



# Meath County Council

*Comhairle Chontae na Mí*

## APPROPRIATE ASSESSMENT OF THE IMPACTS OF THE DISCHARGES FROM THE KELLS, ATHBOY, DUNSHAUGHLIN, TRIM AND ENFIELD-JOHNSTOWN BRIDGE WwTW ON THE RIVER BOYNE AND RIVER BLACKWATER SPECIAL AREA OF CONSERVATION



July 2009



Nicholas O'Dwyer  
CONSULTING ENGINEERS

## MEATH COUNTY COUNCIL

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### APPROPRIATE ASSESSMENT REPORT

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July 2009

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20285-DL-AA-01  
20285-DL-AA-02

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## 1. BACKGROUND TO THIS APPROPRIATE ASSESSMENT REPORT

### 1.1 Purpose of this Document

Nicholas O'Dwyer Ltd. have been appointed by Meath County Council to inform an Appropriate Assessment Report addressing the impacts of the discharges from a number of Wastewater Treatment Works (WwTW) in Co. Meath on the River Boyne and River Blackwater SAC. The WwTW concerned are; Kells, Athboy, Dunshaughlin, Trim and Enfield-Johnstown Bridge. The report has been produced to support the Waste Water Discharge Licence (WwDL) applications for these aforementioned agglomerations (EPA Application Register Numbers DO127-01, DO124-01, DO138-01, DO137-01 and DO131-01).

### 1.2 Background and Regulatory Context

In order to gain Wastewater Discharge Licenses for the discharges from the aforementioned WwTW, Meath County Council submitted Waste Water Discharge License applications to the Environmental Protection Agency (EPA), as required under the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No 684 of 2007).

In response to four of these applications<sup>1234</sup> the EPA requested that Meath County Council,

*"Determine if there is likely to be a significant impact from the waste water discharges (primary, secondary and storm overflows) on the Natura 2000 site (SAC). You shall use the flow diagram in Circular L/08, issued by Water Services Section, Department of Environment, Heritage and Local Government, to assist in this determination. Provide answers to each question on this flow diagram in addition to the final answer. If there is likely to be a significant impact on a Natura 2000 site, based on the flow diagram referenced above, then you must undertake an appropriate assessment. This assessment should address the impacts of the waste water discharges and proposed mitigation measures with respect to the conservation objectives of the identified Natura 2000 sites in the vicinity of the waste water discharges".*

<sup>1</sup> Letter from Loretta Joyce, Inspector, Office of Climate, Licensing & Resource Use, EPA, "Re. Notice in accordance with Regulation 18 (3) (b) of the Waste Water Discharge (Authorisation) Regulations 2007, 10<sup>th</sup> December 2008 DO138-01

<sup>2</sup> Letter from Loretta Joyce, Inspector, Office of Climate, Licensing & Resource Use, EPA, "Re. Notice in accordance with Regulation 18 (3) (b) of the Waste Water Discharge (Authorisation) Regulations 2007, 10<sup>th</sup> December 2008 DO137-01

<sup>3</sup> Letter from Loretta Joyce, Inspector, Office of Climate, Licensing & Resource Use, EPA, "Re. Notice in accordance with Regulation 18 (3) (b) of the Waste Water Discharge (Authorisation) Regulations 2007, 15<sup>th</sup> April 2009 DO127-01

<sup>4</sup> Letter from Loretta Joyce, Inspector, Office of Climate, Licensing & Resource Use, EPA, "Re. Notice in accordance with Regulation 18 (3) (b) of the Waste Water Discharge (Authorisation) Regulations 2007, 15<sup>th</sup> April 2009 DO124-01

The discharges from all five WwTW ultimately discharge to the **River Boyne and River Blackwater SAC**. In order to address cumulative impacts of these discharges on this SAC it was deemed most appropriate to prepare the one Appropriate Assessment Report for the discharges from all WwTW. This was agreed in conversations with the EPA and with regard to the holistic approach taken in the Water Framework Directive<sup>5</sup>. The National Parks and Wildlife Service (NPWS) were consulted in relation to the scope of the Appropriate Assessment and a copy of this correspondence is included in **Appendix 1**. Communications held with the NPWS District Conservation Officer confirmed that there is little baseline information and no management plan as yet for the River Boyne and River Blackwater SAC as it was only designated in 2003<sup>6</sup>.

### 1.3 Natura 2000 Site Designation and Description

*The Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EEC* (the Habitats Directive) and *The Conservation of Wild Birds 79/409/EEC* (the Birds Directive) aim to protect biodiversity by maintaining and restoring natural habitats and wildlife species and providing robust protection for those habitats and species of European importance. The habitats listed in Annex I and species listed in Annex II of the Habitats Directive, and birds listed on Annex 1 of the Birds Directive are protected by a network of protected areas known as Natura 2000 and the sites are referred to as '**European Sites**'. Member States propose national networks of sites for evaluation in order to form a European network and when adopted these sites are designated as **Special Areas of Conservation (SACs)** under the Habitats Directive and **Special Protection Areas (SPAs)** under the Birds Directive.

The NPWS is part of the Department of the Environment, Heritage and Local Government (DoEHLG) and manages the Irish State's nature conservation responsibilities under national and European law, including the designation and protection of SACs and SPAs.

The River Boyne is one of Ireland's larger river catchments. It rises near Edenderry on the borders of Counties Offaly and Kildare and flows in a north-easterly direction for 112km before entering the Irish Sea at Drogheda. Together with its tributaries, it drains a catchment of approximately 2,500 km<sup>2</sup>.

The **River Boyne and River Blackwater SAC** is located primarily in Meath and Westmeath, but also drains smaller areas of Cavan and Louth. The designation covers the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. The location of the SAC and the WwTW for each of the five agglomerations is shown in Figure 20285-DL-AA-01.

The primary discharge from the Kells, Trim, Athboy and Dunshaughlin WwTW is directly to the SAC. The primary discharge from the Enfield WwTW is to the River Blackwater (Longwood) which is a tributary of the designated River Boyne.

<sup>5</sup> EU Water Framework Directive (2000/60/EC)

<sup>6</sup> Pers Comm Morris Egan, July 2009

## 1.4 The Appropriate Assessment Process

### 1.4.1 Background

The Habitats Directive was the first to introduce the precautionary principle to protected areas in Europe whereby developments can only be permitted when assessments have concluded that projects will not cause adverse impacts on the integrity of the European Sites (SACs and SPAs). The Habitats Directive outlines a statutory framework that must be applied for any plan or project that may have an effect on European Sites (SACs and SPAs). Competent authorities are required to conduct **Appropriate Assessments** (AAs) for all developments likely to cause significant effects on European Sites. An Appropriate Assessment is an assessment of the potential adverse or negative effects of a plan or project, in combination with other plans and projects on a European Site.

Appropriate Assessments must consider **In Combination Impacts** with other plans or projects, including those being progressed by other competent authorities as defined by the Habitats Regulations and with the prevailing background conditions.

In this case the developments (i.e. WwTW) are not new (except for the upgrades currently underway in Athboy and Kells) and are already in operation with final effluent discharges to the River Boyne and River Blackwater SAC. However the EPA has deemed that AA may be necessary based on the requirements of the flow diagram in Circular L8/08<sup>7</sup>. The requirements of this diagram will now be addressed for each of the WwTW.

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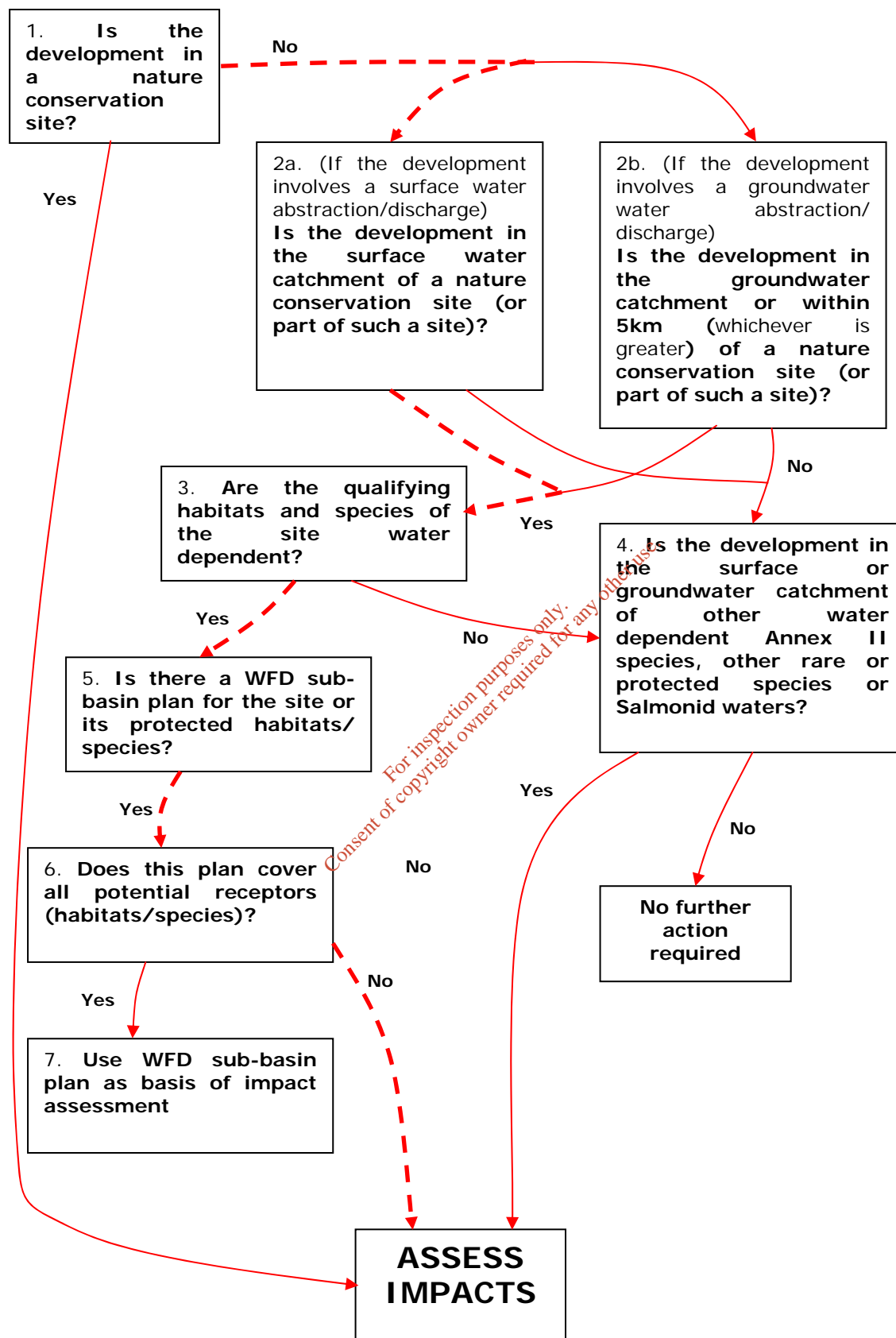
<sup>7</sup> Circular L8/08, Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments

The requirement to screen the **Enfield WwTW** for impacts

Consideration	Response
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 – the surface water discharge is to River Blackwater (Longwood) The River Blackwater is not an SAC at this point but about 15km downstream it discharges to the River Boyne and River Blackwater SAC.
4. Is the development a groundwater discharge or abstraction in the ground water catchment or within 5km of a nature conservation site with water-dependant qualifying habitats/species?	No.
5. Is the development in the surface water or groundwater catchment of salmonid waters?	Yes – the surface water discharge is to the River Blackwater (Longwood) which discharges to the River Boyne. The River Boyne main channel is designated as a salmonid water.
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.

As the answer to one of the questions is 'yes', the project must be screened for its impacts. The flow diagram, below, was used for screening the project, with the dashed lines indicating the project-specific outcomes.

## ENFIELD WwTW

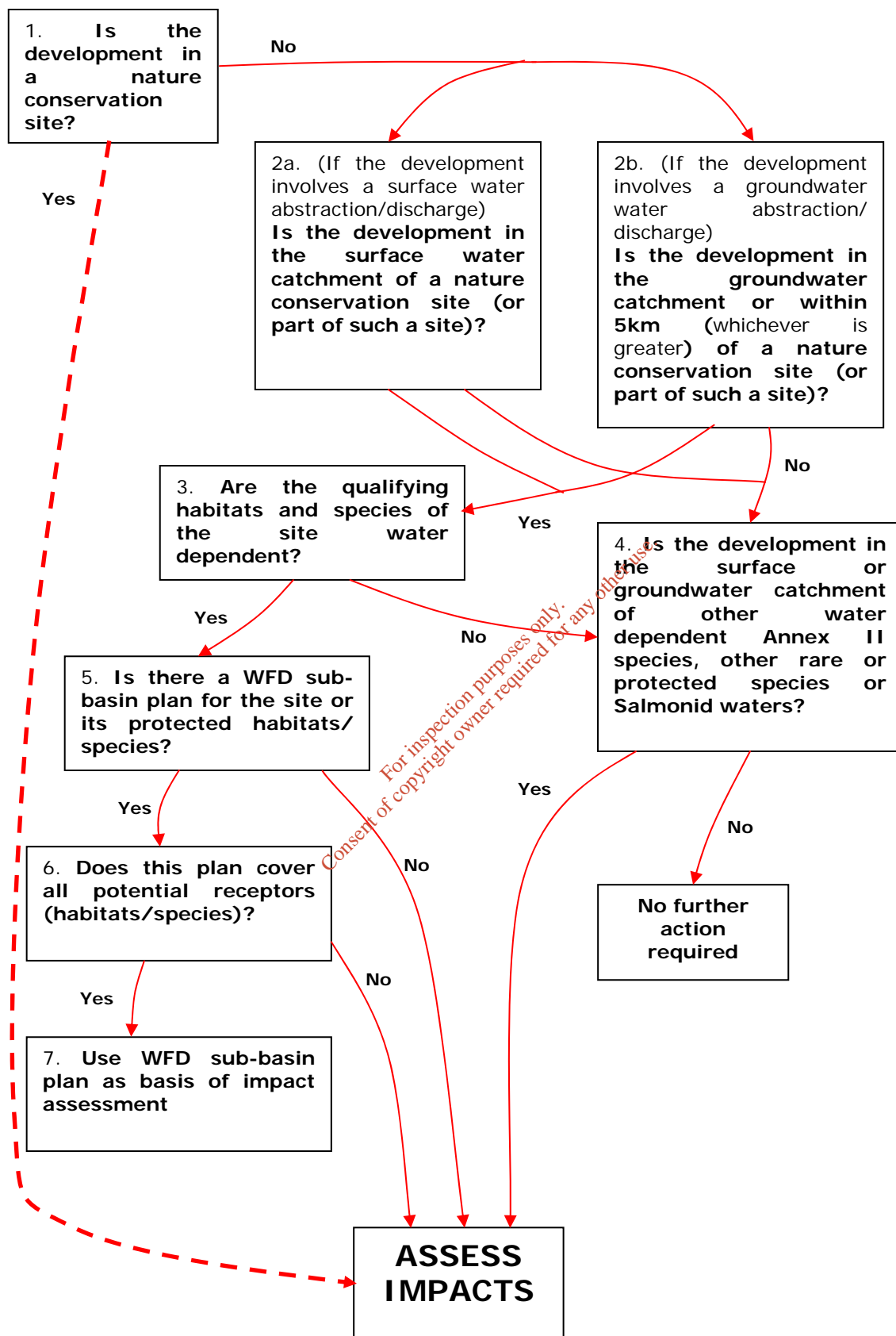


The requirement to screen the **Athboy WwTW** for impacts

Consideration	Response
1. Is the development in or on the boundary of a nature conservation site NHA/SAC/SPA?	Yes. The WwTP site is adjacent to the River Boyne and River Blackwater SAC boundary.
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 – the surface water discharge is to the Athboy River which forms part of the River Boyne and River Blackwater SAC.
4. Is the development a groundwater discharge or abstraction in the ground water catchment or within 5km of a nature conservation site with water-dependant qualifying habitats/species?	No.
5. Is the development in the surface water or groundwater catchment of salmonid waters?	Yes – the surface water discharge is to the Athboy River which discharges to the River Boyne. The River Boyne main channel is designated as a salmonid water.
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.

As the answer to one of the questions is 'yes', the project must be screened for its impacts. The flow diagram, below, was used for screening the project, with the dashed lines indicating the project-specific outcomes.

## ATHBOY WwTW



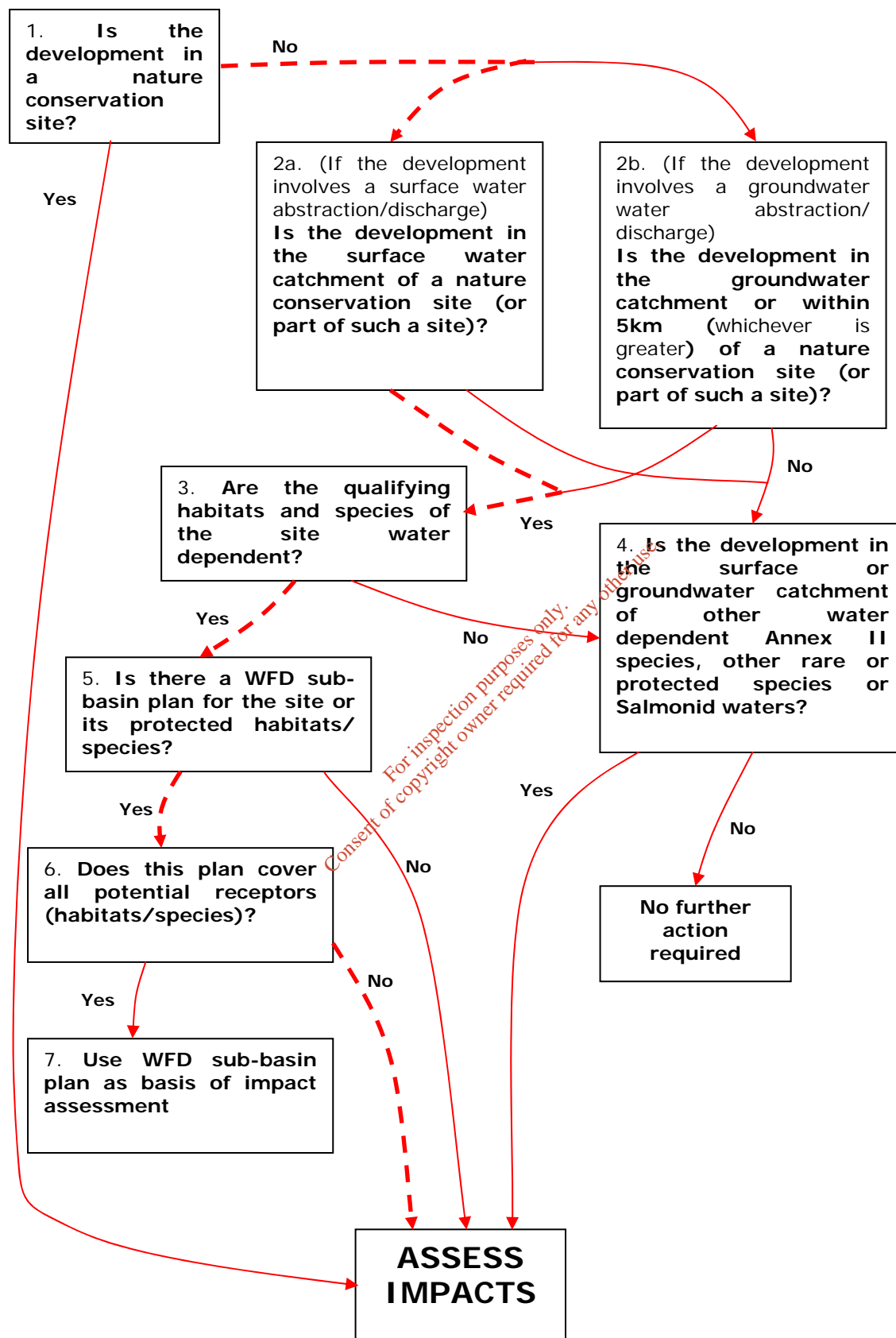
The requirement to screen the **Dunshaughlin WwTW** for impacts

Consideration	Response
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 – the surface water discharge is to the River Boyne and River Blackwater SAC.
4. Is the development a groundwater discharge or abstraction in the ground water catchment or within 5km of a nature conservation site with water-dependant qualifying habitats/species?	No.
5. Is the development in the surface water or groundwater catchment of salmonid waters?	Yes – the surface water discharge is to the River Boyne. The River Boyne main channel is designated as a salmonid water.
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.

As the answer to one of the questions is 'yes', the project must be screened for its impacts. The flow diagram, below, was used for screening the project, with the dashed lines indicating the project-specific outcomes.



## DUNSHAUGHLIN WwTW

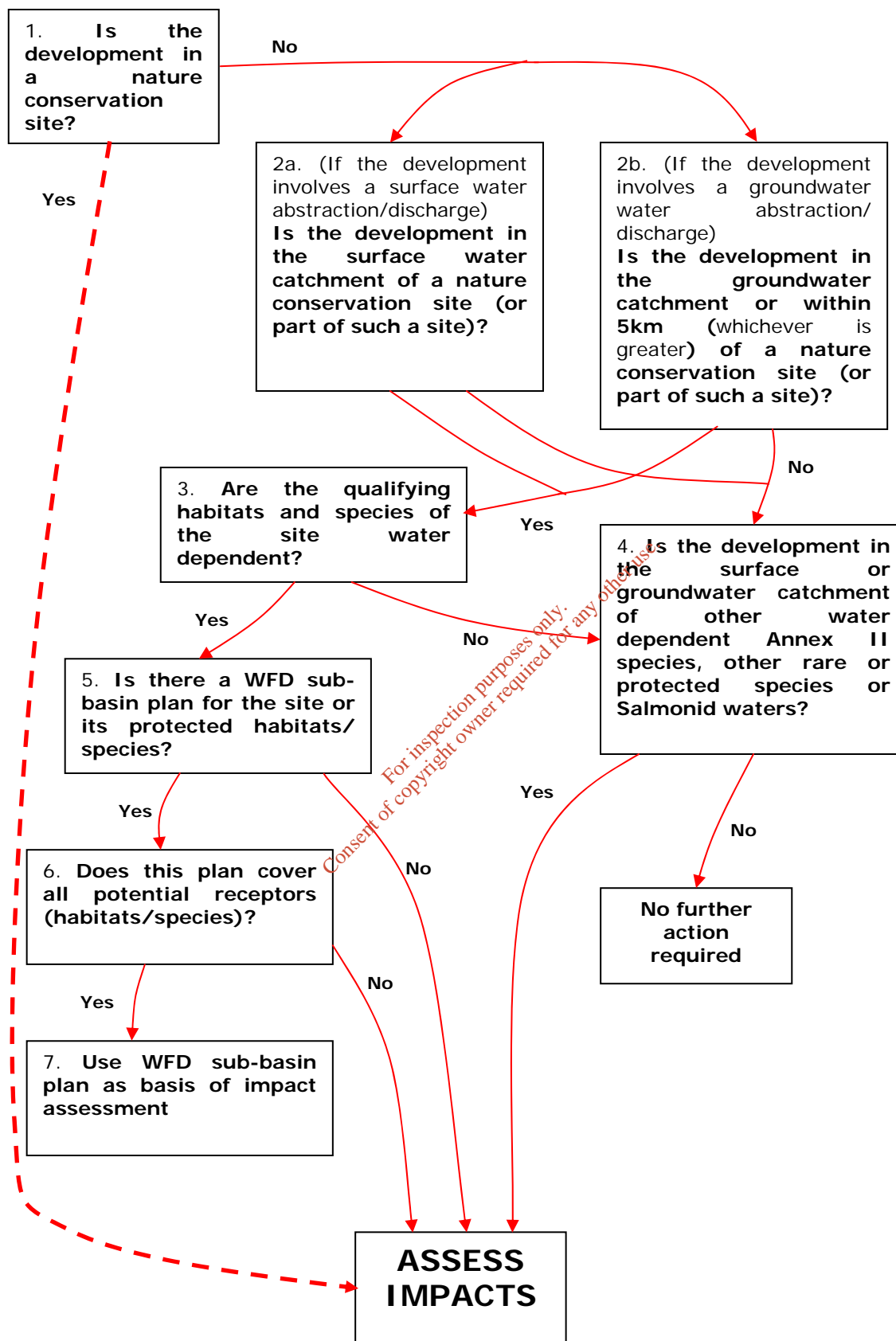


The requirement to screen the **Trim WwTW** for impacts

Consideration	Response
1. Is the development in or on the boundary of a nature conservation site NHA/SAC/SPA?	Yes. The WwTP site is adjacent to the River Boyne and River Blackwater SAC boundary.
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 – the surface water discharge is to the River Boyne and River Blackwater SAC.
4. Is the development a groundwater discharge or abstraction in the ground water catchment or within 5km of a nature conservation site with water-dependant qualifying habitats/species?	No.
5. Is the development in the surface water or groundwater catchment of salmonid waters?	Yes – the surface water discharge is to the River Boyne. The River Boyne main channel is designated as a salmonid water.
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.

As the answer to one of the questions is 'yes', the project must be screened for its impacts. The flow diagram, below, was used for screening the project, with the dashed lines indicating the project-specific outcomes.

## TRIM WwTW

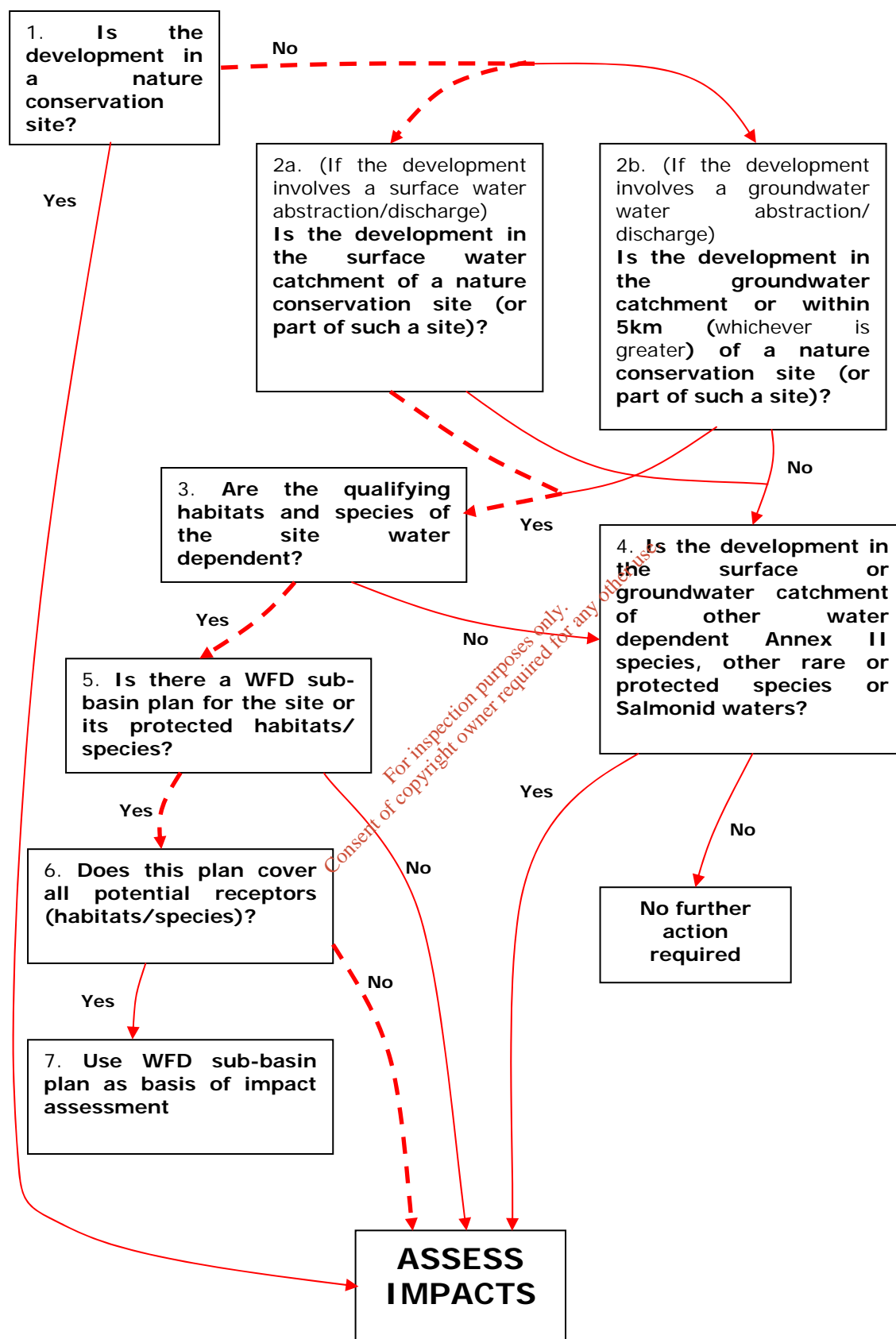


The requirement to screen the **Kells WwTW** for impacts

Consideration	Response
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 – the surface water discharge is to an unnamed stream which discharges into the River Boyne and River Blackwater SAC.
4. Is the development a groundwater discharge or abstraction in the ground water catchment or within 5km of a nature conservation site with water-dependant qualifying habitats/species?	No.
5. Is the development in the surface water or groundwater catchment of salmonid waters?	Yes – the surface water discharge is to the River Blackwater which discharges to the River Boyne. The River Boyne main channel is designated as a salmonid water.
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.

As the answer to one of the questions is 'yes', the project must be screened for its impacts. The flow diagram, below, was used for screening the project, with the dashed lines indicating the project-specific outcomes.

## KELLS WwTW



**Based on the results of these flow diagrams we are required to assess the impacts of all 5 WwTW on the River Boyne and River Blackwater SAC.**

#### **1.4.2 Stages of the Assessment**

As per the EPA explanatory note on Appropriate Assessment, there are four main stages to the Appropriate Assessment process.

Stage 1 of the process is Screening. This Stage identifies the likely impacts on European Sites of a plan or project either alone or in combination and considers whether these effects are likely to be significant.

In Stage 2 the impact of the project or plan on the integrity<sup>8</sup> of the European Site is considered with respect to the Conservation Objectives of the site.

Stage 3 examines alternative ways of implementing the plan or project that would avoid any significant impact on the European Site.

Stage 4 addresses the question of significant impacts where there are reasons of overriding public interest or human Health and Safety considerations or important environmental benefits.

#### **1.5 Limitations to the Assessment Process**

As per the Habitats Directive, the competent National Authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European Site concerned. In this case, the WwTW are not new plans or projects and are already in operation with discharges of Wastewater to the River Boyne and River Blackwater SAC. The benefits of the Assessment Process when a plan or project is already in operation are questionable as the plan or project is already agreed on. However, the Assessment may identify any inadequacies in the existing works and identify mitigation measures if required. Alternatives to the plan or project are not really considered as it is assumed that the negative environmental impact of constructing an entirely new WwTP will far outweigh the environmental impact of the existing works.

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<sup>8</sup> Managing Natura 2000 sites: the provisions of Article 6 of the "Habitats" Directive 92/43/EEC (2000) defines integrity as "the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified"

## 2. STAGE 1-SCREENING

### 2.1 Step 1: Management of the Site

*Is the plan or project directly connected with or necessary to the management of the site?*

The WwTW are not directly connected with, or necessary to, the management of The River Boyne and River Blackwater SAC.

### 2.2 Step 2: Description of the project or plan

*Identify all the elements of the project or plan alone or in combination with other plans or projects that have the potential for having significant effects on the Site. The European Site should be described.*

#### 2.2.1 Description of the Kells, Athboy, Dunshaughlin, Trim and Enfield-Johnstown Bridge WwTW

The elements of the WwTW that have potential for having significant effects on the Site are the discharges of wastewater to the River Boyne and River Blackwater SAC. A brief description of each WwTW and discharges is given here. More detailed information is contained in the WwDL Application for each agglomeration.

##### **KELLS WwTW**

Kells is served by a 8,000 p.e. extended aeration treatment plant currently being upgraded. The *primary discharge* is to the Headfort stream adjacent to the WwTP which discharges into the River Blackwater (part of the River Boyne and River Blackwater SAC) within a few hundred meters of the point of discharge.

In addition to the primary discharge there is an *overflow from the storm tank* (this discharges from the same point as the primary discharge) and a further *storm water overflow* from the sewer network within the town. The storm water overflow from the storm tank **will comply with the Procedures and Criteria for Storm Water Overflows published by the Dept. of the Environment, 1995** once upgrade works are complete. The compliance of the other storm overflow with these procedures is unknown, as contributing population, flow, overflow occurrence etc are not known.

The WwTP consists of inlet works, 2 no. aeration tanks, 2 clarifiers and sludge treatment facilities. Optimization works currently underway in Kells will allow for storm water storage and a new effluent outfall directly to the River Blackwater through a system of diffusers. Also included as part of this optimisation contract are upgrades to the RAS/SAS pumping system, repair of the belt press and provision of monitoring facilities for storm events. This work is expected to finish before the end of 2009.

### **ATHBOY AND RATHCAIRN WwTW**

A new 5,800 p.e. WwTW to serve Athboy and Rathcairn (replacing the existing overloaded plant) is currently under construction. The WwTW will include storm storage, preliminary treatment, biological treatment, sludge treatment and phosphorus removal.

In addition to the *primary discharge* from the WwTW, there will be an *overflow from the storm tank* which will discharge from the same point as the Primary Discharge. The storm water overflow **will comply with the Procedures and Criteria for Storm Water Overflows published by the Dept. of the Environment, 1995.**

Discharges are to the Athboy River which forms part of the River Boyne and River Blackwater SAC. The design effluent quality is 25mg/l BOD, 35mg/l TSS, 125mg/l COD, 20mg/l Total Nitrogen and 1mg/l Total Phosphorus.

### **DUNSHAUGHLIN AND CASTLETOWN TARA WwTW**

Dunshaughlin and Castletown Tara are served by a 17km trunk sewer main that conveys the wastewater from Dunshaughlin to the 12,000 p.e. WwTW at Castletown Tara. Preliminary treatment and storm water storage takes place in Dunshaughlin prior to treatment in Castletown Tara.

There is a *Storm Water Overflow* in Dunshaughlin to the River Skane but discharge is extremely rare. The main WwTP in Castletown Tara provides further stormwater storage, secondary treatment and phosphorous removal. The *primary discharge* is to the River Boyne and River Blackwater SAC. 2 No. storm water tanks are provided at the main wastewater treatment plant at Castletown Tara. In the event of an *overflow*, the screened discharge joins the treated primary effluent prior to discharge to the Boyne River. **Both overflows comply with the Procedures and Criteria for Storm Water Overflows published by the Dept. of the Environment, 1995.**

The design effluent quality is 20mg/l BOD, 30mg/l TSS, 20mg/l Total Nitrogen and 1mg/l Total Phosphorus.

Prior to the construction of the WwTW an **Environmental Impact Assessment** was completed, containing detailed environmental information. The resultant EIS concluded that overall there would be a positive environmental, economic and recreational effect by the construction of the new WwTW.

### **TRIM WwTW**

Trim is served by a 12,000 p.e. extended aeration treatment plant with nutrient removal and storm storage. The *primary discharge and overflow* from the storm water tanks are to the River Boyne and River Blackwater SAC. There is also another *storm water overflow* to the River Boyne from sewers within the town however overflow is very rare. **Both overflows comply with the Procedures and Criteria for storm Water Overflows published by the Dept. of the Environment, 1995.**

The WwTP consists of inlet works, 3 no aeration basins, phosphorus removal system, 3 clarifiers, RAS/SAS system, and storm water storage. The design effluent quality is 25mg/l BOD, 35mg/l TSS, 125mg/l COD, 20mg/l Total Nitrogen and 2mg/l Total Phosphorus.

Prior to the construction of the WwTW an **Environmental Impact Assessment** was completed, containing detailed environmental information. The resultant EIS



concluded that overall there would be a positive environmental, economic and recreational effect by the construction of the new WwTW.

### **ENFIELD WwTW**

Enfield, Co. Meath and Johnstown Bridge Co. Kildare are served by a 3,500 p.e. WwTW which is situated near Johnstown Bridge. The current load to the WwTW is estimated to be approximately 3,770 p.e. The WwTW is an extended aeration plant with phosphorous removal.

In addition to the *primary discharge* from the WwTW, there is an *overflow from the storm tank*. Discharges are to River Blackwater (Longwood). The River Blackwater does not form part of the River Boyne and River Blackwater SAC at this point but about 15km downstream it discharges to the SAC. **Both overflows comply with the Procedures and Criteria for storm Water Overflows published by the Dept. of the Environment, 1995.** The design effluent quality is 20mg/l BOD, 30mg/l TSS, 20mg/l Total Nitrogen and 1mg/l Total Phosphorus.

**The location of the WwTW and their discharges in relation to the location of the SAC are shown in Figure 20285-DL-AA-01.**

### **2.2.2 In Combination Impacts**

Appropriate Assessments must consider "In Combination Impacts" with other plans or projects, including those being progressed by other competent authorities as defined by the Habitats Regulations and with the prevailing background conditions.

The River Boyne and River Blackwater SAC is located primarily in Meath and Westmeath, but also drains smaller areas of Cavan and Louth. The designation covers the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. In order to determine "In Combination Impacts" the entire SAC must be examined. As this Appropriate Assessment is being carried out for Meath County Council, in combination impacts in County Meath (and downstream of the discharges from Kells, Athboy, Dunshaughlin, Trim and Enfield-Johnstown Bridge WwTW) will be focussed on.

### **EASTERN RIVER BASIN DISTRICT**

In order to provide background information on the "In Combination Impacts", the **Eastern River Basin District** will be examined. Eight River Basin Districts were established in Ireland arising out of the legal requirements of the Water Framework Directive. The River Boyne forms part of the Eastern River Basin District.

One of the first tasks of the River Basin Districts was to establish a detailed summary of the state of the waters in each respective district. A Characterisation Report on the Eastern River Basin District was published in 2005. Section 5 of this Report deals specifically with characterisation of the Boyne Catchment. This section of the report is attached in **Appendix 2**. A brief summary will be given here.

One of the main requirements of the Water Framework Directive is that **by 2015 all rivers achieve "good" status**. Based on the Risk Assessment of River Water

Bodies in the Boyne catchment, **71% are classed as at risk of not achieving this "good" status.**

One of the main functions of the River Basin Districts is the formulation of River Basin Plans. The Eastern River Basin District Plan has been used as a source to aid in determining an overall picture of water quality in the area. The Eastern River Basin District is further divided into a number of local areas for which individual plans have been drafted. The local area plans detailing the section of the River into which our treatment plants discharges are as follows:

- The Boyne Lower: Discharges from Trim and Dunshaughlin WwTW
- The Blackwater South: Discharges from Enfield/Johnstown Bridge WwTW
- The Blackwater North Discharges from Kells WwTW
- Athboy: Discharges from Athboy WwTW

One of the main findings of these River Basin Plans is that in County Meath as a whole the primary pressures that might cause failure of meeting this "good" status are agriculture (60%), waste water and industrial discharges (30%) and waste water from unsewered properties 10%.

Environmental pressures that are listed as being present in the Boyne Catchment include:

- Diffuse sources
- Point sources
- Physical alterations
- Waste Disposal
- Water Abstraction
- Recreation and tourism

### **DIFFUSE SOURCES**

The primary environmental problem in the Boyne Catchment is considered to be diffuse sources of agricultural run-off from pastures, arable lands, crop cultivation, managed forests and peatlands. These run-offs likely contain elevated levels of nutrients, namely nitrogen and phosphorus, suspended solids and residues of pesticides and herbicides.

### **POINT SOURCES**

#### **Discharges from other WwTW**

There are thirty-six municipal WwTW in the Boyne Catchment. All but two provide a minimum of secondary treatment. Of particular interest to this Appropriate Assessment are the WwTW discharging to the SAC (or its tributaries) in close proximity and upstream of the waste water discharges detailed as part of this report, namely Longwood, Ballivor and Summerhill. These WwTW are shown on Figure 20285-DL-AA-02.

**Longwood** - The 1,845 p.e. agglomeration is currently served by the Longwood WwTP discharging to the River Blackwater, a tributary of the Boyne not designated at point of discharge as part of the SAC. This plant was upgraded and commissioned in Spring 2006, with a design capacity of 1,500 p.e.

**Ballivor** – The 1,792 p.e. agglomeration is served by the Ballivor WwTW which was upgraded and commissioned in 2006 to a design p.e. of 2,000. The plant discharges to the Stonyford River which is designated as part of the River Boyne and River Blackwater SAC.

**Summerhill** – The 975 p.e. agglomeration is served by the Summerhill WwTW originally designed for a p.e. of 600. A new 3,000 p.e. WwTP is currently under construction at Clonmahon. Discharge is to the Cloneymeath River which is not designated as part of the SAC.

**Some of the larger WwTPs that discharge to the River Boyne and River Blackwater downstream of the discharges for which this report is compiled are also detailed for completeness.**

**Navan** – The 37,595 p.e. agglomeration is served by the Navan WwTW. The treatment works consists of primary and secondary biological treatment with nutrient removal and is presently designed to cater for a population equivalent of 40,000. Discharge is to the River Boyne.

**Slane** – The 1,786 p.e. agglomeration is served by the Slane WwTW. The main treatment works site comprises two separate treatment systems with a combined p.e. of 2250), which together serve the Slane agglomeration. Discharge is to the River Boyne.

**Donore** – The 726 p.e. agglomeration is served by the Donore WwTW. A new 1,200 p.e. WwTP to serve Donore is currently under construction. Primary Discharge will be to the River Boyne.

**Drogheda** - (Louth County Council) – The 101,600 p.e. agglomeration is served by the Drogheda WwTP. The Secondary Treatment Plant discharges to the Boyne Estuary.

**Tullyallen** - (Louth County Council) – The 1,259 p.e. agglomeration is served by the Tullyallen WwTP which was upgraded in 2005/2006 to serve 1500 p.e. Discharge is to the River Boyne.

**It is anticipated that some of these WwDL Applications will require further assessment in relation to the requirements of the Habitats Directive.**

### **Industrial Discharges**

In the Boyne Catchment there are a total of 80 industries that produce waste water and are licenced under the following regimes

- 36 Integrated Pollution Control (IPC) by EPA
- 23 Water Pollution Act Section 4 by Local Authority
- 21 WPA Section 16 (to foul sewer) by Local Authority

Based on communications with Meath<sup>9</sup> and Louth<sup>10</sup> County Councils **Table 1** below details the current discharges to the Boyne licensed under Section 4 in proximity and downstream of the discharges from the Kells, Athboy, Dunshaughlin, Trim and Enfield-Johnstown Bridge WwTW.

<sup>9</sup> Pers Comm with Geraldine Cusak and David Byrne July 2009

<sup>10</sup> Pers Comm with Sean Callaghan July 2009

**TABLE 1 – Section 4 Discharges to the River Boyne**

Company Name	Address	Water Body
Maynooth Mission to China	Dalgan Park Navan	River Boyne (SAC)
Martin Naughton	Stackallen House, Slane, Co. Meath	River Boyne (SAC)
Boyne Valley Visitors Centre	Staleen, Donore, Co. Meath	River Boyne (SAC)
Balbradagh Developments	Robinstown Co Meath	River Boyne (SAC) (trib)
Peter & Ann Waters	Rathdrinagh Beauparc Navan Co Meath	River Boyne (SAC) (trib)
TSH Enterprises Ltd	Isaacstown Site, Rathmolyon, Co Meath	River Boyne (SAC) (trib)
M & M Construction	Cherryvalley, Rathmolyon, Co Meath	River Boyne (SAC) (trib)
Marsh Oil Products	Marsh Rd., Drogheda, Co. Louth	River Boyne (SAC)

### 2.2.3 Future In Combination Impacts

In order to determine future “In Combination Impacts” a letter requesting this information was sent to the Planning Department of Meath County Council in June 2009. A copy of this letter is included in **Appendix 3**. Further to discussion it is assumed that in the current economic climate it is unlikely that there will be industrial developments which will discharge directly to the River Boyne and Blackwater SAC.

### 2.2.4 Accounting for In Combination Impacts

The current discharges to the River Boyne and River Blackwater SAC from the Kells, Athboy, Dunshaughlin, Trim and Enfield-Johnstown Bridge WwTW were described in Section 2.2.1. These discharges have potential to impact on the SAC. In order to account for In Combination Impacts described above the Waste Assimilative Capacity of the River will be assessed at each discharge point in Section 3.5.

### 2.2.5 Description of River Boyne and River Blackwater SAC

The full site synopsis is appended in **Appendix 4**. The site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. The site is a candidate SAC selected for alkaline fen and alluvial woodlands, both habitats listed on Annex 1 of the E.U. Habitats Directive. The site is also selected for Atlantic Salmon, Otter and River Lamprey listed on Annex II of the same Directive.

## 2.3 Step 3: Characteristics of the Site

### Alkaline Fen (Habitat Code 7230)

Alkaline fens are peat-forming wetlands that receive mineral nutrients from sources other than precipitation. In Ireland, alkaline fens are fed by calcium-rich groundwater. They occur in a variety of situations. Some typical species of alkaline fens include black bog-rush (*Schoenus nigricans*), blunt-flowered rush (*Juncus subnodulosus*), devil's bit scabious (*Succisa pratensis*), hemp agrimony (*Eupatorium cannabinum*) and purple moor-grass (*Molinia caerulea*).

According to the site synopsis, the main areas of alkaline fen are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough. The hummocky nature of the terrain has led to speepages and springs which are rich in lime leading to the development of base rich marshes. Diversity of plant and animal life is high, and the flora in particular includes many rarities including Narrow-leaved Marsh Orchid (*Dactylorhiza traunsteineri*), Fen Bedstraw (*Galium uliginosum*), Cowbane (*Cicuta virosa*), Frogbit (*Hydrocharis morsus-ranae*) and Least Bur-reed (*Sparganium minimum*).

Like most peatland types in Ireland, fens have experienced a decline in quality, mostly as a result of activities such as peat mining, draining for cropland, infilling, and fertiliser pollution and eutrophication. Only limited measures have been introduced to address these damaging activities, which are likely to have increased in severity since the 1990's. The overall conservation status for alkaline fen habitat is bad.

**The alkaline fen habitats described in the site synopsis are located upstream of the discharges from all of the WwTW. Therefore no impacts are possible and this habitat is not considered further as part of this assessment.**

### Alluvial Forests (Alluvial Woodlands) (Habitat Code 91E0)

Alluvial Forests are typically woodlands of alder (*Alnus glutinosa*) and ash (*Fraxinus excelsior*), often with willows (*Salix* spp.) and sometimes oak (*Quercus robur*). This habitat occurs in areas subject to periodic flooding along rivers and on lake shores. A species-rich and often luxuriant flora is associated with these woodlands, including creeping bent (*Agrostis stolonifera*), remote sedge (*Carex remota*), meadow-sweet (*Filipendula ulmaria*), reed-grass (*Phalaris arundinacea*) and water mint (*Mentha aquatica*). They occur widely throughout the country usually as small and isolated stands with the most extensive areas in the south-west.

According to the site synopsis Wet woodland fringes many stretches of the Boyne. In particular, the Boyne River Islands are covered by dense Willow woodland and small areas of Alder Woodland. Water quality may affect the diversity of ground flora which grows in association with alluvial woodland.

**There is the potential for adverse impacts upon this habitat and this habitat is considered further as part of this assessment.**

### Otter

Otters use a wide variety of rivers, streams, estuaries and coastal reaches, occupying home ranges from a few kilometres to over forty kilometres in length, depending on population density, food availability and habitat quality. Otters use

a number of resting sites throughout their home ranges known as holts (covered sites such as cavities behind riparian ash or sycamore roots) and couches (uncovered sites such as above-ground cover amongst bramble or reeds). According to the SAC site synopsis otters are found throughout the site.

**There is the potential for adverse impacts upon this species and it is considered further as part of this assessment.**

#### **Atlantic Salmon**

Atlantic Salmon use the tributaries and headwaters of the River Boyne as spawning grounds. Atlantic Salmon run the Boyne almost every month of the year. The Boyne is most important as it represents an eastern river which holds large three-sea-winter fish from 20-30lb. These fish generally arrive in February with smaller spring fish (10lb) arriving in April/May. The grilse come in July, water permitting. The river gets a further run of fish in late August and this run would appear to last well after the fishing season.

**There is the potential for adverse impacts upon this species and it is considered further as part of this assessment.**

#### **River Lamprey (*Lampetra fluviatilis*) 1099**

There are three types of lamprey in Ireland, the river lamprey, the sea lamprey and the brook lamprey. The river lamprey grows to 30cm and has a similar life history to the sea lamprey. River Lamprey is present in the lower reaches of the Boyne River.

**There is the potential for adverse impacts upon this species and it is considered further as part of this assessment.**

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### 3. STAGE 2: APPROPRIATE ASSESSMENT

*In Stage 2 the impact of the discharges from the WwTW on the integrity of the River Boyne and River Blackwater SAC is considered with respect to the Conservation Objectives of the site. This involves acquiring adequate information on the plan or project, predicting the likely effects (direct, indirect, short and long term, isolated, interactive and cumulative) and their impacts on the conservation objectives and status of the European Site. Finally, mitigation measures need to be identified and assessed against the adverse effects the plan or project is likely to cause.*

#### 3.1 Conservation Objectives – Habitats

Information on the “plan or project” i.e. the WwTW has been provided in Stage 1. In relation to Conservation Objectives, the River Boyne and River Blackwater SAC does not have specific Conservation Objectives, and for the purposes of this assessment, the Conservation Objectives are assumed to be the maintenance of **Favourable Conservation Status**. Under the Habitats Regulations, Favourable Conservation Status for a natural habitat occurs when:

- Its natural range and areas it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;
- The conservation status of its typical species is favourable.

The habitats in the River Boyne and River Blackwater SAC that have a link to the Aquatic Environment downstream of the discharges from the WwTW in consideration are the areas of alluvial woodlands. A site visit to the River Boyne and River Blackwater SAC to confirm the presence of the various protected habitats and species was undertaken during June 2009. This is detailed in **Appendix 5**.

##### **Alluvial Woodlands**

Alluvial Woodlands/Alluvial Forests (91E0) are listed on Annex I of the EU Habitats Directive. As detailed within a report to the EU on the Status of EU Protected Habitats and Species in Ireland<sup>11</sup> the range of Alluvial Woodlands across Ireland is good, however the area, structure and function and future prospects are bad. The reason for the decline of alluvial forests is their fragmented nature, sub-optimal grazing regimes and drainage and abundance of alien invasive species and has little or no relation to discharges of wastewater.

#### 3.2 Conservation Objectives - Species

The River Boyne and River Blackwater SAC is designated for Atlantic Salmon, River Lamprey and Otter. The favourable conservation status for a species refers to:

<sup>11</sup> The Status of EU protected Habitats and Species in Ireland



- The population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations in a long-term basis.

### Otter

Water quality generally has an indirect effect on otters by influencing prey availability rather than directly affecting the otters themselves (except in cases of toxic pollution)<sup>12</sup>. In Ireland, the otter diet is largely of aquatic origin, with diet predominantly consisting of salmonids, frogs and eels in freshwater areas (Chanin, 2003).

Ireland has long been considered a stronghold for otter, and although recent national surveys have reported a decline in positive records, 70% of sites still showed evidence of use by otter in the 2004/5 National Survey<sup>13</sup>.

The Conservation Status of this species in Ireland was assessed as Poor overall, mainly attributable to the otter population being below the favourable reference population, however the situation is expected to improve with future prospects considered to be good<sup>14</sup>.

The following water quality impacts are cited in Chanin 2003, as being of relevance to otters:

Those having an indirect effect (mainly on food supply):

- Organic pollution from sewage treatment works, farms and the brewing, food and dairying Industries;
- Eutrophication<sup>15</sup> as a result of run-off from farms and sewage treatment works;
- Acidification mainly in the form of acid rain, and
- Acid mine waste.

Those with mainly direct effects:

- Oil spillage, mainly in coastal areas, and
- Radioactivity.

Those with effects as a result of bioaccumulation:

- Metals, particularly mercury, but also cadmium and lead, and
- Pesticides and PCBs.

Literature cited in Chanin 2003 (Mason, 1989<sup>16</sup>) concludes that PCBs have been the most important factor in limiting otter populations in Europe, while heavy

<sup>12</sup> Chanin P (2003) *Ecology of the European Otter*. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.

<sup>13</sup> Bailey, M & Rochford J (2006) Otter Survey of Ireland 2004/2005. Irish Wildlife Manuals No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

<sup>14</sup> The Status of EU protected habitats and species in Ireland

<sup>15</sup> Eutrophication is the term given to the enrichment of a waterbody with nutrients (in particular nitrogen and phosphorus) stimulating plant growth and leading to possible restrictions in use.

<sup>16</sup> Mason CF (1989). Water pollution and otter distribution: a review. *Lutra*, 32, 2, 97–131.



metals may have had local effects but were not responsible for declines on a wide scale.

### Salmon

The salmon population in Ireland has declined by 75% in recent decades and although salmon still occur in 148 Irish rivers only 43 of these have healthy populations<sup>17</sup>. There are numerous factors which impact negatively on salmon, the most important of which are reduced marine survival (probably as a result of climate change), poor river water quality (resulting from factors such as inadequate sewage treatment, agricultural enrichment, acidification, erosion and siltation), forestry-related pressures and over-fishing. Salmon have different habitat requirements according to life stage but all stages are dependant on very good water quality.

The current estimates suggest that less than 10% of the wild smolts that go to sea from Irish rivers are surviving. There are real concerns relating to factors causing mortality at sea; however there is insufficient information on all factors at this stage. There have been some recent positive developments: the drift net fishery for salmon was closed in 2007 and water quality in Irish rivers and lakes in general is improving. However, the overall conservation status of salmon is still considered bad.

### River Lamprey

Records of adult lampreys are sparse, with most fieldwork aimed at juveniles. Recent field surveys point to a widespread distribution of juvenile river/brook lamprey, throughout the country. They tend to be patchily distributed within catchments, but can occur in high densities (100/m<sup>2</sup>) where habitat and flow regimes are suitable<sup>18</sup>.

There is a lack of data in relation to the water quality requirements of lamprey though it is generally assumed that quality should correspond to Q4. As river lamprey migrate downstream to the sea to spawn it is critical that their migration route is free from barriers.

According to a Survey of Juvenile Lamprey Populations in the Boyne Catchment, undertaken in 2005, lampreys (both river/brook) were present at reasonable numbers at all sites and several age groups were present. Therefore the authors determined that the overall status is considered to be favourable.

The current status and future prospects of these species across Ireland appears to be good.

**As salmon and lamprey have high water quality requirements and will be in closer proximity to the WwTW discharge than the Annex 1 habitats of the River, the approach taken within this assessment is that measures which mitigate for any impact on salmon and lamprey will also mitigate for potential impacts to the Annex 1 habitats.**

<sup>17</sup> The status of EU protected Habitats and Species in Ireland

<sup>18</sup> The status of EU protected Habitats and Species in Ireland

### 3.3 Prediction of likely effects

Sewage discharges can potentially have several effects in receiving waters:

- Addition of toxic substances resulting in decline of species diversity and abundance
- Addition of suspended solids leading to clogging of gills and feeding mechanisms of filter feeders and decreased photosynthesis activity
- Addition of pathogens
- Deoxygenation due to inputs of readily oxidizable organic matter
- Nutrient (P and N) enrichment causing increased algal growth leading to eutrophication and a possible fall in dissolved oxygen levels

Potential adverse impacts relating to water quality for each of the designated features of the SAC is provided below in Table 2.

**Table 2 -Water Quality Impacts in Relation to cSAC Assessment Features**

Designated Features	Potential Impacts Due to WWTW
<b>Alluvial woodlands</b>	<p><b>Indirect</b> - Nutrient enrichment may result in effects upon site integrity, algal mats, knock on effects on invertebrates and wildfowl. Level of potential impacts is low. WAC will be checked to ensure assimilative capacity is available.</p> <p><b>Direct</b> - Toxicants, including organic substances and metals, may bioaccumulate further up the food chain (knock on effect on wildfowl for example). While this is considered unlikely it is included for completeness. Results of dangerous substances monitoring have been checked to ensure all limits are met.</p> <p><b>Short -term</b> – in catastrophic failure scenarios (e.g. failure of entire treatment works) there may be short term effects on the alluvial woodlands and species supported.</p> <p><b>Long-term</b> – Build up of nutrients and toxic substances over time. The WAC and dangerous substances monitoring will be checked.</p> <p><b>Isolated</b> – In catastrophic failure scenarios there may be associated isolated effects on the alluvial woodlands and species supported.</p> <p><b>Interactive</b> – The interactive effects of discharges on designated features is considered.</p>
<b>Salmon &amp; Lamprey</b>	<p><b>Indirect</b> – Nutrient enrichment may result in effects upon site integrity, algal mats, knock on effects on invertebrates and wildfowl.</p> <p><b>Direct</b> - Fish potentially impacted through eutrophication, reduced oxygen, toxic effects (esp. from ammonia) and changes to suspended sediments which may cause gill abrasion and bed smothering impacts. WAC will be checked to ensure assimilative capacity is available.</p> <p><b>Short -term</b> – in catastrophic failure scenarios (e.g. failure of entire treatment works) there may be short term detrimental effects on salmon and lamprey.</p> <p><b>Long-term</b> – Build up of nutrients and toxic substances over time. The WAC and dangerous substances monitoring have been checked.</p> <p><b>Isolated</b> – In catastrophic failure scenarios there may be associated isolated effects on salmon and lamprey.</p> <p><b>Interactive</b> – The interactive effects of discharges on designated features is considered</p>

Designated Features	Potential Impacts Due to WWTW
Otter	<p><b>Indirect</b> – Adverse effects on food resources (mainly fish). Fish potentially impacted through eutrophication, reduced oxygen, toxic effects (esp. from ammonia) and changes to suspended sediments which may cause gill abrasion and bed smothering impacts</p> <p><b>Direct</b> – Bioaccumulation of metals, particularly mercury, but also cadmium and lead. Toxic effects of pesticides and PCBs. While this is considered unlikely for the current scheme it is included for completeness. Results of dangerous substances monitoring have been checked to ensure all limits are met.</p> <p><b>Short –term</b> - in catastrophic failure scenarios (e.g. failure of entire treatment works) there may be short term effects on otter.</p> <p><b>Long-term</b> – Possible Bioaccumulation of metals. Toxic effects of pesticides and PCBs. While this is considered unlikely for the current scheme, included for completeness. Results of dangerous substances monitoring have been checked to ensure all limits are met.</p> <p><b>Isolated</b> In catastrophic failure scenarios there may be associated isolated effects on otter populations.</p> <p><b>Interactive</b> - The interactive effects of discharges on designated features is considered.</p>

### 3.4 Quality of Discharges

The Quality of discharges from each WwTW is fully detailed as part of the WwDL Applications. A brief summary is given here.

#### 3.4.1 Kells WwTW

Discharges from the WwTW in Kells have consistently met the requirements of the UWWTR between January 2008 and March 2009.

#### 3.4.2 Athboy and Rathcairn WwTW

Discharges from the existing WwTW in Athboy have consistently met the requirements of the UWWTR since September 2008. Though the Athboy River is not designated under the UWWTR as a Sensitive River, the discharges since September 2008 have also met the requirements for Phosphorus. The new WwTW facility will only further compliance with these Regulations.

#### 3.4.3 Dunshaughlin and Castletown Tara WwTW

Discharges from the Castletown Tara WwTW have consistently met the requirements of the UWWTR.

#### 3.4.4 Trim WwTW

Discharges from the WwTW in Trim meet the requirements of the UWWTR. Though the River Boyne is not designated under the UWWTR as a Sensitive River

at the point of discharges, the discharges have also met the requirements for Phosphorus.

### 3.4.5 Enfield WwTW

Monitoring data indicates that the primary discharge from the Enfield Agglomeration complies with the requirements of the UWWTR. The River Blackwater (Longwood) is not a designated sensitive area and therefore the WwTP is not required to comply with Total Phosphorus or Total Nitrogen limits.

The EPA WwDL very recently granted for Enfield contains the following discharge limits:

**Table 3 - Final Emission Limits - Enfield**

Parameter	Emission Limit Value
Temperature	25° C (max)
pH	6.0 – 9.0
	Mg/l
CBOD	20
COD	125
Suspended Solids	30
Ammonia	5
Total Phosphorous (as P)	1
Total Phosphorous (as P) with effect from 1/01/11	0.5

## 3.5 Existing River Water Quality

### Description of Water Quality Standards

The main channel of the River Boyne is designated as a **Salmonid Water** under the European Communities (Quality of Salmonid Waters) Regulations, 1998. A 6.5km section of the River Boyne, downstream of the sewage treatment works outfall at Blackcastle, Navan, Co. Meath, is designated as a **Sensitive Water** under the Urban Waste Water Treatment Regulations, 2001. A description of the water quality at each discharge location will now be given.

#### ENFIELD WwTW

The upstream and downstream (of the primary discharge) Biological Quality Ratings on the River Blackwater (Longwood) are both Q4 – good/unpolluted status. The WFD Risk Category is “**at risk of not achieving good status**”.

Waste Assimilative Capacity Calculations were presented as part of the WwDL application. The granted licence gives an overview of these calculations (as per Table 4) which are based on the current loading of 3,770 p.e. and projected loading of 4,400 p.e.

TABLE 4 – OVERVIEW OF WAC CALCULATIONS

PARAMETER	% AVAILABLE CAPACITY USED <sup>NOTE 3</sup>		BACKGROUND (MG/L) <sup>NOTE 4</sup>	PROPOSED ELVS FOR DISCHARGE FROM SW1 (mg/l)	CONTRIBUTION FROM PRIMARY DISCHARGE (mg/l)		PREDICATED DOWNSTREAM CONCENTRATION		WATER QUALITY STANDARDS (mg/l)
	2008	2015			2008	2015	2008	2015	
BOD	35.9	37.3	2.437	20	0.773	0.800	3.209	3.237	5 <sup>NOTE 1</sup>
Ortho-P	-8.3	-5.5	0.135	1	0.0048	0.0050	0.1398	0.140	0.030 <sup>NOTE 2</sup>
	-2.6	-2.7		0.5 <sup>NOTE 5</sup>	0.0020	0.0021	0.137	0.137	

NOTE 1: European Communities (Quality of Salmonid Waters) Regulations, 1998. The Blackwater (Longwood) is not a designated salmonid water

NOTE 2: Target Ortho-P value based on Q value measured in 1997

NOTE 3: % Available capacity is a negative number when there is no available assimilate capacity

NOTE 4: Based on upstream monitoring data from 6 months during 2008

NOTE 5: Lower Emission Limit of 0.5mg/l to apply from 1<sup>st</sup> of January 2011

NOTE 6: Based on proposed emission limit values. Note the River Blackwater (Longwood) is not a designated sensitive water and therefore is not required to comply with total P and N limits.

As can be seen from Table 4 there is currently no available assimilative capacity for Orthophosphate as the background concentration of 135µg/l (EPA data) is higher than the target value of 30µg/l. Measures to reduce the diffuse phosphorus sources are likely to reduce the background levels in the River. The available assimilative capacity used for Orthophosphate in Table 4 is based on a total phosphorus discharge concentration of 1 mg/l, which is the design limit of the WwTP. However, the design discharge concentration of 1 mg/l is not being achieved consistently. The average total phosphorus concentration in the effluent was 1.5mg/l for the first eight months of 2008<sup>19</sup>. **\*This data is based on EPA background concentrations of Orthophosphate. Upstream monitoring carried out by Meath County Council at site 07B020100 achieved an annual median MRP of 0.030mgP/l based on 7 sampling events between January and November 2008. This is a much lower figure than the 0.135mg/l figure used in the EPA calculations.**

As one of the conditions of the granted WwDL, Meath County Council will be required to optimise phosphorus reduction and the licence requires that total phosphorus be reduced from a design discharge concentration of 1mg/l to 0.5mg/l by 1<sup>st</sup> of January 2011. This will reduce the contribution made by the primary discharge on downstream orthophosphate concentration from 0.0048mg/l to 0.0020mg/l.

Up and downstream monitoring on the River Blackwater (Longwood) was carried out by Meath County Council during 2007 and 2008. The results indicate that Nitrite concentration is high downstream but the nitrite value is a guideline value only as the River Blackwater (Longwood) is not a salmonid river and has no particular designation.

There is significant dilution available in the River Blackwater (Longwood). The 95-percentile flow of the river is 0.24m<sup>3</sup>/s. The Dry Weather Flow to the WWTP is 0.01 15m<sup>3</sup>/s (at 2015 loading of 4,400 p.e.). The dilution factor in the River Blackwater (Longwood) is: 0.24 / 0.0115 = 21.

**The primary discharge was monitored for a range of dangerous substances. All dangerous substances were below specified standards.**

<sup>19</sup> Inspectors Report on a Waste Water Discharge Licence Application D0131-01

**KELLS WwTW**

The upstream and downstream Biological Quality Ratings on the River Blackwater are both Q 3-4 – Moderate Status. The WFD Risk Category is “at risk of not achieving good status”.

WAC Calculations were presented as part of the WwDL Application. A brief summary is given here. The WAC have been determined using a p.e. of 9,000 (the design p.e. for the plant is 8,000 but use of 9,000 allows for a degree of safety). Up and Downstream chemical data giving background concentrations is shown in Table 5 as presented in the EPA Report for Water Quality in Ireland 2001-2003.

**TABLE 5**

PARAMETER	CONCENTRATION	
	Upstream 1100	Downstream 1300
BOD	2.5	2.4
Ortho-Phosphate P	0.03	0.04
Ammonia N	0.03	0.05
Oxidised Nitrogen N	1.4	1.9

The dilution available in the Blackwater River is 43. This is based on a 95% flow of the river of 1.01m<sup>3</sup>/s. The Dry Weather Flow to the WWTP is 0.0234m<sup>3</sup>/s (at loading of 9,000p.e.). The dilution factor in the River Blackwater is: 1.01/ 0.0234 =43.

**BOD**

Assuming an effluent BOD of less than 25mg/l and using an allowable concentration of allowable BOD of 4mg/l (lower than prescribed in the Salmonid Regulations) the resultant loading to the river is less than the WAC calculated for the River and is therefore acceptable.

**Ortho-Phosphate P**

The existing WwTP at Kells does not include chemical dosing for phosphorus removal. Using the average effluent concentration of Ortho-Phosphate P of 3.1mg/l, the WwTP flowrate of 2025m<sup>3</sup>/day and allowable Ortho-Phosphate concentration of 0.03mg/l (Phosphorus Regulations), the effluent Ortho-Phosphate P is less than the WAC for the River and is therefore acceptable (Medium Upstream results for Ortho-Phosphate P are 0.03mg/l – the WAC uses an upstream value of 0.02mg/l as improvements to phosphorus control from agriculture are provided).

However, it should be noted that if such improvements to background levels are not made, the River has limited assimilative capacity for Ortho-Phosphate P. A possible solution would be to impose a final effluent phosphorous limit to ensure that levels are reduced below the average effluent concentration in 2008 of 3.1mg/l. This may have an impact on improving the river water quality but the effect may be somewhat limited as the increase in Ortho-phosphate P based on the WAC calculations is 0.01mg/l at the current effluent concentrations.

**Ammonia**

Using a maximum effluent Ammonia Concentration of 40mg/l, the WwTP flowrate of 2025m<sup>3</sup>/day and target level in the River of 0.5mg/l the effluent Ammonia is less than the WAC for the River and is therefore acceptable

**The primary discharge was monitored for a range of dangerous substances. All dangerous substances were below specified standards.**

#### **ATHBOY AND RATHCAIRN WwTW**

In 2003 the up and downstream Biological Quality Ratings on the Athboy River were both Q3 – poor status. In 2006 the up and downstream Biological Quality Ratings were Q4 good status and Q3 poor status.

The WFD Risk Category is “at risk of not achieving good status”.

The dilution available in the Athboy River is 11.3. This is based on a 95% flow of the river of 0.17m<sup>3</sup>/s. The Dry Weather Flow to the WwTP is 0.0151m<sup>3</sup>/s (at loading of 5,800p.e.). The dilution factor in Athboy River is:  $0.17 / 0.0151 = 11.3$ .

WAC calculations were presented as part of the WwDL Application. A brief summary is given here.

#### **BOD**

Using the design p.e. of the under construction WwTP (5,800), assuming an effluent BOD of less than 25mg/l and using a concentration of allowable BOD in the river of 4mg/l (lower than prescribed in the Salmonid Regulations) and a background concentration of 1mg/l the resultant loading to the river is less than the WAC calculated for the River and is therefore acceptable.

#### **Ortho-Phosphate P**

Using the design effluent Ortho-Phosphate concentration of 1mg/l, the WwTP flowrate of 1305m<sup>3</sup> day and allowable Ortho-Phosphate concentration of 0.03mg/l (Phosphorus Regulations), the effluent Ortho-Phosphate P is less than the WAC for the River and is therefore acceptable. It has been assumed that background concentration of Ortho-Phosphate P will be improved to achieve the 0.02mg/l rating. If improvements to background levels are not made, the River has limited assimilative capacity for Ortho-Phosphate P. Please note from Meath County Councils monitoring programme, the annual median MRP for year to June 2008 at the upstream station was 0.022mgP/L and 0.047mgP/l at the downstream station.

#### **Ammonia**

Using a maximum effluent Ammonia Concentration of 40mg/l, the WwTP flowrate of 1305m<sup>3</sup> day and target level in the River of 0.5mg/l the effluent Ammonia is less than the WAC for the River and is therefore acceptable.

**The primary discharge was monitored for a range of dangerous substances. All dangerous substances were below specified standards.**

#### **DUNSHAUGHLIN AND CASTLETOWN TARA WwTW**

The Biological Quality Rating upstream of the Primary Discharge from the WwTP on the River Boyne is Q3-4- Moderate Status. The downstream rating is also Q3-4 Moderate Status. The WFD Risk Category is “at risk of not achieving good status”.

The dilution available in the River Boyne is 88. This is based on a 95% flow of the river of 2.75m<sup>3</sup>/s. The Dry Weather Flow to the WwTP is 0.0313m<sup>3</sup>/s (at loading of 12,000p.e.). The dilution factor in the River Boyne is:  $2.75 / 0.0313 = 88$ .

WAC calculations were presented as part of the WwDL Application. A brief summary is given here.



### **BOD**

Using the design p.e. of 12,000, assuming an effluent BOD of less than 25mg/l and using a concentration of allowable BOD in the river of 4mg/l (lower than prescribed in the Salmonid Regulations) the resultant loading to the river is less than the WAC calculated for the River and is therefore acceptable. A background concentration of 1.6mg/l is used.

### **Ortho-Phosphate P**

Using the design effluent Ortho-Phosphate concentration of 1mg/l, the WwTP flowrate of 2,700m<sup>3</sup> day and allowable Ortho-Phosphate concentration of 0.03mg/l (Phosphorus Regulations), the effluent Ortho-Phosphate P is less than the WAC for the River and is therefore acceptable. The chemical analysis of the river up and down stream shows the existing median Ortho-Phosphate P levels to be 0.05mg/l and 0.03mg/l respectively. The high levels of Phosphorus along the River is likely to be due to diffuse sources such as Agriculture. It is assumed that background concentration of Ortho-Phosphate P will be improved to achieve a phosphorus level of 0.02mg/l.

However, it should be noted that if such improvements to background levels are not made, the River has limited assimilative capacity for Ortho-Phosphate P.

### **Ammonia**

Using a maximum effluent Ammonia Concentration of 40mg/l, the WwTP flowrate of 2,700m<sup>3</sup> day and target level in the River of 0.5mg/l the effluent Ammonia is less than the WAC for the River and is therefore acceptable. An upstream and downstream median level of ammonia of 0.03mg/l is found in both cases.

**The primary discharge was monitored for a range of dangerous substances. All dangerous substances were below specified standards.**

### **TRIM WwTW**

The upstream Biological Quality Rating on the River Boyne is Q3-4 (Station no. 1200 2003 ). The downstream rating is Q3-4 Moderate Status (Station no. 1400 2003). The WFD Risk Category is "at risk of not achieving good status".

The dilution available in the River Boyne is 96. This is based on a 95% flow of the river of 3m<sup>3</sup>/s. The Dry Weather Flow to the WWTP is 0.0313m<sup>3</sup>/s (at loading of 12,000p.e.). The dilution factor in the River Blackwater (Longwood) is: 3/ 0.0313 = 96.

WAC calculations were presented as part of the WwDL Application. A brief summary is given here.

### **BOD**

Using the design p.e. of 12,000, assuming an effluent BOD of less than 25mg/l and using a concentration of allowable BOD in the river of 4mg/l (lower than prescribed in the Salmonid Regulations) the resultant loading to the river is less than the WAC calculated for the River and is therefore acceptable. A background concentration of 1.4mg/l is used.

### **Ortho-Phosphate P**

Using the design effluent Ortho-Phosphate concentration of 2mg/l, the WwTP flowrate of 2,700m<sup>3</sup> day and allowable Ortho-Phosphate concentration of 0.05mg/l (Phosphorus Regulations), the effluent Ortho-Phosphate P is less than the WAC for the River and is therefore acceptable. The chemical analysis of the



river up and down stream shows the existing median Ortho-Phosphste p levels to be 0.04mg/l in both cases. The high levels of Phosphorus along the River is likely to be due to diffuse sources such as Agriculture. It is assumed that background concentration of Ortho-Phosphate P will be improved to achieve the 0.03 rating.

### **Ammonia**

Using a maximum effluent Ammonia Concentration of 40mg/l, the WwTP flowrate of 2,700m<sup>3</sup> day and target level in the River of 0.5mg/l the effluent Ammonia is less than the WAC for the River and is therefore acceptable. An upstream level of ammonia of 0.04mg/l is found.

**The primary discharge was monitored for a range of dangerous substances. All dangerous substances were below specified standards.**

## **3.6 Mitigation Measures**

A number of mitigation measures will put in place further to the issuing of the Wastewater Discharge Licences from the EPA. These will ensure that significant effects on the River Boyne and River Blackwater will not occur.

The mitigation measures to be implemented further to the granting of the WwDL for Enfield are:

- Compliance with Final Effluent Discharge Standards as detailed in Section 4 by the dates specified
- Annually assess the remaining organic and hydraulic treatment capacities within the WwTW
- Establish and maintain a programme for maintenance and operation of all plant and equipment
- Screening of effluent for organic compounds and metals
- Compliance with all conditions of the WwDL including the emergency procedures plan.

It is anticipated that similar mitigation measures will be put in place for each of the other WwTW.

The upgrade works currently underway in Kells and Athboy will provide further mitigation against significant impact on the River Boyne and River Blackwater SAC.

#### 4. CONCLUSION

The habitats for which the SAC is designated downstream of the discharges from the Kells, Athboy, Dunshaughlin, Trim and Enfield Johnstown Bridge WwTW (Alluvial Woodlands) are not particularly vulnerable to discharges of Wastewater.

The species for which the SAC is designated (Atlantic Salmon, River Lamprey and Otter) may be vulnerable to discharges of untreated Wastewater. However, it has been shown in Stage 1 and Stage 2 of this Assessment, the WAC Calculations and a review of the results of the Dangerous Substances Monitoring, that discharges from the WwTW do not cause adverse impacts on the integrity of the River Boyne and River Blackwater SAC. Once the upgrades to the Kells and Athboy WwTW are complete all overflows **will comply with the Procedures and Criteria for Storm Water Overflows published by the Dept. of the Environment, 1995.**

Stage 3 of the Appropriate Assessment process is only required when adverse impacts on the European Site are shown. Therefore, this Stage of the Assessment, (Consideration of Alternatives) has been omitted. Similarly, Stage 4 of the Appropriate Assessment, has also been omitted. This Stage allows for a plan or project to proceed with adverse impacts on the European Site provided there are imperative reasons of over-riding public interest such as human Health and Safety considerations or Environmental Benefits.

The mitigation measures anticipated to be put in place (further to granting of WwDL) and upgrade works currently underway will further ensure discharges do not affect the habitats and species of the SAC.

It can be concluded that the mitigation measures described above would remove the potential for the majority of activities associated with the WwTW to have a significant effect on the River Boyne and River Blackwater SAC. In relation to "In Combination Impacts" the Waste Assimilative Capacity of the River at the discharge point from each WwTW was shown to be acceptable. The background river water quality values used in these calculations will include emissions due to "In Combination Impacts".

There only remains an extremely small possibility of extreme/unforeseen events causing significant effects. However, by employing mitigation measures and enforcing the effluent standards as will be required by the WwDLs, it is considered that the risk of such events occurring has been reduced to the lowest possible level (negligible risk) and thus it can be fully concluded that the integrity of the River Boyne and River Blackwater SAC will not be adversely affected by discharges of Wastewater from the Kells, Athboy, Dunshaughlin, Trim and Enfield-Johnstown Bridge WwTW.

**APPENDIX 7**

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19 June 2009

Our Ref: 20285/cor/sh190609

National Parks and Wildlife Service  
7 Ely Place  
Dublin 2

**RE: APPROPRIATE ASSESSMENT REPORT (RIVER BOYNE & RIVER  
BLACKWATER SAC)**

**Scope of Appropriate Assessment**

Dear Sir/Madam,

Nicholas O'Dwyer Ltd. have been appointed by Meath County Council to inform an Appropriate Assessment Report addressing the impacts of the discharges from a number of Wastewater Treatment Works (WwTW) in Co. Meath on the River Boyne and River Blackwater SAC. The WwTW concerned are Kells, Athboy, Dunsaulhlin, Trim and Enfield-Johnstown Bridge. The report will be produced to support the Waste Water Discharge Licence applications for these aforementioned areas (EPA Application Register Numbers DO127-01, DO124-01, DO138-01, DO137-01 and DO131-01).

We propose to address the cumulative aspects of these discharges on the SAC in the one Appropriate Assessment Report. This "holistic" approach was deemed to be the best practice based on the principles of the Water Framework Directive and also following conversations with the EPA.

The Appropriate Assessment will follow the guidelines contained in the EPA Appropriate Assessment Note, European Guidelines and with regard to previous Appropriate Assessments which have been submitted for other WwTW licenced by the EPA. The report will briefly summarise the components and discharges from each WwTW. A description of the SAC, its qualifying features and conservation status will be addressed. In combination factors including discharges from sources other than the WwTW will also be detailed.

Nicholas O' Dwyer Ltd. would like to confirm this scope is agreeable with the NPWS and if there are any issues with regard to the River Boyne and River Blackwater SAC that are of particular concern.

- 2 -

In order that we can give due consideration to your comments we would request that we receive any comments by the **7th of July** at the latest. Should we receive no response from the NPWS we will assume that this scope is agreeable and proceed with the Appropriate Assessment which we expect to submit to the EPA by the end of July 2009.

Yours faithfully,

---

**Sinead Hanrahan, Project Engineer  
for NICHOLAS O'DWYER LTD.**

CC: - Mr Gerry Boyle, Meath County Council  
- Ms. Karen Creed, Environmental Protection Agency  
- Ms. Loretta Joyce, Environmental Protection Agency

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**APPENDIX 2**

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## Section 5

### Characterisation of the Boyne Catchment

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#### 5.1 Driving Forces and Pressures in the Boyne Catchment

The primary environmental driving force in the Boyne Catchment/HA07 is considered to be agricultural production. HA07 contains 2560 km<sup>2</sup> of agricultural land (95% of the total catchment). Pastures comprise 74% of the catchment, while 15% is used for arable land and crop cultivation, up to 5% for managed peatlands and up to 1% for managed forest. Other ERBD driving forces of population growth (residential and tourists), industrial production, transportation, and energy demand and consumption are also present but to a lesser degree (Final Initial Characterisation Report, 2004).

The agricultural production and the other driving forces cause a number of pressures to exert negative impacts on water bodies and the larger natural environment. Environmental pressures present in the Boyne Catchment (HA07) include:

- Diffuse sources
- Point sources
- Physical alterations
- Waste disposal
- Water abstraction and
- Recreation and tourism

##### 5.1.2 Point Sources

Thirty-six municipal wastewater treatment plants (MWWTPs) are located in the Boyne Catchment. The population equivalent (p.e.)-served range from 60 to 62,000, 24 have p.e. greater than 500. All discharge to surface waters, and all but two provide a minimum of secondary treatment. In the Boyne Catchment, there are a total of 80 industries that produce wastewater and are licensed under the following regimes:

- 36 Integrated Pollution Control (IPC) by EPA
- 23 Water Pollution Act (WPA) Section 4 (to water body) by Local Authority and
- 21 WPA Section 16 (to foul sewer) by Local Authority.

A wide range of industries is represented, with pig farms being one of the most common (12). There are also 25 active quarries or pits in the Boyne Catchment along with one mine, Tara Mines, located along the Yellow (Blackwater) Stream. **Figure 5.1a** presents the “municipal” point-source discharges in the Boyne Catchment, whilst **Figure 5.1b** shows the “industrial” point sources.

Figure 5.1a: Municipal Point Sources (HA07)

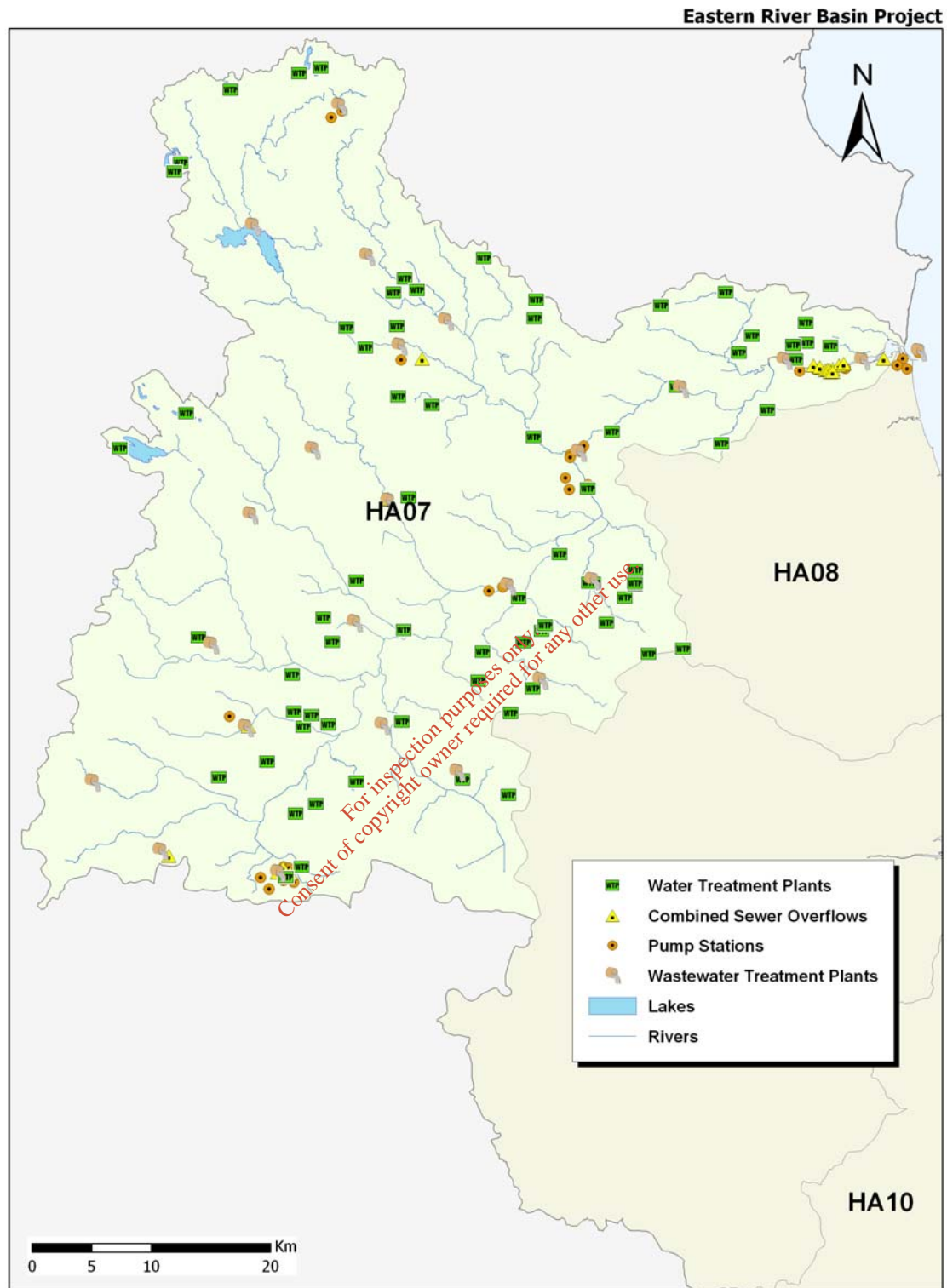
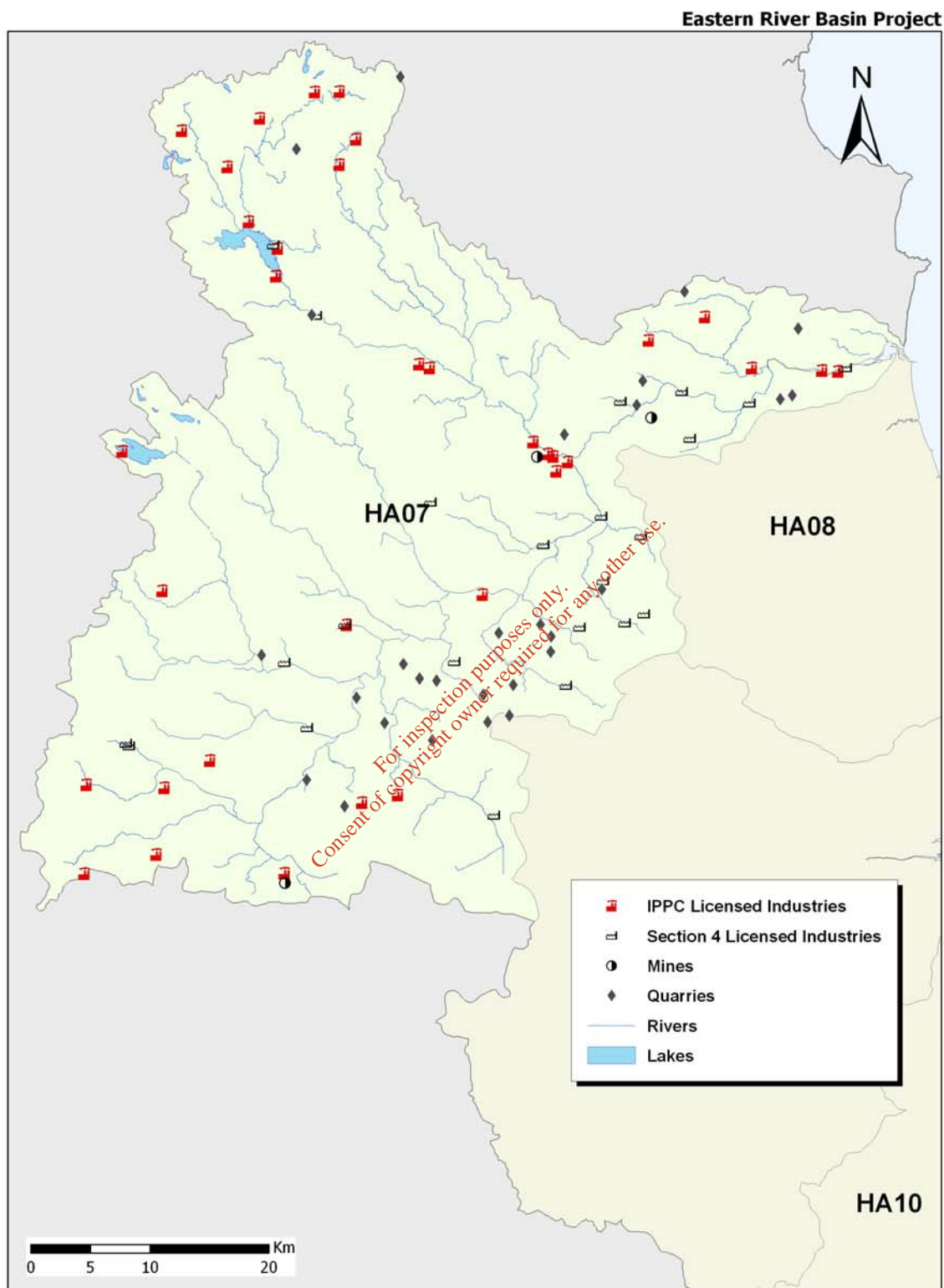




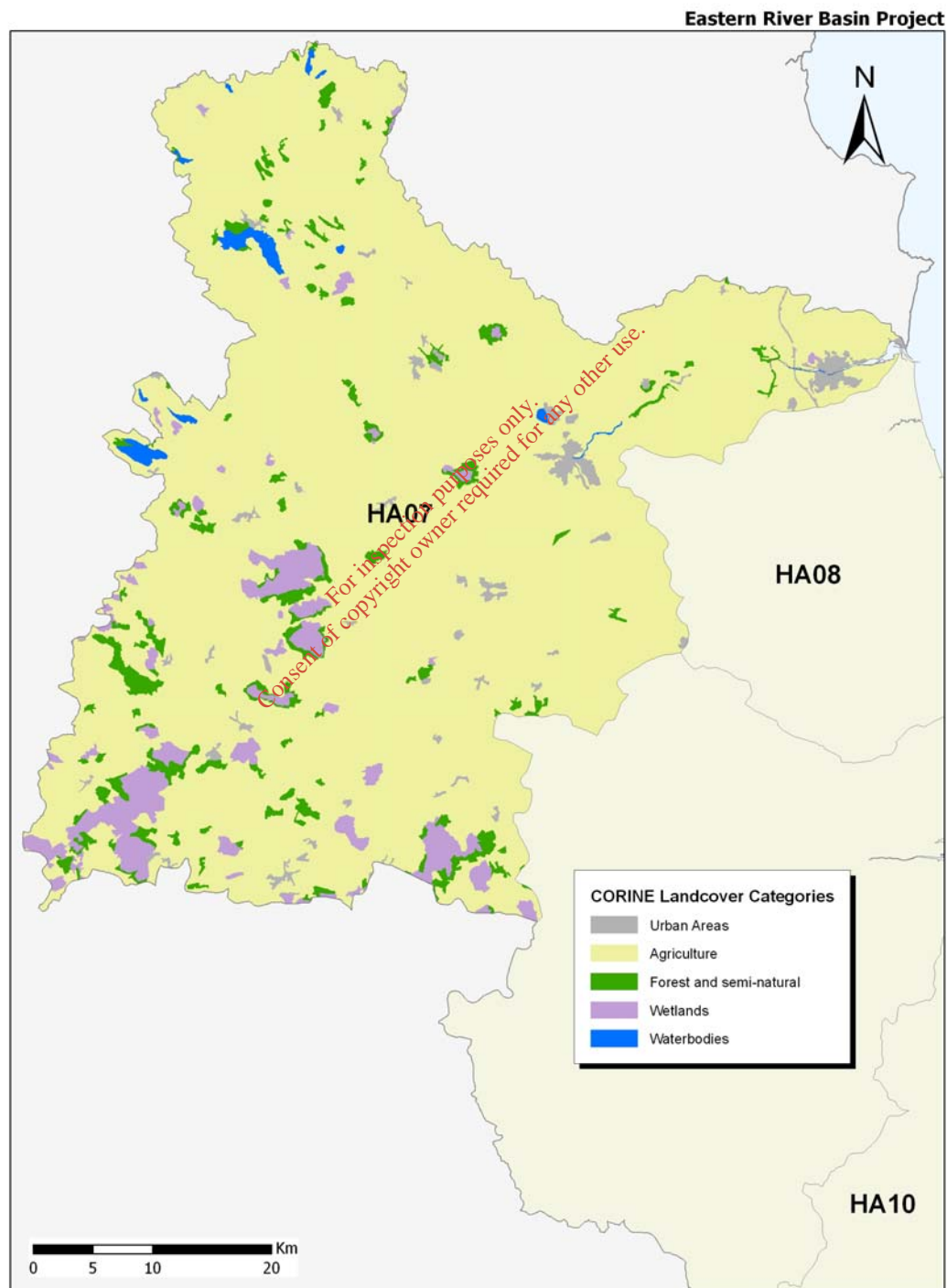
Figure 5.1b: Industrial Point Sources (HA07)



### 5.1.1 Diffuse Sources

Agricultural runoff has been identified as one of the primary environmental pressures in the Boyne Catchment due to the extensive presence of pastures, arable lands, and crop cultivation, as well as managed forests and peatlands. Runoff from these agricultural lands most likely includes elevated levels of nutrients, namely, nitrogen and phosphorus, suspended solids, and residues of pesticides and herbicides. **Figure 5.2** shows the main land use pressures in the Boyne catchment.

**Figure 5.2: Boyne Diffuse Sources (HA07)**



While over a third of the agricultural land in the ERBD is being farmed under REPS guidelines, exports rates for nutrients are estimated to be high or medium for the majority of the HA07.

The Boyne Catchment contains 12 urban centres of more than 2000 people, and associated facilities covering a total of 30 km<sup>2</sup> or 2% of the catchment. These urban areas are a source of urban stormwater runoff and pollutant loads. Combined sewer overflows occur in the town of Drogheda. Since a substantial portion of the population of the Boyne Catchment resides outside of urban areas, a number of unsewered areas or septic tanks are probably present and may exert diffuse pressures on surface and ground waters.

### 5.1.3 Physical Alterations

Approximately 656 km of stream channels in HA07 have been modified to prevent flooding and to allow agricultural fields and urban development. There is one dam within HA07 that controls flows. It is located at the headwaters of a small tributary and creates the Killineer Reservoir. The estuary of the River Boyne has been altered to provide both safe harbour for boats and flood control. There are also 17 mills, 14 sluices, 5 culverts and 87 weirs on the Boyne system.

### 5.1.4 Solid Waste Disposal

A total of 19 waste disposal sites exist on the Boyne catchment. There are 5 active municipal licensed landfills in the Boyne Catchment. There are an additional 14 known closed sites. The number of private licensed or unlicensed landfills is unknown.

### 5.1.5 Water Abstraction

In HA07, water is abstracted at 15 surface water locations and at least 118 public and private groundwater locations. The largest facilities are concentrated near the towns of Drogheda, Trim, and Navan. The surface abstractions total 66,300 m<sup>3</sup>/day, whilst the ground water abstracted volume is just over 23,000 m<sup>3</sup>/day. These facilities are estimated to utilise less than 1% of the available water resources.

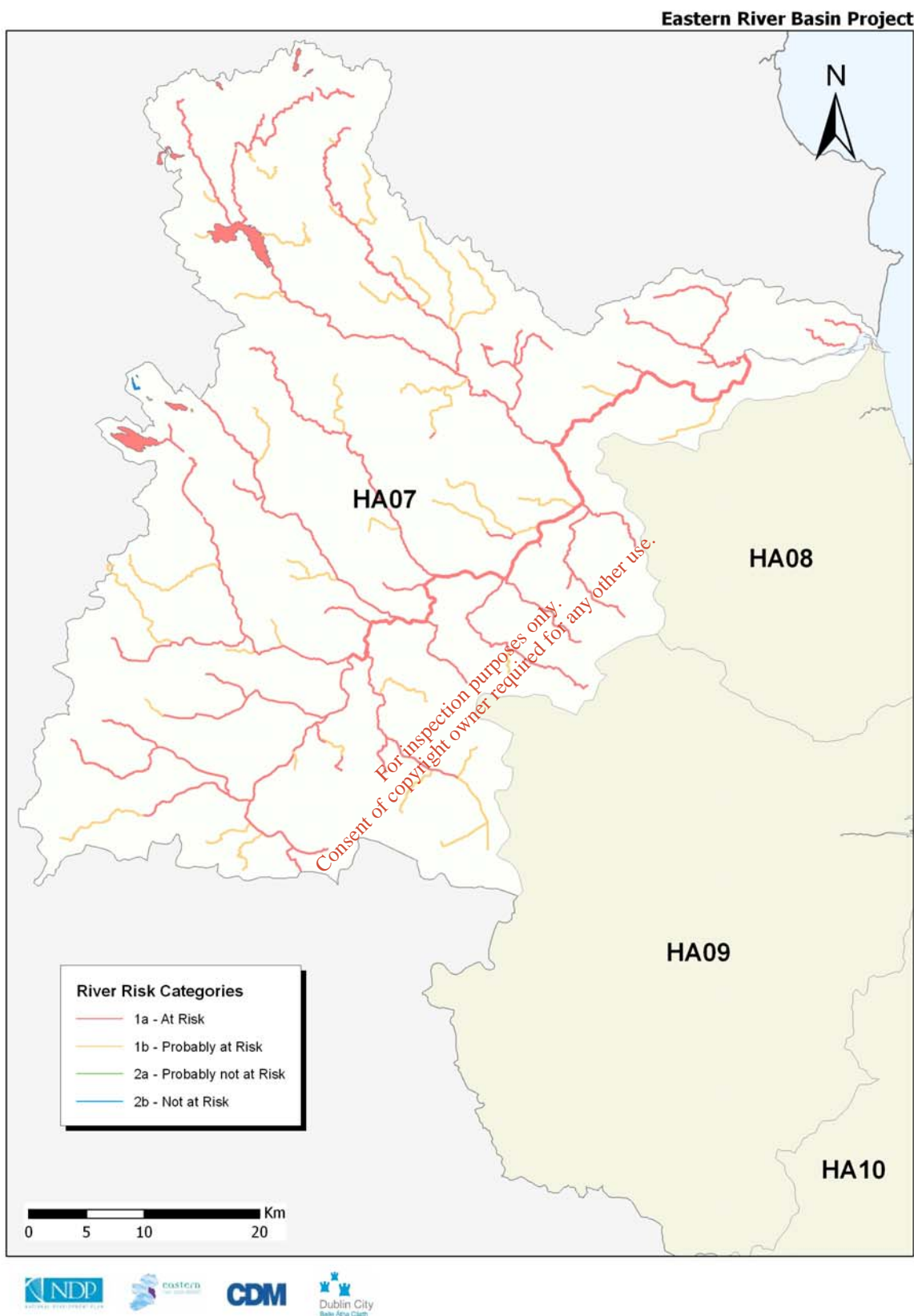
### 5.1.6 Tourism

Major tourist destinations located in the Boyne Catchment include Newgrange, the Trim Castle, and the Hill of Tara. Large numbers of tourists visit these sites but typically spend less than a day in the catchment.

## 5.2 Groundwater Evaluation

See Section 9.

Figure 5.3: Overall Risk Rivers (HA07)



## 5.3 River Evaluation - Boyne Catchment

### 5.3.1 River Water Bodies in the Boyne Catchment

The Boyne Catchment has 772 km of stream channels of various orders as previously shown in **Section 3, Table 3.2**. A total of 119 river water bodies have been identified in the Boyne Catchment. These water bodies are shown in **Figure 5.3** and are listed in **Table A.3 of Appendix A**. The most common typology categories, defined in **Section 4.3.2**, are Type 31 (66%), Type 32 (12%) and Type 11 (11%), as shown in **Figure 5.4**.

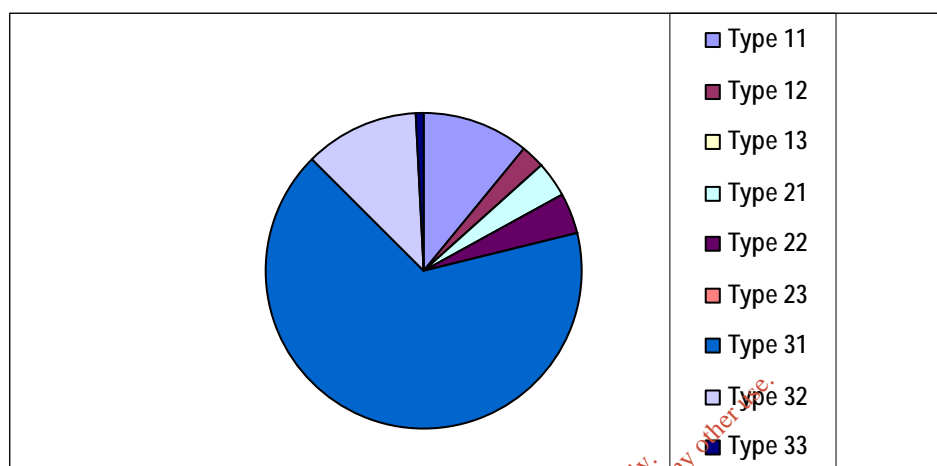


Figure 5.4: River Typologies (Num)

Water quality monitoring and biological monitoring at over 100 stations indicate that about 30% of the river water bodies are “unpolluted” (Class A) and 1% are considered “seriously polluted” (Class D). However, 42% of the monitored channels are considered “slightly polluted” (Class B) (*ERBD Initial Characterisation Report, 2004*).

In general, the lengths of “unpolluted” (Class A) and “moderately polluted” (Class C) channels have declined, while a slight increase in the “slightly polluted” channels has occurred. Impacted river channels were typically located in areas with pastures, arable land, and peat bogs, and/or downstream of MWWTPs.

### 5.3.2 Risk Assessment of River Water Bodies in the Boyne Catchment

Results of the risk assessment are summarised in **Table 5.1**. None of the river lengths are classified as “Not At Risk”, or “Probably Not At Risk”, i.e. 2a or 2b. Of the 1a and 1b water bodies, 71% are classed as being “At Risk” while 29% of them are classified as “Probably At Risk”. Each water body identified on the map in **Figure 5.3** has been colour coded to indicate the level of risk. Detailed results for individual water bodies are presented in **Table A.3 of Appendix A**. Results are also presented on a county basis in Appendices E – O.

Table 5.1: Summary of Risk Assessment for River Water Bodies in HA07

Risk Category	Assessment Categories (number of water bodies)				Overall	River Length	% of Length
	Morpho-logical	Hydrology	Diffuse	Point Source			
Not at risk (2b)	18	105	1	57	0	0	0
Probably not at risk (2a)	2	0	5	38	0	0	0
Probably at risk (1b)	97	5	85	16	52	225.6	29%
At risk (1a)	2	9	28	8	77	546.3	71%
TOTAL	119	119	119	119	119	771.9	100%



Figure 5.5: Morphological Risk (HA07)

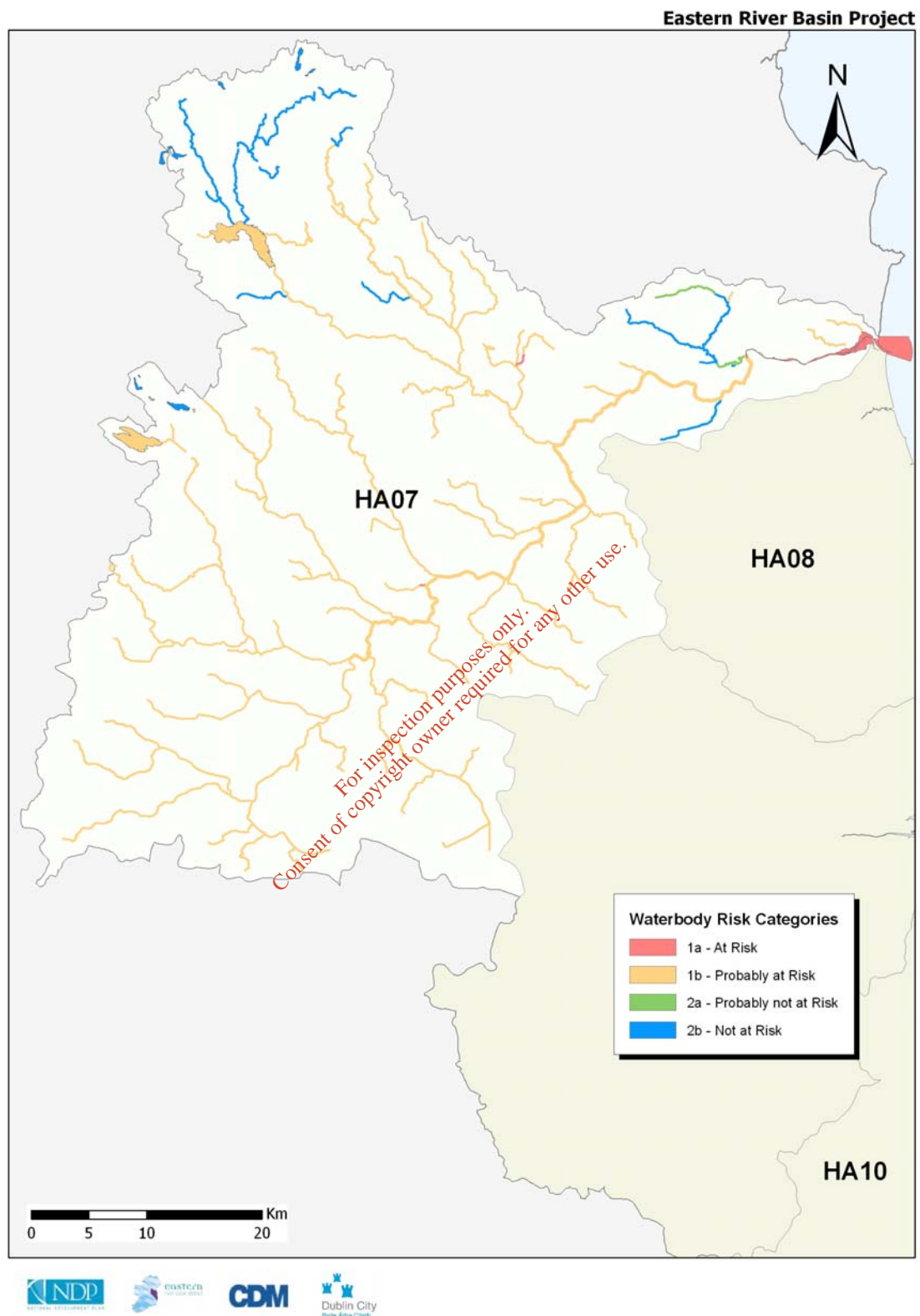
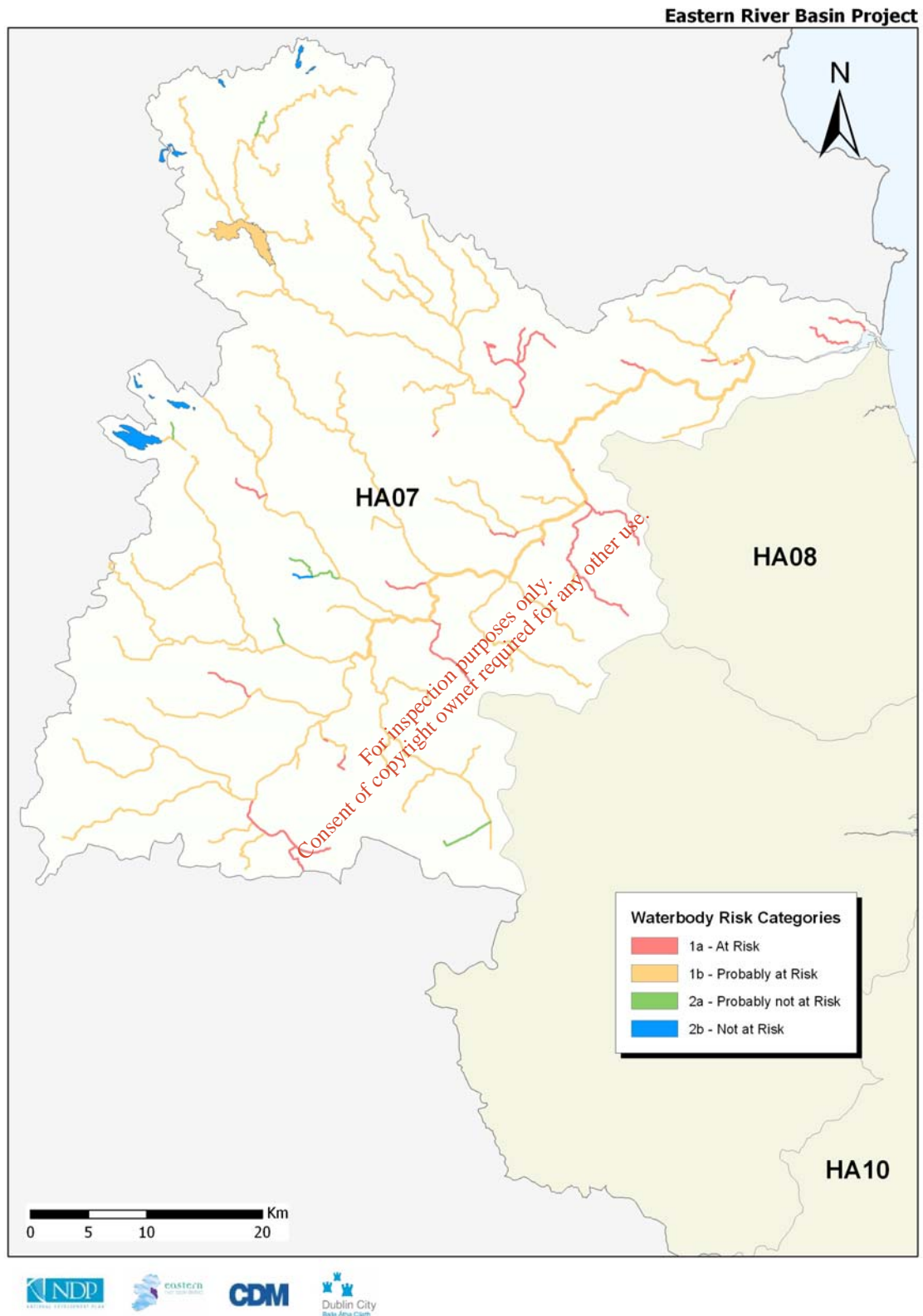


Figure 5.6: Diffuse Risk (HA07)



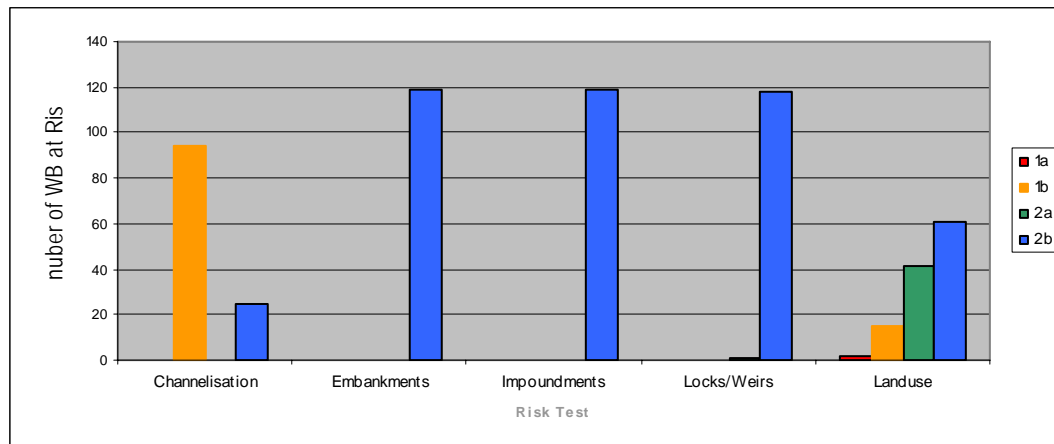


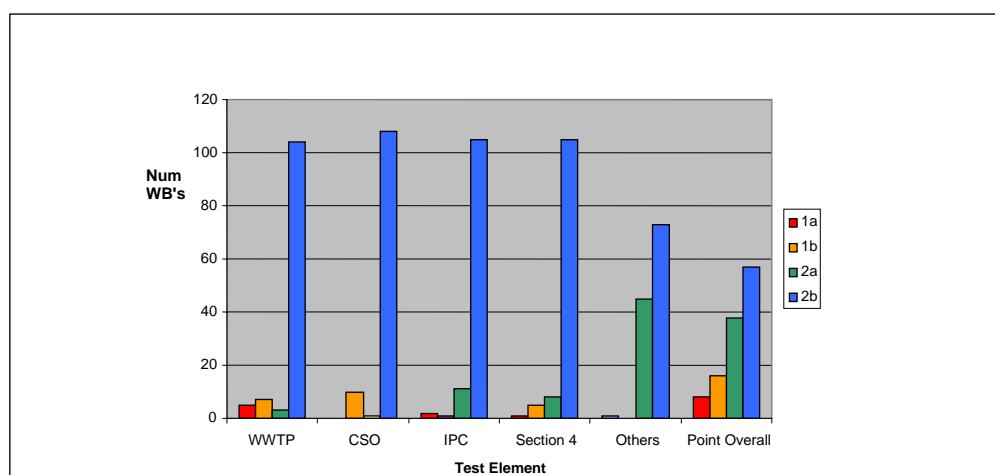
Figure 5.7: Morphological Risk – HA07

The causes of the high number of “At Risk” water bodies in the Boyne catchments are due to 2 main pressure areas, Diffuse Pollution and Morphological Pressures. Morphological pressures account for more than 83% of water bodies falling into the 2 “At Risk” categories. **Figure 5.7** shows the breakdown of water bodies at risk in the 5 morphological elements. It can be seen that the highest incidence of risk comes from channelisation, and to a lesser degree, intensive land use. The Boyne catchment has been extensively drained, particularly in the 1970s and 1980s as a means to improve and expand farm land. This causes large areas of the Boyne to be classified as probably at risk, although it is difficult at this stage to fully assess the ecological effect of these drainage works with respect to the standard of “good ecological status”. **Figure 5.5** shows the morphological risk status in a map format.

The most significant sub-elements for the diffuse pollution risk tests are those for general diffuse pollution. Here, known ecological parameters were regressed against a wide range of land uses and activities. It was found that grassland, urban fabric and arable land have the most effect on ecological quality, represented by Q-value. In the Boyne catchment, 24% of water bodies are classed as “At Risk” from one or more of these pressures, with a further 71% of water bodies classed as “Probably At Risk” (**Figure 5.6**). The unsewered areas have been identified as another pressure putting water bodies into the 2a category. A significant number of clusters or agglomerations of dwellings that do not appear to be served by a foul sewer system. Were identified in HA07. These areas warrant further investigation as they have the potential to cause pollution, particularly in areas where drainage is poor, such as on heavy clay soils. Many of these 2a water bodies are on the Blackwater Kells and Blackwater Longwood sub-catchments.

**Figure 5.8** shows the effect of point sources. They are not as significant as morphology and diffuse sources in terms of risk, with a total of 8 water bodies classed as 1a and 16 as 1b risk classes. This gives a total of 24 river water bodies with some level of risk, which translates to 20% of river water bodies in the Boyne catchment (**Figure 5.9**).

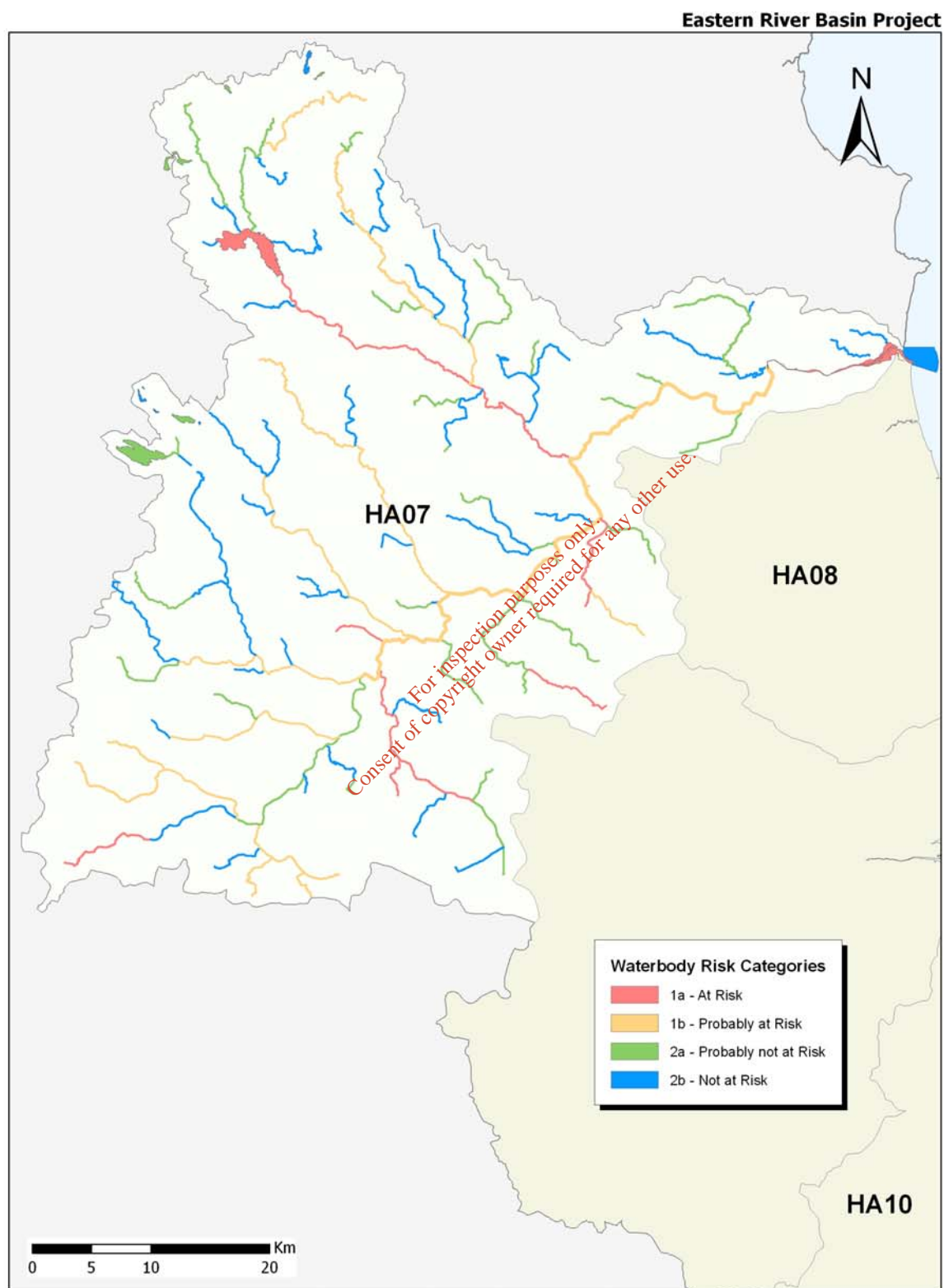
Figure 5.8: Point Sources – HA07





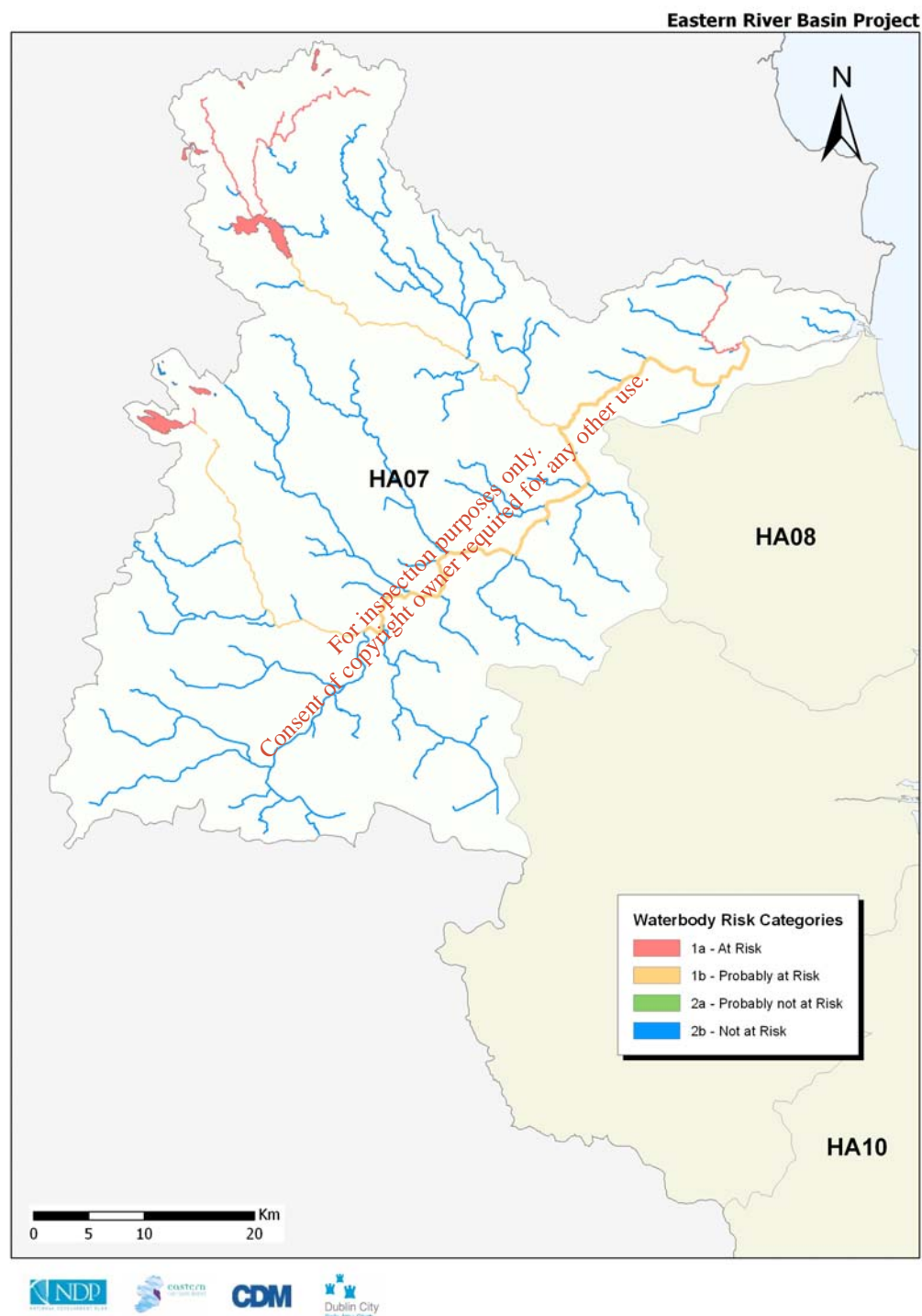
The most significant point sources are WWTPs and CSOs, however some risk is also associated with Section 4 trade effluents and IPC authorisations.

Figure 5.9: Point Source Risk (HA07)



Nine river bodies were characterised "At Risk" and a further 5 "Probably At Risk" from hydrological pressures. i.e. abstraction (Figure 5.10). This considers the volume abstracted from the river against the recharge from rain on the catchment. Over abstraction not only can cause direct ecological effects from reducing flow, drying out of spawning gravels and loss of in river habitat, but also indirect effects caused by lack of attenuation for downstream discharges.

Figure 5.10: Hydrological Risk (HA07)



## 5.4 Lake Evaluation in the Boyne Catchment

### 5.4.1 Lake Water Bodies in the Boyne Catchment

The Boyne Catchment contains 74 natural lakes, of which 13 have surface areas that exceed 10 ha (*ERBD Final Initial Characterisation Report*, 2004). Five lakes exceed the Water Framework Directive size qualification of 50 ha. They include Lough Ramor, Loughs Nadreegeel 1 and 2, Lough Skeagh, Lough Lene, and Lough Bane.

In addition, a further 6 lakes have been identified as reportable, either because they exceed abstraction thresholds or because they lie in SACs of particular sensitivity with regard to lakes. The 6 lakes are Loughs Annagh (SAC), Acurry (Abstraction), Drumkeery (Abstraction), Ben (SAC), Glass (SAC) and Doo (SAC). These 11 WFD lakes are located in the upper reaches of the Blackwater and Deel tributaries and are identified on the map in **Figure 5.13**.

WFD lakes of the Blackwater tributary (Lough Ramor, Loughs Nadreegeel 1 and 2, and Lough Skeagh) exhibit clear signs of deterioration of water quality as cited by the EPA (2001a). A number of smaller lakes lying in the Blackwater catchment have less than satisfactory water quality conditions as well. WFD lakes of the Deel tributary (Lough Lene, and Lough Bane) are relatively free of pollution with acceptable trophic status (*ERBD Final Initial Characterisation Report*, 2004).

### 5.4.2 Risk Assessment of Lake Water Bodies in the Boyne Catchment

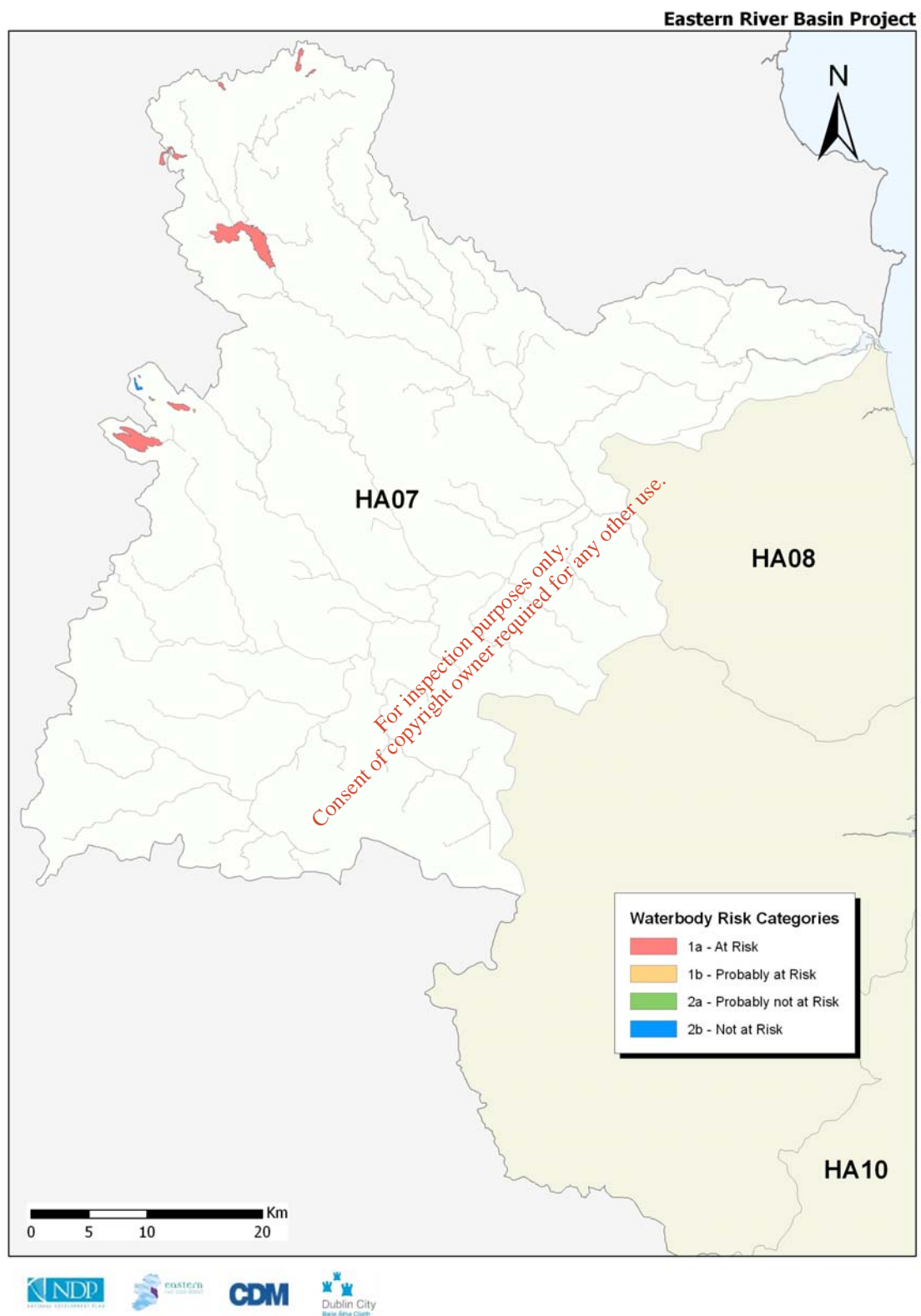
Results of the risk assessment performed on the WFD and reportable, lakes located in the Boyne Catchment are summarised in **Table 5.2**. Of the 11 WFD lakes, 2 are classified as "Not At Risk," and these only represent 2% of the total surface area. The remaining 9 lakes, representing 98% of the surface area, are classified as "At Risk" (97%) or "Probably At Risk" (1%). Each WFD lake water body identified on the map in **Figure 5.11** has been colour coded to indicate the level of risk. Detailed results of the assessments for individual water bodies are presented in **Table A.4** of **Appendix A**. Results are also presented on a county basis in **Appendices E-O**.

**Table 5.2: Summary of Risk Assessment for WFD Lake Water Bodies in HA07**

Risk Category	Assessment Categories (number of water bodies)				Overall	Lake Area (ha)	% of area
	Morpho-logical	Hydrology	Diffuse	Point Source			
<i>Not at risk (2b)</i>	7	4	10	5	2	28	2
<i>Probably not at risk (2a)</i>	0	0	0	5	0	0	0
<i>Probably at risk (1b)</i>	0	0	0	0	2	10	1
<i>At risk (1a)</i>	4	7	1	1	7	1382	97
<b>TOTAL</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>1420</b>	<b>100</b>

As can be seen, hydrological and morphological pressures have the greatest effect on the lakes that are in the 1a and 1b categories. Channelisation of the inflowing stream is the most significant morphological pressure whilst abstraction is the most significant pressure.

Figure 5.11: Overall Risk Lakes (HA07)



Diffuse pollution of lakes is assessed by considering the risk status on their contributing catchment draining to the lakes. As many of the Boyne lakes are relatively high on their catchments, risk of diffuse pollution is less than lower in the catchments. In terms of point sources, only WWTPs and Section 4s are significant enough to exert an impact of the risk status of just 2 lakes.

## 5.5 Transitional Waters Evaluation in the Boyne Catchment

### 5.5.1 Transitional Water Bodies in the Boyne Catchment

The one transitional water body in the Boyne Catchment, as determined by the EPA from their draft typology (EPA, 2003d), is the Boyne Estuary. Its location is shown in **Figure 5.12**. The estuary is approximately 14 km in length from the limit of tidal influence above Drogheda to the sea at Mornington, and covers 3.2 km<sup>2</sup>. The estuary flushes relatively quickly with a full exchange occurring between one and three days (Marine Institute, 1999).

The Boyne Estuary has mixed levels of quality. Nutrient concentrations in the estuary have been measured on numerous occasions and have remained above those considered to be limiting (NORSAP, 1992; Marine Institute, 2002). The primary sources appear to be nutrients from MWWTPs and diffuse sources located further upstream in the catchment. However, the high rate of flushing minimises negative impacts such as high algae levels or low dissolved oxygen levels.

Benthic studies indicate that the fauna is in a relatively unperturbed state (Wilson & Elkaim, 1991). Concentrations of hazardous substances have not exceeded the Environmental Quality standards, except for levels of arsenic and zinc detected in the sediments. No site-specific water quality data are available for County Louth beaches located in the Boyne Estuary. The water quality at bathing areas within the ERBD is typically within the national and European water quality standards. Bacteria contamination does occur on occasion.

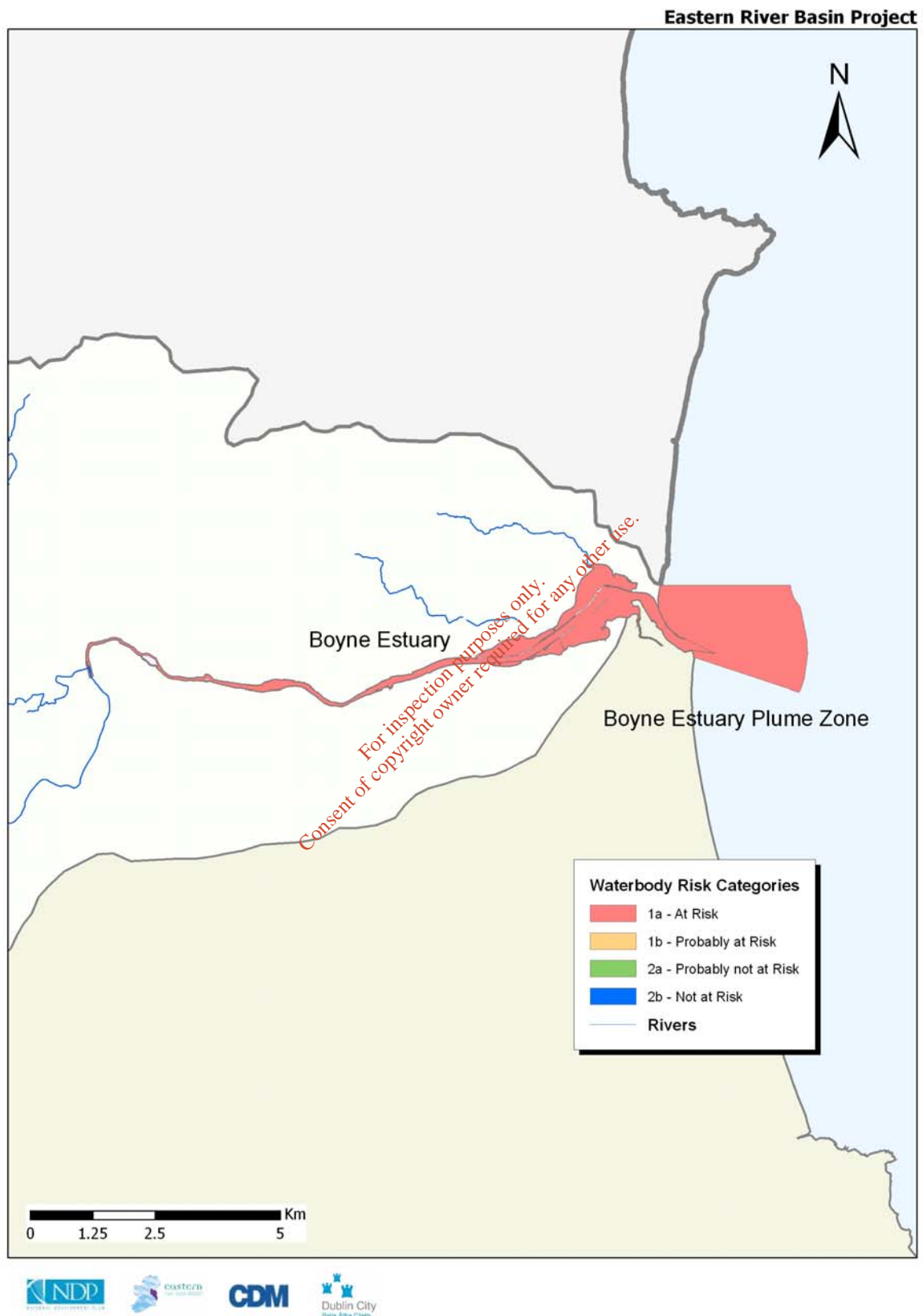
Water quality improvements in the Boyne estuary were recorded after a number of direct industrial discharges to the estuary were removed during the late 1970s and early 1980s. With the introduction of secondary treatment at the Drogheda MWWTP, further improvements in water quality in the vicinity of the town are expected (*ERBD Final Initial Characterisation Report*, 2004).

### 5.5.2 Risk Assessment of Transitional Water Bodies in the Boyne Catchment

The Boyne Estuary is considered "At Risk (1a)" of failing the WFD for transitional water bodies, based on the degree of intensive shoreline land use. Detailed results are presented in **Table A.3** of **Appendix A**. The estuary in **Figure 5.12** has been colour coded to indicate this level of risk. The detailed results are also presented for Counties Meath and Louth in the Appendices. The primary pressure that affects the Boyne Estuary is substantial structural modifications associated with harbour facilities in the town of Drogheda.

The estuary also rates as 1b from point source pressures. Of these pressures, the most significant are identified as WWTPs and CSO's, reflecting the urban pressures from Drogheda. The marine direct impact (MDI) score was also 1b, based on OSPAR calculations; no score was assessed for Dangerous Substances or UWWT sensitivity.

Figure 5.12: Marine Waters Evaluation (HA07)





## 5.6 Coastal Waters Evaluation in the Boyne Catchment

### 5.6.1 Coastal Water Bodies in the Boyne Catchment

The ocean coastal water body of the Boyne Catchment, according to the draft EPA typology (EPA, 2003d), is the Boyne Estuary Plume Zone. It is characterised as an “open” sub-type. The location of Boyne Estuary Plume Zone is shown in **Figure 5.12**. This coastal zone covers 4.6 km<sup>2</sup>.

Very little data are available to evaluate the state of coastal water bodies of the ERBD, and, in particular, the Boyne Estuary Plume Zone.

Available data from studies of the Irish Sea and a proposed new sewage sludge disposal site off Bray Head indicate the coastal zones along the ERBD, including the Boyne Estuary Plume Zone, are of an acceptable quality in terms of water, sediment, and the benthic environment (*ERBD Final Initial Characterisation Report, 2004*).

The Boyne River is one of two substantial sources of pollution to the Boyne Estuary Plume Zone, the second being oceanic contributions through St George's Channel. No negative impacts from these loads have been identified.

### 5.6.2 Risk Assessment of Coastal Water Bodies in the Boyne Catchment

The Boyne Estuary Plume Zone was assessed as being 1a “At Risk” based on the port tonnage (morphology test CM4A) score of 1a. The amount of traffic using Drogheda Port was the primary pressure. This coastal water body also scored 1b on the MDI test, similarly to the adjoining transitional water. The coastal water body scored 2b for all of the other applicable tests, as indicated in the appendix.

## 5.7 Heavily Modified Water Bodies (HMWBs) Evaluation in the Boyne Catchment

### 5.7.1 Heavily Modified Water Bodies in the Boyne Catchment

No HMWBs were identified in the Boyne Catchment.

### 5.7.2 Risk Assessment of Heavily Modified Water bodies in the Boyne Catchment

No HMWBs were identified in the Boyne Catchment.

## 5.8 Artificial Water Bodies Evaluation in the Boyne Catchment

### 5.8.1 Artificial Water Bodies in the Boyne Catchment

The Boyne Catchment contains 10 artificial ponds, lakes, and reservoirs that range in surface area from 2.7 ha to 160 ha. Their uses include water supply (5), settling ponds (2), storage of mine tailings, and unknown (2). However, a limited number of water bodies were submitted for the purposes of EU reporting. These artificial water bodies are located on the map in **Figure 5.13**.

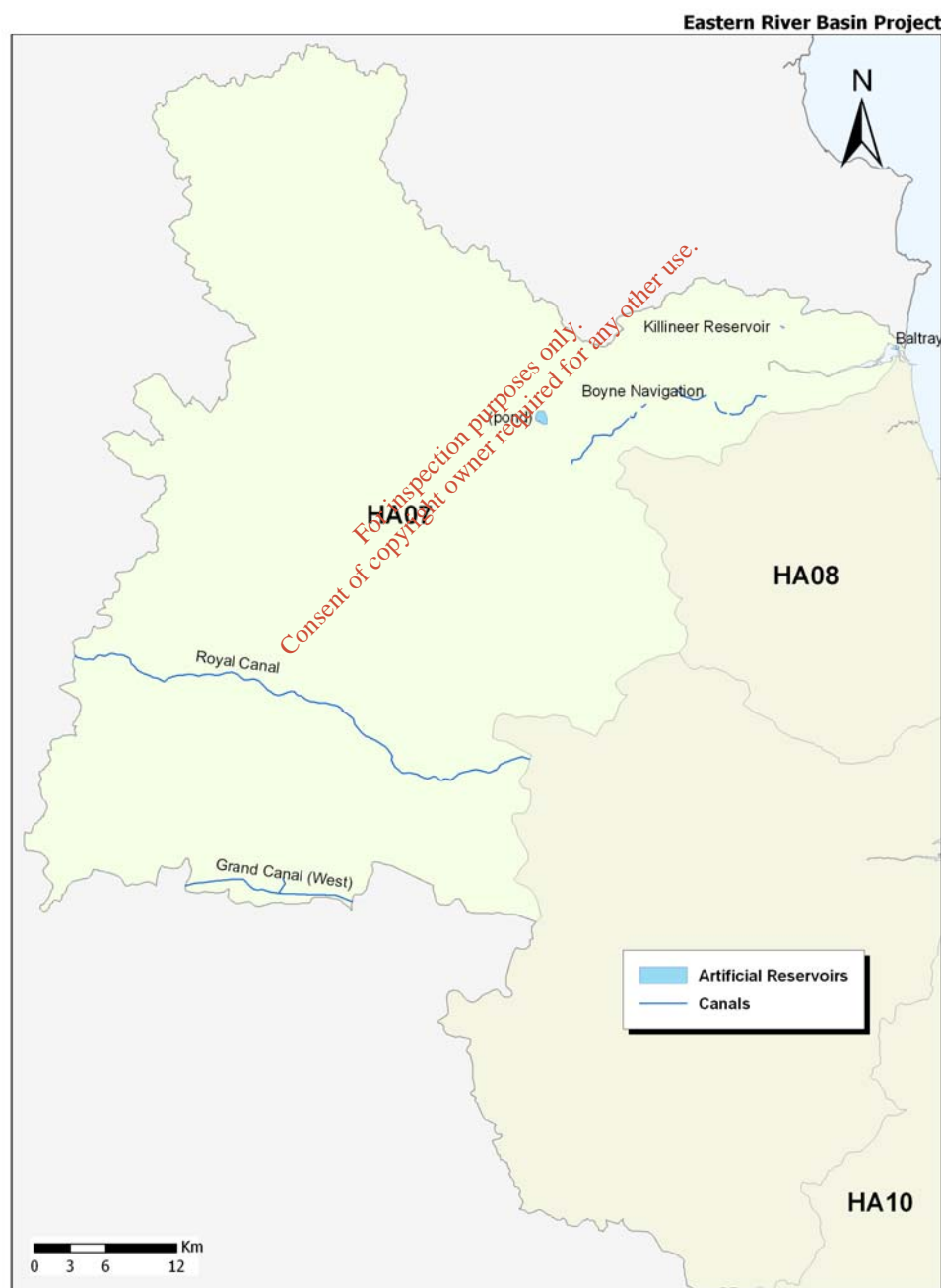
A portion of both the Grand Canal and Royal Canal are located in the south-west portion of the Boyne Catchment as shown in **Figure 5.13**. Nutrient concentrations in the canals are reported to be relatively low for artificial water bodies based on annual monitoring performed at various locations. The canals exhibit signs of being moderately impacted from nutrients with trophic status ranging between mesotrophic and eutrophic (Caffrey *et al.*, 1998). In addition, the Boyne catchment contains a historic canal, the Boyne Navigation.

This waterway was constructed in 1748 to portage the worse rapids on the Boyne and allow barges to access from Drogheda and as far inland as Navan, a distance of approximately 19 miles. The Boyne Navigation is now the property of An Taisce.

### 5.8.2 Risk Assessment of Artificial Water Bodies in the Boyne Catchment

At this stage of the WFD process only the potential AWBs are required to be identified. Many of them do not yet have formal risk assessments. For example, a procedure for assessing risk in the canals has not been developed. Only one artificial lake or reservoir exceeds the Water Framework Directive size qualification of 50 ha, the Randalstown mine tailings facility associated with the Tara Mines. Since this artificial lake operates only for industrial waste treatment, a risk assessment under the WFD is not required.

Figure 5.13: Artificial Water Bodies (HA07)





## 5.9 Water Dependent habitats in the Boyne Catchment

*The risk assessment has not been developed for water dependent habitats.*

## 5.10 Protected Areas in the Boyne Catchment

The WFD requires that a Register of Protected Areas be established for the purposes of Characterisation. Risk assessment has not been developed for protected areas. The areas that require re-designating are areas concerned with:

- Abstraction of water intended for human consumption
- Protection of economically significant aquatic species (fish, shellfish)
- Recreational bathing waters
- Nutrient Sensitive Areas
- Protection of species (including birds)

In the Boyne Catchment, a total of 64 water bodies fall within the register of protected areas. They consist of 43 river water bodies, 11 lake water bodies, 7 groundwater bodies, and 1 each of coastal and transitional water bodies. Some water bodies are covered by more than 1 designation. For example, Castlepollard High Lake is an SAC, as well as a drinking water source. The designated Protected Areas are listed in **Tables 3.5** and **3.6**, with the relevant water bodies listed in **Appendix A-7**.

### Abstraction

A total of 17 water bodies have been designated as protected areas for abstraction. These are listed in **Appendix A-7**. These include 7 ground water bodies, 6 lakes and 4 rivers. Of these, 9 were "At Risk", 4 "Probably At Risk" and 4 "Probably Not At Risk".

### Significant Aquatic Species

No shellfish designated waters exist in ERBD, so the main designation that is applicable is salmonid waters. A total of 4 water bodies have been designated as protected areas on this basis. These are located on the Boyne main channel and consist of three river water bodies plus the transitional water body. All were "At Risk".

### Bathing Waters

A total of one water body has been designated as a protected area for bathing water. This is Castlepollard High Lake. This is considered to be "At Risk".

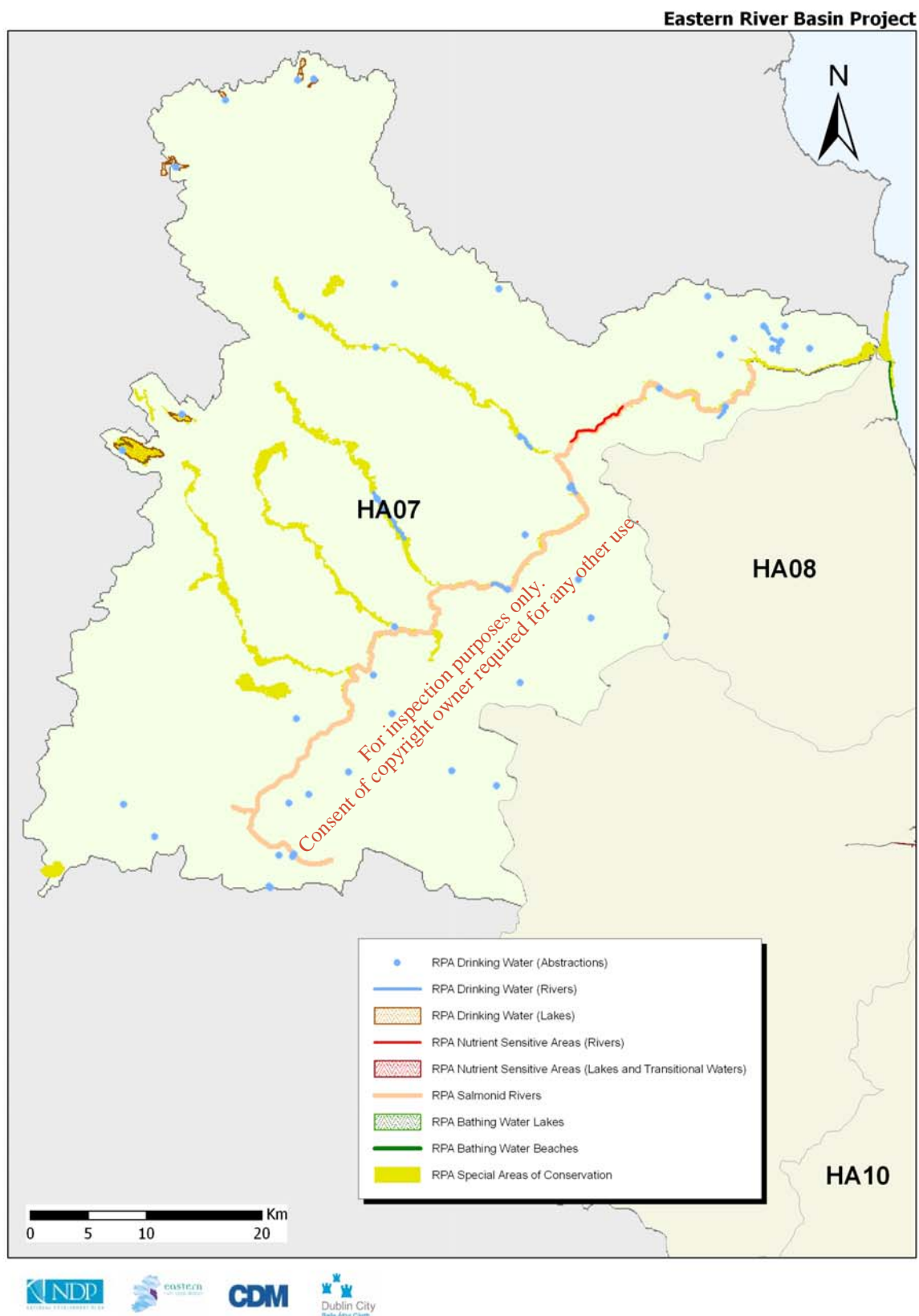
### Nutrient Sensitive Areas

A total of one water body is designated as a nutrient sensitive area. This is the main channel Boyne downstream of Navan. This is considered to be "At Risk".

### Protection of Species/Habitats

A total of 48 water bodies have been designated as protected areas on this basis of being either an SAC or an SPA. These are listed in **Appendix A7**. These include 7 lakes, 1 coastal, 1 transitional and 39 rivers. Of these, are 31 "At Risk", 15 "Probably At Risk" and 2 "Not At Risk".

Figure 5.14: Protected Areas (HA07)



**APPENDIX 3**

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1<sup>st</sup> of July 2009

**Our Ref:** 20285/cor/sh010709

**Meath County Council  
County Hall  
Navan  
Co. Meath**

**Attention: Ms. Wendy Bagnall, Planning Department**

**RE: APPROPRIATE ASSESSMENT REPORT (RIVER BOYNE & RIVER BLACKWATER  
SAC)**

**Future in combination impacts**

Dear Madam,

Nicholas O'Dwyer Ltd. have been appointed by Meath County Council to inform an Appropriate Assessment Report addressing the impacts of the discharges from a number of Wastewater Treatment Works (WwTW) in Co. Meath on the River Boyne and River Blackwater SAC. The WwTW concerned are Kells, Athboy, Dunsauglin, Trim and Enfield-Johnstown Bridge.

In combination factors, including discharges from sources other than the WwTW, will be detailed as part of the Report. In order to detail future or planned discharges to the River Boyne and River Blackwater SAC, we request details of any Planning Applications that Meath County Council are aware of.

The Appropriate Assessment Report is to be forwarded to the EPA by the end of this month so we request any details as soon as possible.

Yours faithfully,

---

**Sinead Hanrahan, Project Engineer**

**for NICHOLAS O'DWYER LTD.**

**APPENDIX 4**

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**SITE SYNOPSIS****SITE NAME: RIVER BOYNE AND RIVER BLACKWATER****SITE CODE: 002299**

This site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site. Towns both small and large, include Slane, Navan, Kells, Trim, Athboy and Ballivor.

The site is a candidate SAC selected for alkaline fen and alluvial woodlands, both habitats listed on Annex I of the E.U. Habitats Directive. The site is also selected for the following species listed on Annex II of the same directive – Atlantic Salmon, Otter and River Lamprey. The main areas of alkaline fen are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough. The hummocky nature of the local terrain produces frequent springs and seepages which are rich in lime. A series of base-rich marshes have developed in the poorly-drained hollows, generally linked with these three lakes. Open water is usually fringed by Bulrush (*Typha latifolia*), Common Club-rush (*Scirpus lacustris*) or Common Reed (*Phragmites australis*) and this last species also extends shorewards where a dense stand of Great Fen Sedge or Saw Sedge (*Cladium mariscus*) frequently occurs. This in turn grades into a sedge and grass community (*Carex* spp., *Molinia caerulea*) or one dominated by the Black Bogrush (*Schoenus nigricans*). An alternative direction for the aquatic/terrestrial transition to take is through a floating layer of vegetation. This is normally based on Bogbean (*Menyanthes trifoliata*) and Marsh cinquefoil (*Potentilla palustris*). Other species gradually become established on this cover, especially plants tolerant of low nutrient status e.g. bog mosses (*Sphagnum* spp.). Diversity of plant and animal life is high in the fen and the flora, includes many rarities. The plants of interest include Narrow-leaved Marsh Orchid (*Dactylorhiza traunsteineri*), Fen Bedstraw (*Galium uliginosum*), Cowbane (*Cicuta virosa*), Frogbit (*Hydrocharis morsus-ranae*) and Least Bur-reed (*Sparganium minimum*). These species tend to be restricted in their distribution in Ireland. Also notable is the abundance of aquatic Stoneworts (*Chara* spp.) which are characteristic of calcareous wetlands.

The rare plant, Round-leaved Wintergreen (*Pyrola rotundifolia*) occurs around Newtown Lough. This species is listed in the Red Data Book and is protected under the Flora Protection Order, 1999, and this site is its only occurrence in Co. Meath. Wet woodland fringes many stretches of the Boyne. The Boyne River Islands are a small chain of three islands situated 2.5 km west of Drogheda. The islands were formed by the build up of alluvial sediment in this part of the river where water movement is sluggish. All of the islands are covered by dense thickets of wet, Willow (*Salix* spp.) woodland, with the following species occurring: Osier (*S. viminalis*), Crack Willow (*S. fragilis*), White Willow (*S. alba*), Purple Willow (*Salix purpurea*) and Grey Willow (*S. cinerea*). A small area of Alder (*Alnus glutinosa*) woodland is found on soft ground at the edge of the canal in the north-western section of the islands. Along other stretches of the rivers of the site Grey Willow scrub and pockets of wet woodland dominated by Alder have become established, particularly at the river edge of mature deciduous woodland. Ash (*Fraxinus excelsior*) and Birch (*Betula pubescens*) are common in the latter and the ground flora is typical of wet woodland with Meadowsweet (*Filipendula ulmaria*), Angelica (*Angelica sylvestris*), Yellow Iris, Horsetail (*Equisetum* spp.) and occasional tussocks of Greater Tussocksedge (*Carex paniculata*).

The dominant habitat along the edges of the river is freshwater marsh - the following plant species occur commonly here: Yellow Flag (*Iris pseudacorus*), Creeping Bent (*Agrostis stolonifera*), Canary Reed-grass (*Phalaris arundinacea*), Marsh Bedstraw (*Galium palustre*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*). In the wetter areas of the marsh Common Meadow-rue (*Thalictrum flavum*) is found. In the vicinity of Dowth, Fen Bedstraw (*Galium uliginosum*), a scarce species mainly confined to marshy areas in the midlands, is common in this vegetation. Swamp Meadow-grass (*Poa palustris*) is an introduced plant which has spread into the wild (naturalised)

along the Boyne approximately 5 km south-west of Slane. It is a rare species which is listed in the Red Data Book and has been recorded among freshwater marsh vegetation on the banks of the Boyne in this site. The only other record for this species in the Republic is from a site in Co. Monaghan.

The secondary habitat associated with the marsh is wet grassland and species such as Tall Fescue (*Festuca arundinacea*), Silverweed (*Potentilla anserina*), Creeping Buttercup (*Ranunculus repens*), Meadowsweet (*Filipendula ulmaria*) and Meadow Vetchling (*Lathyrus pratensis*) are well represented. Strawberry Clover (*Trifolium fragiferum*), a plant generally restricted to coastal locations in Ireland, has been recorded from wet grassland vegetation at Trim. At Rossnaree river bank on the River Boyne, is Round-Fruited Rush (*Juncus compressus*) found in alluvial pasture, which is generally periodically flooded during the winter months. This rare plant is only found in three counties in Ireland.

Along much of the Boyne and along tributary stretches are areas of mature deciduous woodland on the steeper slopes above the floodplain marsh or wet woodland vegetation. Many of these are planted in origin. However the steeper areas of King Williams Glen and Townley Hall wood have been left unmanaged and now have a more natural character. East of Curley Hole the woodland has a natural appearance with few conifers. Broad-leaved species include Oak (*Quercus* spp.), Ash (*Fraxinus excelsior*), Willows, Hazel (*Corylus avellana*), Sycamore (*Acer pseudoplatanus*), Holly (*Ilex aquifolium*), Horse chestnut (*Aesculus* sp.) and the shrubs Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Elder (*Sambucus nigra*). South-west of Slane and in Dowth, the addition of some more exotic tree species such as Wych Elm (*Ulmus glabra*), Beech (*Fagus sylvatica*), and occasionally Lime (*Tilia cordata*), are seen. Coniferous trees, Larch (*Larix* sp.) and Scots Pine (*Pinus sylvestris*) also occur. The woodland ground flora includes Barren Strawberry (*Potentilla sterilis*), Enchanter's Nightshade (*Circaea lutetiana*) and Ground-ivy (*Glechoma hederacea*), along with a range of ferns. Variation occurs in the composition of the canopy, for example, in wet patches alongside the river, White Willow and Alder form the canopy.

Other habitats present along the Boyne and Blackwater include lowland dry grassland, improved grassland, reedswamp, weedy wasteground areas, scrub, hedge, drainage ditches and canal. In the vicinity of Lough Shesk, the dry slopes of the morainic hummocks support grassland vegetation which, in some places, is partially colonised by Gorse (*Ulex europaeus*) scrub. Those grasslands which remain unimproved for pasture are species-rich with Common Knapweed (*Centaurea nigra*), Creeping Thistle (*Cirsium arvense*) and Ribwort Plantain (*Plantago lanceolata*) commonly present. Fringing the canal alongside the Boyne south-west of Slane, are Reed Sweet-grass (*Glyceria maxima*), Great Willowherb (*Epilobium hirsutum*) and Meadowsweet. The Boyne and its tributaries is one of Ireland's premier game fisheries and it offers a wide range of angling from fishing for spring salmon and grilse to seatrout fishing and extensive brown trout fishing. Atlantic Salmon (*Salmo salar*) use the tributaries and headwaters as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the Habitats Directive. Atlantic Salmon run the Boyne almost every month of the year. The Boyne is most important as it represents an eastern river which holds large three-sea-winter fish from 20 –30 lb. These fish generally arrive in February with smaller spring fish (10 lb) arriving in April/May. The grilse come in July, water permitting. The river gets a further run of fish in late August and this run would appear to last well after the fishing season. The salmon fishing season lasts from 1st March to 30th September. The Blackwater is a medium sized limestone river which is still recovering from the effects of the arterial drainage scheme of the 70's. Salmon stocks have not recovered to the numbers pre drainage. The Deel, Riverstown, Stoneyford and Tremblestown Rivers are all spring fed with a continuous high volume of water. They are difficult to fish in that some are overgrown while others have been affected by drainage with the resulting high banks.

The site is also important for the populations of two other species listed on Annex II of the E.U. Habitats Directive, namely River Lamprey (*Lampetra fluviatilis*) which is present in the lower reaches of the Boyne River while the Otter (*Lutra lutra*) can be found throughout the site. In addition, the site also supports many more of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. Common Frog, another Red Data Book species, also occurs within the site. All of these animals with the addition of the Stoat and Red Squirrel, which also occur within the site, are protected under the Wildlife Act. Whooper Swans winter regularly at several locations along the Boyne and Blackwater Rivers. Parts of these areas are within



the cSAC site. Known sites are at Newgrange (c. 20 in recent winters), near Slane (20+ in recent winters), Wilkinstown (several records of 100+) and River Blackwater from Kells to Navan (104 at Kells in winter 1996/97, 182 at Headfort in winter 1997/98, 200-300 in winter 1999/00). The available information indicates that there is a regular wintering population of Whooper Swans based along the Boyne and Blackwater River valleys. The birds use a range of feeding sites but roosting sites are not well known. The population is substantial, certainly of national, and at times international, importance. Numbers are probably in the low hundreds.

Intensive agriculture is the main landuse along the site. Much of the grassland is in very large fields and is improved. Silage harvesting is carried out. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the lakes. In the more extensive agricultural areas sheep grazing is carried out. Fishing is a main tourist attraction on the Boyne and Blackwater and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. The Eastern Regional Fishery Board have erected fencing along selected stretches of the river as part of their salmonid enhancement programme. Parts of the river system have been arterially dredged. In 1969 an arterial dredging scheme commenced and disrupted angling for 18 years. The dredging altered the character of the river completely and resulted in many cases in leaving very high banks. The main channel from Drogheda upstream to Navan was left untouched, as were a few stretches on the Blackwater. Ongoing maintenance dredging is carried out along stretches of the river system where the gradient is low. This is extremely destructive to salmonid habitat in the area. Drainage of the adjacent river systems also impacts on the many small wetland areas throughout the site. The River Boyne is a designated Salmonid Water under the EU Freshwater Fish Directive. The site supports populations of several species listed on Annex II of the EU Habitats Directive, and habitats listed on Annex I of this directive, as well as examples of other important habitats. Although the wet woodland areas appear small there are few similar examples of this type of alluvial wet woodland remaining in the country, particularly in the north-east. The semi-natural habitats, particularly the strips of woodland which extend along the river banks and the marsh and wet grasslands, increase the overall habitat diversity and add to the ecological value of the site as does the presence of a range of Red Data Book plant and animal species and the presence of nationally rare plant species.

19.06.2003



## APPENDIX 5

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### Site Visit: 26/06/09

A site visit to the Kells, Athboy, Dunshaughlin, Trim and Enfield-Johnstown Bridge WwTP and their primary discharge points was undertaken on the 26<sup>th</sup> of June 2009.

### Kells

The primary discharge from the Kells WwTP is currently to the Headford stream, which discharges to the River Blackwater (part of the River Boyne and River Blackwater SAC) within a few hundred metres of the point of discharge. An upgrade currently underway in Kells will allow for storm water storage and a new effluent outfall directly to the River Blackwater. This work is expected to finish before the end of 2009. Approximately 2025m<sup>3</sup> day will discharge to the River through a system of diffusers along the River bed.

A brief appraisal of the River Blackwater at the proposed point of discharge was carried out. The River is approximately 15-20m wide and gently flowing at the point of discharge of the new outfall. The banks of the River slope quite steeply for approximately 2m to the River channel. The new point of discharge is located adjacent to the scenic Headford Golf Course and the River flows through the landscaped Golf Course for some way following point of discharge. A variety of mature Willow (*Salix spp*), Sycamore (*Acer pseudoplatanus*) and Ash (*Fraxinus excelsior*) trees are found on the river banks. Construction of the new outfall is underway at present.



**PLATE 1: VIEW DOWNSTREAM OF FUTURE PRIMARY DISCHARGE KELLS**

## Athboy

The primary discharge from the Athboy WwTP is to the Athboy River, a tributary of the Boyne, which is designated as part of the River Boyne and River Blackwater SAC. A WwTP upgrade currently underway in Athboy will include new stormwater storage tanks and a new primary discharge to the Athboy River. The new primary discharge point is in close proximity to the old discharge point.

A brief appraisal of the River at the new discharge point was carried out. At the new point of discharge the River is approximately 5m wide and fast flowing. It is approximately 1m deep. The grassy banks of the River slope quite steeply to the River Channel. Vegetation is mostly common grasses, with the occasional tree. Creeping buttercup (*Ranunculus repens*), Hawthorn (*Crataegus Monogyna*), Yellow iris (*Iris pseudacorus*), Great willow herb (*Epilobium hisutum*) are found. There are no obvious signs of any effects associated with effluent discharge.



**PLATE 2: DOWNSTREAM OF EXISTING AND PROPOSED PRIMARY DISCHARGE  
ATHBOY**



### Dunshuaghlin and Casteltown-Tara WwTW

The primary discharge from the Castletown Tara WwTP is to the River Boyne and River Blackwater SAC. Approximately 2,700m<sup>3</sup> per day is discharged to the Boyne channel through a system of diffusers laid along the River bed. This discharge option allows fast mixing to occur. About 50m downstream of the discharge the River enters a riffle zone with natural weirs. This further allows fast mixing of the effluent to occur. There are no visible signs of any effects of effluent discharge to the surrounding habitats.

A brief appraisal of the River at the point of discharge was carried out. The River is approximately 20m wide and gently flowing. The banks gently slope approximately 3m to the River channel. Water depth was approximately 1-2m at the time of site visit. Weather conditions in the preceding days were dry.

The banks of the river were well vegetated and species included Hawthorn (*Crataegus Monogyna*), Ash (*Fraxinus excelsior*), Willow (*Salix spp*), Alder (*Alnus glutinosa*) Bramble (*Rubus sp*), Nettle (*Urtica dioica*), tall grasses and common herbs including Willowherb (*Epilobium hisutum*).



**PLATE 3: VIEW DOWNSTREAM OF PRIMARY DISCHARGE CASTLETOWN TARA WwTP**

## Trim

The primary discharge from the Trim WwTP is to the River Boyne. The point of discharge is located a few kilometres downstream of the treatment plant and could not be visited due to access and time issues. A brief appraisal of the River at the treatment plant was carried out.

The River is approximately 20m wide, moderately flowing and very clear. The water depth is approximately 1m. The gently sloping banks are vegetated by a selection of common broad leaved herbs and grasses.



**PLATE 4: VIEW OF THE RIVER BOYNE AT THE TRIM WwTW**



## Enfield

The Enfield WwTP discharges to an undesignated tributary of the River Boyne, also known as the River Blackwater (Longwood).

At the primary discharge point the River is approximately 3m wide and moderately flowing. The steep (4m) banks are vegetated by common long grasses and common broad leaved herbs. The occasional tree is also found. The river is quite cloudy, possibly due to the upstream section flowing through boggy areas.



**PLATE 5: VIEW OF THE RIVER BLACKWATER (LONGWOOD) AT THE ENFIELD WwTW**



LEGEND

S.A.C.

1 PPC Licensed Industries

2 Glanbia Foods Society

3 Superwarm Homes Ltd.

4 Boylan Print Ltd.

5 Premier Petcare

6 Mary Sow Unit

7 Sherlock Bros. Ltd.

8 Navan Carpets Ltd.

9 Cablove Ltd.

10 Tara Mines Ltd.

11 Xtratherm Ltd.

12 Nells Stainless Ltd.

Complex Tooltip & Molding Ltd.

Waste Water Treatment Plants

1 Drogheda

2 Donore

3 Tullvallen

4 Slane

5 Navan

6 Trim

7 Athboy

8 Kells

9 Ballivor

10 Longwood

11 Summerhill

Section 4 Licensed Industries

1 TSH Enterprises Ltd.

2 M & M Construction Ltd.

3 Balbradagh Developments

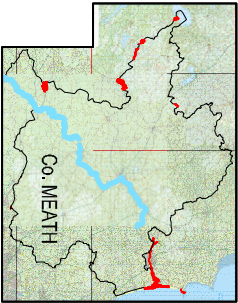
4 Maynooth Mission to China

5 Peter & Ann Waters

6 Martin Naughton

7 Boyne Valley Visitors Centre

8 Marsh Oil Products



REV	DATE	DESCRIPTION	D	C	A

PRELIMINARY

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CONSULTING ENGINEERS  
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Tel: 01-296 9000 Fax: 01-296 9001 E-mail: nicholas@nicholasodwyer.com

CLIENT

MEATH COUNTY COUNCIL

PROJECT

CONDITIONS OF W.W.D. LICENCE

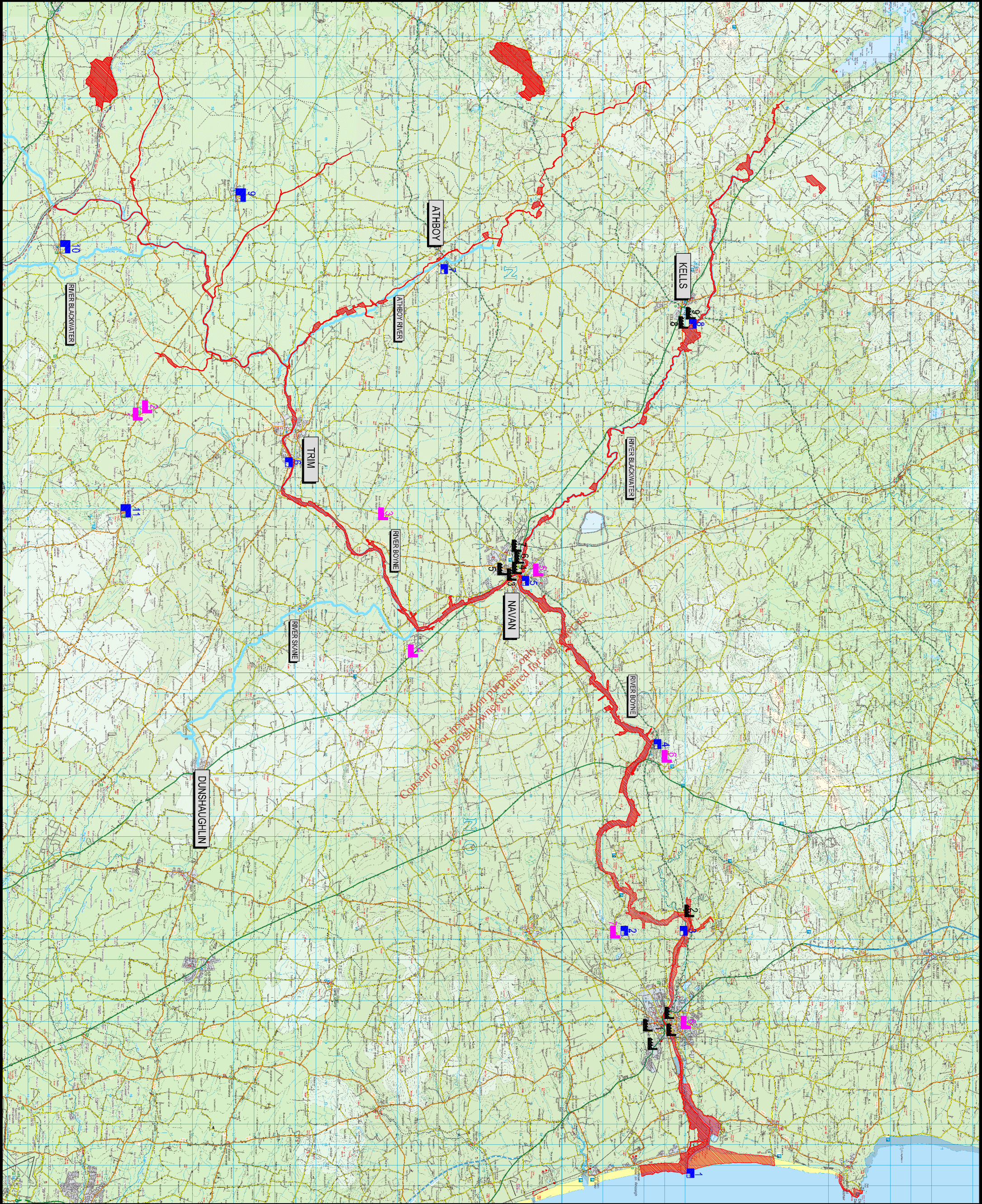
TITLE

INCOMBINATION IMPACT

SCALES	DRAWN	CHECKED	APPROVED
NOT TO SCALE	D. Smithers	S. Hanahan	S. Hanahan
DATE	22.06.09	DATE	22.06.09

DRAWING NO. 20285-DL-AA-02

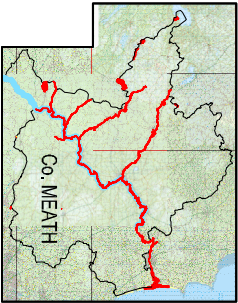
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LEGEND

- WWTP LOCATION
- STORMWATER OVERFLOW
- STORMWATER OVERFLOW (UNCOMMISSIONED)
- PRIMARY DISCHARGE
- PRIMARY DISCHARGE (OLD)
- PRIMARY DISCHARGE (NEW)
- S.A.C.



REV	DATE	DESCRIPTION	D	C	A

PRELIMINARY

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MEATH COUNTY COUNCIL

CONDITIONS OF W.W.D. LICENCE

LOCATION PLAN  
SHOWING S.A.C. DESIGNATION

SCALES	DRAWN	CHECKED	APPROVED
NOT TO SCALE	D. Sweeney	S. Hanahan	S. Hanahan
DATE	22.06.09	DATE	22.06.09

20285-DL-AA-01

