agricultural catchment. Part of the tidal section of the river is included in the site and on the seaward side the boundary extends to the low tide mark. The inner part of the estuary is well sheltered by a stabilised sandy peninsula (Ring peninsula). Sediment types vary from muds to muddy sands in the inner part to fine rippled sands in the outer exposed part. The macro-invertebrate fauna of the intertidal flats is well-developed, with the following species occurring: *Corophium volutator*,*Hediste diversicolor*, *Arenicola marina*, *Macoma balthica*, *Scrobicularia plana*,*Cerastoderma edule* and *Lanice conchilega*. In the more sheltered areas the intertidal flats are colonised by mats of green algae (mostly *Enteromorpha* spp.), with brown seaweeds occurring on the rocky shores of the shingle spits. Common Cord-grass (*Spartina anglica*) has spread within the estuary since the late 1970s.The main channel is flanked by salt marshes and wet fields, much of the latter being improved for agriculture. The salt marshes are mainly classified as Atlantic salt meadows, with such species as Sea Purslane (*Halimione portulacoides*), Sea Lavander (*Limonium humile*) and Sea Milkwort (*Glaux maritima*). On the lower levels of the marshes, and extending out onto the open sand and mud flats, occur annual salt marsh species such as Glasswort (*Salicornia* spp.) and Sea Blite (*Suaeda maritima*). The salt marshes at the site are of particular note as they are of the scarce ‘lagoon’ type. They are also of good quality and parts of them are in active growth.Part of the site is also a Special Protection Area for birds; the main interest of the area lies in its waterfowl, with flocks of up to 20,000 regularly present during winter (e.g. 1995-96 peak = 19,725). A total of 107 wetland species have been recorded from this site. Maximum figures for the four winters 1994/95-97/98 show that Golden Plover, a species listed under Annex I of the Birds Directive, almost reached internationally important numbers (9,100) and that the Bar-tailed Godwit, another Annex I species, was present in nationally important numbers (494). Eleven other species also occurred in nationally important numbers: Teal (688), Ringed Plover (163), Grey Plover (504), Lapwing (3800), Sanderling (108), Dunlin (3,373), Curlew (1,378), Knot (280), Redshank (300), Black-tailed Godwit (422) and Turnstone (144). Several additional species occur in regionally or locally important numbers.

Much of the land adjacent to the estuary has been reclaimed and is subject to intensive agriculture, with cattle grazing and silage being the most common land uses. However, many of these fields remain marshy and are important feeding and roosting areas for wildfowl, Golden Plover and Lapwing. The most serious threat to the site is water pollution, primarily from slurry spreading.

This site’s conservation value derives largely from the presence of a number of important coastal habitats listed in Annex I of the E.U. Habitats Directive. But, there is also considerable ornithological interest; Ballymacoda is one of the most important bird sites in the country and supports a higher number of waders than any other Cork

estuary of its size. It also contains important numbers of the Golden Plover and Bartailed Godwit, two Annex I Bird Directive species, and nationally important numbers of eleven further bird species.
8.10.2001

South Western River Basin District – Report on Dissour and Womanagh Rivers Womanagh and Dissour Rivers. -attached

River Basin District – Womanagh River WMU (Water management Unit) - attached

See also

An assessment of Womanagh River Catchment by Dixon Brosnan Environmental Consultants (2005) submitted with original application

Appendix 2: Treated Effluent Quality Data 2009 and Upgraded WWTP treated effluent quality March – July 2010.

Appendix 3: Map showing locations of all discharges into or adjacent to SPA.

water matters
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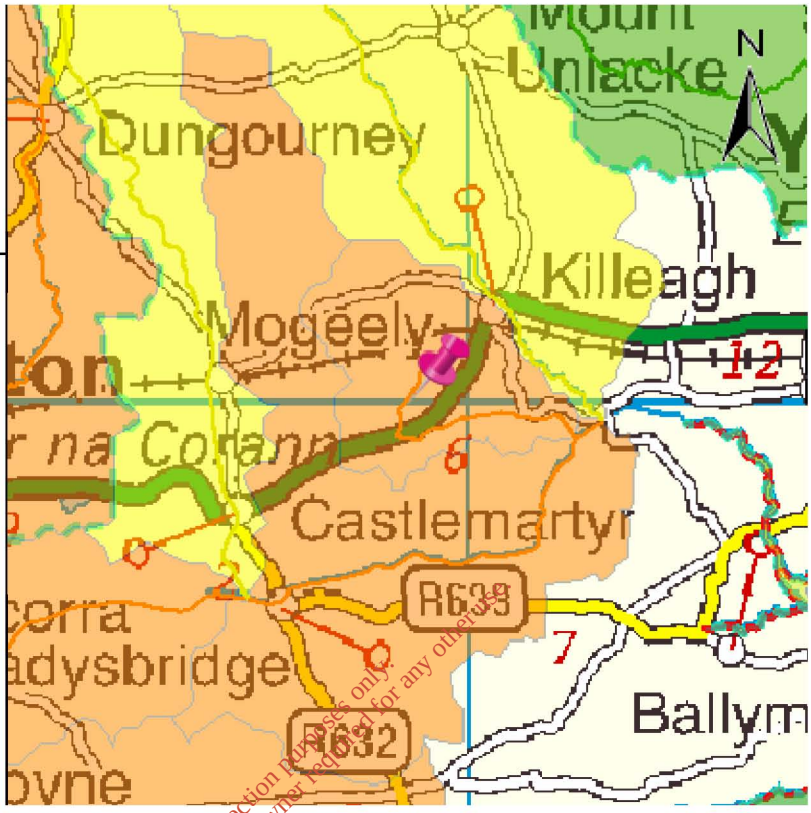
Full Report for Waterbody Womanagh, Trib of Womanagh



Legend

- High
- Good
- Moderate
- Poor
- Bad
- Yet to be determined

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Summary Information:

WaterBody Category:	Subbasin Waterbody
WaterBody	Womanagh,
WaterBody	IE_SW_19_1793
Overall	Poor
Overall	Restore
Overall Risk:	At Risk
Applicable Supplementary	Unsewered;
	Report data

south western river basin district

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

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Status Report

WaterBody Category: Subbasin

WaterBody Name: Womanagh,

WaterBody Code: IE_SW_19_1793

Overall Status Result: Poor

south western river basin district

	Status Element Description	Result
EX	Status from Monitored or Extrapolated Waterbody	
	Biological Elements	
Q	Macroinvertebrates (Q-Value)	Poor
F	Fish	n/a
DI	Phytobenthos (Diatoms)	n/a
FPM	Status value as determined by Margartifera	n/a
	Supporting Elements	
MOR	Hydromorphology	n/a
SP	Specific Pollutants	n/a
PC	General Physico-Chemical	Pass
	Chemical Status	
PAS	Chemical Status	n/a
	Overall Ecological Status	
O	Overall Ecological Status	Poor

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Risk Report

WaterBody Category: Subbasin

WaterBody Name: Womanagh,

WaterBody Code: IE_SW_19_1793

Overall Risk Result: At Risk

south western river basin district

	Risk Test Description	Risk
	Point Risk Sources	
RP1	WWTPs (2008)	Not At Risk
RP2	CSOs	Not At Risk
RP3	IPPCs (2008)	Not At Risk
RP4	Section 4s (2008)	Not At Risk
RPO	Overall Risk from Point Sources - Worst Case (2008)	Not At Risk
	Diffuse Risk Sources	
RD1	EPA diffuse model (2008)	At Risk
RD2a	Road Wash - Soluble Copper	Not At Risk
RD2b	Road Wash - Total Zinc	Not At Risk
RD2c	Road Wash - Total Hydrocarbons	Not At Risk
RD3	Railways	Not At Risk
RD4a	Forestry - Acidification (2008)	Not At Risk
RD4b	Forestry - Suspended Solids (2008)	Not At Risk
RD4c	Forestry - Eutrophication (2008)	Probably Not At Risk
RD5a	Unsewered Areas - Pathogens (2008)	Probably Not At Risk
RD5b	Unsewered Phosphorus (2008)	Not At Risk
RD5	Overall Unsewered (2008)	Not At Risk
RD6a	Arable	Probably Not At Risk
RD6b	Sheep Dip	Not At Risk
RD6c	Forestry - Dangerous Substances	Not At Risk
RDO	Diffuse Overall -Worst Case (2008)	At Risk
	Morphological Risk Sources	
RM1	Channelisation (2008)	Not At Risk
RM2	Embankments (2008)	Not At Risk
RM3	Impoundments	Not At Risk
RM4	Water Regulation	Not At Risk
RMO	Morphology Overall - Worst Case (2008)	Not At Risk

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

	Q/RDI or Point/Diffuse	
QPD	Q class/EPA Diffuse Model or worst case of Point and Diffuse (2008)	At Risk
	Hydrology	
RHY1	Water balance - Abstraction	Not At Risk
	Overall Risk	
RA	Rivers Overall - Worst Case (2008)	At Risk

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Objectives Report

WaterBody Category: Subbasin Waterbody

WaterBody Name: Womanagh,

WaterBody Code: IE_SW_19_1793

Overall Objective: Restore

	Objectives Description	Result
	Objectives	
OB1	Objective 1 - Protected Areas	Not Applicable
OB2	Objective 2 - Protect High and Good Status	Not Applicable
OB3	Objective 3 - Restore Less Than Good Status	Restore
OB4	Objective 4 - Reduce Chemical Pollution	Not Applicable
OBO	Overall Objective	Restore
	Deadline	
YR	Default Year by which the objective must be met	2015
EX	Revised Objective Deadline	2015
OBO	Overall Objective and Deadline	Restore - 2015

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Basic Measures Report

WaterBody Category: Subbasin Waterbody

WaterBody Name: Womanagh, Trib of Womanagh

WaterBody Code: IE_SW_19_1793

south western river basin district

	Basic Measures Description	Applicable
	Key Directives	
BA	Bathing Waters Directive	No
BI	Birds Directive	No
HA	Habitats Directive	No
DW	Drinking Waters Directive	Yes
SEV	Major Accidents and Emergencies (Seveso) Directive	Yes
EIA	Environmental Impact Assessment Directive	Yes
SE	Sewage Sludge Directive	Yes
UW	Urban Waste Water Treatment Directive	No
PL	Plant Protection Products Directive	Yes
NI	Nitrates Directive	Yes
IP	Integrated Pollution Prevention Control Directive	Yes
	Other Stipulated Measures	
CR	Cost recovery for water use	Yes
SU	Promotion of efficient and sustainable water use	Yes
DWS	Protection of drinking water sources	Yes
AB	Control of abstraction and impoundments	Yes
PT	Control of point source discharges	Yes
DI	Control of diffuse source discharges	Yes
GWD	Authorisation of discharges to groundwater	No
PS	Control of priority substances	Yes
MOR	Control of physical modifications to surface waters	Yes
OA	Controls on other activities impacting on water status	Yes
AP	Prevention or reduction of the impact of accidental pollution incidents	Yes

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

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Urban and Industrial Discharges Supplementary Measures Report

WaterBody Category: Subbasin Waterbody

WaterBody Name: Womanagh, Trib of Womanagh

WaterBody Code: IE_SW_19_1793

south western river basin district

	Point discharges to waters from municipal and industrial sources	Result
PINDDIS	Is there one or more industrial discharge (Section 4 licence issued by the local authority or IPPC licence issued by the EPA) contained within the water body?	No
PINDDISR	Are there industrial discharges (Section 4 licence issued by the local authority or IPPC licence issued by the EPA) that cause the receiving water to be 'At Risk' within the water body?	No
PB1	Basic Measure 1 - Measures for improved management.	No
PB2	Basic Measure 2 - Optimise the performance of the waste water treatment plant by the implementation of a performance management system.	No
PB3	Basic Measure 3 - Revise existing Section 4 license conditions and reduce allowable pollution load.	No
PB4	Basic Measure 4 - Review existing IPPC license conditions and reduce allowable pollution load.	No
PB5	Basic Measure 5 - Investigate contributions to the collection system from unlicensed discharges.	No
PB6	Basic Measure 6 - Investigate contributions to the collection system of specific substances known to impact ecological status.	No
PB7	Basic Measure 7 - Upgrade WWTP to increase capacity.	No
PB8	Basic Measure 8 - Upgrade WWTP to provide nutrient removal treatment.	No
PS1	Supplementary Measure 1 - Measures intended to reduce loading to the treatment plant.	No
PS2	Supplementary Measure 2 - Impose development controls where there is, or is likely to be in the future, insufficient capacity at treatment plants.	No
PS3	Supplementary Measure 3 - Initiate investigations into characteristics of treated wastewater for parameters not presently required to be monitored under the urban wastewater treatment directive.	No
PS4	Supplementary Measure 4 - Initiate research to verify risk assessment results and determine the impact of the discharge.	No
PS5	Supplementary Measure 5 - Use decision making tools in point source discharge management.	No
PS6	Supplementary Measure 6 - Install secondary treatment at plants where this level of treatment is not required under the urban wastewater treatment directive.	No
PS7	Supplementary Measure 7 - Apply a higher standard of treatment (stricter emission controls) where necessary.	No
PS8	Supplementary Measure 8 - Upgrade the plant to remove specific substances known to impact on water quality status.	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

PS9	Supplementary Measure 9 - Install ultra-violet or similar type treatment.	No
PS10	Supplementary Measure 10 - Relocate the point of discharge.	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Physical Modifications Supplementary Measures Report

WaterBody Category: Subbasin

WaterBody Name: Womanagh,

WaterBody Code: IE_SW_19_1793

south western river basin district

	Physical Modifications Supplementary Measures	Applicable
	Reduce	
SM1	Codes of Practice	Yes
SM2	Support for voluntary initiatives	Yes
	Remediate	
SM3	Channelisation impact remediation schemes	No
SM4	Channelisation investigation	No
SM5	Overgrazing remediation	No
SM6	Impassable barriers, impact confirmed, investigation into feasibility of remediation required	No
SM7	Impassable barriers investigation	Yes

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Unsewered Properties Supplementary Measures Report

WaterBody Subbasin Waterbody

WaterBody Name: Womanagh, Trib of Womanagh

WaterBody IE_SW_19_1793

south western river basin district

	Supplementary Measures for Unsewered Properties	Applicable
SP1	Amend building regulations	Yes
SP2	Establish certified expert panels for site investigation and certification of installed systems	Yes
SP3	Assess applications for new unsewered systems by applying risk mapping/decision support systems and codes of practice	Yes
SP4	Carry out an inspection programme in prioritised locations for existing systems and record results in an action tracking system	No
SP5	Enforce requirements for percolation	No
SP6	Enforce requirements for de-sludging	Yes
SP7	Consider connection to municipal systems	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

Forestry Measures Report

WaterBody Category: Subbasin
Waterbody

WaterBody Name: Womanagh, Trib of Womanagh

WaterBody Code: IE_SW_19_1793

south western river basin district

	Forestry Measures for	Applicable
	Forestry	
SF1	Management Instruments - Ensure regulations and guidance are cross referenced and revised to incorporate proposed measures	No
SF2	Acidification - Avoid or limit afforestation on 1st and 2nd order stream catchments in acid sensitive areas	No
SF3	Acidification - Revise the Acidification Protocol to ensure actual minimum alkalinities are detected and revise boundary conditions for afforestation in acid sensitive areas	No
SF10	Pesticide Use - Pre-dip trees in nurseries prior to planting out	No
SF11	Pesticide Use - Maintain registers of pesticide use	No
SF12	Acidification - Restructure existing forests to include open space and structural diversity through age classes and species mix, including broadleaves	No
SF13	Acidification - Mitigate acid impacts symptomatically using basic material	No
SF14	Acidification - Manage catchment drainage to increase residence times and soil wetting	No
SF15	Acidification - Implement measures to increase stream production.	No
SF16	Eutrophication - Establish riparian zone management prior to clearfelling	No
SF17	Eutrophication and Sedimentation - Enhance sediment control	No
SF18	Eutrophication - Manage catchment drainage to increase residence times and soil wetting, including no drainage in some locations	No
SF19	Sedimentation - Establish riparian zone management prior to clearfelling	No
SF20	Sedimentation - Enhance sediment control	No
SF21	Sedimentation - Manage catchment drainage to increase residence times and soil wetting, including no drainage in some locations	No
SF22	Hydromorphology - Enhance drainage network management, minimise drainage in peat soils	No
SF23	Pesticide Use - Develop biological control methods	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

SF4	Eutrophication and Sedimentation - Avoid or limit forest cover on peat sites	No
SF5	Eutrophication and Sedimentation - Change the tree species mix on replanting	No
SF6	Eutrophication and Sedimentation - Limiting felling coup size	No
SF7	Eutrophication and Sedimentation - Establish new forest structures on older plantation sites	No
SF8	Hydromorphology - Audit existing drainage networks in forest catchments	No
SF9	Pesticide Use - Reduce pesticide usage	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

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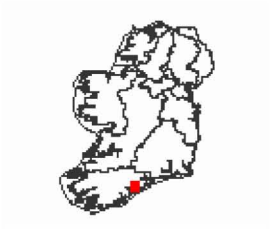
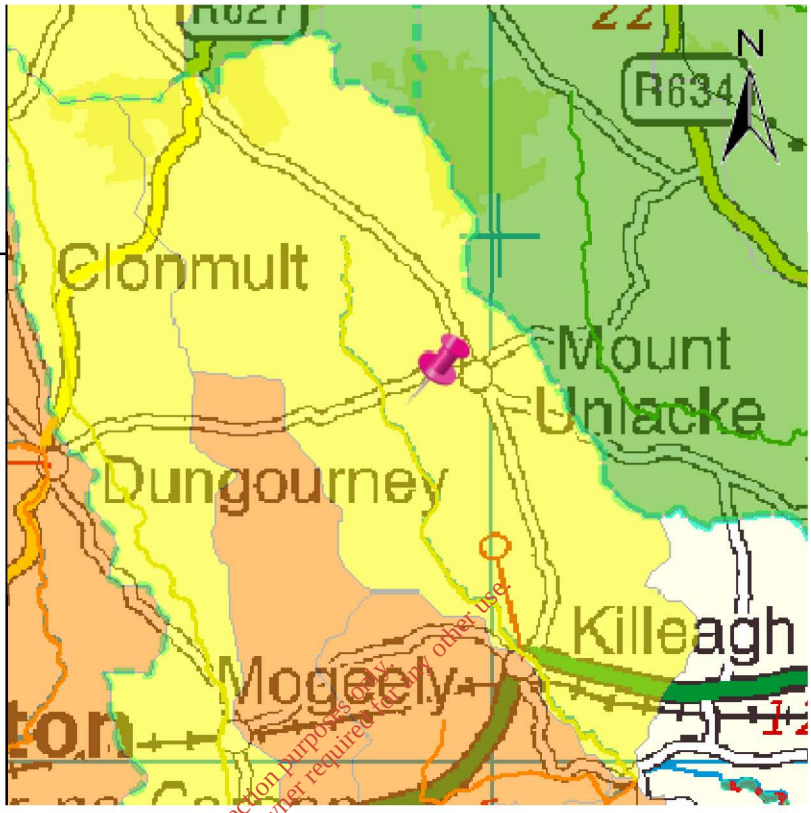
Full Report for Waterbody Dissour, Trib of Womanagh





Legend

- High
- Good
- Moderate
- Poor
- Bad
- Yet to be determined

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Summary Information:

WaterBody Category:	Subbasin Waterbody
WaterBody	Dissour,
WaterBody	IE_SW_19_1798
Overall	Moderate
Overall	Restore
Overall Risk:	At Risk
Applicable Supplementary	Unsewered;
	Report data

south western river basin district

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
"Help us plan!"

Status Report

WaterBody Category: Subbasin

WaterBody Name: Dissour,

WaterBody Code: IE_SW_19_1798

Overall Status Result: Moderate

south western river basin district

	Status Element Description	Result
EX	Status from Monitored or Extrapolated Waterbody	
	Biological Elements	
Q	Macroinvertebrates (Q-Value)	Good
F	Fish	Good
DI	Phytobenthos (Diatoms)	n/a
FPM	Status value as determined by Margartifera	n/a
	Supporting Elements	
MOR	Hydromorphology	n/a
SP	Specific Pollutants	n/a
PC	General Physico-Chemical	Fail
	Chemical Status	
PAS	Chemical Status	n/a
	Overall Ecological Status	
O	Overall Ecological Status	Moderate

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Risk Report

WaterBody Category: Subbasin

WaterBody Name: Dissour,

WaterBody Code: IE_SW_19_1798

Overall Risk Result: At Risk

south western river basin district

	Risk Test Description	Risk
	Point Risk Sources	
RP1	WWTPs (2008)	At Risk
RP2	CSOs	Probably At Risk
RP3	IPPCs (2008)	Not At Risk
RP4	Section 4s (2008)	Not At Risk
RPO	Overall Risk from Point Sources - Worst Case (2008)	At Risk
	Diffuse Risk Sources	
RD1	EPA diffuse model (2008)	Probably At Risk
RD2a	Road Wash - Soluble Copper	Not At Risk
RD2b	Road Wash - Total Zinc	Not At Risk
RD2c	Road Wash - Total Hydrocarbons	Not At Risk
RD3	Railways	Not At Risk
RD4a	Forestry - Acidification (2008)	Not At Risk
RD4b	Forestry - Suspended Solids (2008)	Not At Risk
RD4c	Forestry - Eutrophication (2008)	Probably Not At Risk
RD5a	Unsewered Areas - Pathogens (2008)	Probably Not At Risk
RD5b	Unsewered Phosphorus (2008)	Not At Risk
RD5	Overall Unsewered (2008)	Not At Risk
RD6a	Arable	Probably Not At Risk
RD6b	Sheep Dip	Not At Risk
RD6c	Forestry - Dangerous Substances	Not At Risk
RDO	Diffuse Overall -Worst Case (2008)	Probably At Risk
	Morphological Risk Sources	
RM1	Channelisation (2008)	Not At Risk
RM2	Embankments (2008)	Not At Risk
RM3	Impoundments	Not At Risk
RM4	Water Regulation	Not At Risk
RMO	Morphology Overall - Worst Case (2008)	Not At Risk

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

	Q/RDI or Point/Diffuse	
QPD	Q class/EPA Diffuse Model or worst case of Point and Diffuse (2008)	At Risk
	Hydrology	
RHY1	Water balance - Abstraction	Not At Risk
	Overall Risk	
RA	Rivers Overall - Worst Case (2008)	At Risk

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Objectives Report

WaterBody Category: Subbasin Waterbody

WaterBody Name: Dissour,

WaterBody Code: IE_SW_19_1798

Overall Objective: Restore

	Objectives Description	Result
	Objectives	
OB1	Objective 1 - Protected Areas	Not Applicable
OB2	Objective 2 - Protect High and Good Status	Not Applicable
OB3	Objective 3 - Restore Less Than Good Status	Restore
OB4	Objective 4 - Reduce Chemical Pollution	Not Applicable
OBO	Overall Objective	Restore
	Deadline	
YR	Default Year by which the objective must be met	2015
EX	Revised Objective Deadline	2015
OBO	Overall Objective and Deadline	Restore - 2015

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Basic Measures Report

WaterBody Category: Subbasin Waterbody

WaterBody Name: Dissour, Trib of Womanagh

WaterBody Code: IE_SW_19_1798

south western river basin district

	Basic Measures Description	Applicable
	Key Directives	
BA	Bathing Waters Directive	No
BI	Birds Directive	No
HA	Habitats Directive	No
DW	Drinking Waters Directive	Yes
SEV	Major Accidents and Emergencies (Seveso) Directive	Yes
EIA	Environmental Impact Assessment Directive	Yes
SE	Sewage Sludge Directive	Yes
UW	Urban Waste Water Treatment Directive	Yes
PL	Plant Protection Products Directive	Yes
NI	Nitrates Directive	Yes
IP	Integrated Pollution Prevention Control Directive	Yes
	Other Stipulated Measures	
CR	Cost recovery for water use	Yes
SU	Promotion of efficient and sustainable water use	Yes
DWS	Protection of drinking water sources	Yes
AB	Control of abstraction and impoundments	Yes
PT	Control of point source discharges	Yes
DI	Control of diffuse source discharges	Yes
GWD	Authorisation of discharges to groundwater	No
PS	Control of priority substances	Yes
MOR	Control of physical modifications to surface waters	Yes
OA	Controls on other activities impacting on water status	Yes
AP	Prevention or reduction of the impact of accidental pollution incidents	Yes

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Urban and Industrial Discharges Supplementary Measures Report

WaterBody Category: Subbasin Waterbody

WaterBody Name: Dissour, Trib of Womanagh

WaterBody Code: IE_SW_19_1798

south western river basin district

	Point discharges to waters from municipal and industrial sources	Result
PINDDIS	Is there one or more industrial discharge (Section 4 licence issued by the local authority or IPPC licence issued by the EPA) contained within the water body?	No
PINDDISR	Are there industrial discharges (Section 4 licence issued by the local authority or IPPC licence issued by the EPA) that cause the receiving water to be 'At Risk' within the water body?	No
PB1	Basic Measure 1 - Measures for improved management.	Yes
PB2	Basic Measure 2 - Optimise the performance of the waste water treatment plant by the implementation of a performance management system.	No
PB3	Basic Measure 3 - Revise existing Section 4 license conditions and reduce allowable pollution load.	Yes
PB4	Basic Measure 4 - Review existing IPPC license conditions and reduce allowable pollution load.	Yes
PB5	Basic Measure 5 - Investigate contributions to the collection system from unlicensed discharges.	Yes
PB6	Basic Measure 6 - Investigate contributions to the collection system of specific substances known to impact ecological status.	Yes
PB7	Basic Measure 7 - Upgrade WWTP to increase capacity.	Yes
PB8	Basic Measure 8 - Upgrade WWTP to provide nutrient removal treatment.	No
PS1	Supplementary Measure 1 - Measures intended to reduce loading to the treatment plant.	Yes
PS2	Supplementary Measure 2 - Impose development controls where there is, or is likely to be in the future, insufficient capacity at treatment plants.	Yes
PS3	Supplementary Measure 3 - Initiate investigations into characteristics of treated wastewater for parameters not presently required to be monitored under the urban wastewater treatment directive.	No
PS4	Supplementary Measure 4 - Initiate research to verify risk assessment results and determine the impact of the discharge.	Yes
PS5	Supplementary Measure 5 - Use decision making tools in point source discharge management.	No
PS6	Supplementary Measure 6 - Install secondary treatment at plants where this level of treatment is not required under the urban wastewater treatment directive.	No
PS7	Supplementary Measure 7 - Apply a higher standard of treatment (stricter emission controls) where necessary.	Yes
PS8	Supplementary Measure 8 - Upgrade the plant to remove specific substances known to impact on water quality status.	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

PS9	Supplementary Measure 9 - Install ultra-violet or similar type treatment.	No
PS10	Supplementary Measure 10 - Relocate the point of discharge.	Yes

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Physical Modifications Supplementary Measures Report

WaterBody Category: Subbasin

WaterBody Name: Dissour,

WaterBody Code: IE_SW_19_1798

south western river basin district

	Physical Modifications Supplementary Measures	Applicable
	Reduce	
SM1	Codes of Practice	Yes
SM2	Support for voluntary initiatives	Yes
	Remediate	
SM3	Channelisation impact remediation schemes	No
SM4	Channelisation investigation	No
SM5	Overgrazing remediation	No
SM6	Impassable barriers, impact confirmed, investigation into feasibility of remediation required	No
SM7	Impassable barriers investigation	Yes

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

water matters
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Unsewered Properties Supplementary Measures Report

WaterBody Subbasin Waterbody

WaterBody Name: Dissour, Trib of Womanagh

WaterBody IE_SW_19_1798

south western river basin district

	Supplementary Measures for Unsewered Properties	Applicable
SP1	Amend building regulations	Yes
SP2	Establish certified expert panels for site investigation and certification of installed systems	Yes
SP3	Assess applications for new unsewered systems by applying risk mapping/decision support systems and codes of practice	Yes
SP4	Carry out an inspection programme in prioritised locations for existing systems and record results in an action tracking system	No
SP5	Enforce requirements for percolation	No
SP6	Enforce requirements for de-sludging	Yes
SP7	Consider connection to municipal systems	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

Forestry Measures Report

WaterBody Category: Subbasin
Waterbody

WaterBody Name: Dissour, Trib of Womanagh

WaterBody Code: IE_SW_19_1798

south western river basin district

	Forestry Measures for	Applicable
	Forestry	
SF1	Management Instruments - Ensure regulations and guidance are cross referenced and revised to incorporate proposed measures	No
SF2	Acidification - Avoid or limit afforestation on 1st and 2nd order stream catchments in acid sensitive areas	No
SF3	Acidification - Revise the Acidification Protocol to ensure actual minimum alkalinities are detected and revise boundary conditions for afforestation in acid sensitive areas	No
SF10	Pesticide Use - Pre-dip trees in nurseries prior to planting out	No
SF11	Pesticide Use - Maintain registers of pesticide use	No
SF12	Acidification - Restructure existing forests to include open space and structural diversity through age classes and species mix, including broadleaves	No
SF13	Acidification - Mitigate acid impacts symptomatically using basic material	No
SF14	Acidification - Manage catchment drainage to increase residence times and soil wetting	No
SF15	Acidification - Implement measures to increase stream production.	No
SF16	Eutrophication - Establish riparian zone management prior to clearfelling	No
SF17	Eutrophication and Sedimentation - Enhance sediment control	No
SF18	Eutrophication - Manage catchment drainage to increase residence times and soil wetting, including no drainage in some locations	No
SF19	Sedimentation - Establish riparian zone management prior to clearfelling	No
SF20	Sedimentation - Enhance sediment control	No
SF21	Sedimentation - Manage catchment drainage to increase residence times and soil wetting, including no drainage in some locations	No
SF22	Hydromorphology - Enhance drainage network management, minimise drainage in peat soils	No
SF23	Pesticide Use - Develop biological control methods	No

Date Reported to Europe: 22/12/2008

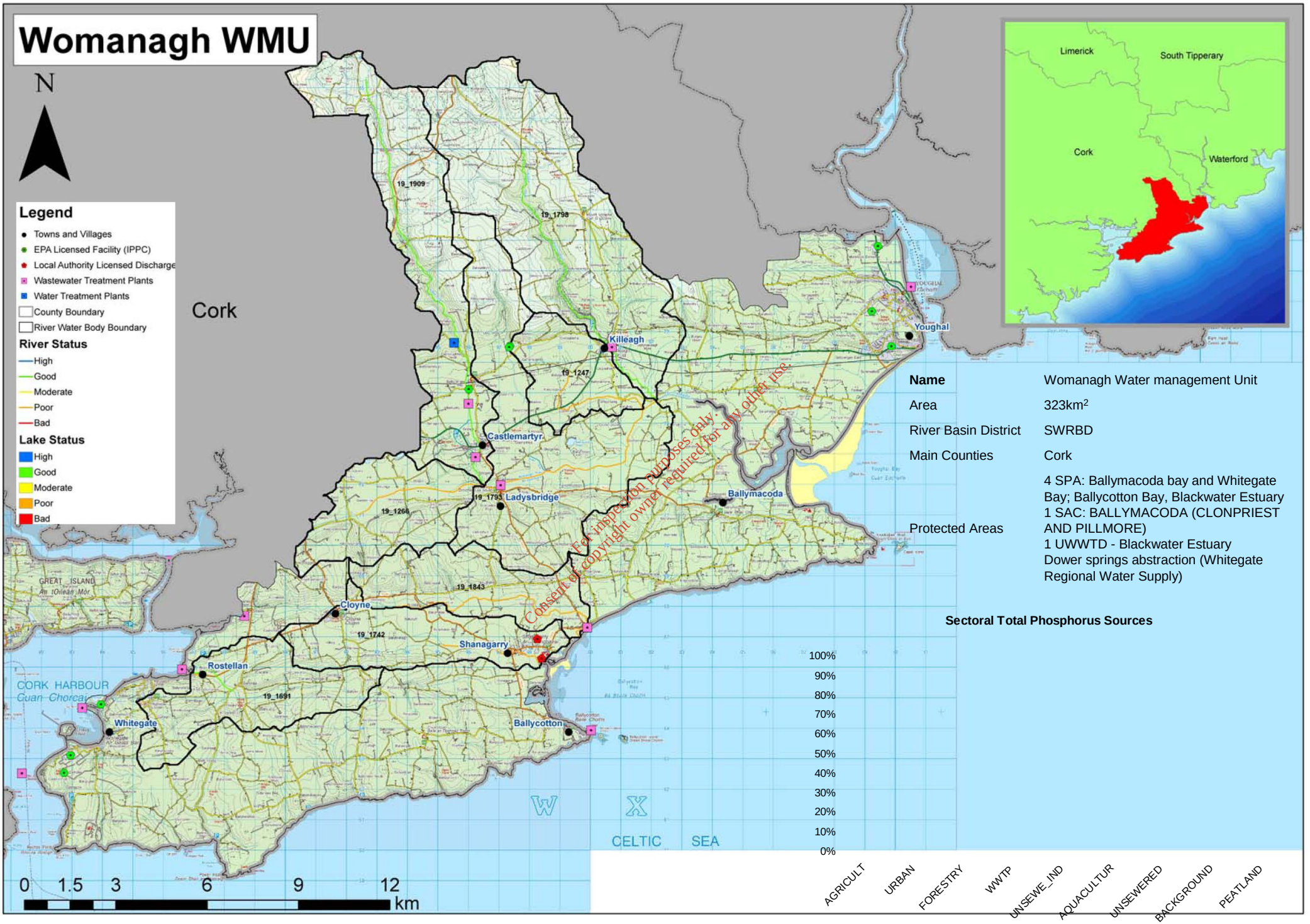
Date Report Created 26/08/2010

SF4	Eutrophication and Sedimentation - Avoid or limit forest cover on peat sites	No
SF5	Eutrophication and Sedimentation - Change the tree species mix on replanting	No
SF6	Eutrophication and Sedimentation - Limiting felling coup size	No
SF7	Eutrophication and Sedimentation - Establish new forest structures on older plantation sites	No
SF8	Hydromorphology - Audit existing drainage networks in forest catchments	No
SF9	Pesticide Use - Reduce pesticide usage	No

Date Reported to Europe: 22/12/2008

Date Report Created 26/08/2010

Womanagh WMU



Calculated in accordance with OSPAR HARP Guidelines.
Not an indication of risk, rather an indication of potential to cause risk.

Womanagh Water Management Unit Action Plan

STATUS/IMPACTS	
Overall status	There are 8 river water bodies in this WMU. 3 Moderate Status, 5 Poor Status.
Status elements	The water bodies with moderate or poor status are dictated by Q score. Physchem is High or Good.
Possible Impacts - EPA Water Quality	DISSOUR – SW_19_1798 2002 - No change. Satisfactory apart from middle reach where treated sewage enters river, from right-hand side, immediately downstream of Killeagh Bridge (0400). *Silt effects. 2005 - Satisfactory throughout in August 2005 following improvement at Killeagh Bridge (0400) since previous survey in September 2002. 2008 - unsatisfactory with only moderate ecological quality representing deterioration since previous survey. Status of WB 2009: Moderate Status dictated by Q score WOMANAGH – SW_19_1909; SW_19_1793 2002 - EPA noted that in the upper reaches, it was satisfactory except in lower reaches (1000, 1300) where again suspected discharges from Mogeely (industrial) and Castlemartyr (sewage) were responsible, respectively, for the slight and moderate pollution recorded. The lower reaches had large colonies of two American alien plants, the water fern (Azolla filiculoides) and least duckweed (Lemna minuta); these floating species reflect highly eutrophic conditions. 2005 - no change. Continuing slightly and moderately polluted in lower reaches respectively in Castlemartyr (1000) and downstream of Lady's Bridge (1300). Also known as Kiltha River in upper reaches. 2008 - Continuing with just moderate ecological quality in Castlemartyr and with good status again recorded in upper reaches where also known as Kiltha River. SW_19_1909 Status of WB 2009: Moderate Status dictated by Q score SW_19_1793 Status of WB 2009: Poor Status dictated by Q score

PRESSURES/RISKS	
Nutrient sources	95% of TP is diffuse of which 88% comes from agriculture. 5% comes from WWTP.
Point pressures	12 WWTP's – Castlemartyr WWTP, Cloyne WWTP, Garryvoe, Killeagh WWTP, Ladysbridge, Mogeely, Rostellan, Saleen, Whitegate/Aghada, Ballycotton, Ringaskiddy Carrigaline Crosshaven, Youghal, 5 IPPC's 3 Section 4 . 1 WTP (Mogeely/Castlemartry Pws)
Wastewater Treatment Plants (WWTP) and Industrial Discharges	Castlemartyr WWTP – Non-compliant frequency of monitoring or non-compliant effluent standard where sufficient capacity is available; Insufficient existing assimilative capacity (BOD), no evidence of impact, not a protected area Cloyne WWTP – Non-compliant frequency of monitoring or non-compliant effluent standard where sufficient capacity is available; Insufficient existing capacity, no evidence of impact, discharge to a protected area Killeagh WWTP - Insufficient existing assimilative capacity (BOD), no evidence of impact, not a protected area; Insufficient future (2015) assimilative capacity (nutrients), discharge not to a protected area Mogeely - Insufficient existing assimilative capacity (BOD), no evidence of impact, not a protected area Ringaskiddy Carrigaline Crosshaven - PE >2,000, discharge to non-coastal water, no secondary treatment or PE > 10,000, discharge to coastal water, no secondary treatment; Insufficient existing capacity, no evidence of impact, discharge to a protected area Rostellan - Discharge to designated shellfish waters Whitegate/Aghada - Insufficient existing capacity, no evidence of impact, discharge to a protected area Youghal - PE >2,000, discharge to non-coastal water, no secondary treatment or PE > 10,000, discharge to coastal water, no secondary treatment; Insufficient existing capacity, no evidence of impact, discharge to a protected area

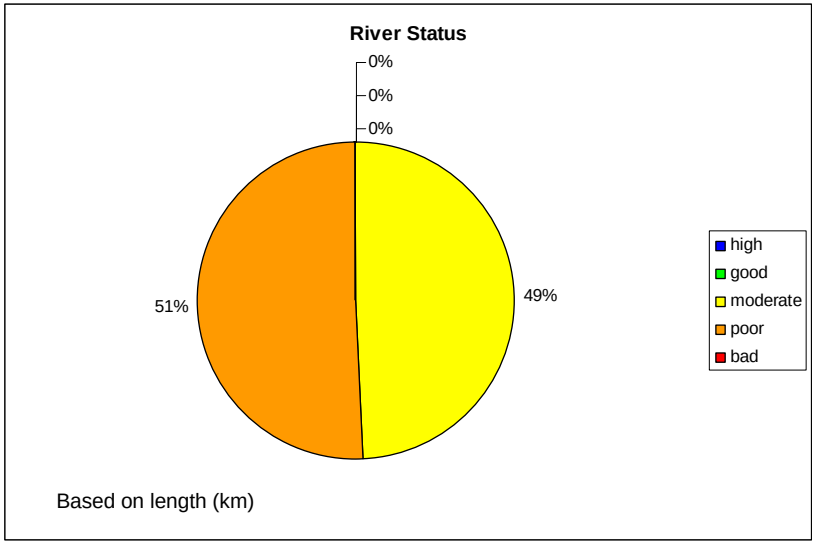
PRESSURES/RISKS	
Quarries, Mines & Landfills	4 quarries and 2 landfills. 1 WB at risk from 1 quarry - SW_19_1909.
Agriculture	8 WBs at risk - SW_19_1793, SW_19_1247, SW_19_1843, SW_19_1266, SW_19_1691, SW_19_1742, SW_19_1909, SW_19_1798.
On-site systems	There are 6252 septic tanks in this WMU. 1198 of these are located in areas of very high or extreme risk.
Forestry	None at Risk
Dangerous substances	None at Risk
Morphology	1 WB at risk - SW_19_1266.
Abstractions	None at Risk (local authority note 19-1793; Dower Springs abstraction (PE 10,000, volume 6,700m^3/day) some recent history of raw water quality problems)
Other	

Womanagh Water Management Unit Action Plan

SELECTED ACTION PROGRAMME *NB All relevant basic measures and general supplementary measures/surveys apply*	
Point Sources	For WWTP action programme, refer to point source table below Section 4's – Review License.
Diffuse Sources	AGRICULTURE - Good Agricultural Practice Regulations and Enforcement SEPTIC TANKS -At Risk septic tanks are to be prioritised for inspections. Subsequent upgrade or connection to municipal systems depends on inspection and economic tests
Sub-basin Plans	Shellfish Waters Pollution Production Programmes: Ballymacoda and Rostellan South Apply Prescribed Measures
Other	Protection of drinking water, abstraction control and future licensing. Ensure licensing of quarries under Section 4 of Water Pollution Act 1977. MORPHOLOGY - Investigation into the impact of historical channelisation on morphological and fish status – Womanagh River (Upper)

Discharge		Measures							Waterbody	
Point Source Discharge	County	Plants Requiring Capital Works	Agglomerations Requiring Further Investigation Prior to Capital Works	Plants Required to Commence Implementation of Pollution Reduction Programmes for Shellfish Waters	Plants Requiring the Implementation of an Appropriate Performance Management System	Plants Requiring the Investigation of CSO's	Plants Required to Ensure Capacity of Treatment Plant is not Exceeded	Extended Timescale for Measure Implementation	Waterbody Code	Extended Deadline to Achieve Waterbody Objective
Castlemartyr WWTP	Cork South		Yes		Yes			Yes	SW_19_1909	Yes
Cloyne WWTP	Cork South		Yes		Yes			Yes	SW_060_0000	Yes
Killeagh WWTP	Cork South						Yes	No	SW_19_1798	No
Saleen	Cork South			Yes				No	SW_060_0000	No
Whitegate/Aghada	Cork South		Yes	Yes				Yes	SW_060_0000	Yes
Youghal	Cork South	Yes	Yes					Yes	SW_020_0100	Yes

OBJECTIVES	
Good status 2015	Restore 2 waterbodies by 2015
Alternative Objectives	Restore 6 waterbodies by 2021 (SW_19_1247, SW_19_1266, SW_19_1793, SW_19_1798, SW_19_1843, SW_19_1909) – extended deadline for nitrogen losses to surface water via groundwater (SW_19_1909 is also extended to allow measures for wastewater to be put in place)



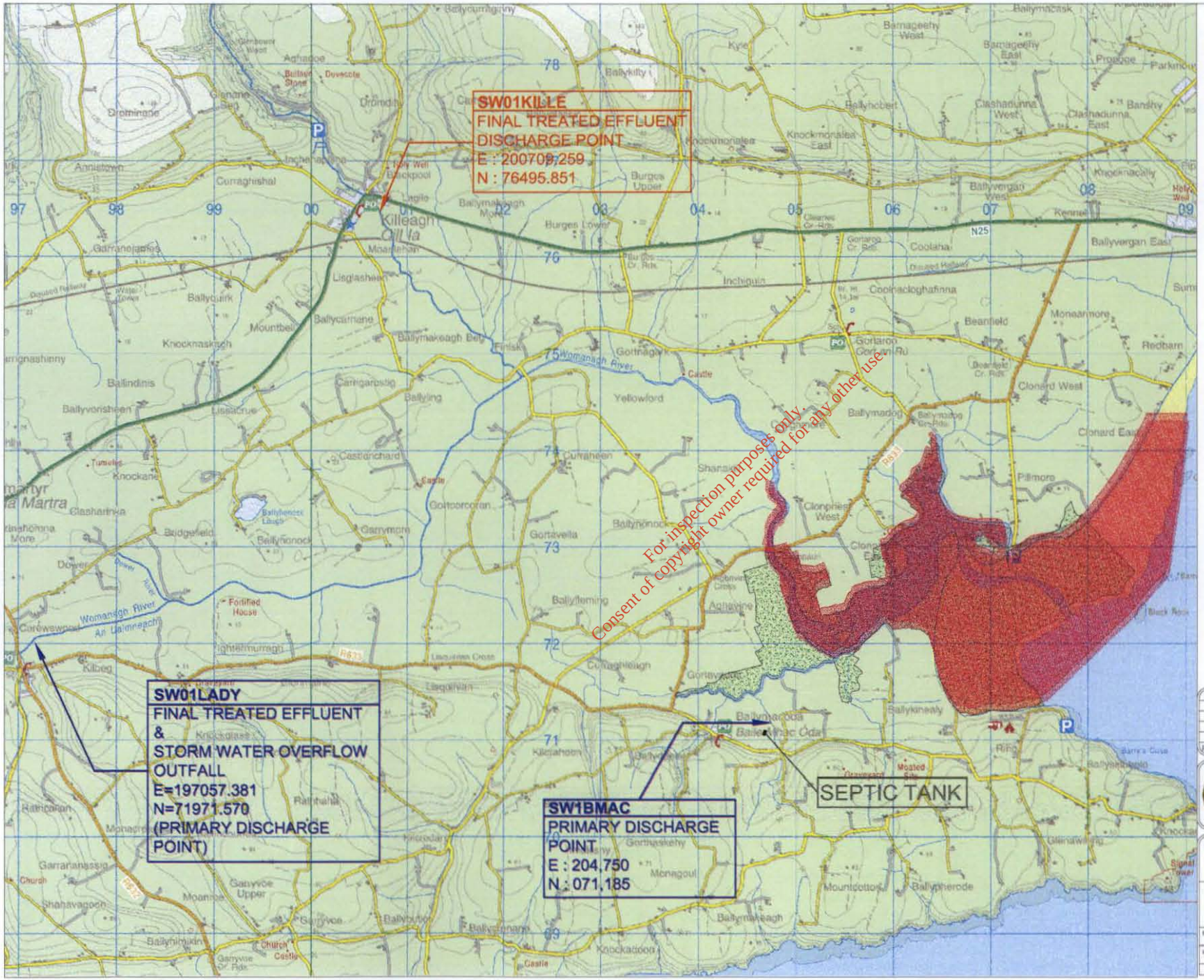
Transitional Status – Refer to separate transitional waters action programme
Groundwater Status – Refer to separate groundwater action programme

Future Pressures and Developments

Throughout the river basin management cycle future pressures and developments will need to be managed to ensure compliance with the objectives of the Water Framework Directive and the Programme of Measures will need to be developed to ensure issues associated with these new pressures are addressed.

Womanagh Water Management Unit Action Plan - Rivers

IE_SW_Womanagh																		
			Biological Elements				Supporting Elements						Protected Areas					
Member State Code	Monitored Y (Extrapolated N)	Donor Waterbody	Macroinvertebrates (Q)	FreshWater Pearl Mussel	Fish	Phytobenthos (Diatoms)	Morphology	Specific Polutants	Physio-chemical	Ecological Status	Chemical Status	Special Area of Conservation	Special Protection Area	Nutrient Sensitive Waters	Drinking Water	Objective	Date objective to be achieved
SW_19_1247	N	SW_19_1793								P						GES	2021
SW_19_1266	N	SW_19_1793								P						GES	2021
SW_19_1691	N	SW_19_1955								M			Y			GES	2015
SW_19_1742	N	SW_19_1957								P			Y			GES	2015
SW_19_1793	Y		P						G	P						GES	2021
SW_19_1798	Y		M		G				G	M						GES	2021
SW_19_1843	N	SW_19_1793								P			Y			GES	2021
SW_19_1909	Y		M		G				H	M						GES	2021



NOTES:

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Special Areas of Conservation (S.A.C.)

Special Protected Areas (S.P.A.)

N

Rev	Date	By	Description

CORK COUNTY COUNCIL
SOUTHERN DIVISION

Noel O Keeffe, B.E. C.Eng. Tan.Eng F.I.E.I.M.I.C.T. County Engineer, County Hall, Cork.
Patricia Power, Director of Services, Area Operations South.

Project: KILLEAGH WWTP
WASTE WATER
DISCHARGE LICENCE APPLICATION
APPROPRIATE ASSESMENT

Title: Ballymacoda SPA/SAC
LOCATION OF SURROUNDING
DISCHARGE POINTS

Designed: ER/MS	Checked: MH	Scales: NTS @ A3	Drawing No: Map001
Drawn: MM	Approved: MH	Date: Mar '10	
File Path:		Status: _	Rev: 0

The Gearagh

Species	1% National	1% International	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	Mean (04/05-08/09)	Peak (04/05-08/09)
Mute Swan	110		43	40	60	130	82	80	78	130
Whooper Swan	130	210	67	46	38	72	70	64	58	72
Pink-footed Goose		2,250						2	0	2
Greenland White-fronted Goose	110	270		1					0	1
Greylag Goose	50	870		63	143	143	143	26	104	143
Barnacle Goose	90	560						1	0	1
Shelduck	150	3,000				1			0	1
Wigeon	820	15,000	550	760	270	750	830	1,100	742	1,100
Gadwall	20	600	4	14	5	5	3	20	9	20
Teal	450	5,000	650	2,000	425	1,000	1,000	1,400	1,165	2,000
Mallard	380	20,000	350	300	140	480	700	800	484	800
Pintail	20	600	2	20	2	2	2	6	6	20
Shoveler	25	400	12	50	35	75	130	130	84	130
Pochard	380	3,500	65	40	1	2	2	2	9	40
Ring-necked Duck				1				1	0	1
Tufted Duck	370	12,000	240	600	233	400	320	410	393	600
Scaup	45	3,100		5		3	2	8	4	8
Goldeneye	95	11,500	30	15	27	25	30	37	27	37
Goosander							3	1	1	3
Ruddy Duck			5	1					0	1
Great Crested Grebe	55	3,600		3	1	5	2	4	3	5
Cormorant	140	1,200	12	7		14	4	5	6	14
Little Egret		1,300				5	3	4	2	5
Grey Heron	30	2,700	4	4	2	11	3	3	5	11
Water Rail								1	0	1
Moorhen	20			2		1		4	1	4
Coot	330	17,500	33	276	135	450	80	400	268	450
Golden Plover	1,700	9,300	3,000	3,000	3,000	6,000	2,500	2,000	3,300	6,000
Lapwing	2,100	20,000	750	1,500	2,000	2,000	1,000	2,500	1,800	2,500
Dunlin	880	13,300	4	120	150	200	1	120	118	200
Snipe		20,000	3	10		3	1	2	3	10
Black-tailed Godwit	140	470		54		4			12	54
Curlew	550	8,500	150	250	2	150	92	140	127	250
Common Sandpiper				1					0	1
Green Sandpiper				2		1		2	1	2
Greenshank	20	2,300		1				1	0	1
Redshank	310	3,900		7		2		1	2	7
Little Gull				1					0	1
Black-headed Gull		20,000	8	10		30	10	35	17	35
Common Gull		16,000						2	0	2
Lesser Black-backed Gull		4,500	14	70	10	300	32	280	138	300
Kingfisher				1		1	2	1	1	2

The counts presented in the table refer to the peak counts of species in each I-WeBS season.
Site peak and mean are calculated as the peak and mean of peak counts respectively over the seasons specified. Blank cells within columns which contain positive values for one or more species constitute zero for those species.

I-WeBS

Ballymacoda

Species	1% National	1% International	2003/04	2004/05	2005/06	2006/07	2007/08	Mean (03/04-07/08)	Peak (03/04-07/08)
Kittiwake							20	4	20
Mute Swan	110		8	5	5	6	3	5	8
Bewick's Swan	20	200	6					1	6
Whooper Swan	130	210	4	5	1		4	3	5
Pink-footed Goose		2,250				2	1	1	2
Greenland White-fronted Goose	110	270	6					1	6
Greylag Goose	50	870	6			4		2	6
Barnacle Goose	90	560				1		0	1
Light-bellied Brent Goose		260	94	176	183	124	248	165	248
Black Brant						1		0	1
Shelduck	150	3,000	131	146	57	46	70	90	146
Wigeon	820	15,000	1,376	1,040	1,303	910	834	1,093	1,376
Gadwall	20	600	5		6		2	3	6
Green-winged Teal			1	1				0	1
Teal	450	5,000	953	976	1,082	826	376	843	1,082
Mallard	380	20,000	70	467	17	39	29	124	467
Pintail	20	600	8	12	15	5	1	8	15
Shoveler	25	400	14	24	23	44	27	26	44
Goldeneye	95	11,500			1	1		0	1
Red-breasted Merganser	35	1,700	4	2	4	1	1	2	4
Red-throated Diver	20	3,000		15			1	3	15
Great Northern Diver		50		1			1	0	1
Little Grebe	25	4,000	3	2	2		3	2	3
Great Crested Grebe	55	3,600	8	9	4	2	13	7	13
Cormorant	140	1,200	38	27	34	23	24	29	38
Little Egret		1,300	9	28	26	28	32	25	32
Grey Heron	30	2,700	7	13	11	11	14	11	14
Water Rail				1			2	1	2
Moorhen	20		5				2	1	5
Oystercatcher	680	10,200	742	440	657	405	396	528	742
Little Ringed Plover					1			0	1
Ringed Plover	150	730	57	84	138	146	97	104	146
Golden Plover	1,700	9,300	8,400	8,780	9,800	8,150	8,500	8,726	9,800
Grey Plover	65	2,500	524	337	396	474	482	443	524
Lapwing	2,100	20,000	2,600	2,610	1,520	2,230	1,603	2,113	2,610
Knot	190	4,500	211	334	125	130	305	221	334
Sanderling	65	1,200	133	164	132	151	122	140	164
Little Stint						1	1	0	1
Pectoral Sandpiper						1	1	0	1
Curlew Sandpiper					7	2	4	3	7
Dunlin	880	13,300	2,640	1,865	1,085	825	1,882	1,659	2,640
Ruff		12,500			1	7	13	4	13
Snipe		20,000	125	25	100	100	105	91	125
Black-tailed Godwit	140	470	820	1,480	801	827	535	893	1,480
Bar-tailed Godwit	160	1,200	592	458	468	436	445	480	592
Whimbrel		2,000		1	1	1	1	1	1
Curlew	550	8,500	1,033	486	770	726	545	712	1,033
Common Sandpiper					6	1		1	6
Green Sandpiper						2		0	2
Greenshank	20	2,300	16	17	9	23	14	16	23
Redshank	310	3,900	251	318	251	257	167	249	318
Turnstone	120	1,500	133	86	85	68	76	90	133
Mediterranean Gull			1	2			1	1	2
Black-headed Gull		20,000	3,325					665	3,325
Common Gull		16,000	361					72	361

The counts presented in the table refer to the peak counts of species in each I-WeBS season.
Site peak and mean are calculated as the peak and mean of peak counts respectively over the seasons specified. Blank cells within columns which contain positive values for one or more species constitute zero for those species.

Lesser Black-backed Gull	4,500	6,500	445	434	233	460	1,614	6,500
Herring Gull	13,000	31	22	41	64	24	36	64
Yellow-legged Gull				1			0	1
Glaucous Gull					1		0	1
Great Black-backed Gull	4,800	140	31	141	79	62	91	141
Sandwich Tern		28	82				22	82
Common Tern		2					0	2
Kingfisher			2	1	2	1	1	2

The counts presented in the table refer to the peak counts of species in each I-WeBS season.
Site peak and mean are calculated as the peak and mean of peak counts respectively over the seasons specified. Blank cells within columns which contain positive values for one or more species constitute zero for those species.

Question 2 **Review the assessment of the impact of the discharge in relation to the requirements of the Environmental Quality Objectives regulations (S.I. No. 272 of 2009) and resubmit and update where relevant**

The River Dissour into which the WWTP discharges has a “Moderate status”. Therefore the lower “good” standard contained in the surface water regulations was used for comparison purposes.

The upstream and downstream sampling results for 2008 at aSW01u and aSW02d were compared to the relevant EQR/S from the surface water regulations in the following tables. The sample results and the EQR/S were included only if there were values for both, to allow comparison.

The upstream and downstream sample results incorporated in the following tables are those laid out in the upstream and downstream sheets of the Revised Table E. However many of these results are at the limit of detection, or are based on averages that include assumed figures. Therefore additional upstream and downstream tables which incorporate actual results for analysis below the Limit of Detection have been included. This “Analysis below the Limit of Detection” is laid out in the Revised Table E.

UPSTREAM COMPARISON TABLE

Physico-chemical conditions	***Ecological quality ratio/standard***	***2008 upstream ambient sampling results at aSW01u***
	Good boundary	
	Rivers (All Types)	
Oxygenation conditions Table 9	***River water body***	***Ambient sampling results***
Biochemical Oxygen Demand (BOD) (mgO_2/l)	Good status≤1.5 (mean) or ≤2.6(95%ile)	<1.0mg/L (mean) <1.0mg/L (95%ile)
Acidification Status Table 9	***River Water Body***	***Ambient sampling results***
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.8
Nutrient conditions Table 9	***River Water body***	***Ambient sampling results***
Total Ammonia (mg N/l)	Good status≤0.065(mean) or ≤0.140(95%ile)	<0.1mg/L (mean) <0.1mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status≤0.035(mean) or ≤0.075(95%ile)	<0.05mg/L (mean) <0.05mg/L (95%ile)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Ambient sampling results***
Phenol	8	<0.1µg/L
Toulene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.1	<20.0µg/L
Copper (depending on water hardness)	5	<20.0µg/L
Cyanide	10	<5.0µg/L
Flouride	500	34.0µg/L
Zinc (depending on water hardness)	50	<20.0µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Ambient sampling results***
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	<20.0µg/L
Nickel and its compounds	20	<20.0µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds (depending on water hardness)	0.09	<20µg/L
Mercury and its compounds	0.05	<0.2µg/L

Note the following:

The black results are within the EQR/S.
The red results break the EQR/S.
The blue results may break the EQR/S.
The results highlighted grey are at the limit of detection.
Water hardness in the River Dissour is 80mg$CaCO_3$/L

UPSTREAM COMPARISON TABLE
(ANALYSIS BELOW THE LIMIT OF DETECTION)

Physico-chemical conditions	***Ecological quality ratio/standard***	***2008 upstream ambient sampling results at aSW01u***
	Good boundary	
	Rivers (All Types)	
Nutrient conditions Table 9	***River Water body***	***Ambient sampling results***
Total Ammonia (mg N/l)	Good status≤0.065(mean) or ≤0.140(95%ile)	0.03mg/L (mean) 0.03mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status≤0.035(mean) or ≤0.075(95%ile)	0.02mg/L (mean) 0.02mg/L (95%ile)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Ambient sampling results***
Total Chromium	8.1	<1.0µg/L
Copper (depending on water hardness)	5	<1.0µg/L
Zinc (depending on water hardness)	50	<1.0µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Ambient sampling results***
Lead and its compounds	7.2	<1.0µg/L
Nickel and its compounds	20	2.5µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds (depending on water hardness)	0.09	<1.0µg/L

DOWNSTREAM COMPARISON TABLE

Physico-chemical conditions	***Ecological quality ratio/standard*** ***Good boundary*** ***Rivers (All Types)***	***2008 Downstream ambient sampling results at aSW01d***
Oxygenation conditions Table 9	***River water body***	***Ambient sampling results***
Biochemical Oxygen Demand (BOD) (mgO_2/l)	Good status≤1.5 (mean) or ≤2.6(95%ile)	1.1mg/L (mean) 1.1mg/L (95%ile)
Acidification Status Table 9	***River Water Body***	***Ambient sampling results***
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.9
Nutrient conditions Table 9	***River Water body***	***Ambient sampling results***
Total Ammonia (mg N/l)	Good status≤0.065(mean) or ≤0.140(95%ile)	<0.1mg/L (mean) <0.1mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status≤0.035(mean) or ≤0.075(95%ile)	<0.05mg/L (mean) <0.05mg/L (95%ile)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Ambient sampling results***
Phenol	8	<0.1µg/L
Toulene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.1	<20.0µg/L
Copper (depending on water hardness)	5	<20.0µg/L
Cyanide	10	<5.0µg/L
Flouride	500	38.0µg/L
Zinc (depending on water hardness)	50	<20.0µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Ambient sampling results***
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	<20.0µg/L
Nickel and its compounds	20	<20.0µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds (depending on water hardness)	0.09	<20µg/L
Mercury and its compounds	0.05	<0.2µg/L

Note the following:

The black results are within the EQR/S.
The red results break the EQR/S.
The blue results may break the EQR/S.
The results highlighted grey are at the limit of detection.
Water hardness in the River Dissour is 80mg $CaCO_3$/L

DOWNSTREAM COMPARISON TABLE
(ANALYSIS BELOW THE LIMIT OF DETECTION)

Physico-chemical conditions	***Ecological quality ratio/standard***	***2008 Downstream ambient sampling results at aSW01d***
	Good boundary	
	Rivers (All Types)	
Nutrient conditions Table 9	***River Water body***	***Ambient sampling results***
Total Ammonia (mg N/l)	Good status≤0.065(mean) or ≤0.140(95%ile)	0.073mg/L (mean) 0.073mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status≤0.035(mean) or ≤0.075(95%ile)	0.04mg/L (mean) 0.04mg/L (95%ile)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Ambient sampling results***
Total Chromium	8.1	<1.0µg/L
Copper (depending on water hardness)	5	<1.0µg/L
Zinc (depending on water hardness)	50	<1.0µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Ambient sampling results***
Lead and its compounds	7.2	2.5µg/L
Nickel and its compounds	20	1.7µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Ambient sampling results***
Cadmium and its compounds (depending on water hardness)	0.09	<1.0µg/L

PREDICTED IMPACTS

MASS BALANCE EQUATIONS FOR BOD:

Worst Case Scenario:

Maximum Discharge, Low Flow in the River, Maximum BOD in Discharge.

Flow of River (95%ile) = 0.04m3/sec
Mean BOD in River (upstream) = <1.0mg/L (Use 0.5mg/L for Calculation)
Max volume of discharge = 0.00398m3/sec
Max value for BOD in discharge = 10.0mg/L (Max from Online Tables)

$$C_{final} = \frac{(0.04 \times 0.5) + (0.00398 \times 10.0)}{(0.04 + 0.00398)}$$

C_{final} = 1.36mg/l BOD

This is within the 1.5 mg/L Mean and 2.6mg/L 95%ile EQS for BOD.

Normal Scenario:

Normal Discharge, Median Flow in the River, Mean BOD in Discharge.

Flow of River (Median) = 0.635m3/sec
Mean BOD in River (upstream) = <1.0mg/L (Use 0.5mg/L for Calculation)
Normal volume of discharge = 0.0029m3/sec
Mean value for BOD in discharge = 3.24mg/L (2010 Mean from Killeagh 2009-2010 Effluent Results)

$$C_{final} = \frac{(0.635 \times 0.5) + (0.0029 \times 3.24)}{(0.635 + 0.0029)}$$

C_{final} = 0.51mg/l BOD

This is within the 1.5 mg/L Mean and 2.6mg/L 95%ile EQS for BOD.

MASS BALANCE EQUATIONS FOR AMMONIA:

Worst Case Scenario:

Maximum Discharge, Low Flow in the River, Maximum Ammonia in Discharge.

Flow of River (95%ile) = 0.04m3/sec
Mean Ammonia in River (upstream) = 0.03mg/L
Max volume of discharge = 0.00398m3/sec
Max value for Ammonia in discharge = 3.8mg/L (2008 Max from Outlet Table E4)

$$C_{final} = \frac{(0.04 \times 0.03) + (0.00398 \times 3.8)}{(0.04 + 0.00398)}$$

C_{final} = 0.37mg/l Ammonia

This is within the 0.065mg/L Mean and 0.14mg/L 95%ile EQS for Ammonia.

Normal Scenario:

Normal Discharge, Median Flow in the River, Mean Ammonia in Discharge.

Flow of River (Median) = 0.635m3/sec

Mean Ammonia in River (upstream) = 0.03g/L
Normal volume of discharge = 0.0029m3/sec
Mean value for Ammonia in discharge = 1.97mg/L (2008 Mean from Outlet Table E4)

$$C_{final} = \frac{(0.635 \times 0.03) + (0.0029 \times 1.97)}{(0.635 + 0.0029)}$$

C_{final} = 0.039mg/l Ammonia

This is within the 0.065mg/L Mean and 0.14mg/L 95%ile EQS for Ammonia.

MASS BALANCE EQUATIONS FOR ORTHOPHOSPHATE:

Worst Case Scenario:

Maximum Discharge, Low Flow in the River, Maximum Orthophosphate in Discharge.

Flow of River (95%ile) = 0.04m3/sec
Mean Orthophosphate in River (upstream) = 0.02mg/L
Max volume of discharge = 0.00398m3/sec
Max value for Orthophosphate in discharge = 1.7mg/L (Max from Online Tables)

$$C_{final} = \frac{(0.04 \times 0.02) + (0.00398 \times 1.7)}{(0.04 + 0.00398)}$$

C_{final} = 0.17mg/l Orthophosphate

This is in breach of the 0.035mg/L Mean and 0.075mg/L 95%ile EQS for Orthophosphate.

Normal Scenario:

Normal Discharge, Median Flow in the River, Mean Orthophosphate in Discharge.

Flow of River (Median) = 0.635m3/sec
Mean Orthophosphate in River (upstream) = 0.02mg/L
Normal volume of discharge = 0.0029m3/sec
Mean value for Orthophosphate in discharge = 0.37mg/L (2010 Mean Estimate from Killeagh 2009-2010 Effluent Results)

$$C_{final} = \frac{(0.635 \times 0.02) + (0.0029 \times 0.37)}{(0.635 + 0.0029)}$$

C_{final} = 0.022mg/l Orthophosphate

This is within the 0.035mg/L Mean and 0.075mg/L 95%ile EQS for Orthophosphate

Revised -Non-Technical Summary Sept 2010

Killeagh is located approximately 10 kilometres west of Youghal and 14 kilometres east of Midleton and is situated on the N25 National Primary Route and former rail line connecting Youghal and Cork. The village has experienced substantial construction and population growth over the last number of years

The Waste Water Works and the activities carried out therein

Killeagh Waste Water Treatment Plant (WWTP) has a capacity to treat a maximum flow of 1000 PE. Currently the plant receives flows in excess of these figures, particularly during heavy rainfall where flows up to 2298m^3/d have been recorded. Although the plant is hydraulically overloaded during heavy rainfall the plant still generally operates within its consents.

The Killeagh WWTP is required to treat the waste water that gravitates into the plant. Waste water from the village is collected in a combined sewer. The developer of a nearby residential development has built a pumping station inside the grounds of the waste water treatment boundary. Flows from this pumping station are pumped into a septic tank where all flows from the rest of the catchment enter the treatment works. Flows from this tank gravitate through an open channel flume with flow recorder and sampler into a Primary/sludge holding tank. Flows then gravitate into a submersible pumping station with 2 No. pumps, which lift the waste water into two Rotating Biological Contactors. Excess flows entering the pumping station are discharged to the Dissour River via the storm water overflow. Waste water from the Rotating Biological Contactors then flows to 2 No. clarifiers for secondary treatment. The treated effluent then discharges down the final effluent line which contains a sampling unit.

Killeagh WWTP is currently operated by a private operator under a 10 year Operation and Maintenance Contract. The Service Provider is fully responsible for the provision of all plant, materials including consumables and labour including licences and permits necessary to ensure that the facility is operated and maintained in accordance with the best practice and any performance requirements stipulated in the Employer's Requirements.

Killeagh Waste Water Treatment Plant is due to be upgraded to a 2,400 PE plant to ensure compliance with the relevant regulations. The improvements include the provision of:

- Wastewater Inlet
- Preliminary treatment
    - Screening
    - Grit removal
- Flow measurement, control and sampling
- Storm water storage
-
- Flow Splitting

- Primary settlement (optional)
- Secondary treatment (BOD and SS removal)
- Tertiary treatment
    - Phosphorus removal
    - Nitrogen removal

- Sampling of final effluent
- Effluent discharge
- Thickening and pumping of sludge (optional)
- Sludge storage
- Treatment of polluted ventilated air

This upgrade is currently under construction and is due for completion for mid 2009.

Work on the upgrade was completed in March 2010. The upgraded WWTP is operating satisfactorily since that date.
During the construction of the upgraded WWTP massive infiltration was discovered entering the old plant. Therefore flows to the upgraded WWTP are drastically reduced. Flows of an average of 260m^3/day have been recorded in the period March to July 2010.

The sources of emissions from the waste water works

The population load for the Killeagh agglomeration arises from the following area:

- Domestic population
- Commercial premises
- School
- Tourism

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

Other potential emissions from the waste water treatment plant include:

- Odour generated from the treatment process – there have been no recorded issues to date.
- Noise pollution – minor during normal operation. There have been no complaints regarding noise at 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 emissions on the environment.

The final effluent discharges to the River Dissour which runs parallel to the site. The flows to the old plant were in the order of 304m^3/d to 852m^3/d with an average inflow of 478m^3/d entering the plant per day. This is now reduced to an average of

260m^3/day entering the plant. This equates to a population of approx 1100.The new plant is designed for 2,400 PE. The proposed upgrade of Killeagh WWTP will increase the capacity of the plant from 1,000 PE to 2,400 PE and discharge effluent to the River Dissour. The T.J. O'Connor & Associates Consulting Engineers Design & Build Works is included in Attachment A.

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

Technology
The new WWTP includes the following elements:

- Inlet Screening including grit removal
- Storm Water Storage
- Primary settlement
- Secondary treatment
- Tertiary treatment

Techniques
The new WWTP shall be operated and maintained in accordance with the best practice and any performance requirements stipulated in the Employer's Requirements.

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

New WWTP completed in March 2010.

Measures planned to monitor emissions into the environment

The Cork County Council Environmental Laboratory carries out sampling of the influent and effluent. The Cork County Council Environmental Department located in Inniscarra takes samples from the stream upstream and downstream of the wastewater treatment plant outfall.

The private operators also carry out sampling of the influent and effluent to ensure that the plant is operating satisfactorily.

Parameter	02/01/2009	05/01/2009	08/01/2009
pH	7.4	7.32	
COD (mg/l)	53	94	
BOD(mg/l)	9.00		8.00
TP(mg/l)	2.35		
Sus Solids (mg/l)	23	12	

Parameter	03/02/2009	06/02/2009	10/02/2009
pH	7.18	7.3	7.29
COD (mg/l)	28	30	37.1
BOD(mg/l)		4.00	
TP(mg/l)		1.12	
Sus Solids (mg/l)	24	11	20

Parameter	03/03/2009	06/03/2009	10/03/2009
pH		7.2	7.32
COD (mg/l)	52.1	23	68.8
BOD(mg/l)		4.00	
TP(mg/l)		1.09	
Sus Solids (mg/l)	14	6	24

Parameter	02/04/2009	06/04/2009	09/04/2009
pH	7.2	7.25	
COD (mg/l)	28	42.1	
BOD(mg/l)	6.00		5.00
TP(mg/l)	2.31		
Sus Solids (mg/l)	7	10	

Parameter	05/05/2009	07/05/2009	11/05/2009
pH	7.18		7.27
COD (mg/l)	16		24.6
BOD(mg/l)		8.00	
TP(mg/l)			

Sus Solids (mg/l)	16		40

Parameter	02/06/2009	04/06/2009	08/06/2009
pH	7.3	7.3	
COD (mg/l)	76.6	26	55.7
BOD(mg/l)		5.00	
TP(mg/l)		0.79	
Sus Solids (mg/l)	20	5	8

Parameter	02/07/2009	06/07/2009	09/07/2009
pH	7.6	7.22	
COD (mg/l)	37	61.9	
BOD(mg/l)	9.00		5.00
TP(mg/l)	1.65		
Sus Solids (mg/l)	18	22	

Parameter	04/08/2009	06/08/2009	10/08/2009
pH	7.23	7.5	7.26
COD (mg/l)	66.6	31	41
BOD(mg/l)		8.00	
TP(mg/l)		1.68	
Sus Solids (mg/l)	46	16	20

Parameter	01/09/2009	03/09/2009	07/09/2009
pH	7.21	7	7.25
COD (mg/l)	19.1	22	55.5
BOD(mg/l)		3.00	
TP(mg/l)		0.96	
Sus Solids (mg/l)	24	5	24

Parameter	01/10/2009	05/10/2009	08/10/2009
pH	7.4	7.24	
COD (mg/l)	47	45.6	
BOD(mg/l)	7.00		6.00
TP(mg/l)	4.56		
Sus Solids (mg/l)	15	16	

Parameter	02/11/2009	05/11/2009	09/11/2009
pH	7.25	7.7	7.22
COD (mg/l)	56	37	12.8
BOD(mg/l)		7.00	
TP(mg/l)		2.28	
Sus Solids (mg/l)	16	19	16

Parameter	03/12/2009	08/12/2009	10/12/2009
pH	7.5	7.2	
COD (mg/l)	21	29	
BOD(mg/l)	4.00		9.00
TP(mg/l)	1.20		
Sus Solids (mg/l)	12	12	

2009 Treated Effluent Results

12/01/2009	15/01/2009	19/01/2009	22/01/2009	26/01/2009
7.29		7.32		7.3
60.6		38.8		28.4
	7.00		8.00	
32		14		10

13/02/2009	17/02/2009	20/02/2009	24/02/2009	27/02/2009
	7.22		7.21	
	58		54.2	
3.00		10.00		6.00
	20		16	

13/03/2009	18/03/2009	19/03/2009	24/03/2009	27/03/2009
	7.29		7.22	
	34		32.9	
5.00		7.00		8.00
	10		14	

14/04/2009	16/04/2009	20/04/2009	23/04/2009	27/04/2009
7.31		7.32		7.32
100.9		97.5		50
	11.00		5.00	
26		28		14

14/05/2009	18/05/2009	21/05/2009	25/05/2009	28/05/2009
	7.27		7.25	
	68.8		66.9	
10.00		3.00		3.00

	6		38	

11/06/2009	15/06/2009	18/06/2009	22/06/2009	24/06/2009
	7.22		7.21	
	40.5		37.3	
3.00		10.00		4.00
	22		16	

13/07/2009	16/07/2009	20/07/2009	23/07/2009	27/07/2009
7.26		7.26		7.2
45.3		60.3		28.4
	10.00		4.00	
24		24		4

13/08/2009	17/08/2009	20/08/2009	24/08/2009	27/08/2009
	7.3		7.2	
	44.9		30.1	
5.00		7.00		9.00
	10		12	

10/09/2009	14/09/2009	17/09/2009	21/09/2009	24/09/2009
	7.32		7.2	
	52.6		55.5	
4.00		2.00		2.00
	46		14	

12/10/2009	15/10/2009	19/10/2009	22/10/2009	27/10/2009
7.22		7.45		7.2
33.6		54.1		86.9
	7.00		7.00	
28		14		32

12/11/2009	16/11/2009	19/11/2009	23/11/2009	26/11/2009
	7.3		7.8	
	39.3		51.2	
8.00		5.00		4.00
	4		20	

15/12/2009	17/12/2009	22/12/2009	23/12/2009	30/12/2009
7.21		7.19		7.21
55.4		28.1		52.2
	6.00		6.00	13.00
32		16		38

29/01/2009	Jan Average
	7.33
	54.96
4.00	7.20
	2.35
	18.20

Feb Average
7.24
41.46
5.75
1.12
18.20

31/03/2009	Mar Average
7.2	7.25
26.5	39.55
	6.00
	1.09
22	15.00

30/04/2009	Apr Average
	7.28
	63.70
8.00	7.00
	2.31
	17.00

May Average
7.24
44.08
6.00

25.00

30/06/2009	June Average
	7.26
62.4	49.75
	5.50
	0.79
	14.20

30/07/2009	July Average
	7.31
	46.58
4.00	6.40
	1.65
	18.40

Aug Average
7.30
42.72
7.25
1.68
20.80

28/09/2009	Sept. Average
7.52	7.25
20.5	37.53
	2.75
	0.96
12	20.83

29/10/2009	Oct Average
	7.30
	53.44
7.00	6.80
	4.56
	21.00

Nov. Average
7.45
39.26
6.00
2.28
15.00

Dec Average
7.26
37.14
7.60
1.20
22.00

Parameter	01/03/2010	05/03/2010	08/03/2010
pH		7.4	7.2
COD (mg/l)		18	32.5
BOD(mg/l)		4.00	
TP(mg/l)		0.13	0.38
Sus Solids (mg/l)		5	4
TN (mg/l)			15.1

Parameter	01/04/2010	06/04/2010	08/04/2010
pH	7.3	7.2	
COD (mg/l)	15	19.9	
BOD(mg/l)	2.00		4.00
TP(mg/l)	0.09	0.25	
Sus Solids (mg/l)	5	8	
TN (mg/l)		7	

Parameter	04/05/2010	06/05/2010	10/05/2010
pH	7.35	7.3	7.24
COD (mg/l)	19.8	18	26.8
BOD(mg/l)		4.00	
TP(mg/l)	0.50	0.14	0.45
Sus Solids (mg/l)	2	5	8
TN (mg/l)	7		8.9

Parameter	03/06/2010	08/06/2010	10/06/2010
pH	7.5	7.32	
COD (mg/l)	15	29.6	
BOD(mg/l)	4.00		2.00
TP(mg/l)	0.50	0.96	
Sus Solids (mg/l)	5	4	
TN (mg/l)	6.3	11.7	

Parameter	01/07/2010	05/07/2010	08/07/2010
pH	7.3	7.22	
COD (mg/l)	23	26.5	
BOD(mg/l)	3.00		2.00
TP(mg/l)	0.82	0.26	
Sus Solids (mg/l)	5	2	
TN (mg/l)	19.7	8.6	

12/03/2010	15/03/2010	19/03/2010	22/03/2010	26/03/2010
	7.48			
	15.9			
4.00		4.00		5.00
	1.30			
	12			
	13.8			

12/04/2010	15/04/2010	19/04/2010	22/04/2010	26/04/2010
7.21		7.2		7.21
11.4		33.5		37.1
	4.00		4.00	
0.20		0.39		0.48
4		8		4
3.9		3.8		4.9

14/05/2010	17/05/2010	20/05/2010	24/05/2010	28/05/2010
	7.27			
	24.7		53.5	
2.00		2.00		4.00
	0.91		1.27	
	2		18	
	6.8		6.8	

14/06/2010	17/06/2010	21/06/2010	24/06/2010	28/06/2010
7.2				7.2
11.2		21.6		30.1
	2.00		3.00	
1.00		1.01		0.84
6		12		10
10.3		9.1		6.5

12/07/2010	15/07/2010	19/07/2010	22/07/2010	26/07/2010
7.12		7.44		7.2
12		15.4		14.8
	2.00		2.00	
0.35		0.21		0.16
6		8		4
6.9		9.6		

29/03/2010	Mar Average
7.26	7.34
23.4	22.45
	4.25
0.15	0.49
8	7.25
4.2	11.03

29/04/2010	Apr Average
	7.22
	23.38
4.00	3.60
	0.28
	5.80
	4.90

31/05/2010	May Average
7.21	7.27
27.1	28.32
	3.00
0.43	0.62
4	6.50
6.7	7.24

June Average
7.31
21.50
2.75
0.86
7.40
8.78

29/07/2010	July Average
	7.26
	18.34
4.00	2.60
	0.36
	5.00
	11.20

D0301-01 Attachment E4 Killeagh Inlet Table E4

Sample Date	27/11/2008	Average		
Sample	Influent			
Sample Code	GS1289	mg/L	Kg/Day	Kg/year
Flow M^3/Day	*	3240	*	*
pH	7.3	7.3	*	*
Temperature °C	*	*	*	*
Cond 20°C	682	682	*	*
SS mg/L	81	81	262.44	95790.6
NH_3 mg/L	22.6	22.6	73.224	26726.76
BOD mg/L	138	138	447.12	163198.8
COD mg/L	331	331	1072.44	391440.6
TN mg/L	32	32	103.68	37843.2
Nitrite mg/L	1.21	1.21	3.9204	1430.946
Nitrate mg/L	4.25	4.25	13.77	5026.05
TP mg/L	5.8	5.8	18.792	6859.08
O-PO4-P mg/L	3.27	3.27	10.5948	3867.102
SO4 mg/L	42.1	42.1	136.404	49787.46
Phenols µg/L	<0.10	<0.0001	<0.000324	<0.11826
Atrazine µg/L	<0.01	<0.00001	<0.0000324	<0.011826
Dichloromethane µg/L	<1	<0.001	<0.00324	<1.1826
Simazine µg/L	<0.01	<0.00001	<0.0000324	<0.011826
Toluene µg/L	<1	<0.001	<0.00324	<1.1826
Tributyltin µg/L	*	*	*	*
Xylenes µg/L	<1	<0.001	<0.00324	<1.1826
Arsenic µg/L	<0.96	<0.00096	<0.0031104	<1.135296
Chromium mg/L	<0.02	<0.02	<0.0648	<23.652
Copper mg/L	<0.02	<0.02	<0.0648	<23.652
Cyanide µg/L	<5	<0.005	<0.0162	<5.913
Fluoride µg/L	53	0.053	0.17172	62.6778
Lead mg/L	<0.02	<0.02	<0.0648	<23.652
Nickel mg/L	<0.02	<0.02	<0.0648	<23.652
Zinc mg/L	<0.02	<0.02	<0.0648	<23.652
Boron mg/L	0.02	0.02	0.0648	23.652
Cadmium mg/L	<0.02	<0.02	<0.0648	<23.652
Mercury µg/L	<0.2	<0.0002	<0.000648	<0.23652
Selenium µg/L	1.5	0.0015	0.00486	1.7739
Barium mg/L	<0.02	<0.02	<0.0648	<23.652

Maximum Flow

Max Flow recorded 2010 344m^3/day

values recorded as 1/2 0f LOD for statistical purposes

D0301-01 Attachment E4 Killeagh Discharge Outlet Table E4

Sample Date	08/03/2006	12/04/2006	07/06/2006	20/09/2006	04/04/2007	04/07/2007	08/08/2007	05/09/2007	17/10/2007	22/11/2007	28/02/2008	03/04/2008	22/05/2008	10/07/2008	03/09/2008	09/10/2008	27/11/2008	Average		
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent			
Sample Code											GS147	GS274	GS442	GS647	GS832	GS1019	GS1288	mg/L	Kg/Day	Kg/year
Flow M^3/Day	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	3240	*	*
pH	7.4	7.4	7.2	7.3	7.5	7.5	7.6	7.6	7.5	7.6	7.6	*	7.4	*	7.8	*	7.4	7.55	*	*
Temperature °C	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cond 20°C	*	*	*	*	*	*	*	*	*	*	*	567	541	487	509	*	750	570.8	*	*
SS mg/L	17	24	19	27	25	13	16	5	17	26	16	29	42	22	31	9	14	23.2857143	75.4457143	27537.6857
NH_3 mg/L	*	*	*	*	*	<0.1	0.2	0.1	<0.1	0.2	1.2	3.8	2	1.1	1.4	*	2.3	1.96666667	6.372	2325.78
BOD mg/L	5.1	5.4	7.1	9	7.6	3.9	4.6	3.4	7.41	9.76	*	7.89	15.94	3.03	6.35	5.54	5.3	7.34166667	23.787	8682.255
COD mg/L	26	33	34	33	50	25	41	38	48	51	62	47	71	<21	30	28	34	47.63	154.3212	56327.238
TN mg/L	16.45	22.5	*	14.8	21.6	*	23.5	16.6	15.8	17.4	25.65	17.1	15.8	12.8	5	*	17	15.5583333	50.409	18399.285
Nitrite mg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.303	0.303	0.98172	358.3278
Nitrate mg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	10.3	10.3	33.372	12180.78
TP mg/L	2.15	2.49	2.02	2.47	8.4	1.31	2.36	2.37	*	4.43	5.58	3.8	4.3	2.5	1.84	*	2.7	3.45333333	11.1888	4083.912
O-PO4-P mg/L	*	*	*	*	*	*	2.31	*	3.27	3.5	5.15	2.51	3.81	1.44	1.05	*	1.92	2.64666667	8.5752	3129.948
SO4 mg/L	*	*	*	*	*	73.4	38.9	36.6	35.5	39.8	33.9	*	*	*	*	*	49.8	41.85	135.594	49491.81
Phenols µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<0.10	<0.0001	<0.000324	<0.11826
Atrazine µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<0.01	<0.00001	<0.0000324	<0.011826
Dichloromethane	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<1	<0.001	<0.00324	<1.1826
Simazine µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<0.01	<0.00001	<0.0000324	<0.011826
Toluene µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<1	<0.001	<0.00324	<1.1826
Tributyltin µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Xylenes µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<1	<0.001	<0.00324	<1.1826
Arsenic µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	1.1	0.0011	0.003564	1.30086
Chromium mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	*	<0.02	*	<0.02	*	<0.02	<0.02	<0.0648	<23.652
Copper mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	*	0.0352	*	<0.02	*	<0.02	*	<0.02	0.0163	0.052812	19.27638
Cyanide µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<5	<0.005	<0.0162	<5.913
Fluoride µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	106	0.106	0.34344	125.3556
Lead mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	*	0.024	*	0.023	*	<0.02	*	<0.02	0.0168	0.054432	19.86768
Nickel mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	*	<0.02	*	<0.02	*	<0.02	<0.02	<0.0648	<23.652
Zinc mg/L	*	*	*	*	*	0.032	0.0286	<0.02	<0.02	*	0.314	*	<0.02	*	<0.02	*	<0.02	0.086	0.27864	101.7036
Boron mg/L	*	*	*	*	*	*	*	*	*	*	0.0517	*	0.054	*	0.045	*	<0.02	0.0402	0.130248	47.54052
Cadmium mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	*	<0.02	*	<0.02	*	<0.02	<0.02	<0.0648	<23.652
Mercury µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	<0.2	<0.0002	<0.000648	<0.23652
Selenium µg/L	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	4.3	0.0043	0.013932	5.08518
Barium mg/L	*	*	*	*	*	<0.02	<0.02	<0.02	<0.02	*	<0.02	*	<0.02	*	<0.02	*	<0.02	<0.02	<0.0648	<23.652

Maximum Flow **Max Flow recorded 2010 344m³/day**

values recorded as 1/2 0f LOD for statistical purposes

D0301-01 Attachment E4 Killeagh Upstream Table E4

Sample Date	27/11/2008		Average
Sample	River	analysis below LOD	
Sample Code	GS1287	GS1287	*
Flow M^3/Day	*	*	*
pH	7.8	*	7.8
Temperature °C	*	*	*
Cond 20°C	187	*	187
SS mg/L	<2.5	*	<2.5
NH_3 mg/L	<0.1	**0.03**	<0.1
BOD mg/L	<1.0	*	<1.0
COD mg/L	<21	*	<21
TN mg/L	37	*	37
Nitrite mg/L	0.00735	*	0.00735
Nitrate mg/L	5.14	*	5.14
TP mg/L	<0.20	*	<0.20
O-PO4-P mg/L	<0.05	**0.02**	<0.05
SO4 mg/L	<30	*	<30
Phenols µg/L	<0.10	*	<0.10
Atrazine µg/L	<0.01	*	<0.01
Dichloromethane µg/L	<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 ug/L	<20	**<1**	<20
Copper ug/L	<20	**<1**	<20
Cyanide µg/L	<5	*	<5
Fluoride µg/L	34	*	34
Lead ug/L	<20	**<1**	<20
Nickel ug/L	<20	**2.5**	<20
Zinc ug/L	<20	**<1**	<20
Boron ug/L	<20	**<1**	<20
Cadmium ug/L	<20	**<1**	<20
Mercury µg/L	<0.2	*	<0.2
Selenium µg/L	2.4	*	2.4
Barium ug/L	26.5	*	26.5

values recorded as 1/2 0f LOD for statistical

D0301-01 Attachment E4 Killeagh Downstream Table E4

Sample Date	27/11/2008	27/11/2008	Average
Sample	River	Analysis below LOD readings	
Sample Code	GS1290	GS1290	*
Flow M^3/Day	*	*	*
pH	7.9	*	7.9
Temperature °C	*	*	*
Cond 20°C	217	*	217
SS mg/L	3	*	3
NH_3 mg/L	<0.1	**0.073**	<0.1
BOD mg/L	1.1	*	1.1
COD mg/L	<21	*	<21
TN mg/L	15	*	15
Nitrite mg/L	*	*	*
Nitrate mg/L	5.25	*	5.25
TP mg/L	<0.20	*	<0.20
O-PO4-P mg/L	<0.05	**0.04**	<0.05
SO4 mg/L	<30	*	<30
Phenols µg/L	<0.10	*	<0.10
Atrazine µg/L	<0.01	*	<0.01
Dichloromethane µg/L	<1	*	<1
Simazine µg/L	<0.01	*	<0.01
Toulene µg/L	<1	*	<1
Tributyltin µg/L	*	*	*
Xylenes µg/L	<1	*	<1
Arsenic µg/L	<0.96	*	<0.96
Chromium ug/L	<20	**<1**	<20
Copper ug/L	<20	**<1**	<20
Cyanide µg/L	<5	*	<5
Fluoride µg/L	38	*	38
Lead ug/L	<20	**2.5**	<20
Nickel ug/L	<20	**1.7**	<20
Zinc ug/L	<20	**<1**	<20
Boron ug/L	<20	**<1**	<20
Cadmium ug/L	<20	**<1**	<20
Mercury µg/L	<0.2	*	<0.2
Selenium µg/L	1.3	*	1.3
Barium ug/L	27	*	0.027

values recorded as 1/2 0f LOD fc

Parameter		Temperatu	Dissolved	pH	BOD	Nitrite	Molybdate	Ammoniun	Nitrate	Hardness	Alkalinity	Appearanc	Chloride	Dissolved	Suspende	Colour	Conductivi	Mg	Ca
			O2		O2	NO2	P	NH4	NO3	CaCO3	CaCO3		Cl			Hz		Mg	Ca
	Max.	--	15	Varies	Varies	0.05	Varies	Varies	Varies	--	--	--	--	150	--	Varies	--	--	--
	Target	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Min.	--	5	Varies	--	--	--	--	--	--	--	--	--	50	--	--	--	--	--
Project	Location	Location R	Location E	Location N	Sample Te	Sample Re	Sample Da	Sample Tir	Comments	Degrees C	mg/l	pH units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	CaCO3	CaCO3	Descriptive	Cl	% O2	mg/l	Hazen	µS/cm	mg/l	mg/l
Dissour	Br U/S Wo	19D03060	202150	74755	WFD Oper	2008/0373	05-Mar-08	11:10		7.4	12.6	7.9	0.4					90	58	clear		99		22	221	6.5	25
Dissour	Br U/S Wo	19D03060	202150	74755	WFD Oper	2008/1122	04-Jun-08	12:20		12	10.8	7.9	1.7	0.03	*0.041*	< 0.026	20.6	92	64		20.3	97	2.3		242		
Dissour	Br U/S Wo	19D03060	202150	74755	Phosphate	2008/1342	02-Jul-08	13:10		23.6	9.2			*0.056*	*0.079*	0.055				clear		110					
Dissour	Br U/S Wo	19D03060	202150	74755	WFD Oper	2008/1757	06-Aug-08	10:00		14.8	9.4	7.8	1.3	*0.052*	*0.056*	0.029	18.9	88	66		17.7	94			211		
Dissour	Br U/S Wo	19D03060	202150	74755	Phosphate	2008/2092	03-Sep-08	12:55	colour=28	12.2	12	7.9	1.1	0.023	*0.036*	0.031	21.86	80	60			114			210		
Dissour	Br U/S Wo	19D03060	202150	74755	Phosphate	2008/2499	01-Oct-08	11:00		11.4	10.6			0.024	*0.031*	< 0.026				clear		98					
Dissour	Br U/S Wo	19D03060	202150	74755	WFD Oper	2008/3366	10-Dec-08	12:25		5.7	12.4	8.2	0.5	0.024	*0.034*	< 0.026	23.6	85	68		19.4	98		19	221		
									Sample Coun	7	7	5	5	6	6	6	4	5	5	-	3	7	1	2	5	1	1
									Maximum	23.6	12.6	8.2	1.7	0.056	0.079	0.055	23.6	92	68	-	20.3	114	2.3	22	242	6.5	25
									Minimum	5.7	9.2	7.8	0.4	0.023	0.031	< 0.026	18.9	80	58	-	17.7	94	2.3	19	210	6.5	25
									Mean	12.4	11	7.94	1	0.035	0.046	0.026	21.2	87	63.2	-	19.1	101	2.3	20.5	221	6.5	25
									Median	12	10.8	7.9	1.1	0.027	0.038	0.021	21.2	88	64	-	19.4	98	2.3	20.5	221	6.5	25
									Std. Deviatior	5.81	1.39	0.152	0.548	0.015	0.018	0.017	1.99	4.69	4.15	-	1.32	7.49	0	2.12	12.9	0	0
Dissour	Killeagh Br	19D03040	200524	76645	Phosphate	2008/1121	04-Jun-08	12:40						0.02	0.021	< 0.026											
Dissour	Killeagh Br	19D03040	200524	76645	Phosphate	2008/1341	02-Jul-08	12:50		22.4	9.5			0.035	*0.053*	0.048				clear		111					
Dissour	Killeagh Br	19D03040	200524	76645	Phosphate	2008/1756	06-Aug-08	09:35		15	9.7			0.038	*0.037*	0.09						97					
Dissour	Killeagh Br	19D03040	200524	76645	Phosphate	2008/2091	03-Sep-08	12:30		12	12.3			0.017	0.029	0.042						116					
Dissour	Killeagh Br	19D03040	200524	76645	Phosphate	2008/2498	01-Oct-08	11:20		11.1	10.8			0.015	0.024	< 0.026				clear		98					
Dissour	Killeagh Br	19D03040	200524	76645	Phosphate	2008/2960	05-Nov-08	12:20	Finisk brid	10.1	10.8	7.9	0.3	0.025	*0.033*	0.03	22.66	80	60			96			214		
Dissour	Killeagh Br	19D03040	200524	76645	Phosphate	2008/2959	05-Nov-08	12:00		9.7	10.9			0.021	0.018	0.043						96					
Dissour	Killeagh Br	19D03040	200524	76645	Phosphate	2008/3365	10-Dec-08	12:40		6	12.5			0.014	0.022	< 0.026						99					
									Sample Coun	7	7	1	1	8	8	8	1	1	1	-	0	7	0	0	1	0	0
									Maximum	22.4	12.5	7.9	0.3	0.038	0.053	0.09	22.66	80	60	-		116			214		
									Minimum	6	9.5	7.9	0.3	0.014	0.018	< 0.026	22.66	80	60	-		96			214		
									Mean	12.3	10.9	7.9	0.3	0.023	0.03	0.037	22.7	80	60	-		102			214		
									Median	11.1	10.8	7.9	0.3	0.02	0.027	0.036	22.7	80	60	-		98			214		
									Std. Deviatior	5.2	1.15	0	0	0.009	0.011	0.026	0	0	0	-		8.15			0		