



Laois County Council

RECEIVING WATER IMPACT ASSESSMENT

Errill WwTP



Draft: December 2009

Prepared on behalf of:

**WATER SERVICES
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EXECUTIVE SUMMARY

This is a receiving water impact assessment report for the Errill Waste water Treatment Plant (WwTP). It has been prepared under Section F of the Environmental Protection Agencies Waste Water Discharge Licensing Application Guidance Note. This report was prepared during the period November to December 2009 on behalf of Laois County Council by ECOFACT Environmental Consultants Ltd.

The current study was based on information compiled during a desk study and a site visit. Information compiled during the desk study included water quality monitoring information supplied by the EPA and Laois County Council, along with information on areas designated for nature conservation obtained from the National Parks and Wildlife Service (NPWS). The field study consisted of a walkover of the existing WwTP site and adjoining river section.

The results of the current assessment suggest that the Errill WwTP is having no impact on water quality in the Errill River. This is suggested by the decrease in some parameters downstream of the outfall when referenced to the upstream sampling site. However the dataset on which this assessment is based is quite limited, as there is no upstream biological EPA monitoring site for the Errill WwTP. In addition the EPA chemical data is inconclusive due to the influence of outside tributaries downstream of the Errill discharge point. In light of this further biological and chemical sampling upstream of the study area is recommended and downstream before the confluence of these tributaries. It can be concluded that the operation of the plant is having no impact on the Errill River based on the current assessment and no impact either on its own or cumulatively on the Erkina River or the Nore River.

An Appropriate Assessment (Stage 1, Screening Assessment) has been completed as part of this receiving water impact assessment using EPA (2009) Waste Water Discharge Licensing Appropriate Assessment Guidance Notes. The conclusion of the Appropriate Assessment is that the existing WwTP is not having a direct impact on the River Barrow and River Nore SAC, and that secondary impacts would not affect the River Barrow and River Nore SAC provided the WwTP continues to operate within the current parameters.

It is recommended that a discharge licence be granted for the plant.

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1. INTRODUCTION

1.1 Background

This report provides a Receiving Water Impact Assessment for the Waste Water Treatment Plant (WwTP) serving Errill Village, Co Laois. Errill village is located in south-west County Laois in proximity to the Tipperary/ Kilkenny border, approximately 40 kms from Portlaoise and the M7 Dublin to Limerick motorway, 6.5 kms from Rathdowney and 16 kms from Borris-in-Ossory. The WwTP serving Errill village is located at the bridge immediately to the south of the grave yard in Errill. The village of Errill and the surrounding area are not located within a designated conservation site. The upper Erkina River flows to the south of the village. The WwTP serving Errill village discharges directly into this river which is one of the main tributaries of the River Nore. The Nore main channel is a designated salmonid water under the European Communities (Quality of Salmonid Waters) Regulations of 1988 (S.I. No. 293, 1988), implementing the Freshwater Fish Directive (78/659/EEC). The main channel of the River Nore is also protected as a component of the River Nore and River Barrow candidate Special Area of Conservation (SAC) under the Habitats Directive (92/43/EEC).

The purpose of the report is to assess whether the existing waste water discharge(s) from the plant in Errill is having a significant adverse impact on the receiving waters, or any Natura 2000 Site. This report was prepared during the period November to December 2009 by Ecofact Environmental Consultants Ltd. on behalf of the Water Services Section of Laois County Council.

1.2 Legislation

The current report was prepared with consideration to the following water quality legislation:-

- European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009)
- Waste Water Discharge (Authorisation) Regulations 2007 (SI No. 684 of 2007);
- Urban Wastewater Treatment Regulations, 2001 (S.I. No. 254 of 2001);
- European Communities (Water Policy) Regulations, 2003 (SI No. 722) implementing the Water Framework Directive (WFD) 2000/60/EC.
- Water Policy Regulations (S.I. No. 722 of 2003) and Water Policy Regulations (Amendment) (S.I. No. 413 of 2005) implementing the EU Water Framework Directive (2000/60/EC);
- Local Government (Water Pollution) Acts, 1977 (Water Quality Standards for Phosphorus) Regulations, 1998. (S.I. No. 258 of 1998), and Local Government (Water Pollution) (Amendment) Act, 1990. (Act No. 21 of 1990);
- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988) implementing Freshwater Fish Directive (78/659/EEC);
- Quality of Bathing Waters Regulations, 1992, and Quality of Bathing Waters Regulations (Amendment), 1996. (implementing Bathing Water Directive, 76/160/EEC);
- European Communities Quality of Surface Water Intended for the Abstraction of Drinking Water Regulations, 1989. (Implementing the Surface Water Directive, 75/440/EEC);
- Water Quality (Dangerous Substances) Regulations, 2001.(Implementing the Dangerous Substances Directive, 76/464/EEC);
- Protection of Groundwater Regulations, 1999. (S.I. No. 41 of 1999);
- Water Quality (Dangerous Substances) Regulations, 2001 (S.I. No. 12 of 2001).

In addition, cognisance was also taken of the following legislation relating to nature conservation and fisheries:-

- The European Communities (Natural Habitats) (Amendment) Regulations 2005 (S.I. No. 378/2005), The European Communities (Natural Habitats) (Amendment)

- Regulations 1998 (S.I. No. 233/1998), and the European Community (Natural Habitats) Regulations 1997 (S.I. No. 94/1997) (implementing Council Directives 92/43/EEC and 97/62/EC on the conservation of natural habitats and of wild fauna and flora);
- Wildlife Act, 1976 (S.I. No. 39 of 1976) and the Wildlife (Amendment) Act, 2000 (S.I. No. 71 of 2001);
- Fisheries (Amendment) Act, 1997, (S.I. No. 23 of 1997) and Fisheries (Consolidation) Act, 1959 (S.I. No. 14 of 1959);
- The EU Birds Directive (79/409/EEC).

1.3 Methodology

This report has been prepared under the Waste Water Discharge (Authorisation) Regulations, 2007, using Section F of the Environmental Protection Agencies Waste Water Discharge Licensing Application Guidance Note (EPA, 2008). The Errill WwTP was visited on the 23rd of November, 2009 and a walk over assessment was carried out on the plant and receiving water.

A desktop review was carried out to identify features of surface water importance within the study area and surrounding region. A review of areas designated (or being considered for designation) for nature conservation was carried out by consulting the National Parks and Wildlife Service (NPWS). These included Special Areas of Conservation, Special Protection Areas for birds (both internationally important) and proposed Natural Heritage Areas (of national importance). The locations of any designated salmonid waters, recreational and bathing waters and nutrient sensitive areas within the study area were identified through consultation with the Environmental Protection Agency (EPA). Likewise the presence of any important recreational or commercial fisheries was identified through consultation with the Southern Regional Fisheries Board (SRFB).

Technical files and previous reports prepared for the WwTP were supplied by Laois County Council for review in the current assessment. These reports included the catchment report for the town, prepared as part of the National Urban Waste Water Study. In addition, monitoring information on the discharges from the WwTP and the receiving waters were obtained from Laois County Council and used in this assessment. A review of the published literature, including the Laois County Development Plan 2006-2012, was undertaken in order to collate data on the receiving environment, including aquatic species and habitats of conservation concern in the study area. A range of additional sources of information including scientific reports produced by, and information on the websites of the EPA, NPWS, Laois County Council and other agencies were also reviewed. A full bibliography of information sources reviewed is given in the references section. Ordinance Survey Maps and OS aerial photographs were also reviewed during the desk assessment.

An Appropriate Assessment (Stage 1, Screening Assessment) has been completed and is presented in Appendix 2. The Appropriate Assessment was prepared following the guidance documents:-

- EPA (2009) Waste Water Discharge Licensing Appropriate Assessment Guidance Notes. Notes on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007) Environmental Protection Agency, Co. Wexford.
- European Commission (2001). Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission Environment DG.

The findings of the Receiving Water Impact Assessment were used in used in completing the Appropriate Assessment.

1.4 Consultation

Preparation of this report included consultation with the following agencies and state bodies:-

- Laois County Council (Laois Co. Co.);
- National Parks and Wildlife Service (NPWS);
- Environmental Protection Agency (EPA);
- Southern Regional Fisheries Board (SRFB);
- South Eastern River Basin District Office (SERBDO);
- Department of Communications, Marine and Natural Resources (DCMNR);
- Geological Society of Ireland (GSI).

Table 1 Criteria used in assessing the importance of surface water features

Rating	Qualifying Criteria
A	Internationally Important Sites designated (or qualifying for designation) as SAC* or SPA* under the EU Habitats or Birds Directives. Undesignated sites containing good examples of Annex I <u>priority</u> habitats under the EU Habitats Directive. Major salmon river fisheries Major salmonid lake fisheries.
B	Nationally Important Sites or waters designated or proposed as an NHA* or statutory Nature Reserves. Undesignated sites containing good examples of Annex I habitats (under EU Habitats Directive). Undesignated sites containing <u>significant numbers</u> of resident or regularly occurring populations of Annex II species under the EU habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000. Major trout river fisheries. Water bodies with major amenity value. Commercially important coarse fisheries.
C	High Value, Locally Important Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or significant populations of locally rare species. Small water bodies with known salmonid populations or with good potential salmonid habitat. Sites containing <u>any</u> resident or regularly occurring populations of Annex II species under the EU habitats Directive or Annex I species under the EU Birds Directive. Large water bodies with some coarse fisheries.
D	Moderate Value, Locally Important Sites containing some semi-natural habitat or locally important for wildlife. Small water bodies with some coarse fisheries value or some potential salmonid habitat. Any water body with unpolluted water (Q-value 4-5).
E	Low Value, Locally Important Artificial or highly modified habitats with low species diversity and low wildlife value. Water bodies with no current fisheries value and no significant potential fisheries value.

2. SCHEME DESCRIPTION

2.1 Introduction

The WwTP that serves Errill village operates using a conventional activated sludge suspended growth process. The treatment plant has a design population of 250 persons. The discharge point of the WwTP is located at the back right corner of the WwTP and is gravity fed into the Erkina River.

The activated sludge process works by introducing atmospheric air or pure oxygen into a mixture of primary treated or screened sewage (or industrial wastewater) combined with organisms to develop a biological floc which reduces the organic content of the sewage. The combination of raw sewage (or industrial wastewater) and biological mass is commonly known as Mixed Liquor.

In all activated sludge plants, once the sewage (or industrial wastewater) has received sufficient treatment, excess mixed liquor is discharged into settling tanks and the treated supernatant is run off to undergo further treatment before discharge. Part of the settled material, the sludge, is returned to the head of the aeration system to re-seed the new sewage

(or industrial wastewater) entering the tank. This fraction of the floc is called Return Activated Sludge (R.A.S.).

Excess sludge which eventually accumulates beyond what is returned is called Waste Activated Sludge (W.A.S.). W.A.S is removed from the treatment process to keep the ratio of biomass to food supplied (sewage or wastewater) in balance. This is called the F:M ratio. W.A.S is stored away from the main treatment process in storage tanks and is further treated by digestion, either under anaerobic or aerobic conditions prior to disposal.

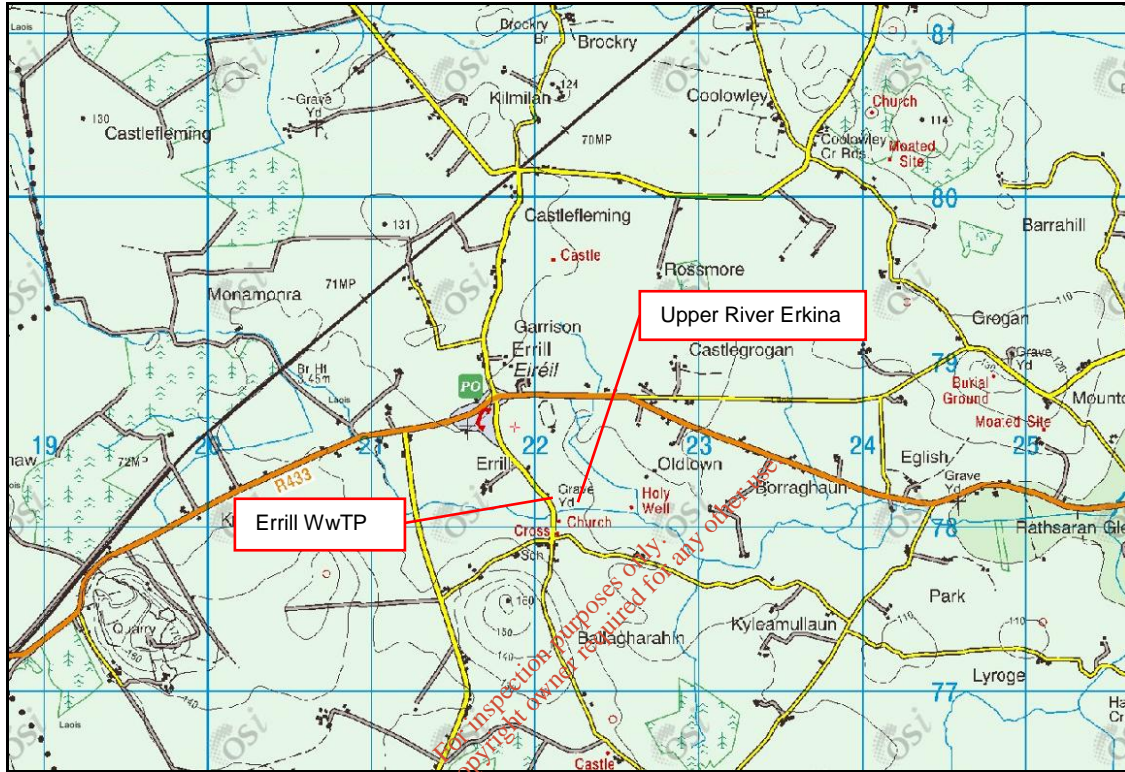


Figure 1 Map showing the location of the Errill WwTP.

2.3 Discharge Standards

The requirements of Urban Wastewater Treatment Directive 91/271/EEC for treatment plants serving more than 2000 population equivalent are:

Biochemical Oxygen Demand (BOD ₅)	25 mg/l O ₂
Chemical Oxygen Demand	125 mg/l O ₂
Suspended Solids (p.e. >10 000)	35 mg/l
Suspended Solids (p.e. 2000 - 10 000)	60 mg/l

The following additional requirements apply for discharges to areas that are deemed to be sensitive:

Total Phosphorus (10 000 – 100 000 p.e.)	2 mg/l
Total Phosphorus (over 100 000 p.e.)	1 mg/l
Total Nitrogen (10 000 – 100 000 p.e.)	15 mg/l
Total Nitrogen (over 100 000 p.e.)	10 mg/l

The discharge design standard for the Errill WwTP is BOD (15 mg/L), Suspended Solids (20 mg/L) and Ortho-phosphate is 1 mg/L (standards provided by Laois County Council). Data for the influent at Errill WwTP is presented in Table 2; data for the effluent is presented in Table 3. Flows for the Errill WwTP have been provided by Laois County Council for the plant and are presented in Table 4 below.

Table 2 Water quality results for the influent at the Errill WwTP during the period 2006/2007 (Derived from data supplied by Laois County Council).

Parameter	Maximum	Minimum	N	Median	Mean	Stdev
Ammonia(NH3) mg/l	112.75	6.46	23	30.4	36.74	26.58
BOD mg/l	490	19	23	154.5	164.2	108.4
CODmg/l	850	31	23	328	394.5	253.48
Conductivity @ 25°C	1963	439	23	1114	1173.5	351.5
Nitrate (NO3) mg/l	5.846	0	23	1.923	2.188	1.814
Ortho-phosphate mg/l	7.32	0.929	23	3.192	3.355	1.57
pH	8.3	7.3	23	7.9	7.9	0.255
Suspended Solids mg/l	442	18	23	157	200.9	129.7

Table 3 Water quality results for the effluent at the Errill WwTP during the period 2006/2009 (Derived from data supplied by Laois County Council)

Parameter	Maximum	Minimum	N	Median	Mean	Stdev
Ammonia(NH3) mg/l	52.41	0.118	23	5.29	8.933	11.485
BOD mg/l	66	1.8	23	6	14.32	17.5
CODmg/l	160	5	23	32.5	43.9	35.22
Conductivity @ 25°C	1392	710	23	942	992	180
Nitrate (NO3) mg/l	20	0.075	23	1.93	4.44	5.64
Ortho-phosphate mg/l	4.57	0.213	23	1.581	1.748	1.148
pH	8.129	7.575	23	7.857	7.960	0.149
Suspended Solids mg/l	73	11	23	27	32.52	17.7

Table 4 Existing flow rates for the Errill plant.

Errill WwTP	
Design PE	250
DWF (litres/person/day)	225
DWF (l/s)	1.95

2.5 Monitoring

Monitoring of the water quality of the outfall from the Errill WwTP is undertaken by Laois County Council on an approximate monthly basis. Water quality is also monitored in the receiving water upstream and downstream of the primary discharge. The parameters measured in the water samples are; Ammonia, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Conductivity, Nitrates, Ortho-phosphate, and pH and Suspended Solids.

3. RECEIVING ENVIRONMENT

3.1 Catchment Description

Errill village and WwTP is in the River Erkina catchment. The River Erkina is a tributary of the River Nore in Hydrometric Area 15. The River Erkina rises at Cullahill in Co. Tipperary and generally flows in an easterly direction to meet the River Nore at Durrow. The total length of the River Erkina channel is approximately 35 km. The headwaters of the river comprise a number of smaller unnamed second and third order streams. The River Erkina becomes a 3rd order river at Errill. The Donaghmore Stream flows in a southerly direction and joins the Erkina River north of Rathdowney, while the Rathdowney Stream flows in a northerly direction and joins the Erkina at Rathdowney village. The main tributary of the Erkina is the River Goul which joins the river at Black Island, ca. 3.5 km west of Durrow.

The upper / elevated reaches of the River Erkina catchment (Errill) drain surface water gleys / acidic ground water gleys and acid brown earths/brown podzolics over Devonian sandstone till along with some cutaway raised bog. The bulk of the catchment (on lower ground) drains grey brown podzolics / basic brown earths mainly over carboniferous limestone till. Land cover is mainly pastures with smaller element of coniferous forestry (Source: EPA).

The village of Errill and the Errill WwTP are in area of high groundwater vulnerability and are boarded to the North of the village by an area of extreme vulnerability. The aquifers in this area are locally important. To the west and south west of Errill village the bedrock is generally

moderately productive. In the village of Errill, to the south of the village and north east of the village, aquifers are again locally important with bedrock that is moderately productive in local zones.

3.2 Water quality

3.2.1 EPA biological water quality data

The Errill River is monitored by the EPA with a station located downstream of the Errill WwTP (Eglish bridge (0500)). The EPA biological water quality monitoring data for the Errill River rates the watercourse as being of Class B water quality for approximately 100% of its length (Table 5). The Eglish Bridge monitoring station (station code 15/E/01/0500) is located approximately 2.5 river kilometers downstream stream of Errill WwTP. This station has been found to achieve a Q3-4 'moderate ecological status' biological water quality rating for two consecutive years from 2005 – 2007. The EPA does not monitor biological water quality upstream of the Errill WwTP.

The headwaters of the Erkina River confluence with the Errill River and Erkina main channel at station 0100 (bridge south east of Beachmount upstream of Rathdowney) (Neill, 2008; 2009). This station achieved a Q3-4 'moderate ecological status' in 2005 and 2007. Further downstream of the main Erkina channel the same ecological status was recorded again in 2005 and 2007 at station 0100 (Clarneyball bridge) (EPA online). According to the EPA the Erkina River is unsatisfactory throughout due to slightly polluted conditions however a minor improvement in ecological quality was recorded downstream of Rathdowney at station 0200 (Coneyburrow bridge) in 2007 from Q3 to Q3-4. Therefore the Errill River and the Erkina River downstream of Errill WwTP has an overall moderate ecological status. It is noted therefore that there is insufficient data upstream of the study site to make a conclusive comparison and an accurate assessment of the impact of the WwTP on the Errill River

The Erkina River is Class A for approximately 32.1%, Class B for approximately 57.1% and Class C for approximately 10.7% of its length.

Table 5 presents a summary of the EPA biological water quality data from the Errill River; Table 6 presents a summary of the EPA biological water quality data from the Erkina River; while Table 7 presents the results of the EPA biological water quality monitoring at the station upstream of the Errill WwTP on the Errill River.

Table 5 Summary of EPA water quality results showing overall results for the Errill River (Nore). Data is from EPA biological surveys during the period 2004-2006 (adapted from Clabby *et al.*, 2008).

Catchment	Class A	Class B	Class C	Class D	Total (km)
Errill River (km)	0	1	0	0	1

Table 6 Summary of EPA water quality results showing overall results for the Errill River (Nore). Data is from EPA biological surveys during the period 2004-2006 (adapted from Clabby *et al.*, 2008).

Catchment	Class A	Class B	Class C	Class D	Total (km)
Erkina River (km)	9	16	3	0	28

Table 7 Errill River (EPA code 15/E/01) Biological Quality Ratings (Q values) from one site (u/s of the Errill WwTP), adapted from EPA website).

Station	Station Location	Distance from WwTP	1995	1998	2001	2005	2007
0500	Eglish Br	approx. 2.5 river km	/	/	/	3-4	3-4

3.2.1.2 EPA chemical water quality data

The EPA maintains a chemical water quality monitoring programme on the Errill River in conjunction with the biological monitoring programme. The EPA chemical water quality station upstream is at Errill Bridge south east of Errill village (Station code 15/E/03/0400) is located ca. 30m upstream of the Errill WwTP. The downstream monitoring site is at the start of the Erkina River main channel at station 0100 (bridge south east of Beachmount, upstream of

Rathdowney). Chemical water quality data upstream and downstream of the Errill WwTP is provided in Neil (2008) and Neil (2009) for the period 2007 and 2008 and reproduced in Appendix 1.

The mean orthophosphate levels upstream (0.02mg/l P) were within the high status ≤ 0.025 (mean) limit of the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009) upstream. The orthophosphate levels increased downstream to 0.27mg/l P and exceeded the EC Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009) and the Surface Water Abstraction Regulations (1989) at 0.22mg/l P.

The mean Total Ammonia level upstream of the plant was 0.03mg/l N and downstream of the plant was 0.021mg/l N, both of which were within the high status ≤ 0.04 mg/l N (mean) limit of the EC Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009) and did not exceed the EC (Drinking Water) (No.2) Regulations, 2007 [SI No. 278 of 2007], the Salmonid Waters Regulations [1988] and the Surface Water Abstraction Regulations (SI No. 294 of 1989).

The mean BOD (mg/l O₂) level upstream (1.32mg/l O₂) was within the high status ≤ 1.3 (mean) limit and the mean BOD level downstream was within the good status ≤ 1.5 (mean) limit of the EC Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009). Both upstream and downstream of the plant the level of BOD was within the Surface Water Abstraction Regulations (SI No. 294 of 1989) and the Salmonid River Regulations [1988].

The mean DO (%Sat and mg/l O₂) level increased from upstream to downstream from 91% upstream to 101.8% downstream, likewise 10.3mg/l O₂ upstream to 11.4mg/l O₂ downstream. These values were within the 95%ile (>80%) saturation level both upstream and downstream and also within the limits for the Salmonid River Regulations [1988] at >9mg/l O₂.

The mean pH for the Errill River upstream was 7.9 and downstream was 8 both of which correspond to a water hardness of >100 and both meet the standards for the Salmonid Waters Regulations [1988], Surface Water Regulations [SI 272/2009], the EC (Drinking Water) (No.2) Regulations, 2007 [SI No. 278 of 2007] and the Surface Water Abstraction Regulations (SI No. 294 of 1989).

The mean level of nitrites upstream of the WwTP was 0.012mg/l N and increased but not significantly downstream of the plant to 0.017mg/l N. This nitrite level does not exceed the EC (Drinking Water) (No.2) Regulations, 2007 [SI No. 278 of 2007] limit at 0.5mg/l N nor the Salmonid Rivers Regulations [1988] at <0.05mg/l. Levels in unpolluted waters are normally low, below 0.03 mg/l N.

The overall ecological status of the Erkina River catchment which includes the Errill River is classed as 'moderate' and this was determined by macroinvertebrate and Margartifera analysis. The overall risk class of the Upper Erkina is class 1a 'at risk of not achieving good status' (Source: WFD online maps).

3.2.1.4 Laois County Council Monitoring Data

Laois County Council monitors chemical water quality in the Errill River at stations located upstream and downstream of the Errill WwTP discharge. The results of the most recent monitoring of chemical water quality at these two sites were provided by Laois County Council for use in the current assessment. This data extends from the period January 2006 to March 2009 and is summarised in Tables 8 and 9. Table 10 presents the mean concentration of parameters measured upstream and downstream of the Errill outfall and the percentage change between these two stations. A discussion of the results for this period is presented below. It is noted that there is again an insufficient amount of data to make a statistically robust assessment.

Water quality results upstream of the discharge point is presented in Table 8 and water quality results downstream of the discharge point is presented in Table 9.

Table 8 Water quality results upstream of the Errill WwTP during the period 2006/2007
(Derived from data supplied by Laois County Council).

Parameter	Maximum	Minimum	N	Median	Mean	Stdev
Ammonia(NH3) mg/l	0.158	0.022	23	0.066	0.069	0.032
BOD mg/l	2	0.3	23	1.3	1.39	0.54
CODmg/l	/	/	/	/	/	/
Conductivity @ 25°C	679	393	23	582	557.2	66.32
Nitrate (NO3) mg/l	5.415	1.009	23	2.685	2.971	1.276
Ortho-phosphate mg/l	0.146	0.006	23	0.0185	0.031	0.039
pH	8.1	7.3	23	7.8	7.8	0.24
Suspended Solids mg/l	/	/	/	/	/	/

Table 9 Water quality results downstream of the Errill WwTP during the period 2006/2007
(Derived from data supplied by Laois County Council).

Parameter	Maximum	Minimum	N	Median	Mean	Stdev
Ammonia(NH3) mg/l	0.486	0	23	0.067	0.132	0.148
BOD mg/l	5	0.5	23	2	1.77	1.04
CODmg/l	/	/	/	/	/	/
Conductivity @ 25°C	828	467	23	592.5	590.9	81.25
Nitrate (NO3) mg/l	5.473	1.377	23	2.90	2.99	1.024
Ortho-phosphate mg/l	0.087	0.009	23	0.034	0.042	0.024
pH	8.2	7.7	23	8.07	8.02	0.13
Suspended Solids mg/l	/	/	/	/	/	/

Table 10 Mean concentrations of parameters upstream and downstream of the Errill WwTP and percentage increase or decrease of parameters downstream of the outfall during the period January 2006 to March 2009.

Parameter	Upstream (mg/l)	Downstream (mg/l)	% increase/decrease
Ammonia(NH3)	0.069	0.132	91.3
BOD	1.39	1.77	27.3
Conductivity @ 25°C	557.2	590.9	6.0
Nitrates(NO3)	2.971	2.99	0.6
Ortho-phosphate	0.031	0.042	35.5
pH	7.8	8.02	2.8

Ammonia

During the period January 2006 to March 2009 the mean background level of ammonia in the upper Erkina was 0.069 mg/l N. The maximum level recorded at this control site during the study period was 0.158 mg/l N. These levels suggest no significant background pollution in the River. The mean ammonia concentration recorded downstream of the Errill outfall was 0.132 mg/l N (maximum 0.486 mg/l N). This represents an 91.3% increase in the level of Total ammonia from upstream to downstream of the Errill WwTP. The maximum level exceeds the limits of the EC (Drinking Water) (No. 2) Regulations, 2007 (SI No. 278 of 2007), the Surface Water Abstraction Regulations (1989) and the Freshwater Fish Directive (78/659/EEC) however at mean levels the Total Ammonia level recorded is within the limits of all of the above regulations.

Orthophosphates

Under the Draft Surface Water Regulations (DOEHLG, 2008) a river can be assigned 'High status' or 'Good status' based on Ortho-phosphate concentrations. 'High status' is assigned to a river if concentrations are ≤ 0.025 mg/l during mean flows or ≤ 0.045 during 95%ile flows. 'Good status' is assigned if concentrations are ≤ 0.035 during mean flows or ≤ 0.075 mg/l during 95%ile flows. The maximum values obtained both upstream (0.146 mg/l P) and downstream (0.087 mg/l P) of the WwTP during the period January 2006 to March 2009 for this parameter were above the Surface Water Quality Objective Regulations 2009 limit. Mean values were considered to be within the above limits upstream (0.031 mg/l P) and were within the ≤ 0.045 (95%ile) limit downstream (0.042 mg/l P) of the Errill WwTP.

BOD

The 2009 Surface Water Quality Objective Regulations provides a BOD limit value of ≤ 1.3 mg/l (mean) or ≤ 2.2 mg/l (95%ile) for rivers attaining 'high ecological status' and ≤ 1.5 mg/l (mean) or ≤ 2.6 mg/l (95%ile) for rivers attaining 'good ecological status'. Mean BOD levels during the

period January 2006 to March 2009 were higher downstream (1.77mg/l O₂) of the WwTP outfall than upstream (1.39mg/l O₂). The maximum BOD level recorded upstream of the outfall (2 mg/l O₂) during this period was lower than the maximum BOD level recorded downstream (5 mg/l O₂). Un-polluted river waters are likely to have a BOD value <3 mg/l O₂ and values above 4-5 mg/l O₂ indicate possible pollution. The maximum level of BOD downstream is elevated and exceeds the limitations of the Surface Water Quality Objective Regulations (2009), the Salmonid Rivers Regulations [1988] and the Freshwater Fish Directive (78/659/EEC) however the mean levels of BOD both upstream and downstream are within the limits of the above regulations.

Nitrates

The mean value of this parameter recorded during the period January 2006 to March 2009 was higher at the downstream site (2.99mg/l N), compared to the upstream site (2.971mg/l N). The maximum level of nitrates recorded upstream of the WwTP was 5.415mg/l N and downstream was 5.473mg/l N. A limit value of 50 mg/l as NO₃ (or 11.3 mg/l N) has been set for Class A1 water under the EC Surface Waters Regulations, 2009 [S.I. No. 272 of 2009] and this regulation also sets a lower guide level of 5.65 mg/l N as a quality objective. The receiving water both upstream and downstream of the Errill WwTP is just within this threshold value of 5.65 mg/l N at mean and maximum levels.

3.2.3 Dangerous substances

There is no information on dangerous substances in relation to the Errill WwTP.

3.2.4 Assimilation capacity

The primary regulatory guideline for effluent standards is the EU Urban Wastewater Treatment Regulations, 2001 which is implemented in Ireland through S.I. 254 of 2001 and the Water Quality Standards for Phosphorus (S.I. 258 of 1998). The Urban Wastewater Treatment Regulations requires the provision of secondary treatment for all discharges to freshwaters and estuaries from towns with a population equivalent of between 2,000 and 10,000. While the requirements of the Urban Wastewater Treatment Regulations are set, water quality requirements are dependent on the background values and the 95 percentile flow in the river (i.e. assimilation capacity).

Table 11 Requirements of the draft Water Framework Directive for assigning rivers 'High' or 'Good' status with respect to certain parameters and flow rates (from DOELG, 2008).

Parameter	Mean flow		95%ile flow	
	High status	Good status	High status	Good status
BOD (mg O ₂ /l)	≤1.3	≤1.5	≤2.2	≤2.6
Total Ammonia (mg N/l)	≤0.040	≤0.065	≤0.090	≤0.140
Ortho-phosphate (mg P/l)	≤0.025	≤0.035	≤0.045	≤0.075

There was no information available on flows in the Errill River (OPW online) at the time of preparing the current report. However, a general appraisal of assimilation capacity of the Errill River is provided in Table 12.

Table 12 Assimilation capacity assessment for the Errill River, upstream of the Errill WwTP

Date	Mean	Median	Assimilation capacity (Good Status)		Summary
			Mean Flows	95%ile flows	
BOD	1.39	1.3	Yes	Yes	Significant assimilation capacity available
Orthophosphate	0.031	0.0185	Yes	Yes	Significant assimilation capacity available
Total Ammonia	0.069	0.066	No	Yes	Limited no assimilation capacity available

There are limitations to the precision of the assimilation capacity results. In calculating the assimilation capacity, the background concentration is a key constraint. Variations in sampling for background concentrations would be expected due to changes in flow rates, season and local activities on the land. It also can be expected that flows in the river will be regularly

above the 95%ile level providing increased dilution. Indeed flow will be at or below this level for only 5% of the time.

3.4 Areas designated for nature conservation

Sites of international conservation importance are designated as Special Areas of Conservation (SACs) under the Habitats Directive (1992) and/or Special Protection Areas (SPAs) under the Birds Directive (1979). Together, SACs and SPAs make up the Natura 2000 network of wildlife conservation sites. Sites of national importance for wildlife are designated as Natural Heritage Areas (NHAs) under the Irish Wildlife Act, 2000.

The existing WwTP at Errill is not located within a designated conservation site. The upper Erkina is also not within an area designated for nature conservation. The Erkina River becomes part of the River Barrow and River Nore SAC (site code 002162) in its lower reaches from approximately 7km below Rathdowney, Boston Bridge. Conservation interests of this SAC include the Nore freshwater pearl mussel *Margaritifera durrovensis* which occurs near the Erkina confluence with the Nore, along with white-clawed crayfish *Austropotamobius pallipes*, Atlantic salmon *Salmo salar* and brook lamprey *Lampetra planeri* which occur in the Erkina itself.

The River Barrow and River Nore SAC is selected for alluvial wet woodlands and petrifying springs, priority habitats on Annex I of the E.U. Habitats Directive, 1992. The site is also selected as a cSAC for old oak woodlands, floating river vegetation, estuary, tidal mudflats, *Salicornia* mudflats, Atlantic salt meadows, Mediterranean salt meadows, dry heath and eutrophic tall herbs, all habitats listed on Annex I of the E.U. Habitats Directive. As well as habitats, the cSAC has been selected due to the presence of invertebrate, fish and mammal species which are listed under Annex II of the EU Habitats Directive, including freshwater pearl mussel (*Margaritifera margaritifera* and its hardwater form *M. m. durrovensis*), freshwater crayfish *Austropotamobius pallipes*, Atlantic salmon *Salmo salar*, twaite shad *Alosa fallax*, the three Irish Lamprey species - sea *Petromyzon marinus*, brook *Lampetra planeri* and river *Lampetra fluviatilis*, the Desmoulin's whorl snail *Vertigo moulinsiana* and Eurasian otter *Lutra lutra*. This site is one of only a handful of spawning grounds in the country for twaite shad, and is the most important site for this species.

Other important animal species are also found in the Barrow/Nore cSAC. These include Daubenton's bat *Myotis daubentonii*, badger *Meles meles*, Irish hare *Lepus timidus hibernicus* and frog *Rana temporaria*, all species listed in the Irish Red Data Book. The rare Red Data Book fish species smelt *Osmerus eperlanus* occurs in the estuary of the River Nore. Two other freshwater mussel species, *Anodonta anatina* and *A. cygnea* are also found in the Nore (Lucey, 1998). The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity Inistioge on the Nore. Good quality water is necessary to maintain the populations of the Annex II animal species listed above. Good quality is dependent on controlling fertilisation of the grasslands, particularly along the Nore. It also requires that sewage be properly treated before discharge.

3.5 Protected aquatic flora and fauna

Table 13 presents a list of the protected species recorded in the River Nore catchment and their status. Each species is discussed separately below in relation to the operation of the Errill WwTP and the upper Erkina River.

3.5.1 White-clawed crayfish

The white-clawed crayfish is the only freshwater crayfish recorded in Ireland. Populations of the species in the rest of Europe have declined dramatically and Ireland is seen as a unique stronghold for this species in a European context (Reynolds 1998). It is classified as vulnerable and rare in the IUCN Red List and is protected in Ireland under the schedules of the Wildlife Act 1976. It is also listed in Appendices II and V of the Habitats Directive (92:43:EEC). It is generally considered to be widespread in lowland lakes and rivers such as the River Nore, which are underlain by Carboniferous limestone, or its derivative - glacial drift

(Reynolds, 1998). The Erkina River contains suitable habitat for White-clawed crayfish and evidence of Crayfish carapace has been noted in the Erkina River. However according to Reynolds (2007), the White-clawed crayfish is diminishing in the upper mainstem of the Nore including the Goul, Gully and Erkina tributaries. It is likely that crayfish are also present in the Errill River.

Table 13 Status of fauna listed in the Habitats Directive (92:43:EEC) in the River Nore catchment (adapted from Lucey, 1998 and other sources).

Common name	Scientific name	Main channel	Tributaries
Pearl mussel	<i>Margaritifera margaritifera</i>	Rare	Rare
White-clawed crayfish	<i>Austropotamobius pallipes</i>	Common	Common
Brook lamprey	<i>Lampetra planeri</i>	Common	Common
River lamprey	<i>Lampetra fluviatilis</i>	Rare	Rare
Sea lamprey	<i>Petromyzon marinus</i>	Rare	Rare
Twaite shad	<i>Alosa fallax</i>	Rare	Absent
Atlantic salmon	<i>Salmo salar</i>	Common	Common
Eurasian Otter	<i>Lutra lutra</i>	Common	Common

3.5.2 Lampreys

The brook lamprey is the smallest of the three lampreys native to Ireland and it is the only one of the three species that is non-parasitic and spends all its life in freshwater (Maitland & Campbell 1992). The river lamprey is larger in size than the brook lamprey and exhibits an anadromous¹ life cycle. The sea lamprey is the largest of the Irish lampreys. Brook lamprey and sea lamprey are listed in Appendix II, while river lamprey is listed in both Appendices II and IV of the Habitats Directive (92:43:EEC). All three species are listed in Appendix III of the Bern Convention. All three lamprey species have been recorded from the Nore catchment (Kurtz & Costello 1999). Brook lamprey occur in the Erkina river (Kurtz and Costello, 1999). Brook lamprey are likely to spawn in the River Nore and within the Erkina and Errill Rivers.

3.5.3 Shad

Twaite Shad and Allis Shad are among the rarest species of fish breeding in Irish freshwaters and are listed under Annexes II and V of the EU Habitats Directive. Both species are also listed in Appendix III of the Bern Convention. Shad have an anadromous life cycle and both species are thought to occur in the Barrow/Nore Estuary. However, it is clear that these species are confined to the lower reaches of the river and would therefore not occur in the study area.

3.5.4 Atlantic salmon

The Atlantic salmon is listed under Annexes II and V of the EU Habitats Directive and Appendix III of the Bern Convention. It is an economically important species and salmon recreational and commercial fisheries occur throughout Ireland. The Erkina River is an important salmonid river and suitable salmon spawning habitat occurs along the Erkina River and also potentially on the Errill River.

3.5.5 Eurasian Otter

The otter *Lutra lutra* is a legally protected species under the Wildlife Act, 1976 (and Wildlife (Amendment) Act, 2000). It is listed under Annex II of the EU Habitats Directive and under Annex II of the Berne Convention. It is found throughout Ireland where it has apparently avoided the population declines that have occurred in many other countries (Hayden and Harrington 2000). The otter is known to occur on rivers, lakes, canals and coasts throughout the country.

¹ Anadromous fish spend most of their adult lives in salt water, and migrate to freshwater rivers and lakes to reproduce.

3.5.6 Freshwater Pearl-mussel

The populations of *M. margaritifera* within the River Nore have been described as a separate hard water species (*Margaritifera durrovensis*), or as a subspecies; however discussion remains as to whether these hard water populations are actually an ecophenotypic hard water form of *M. margaritifera* (Lucey, 2006). The distribution of the Nore freshwater pearl mussel *M. m. durrovensis* is limited to a 14km stretch of the river between Watercastle and Attanagh Bridge. The lower Erkina River is included in the Barrow / Nore SAC due to the presence of the freshwater pearl mussel at the confluence of the Erkina River with the River Nore downstream of Durrow. However it is unlikely that this species occurs within the upper Erkina River and Errill River.

3.6 Recreational and Commercial fisheries

The freshwater stretches of the River Nore main channel is a designated salmonid river under the EU Fish Directive (78/659/EEC). The Erkina River is an important salmonid river with good stocks of brown trout, good course fishing and spawning and nursery grounds for salmonids and therefore the upper Erkina and the Errill River is of potential fisheries importance.

3.7 Water abstractions

There is two water abstractions points to the south west of Errill village (Laois County Council Water Supply Map).

3.8 Designated recreational and bathing waters

There are no designated recreational or bathing waters on the Errill River, Erkina River or the River Nore at the confluence with the lower reaches of the Erkina River (Source: EPA online Envision map).

3.9 Nutrient sensitive areas

There are no designated nutrient sensitive areas on the Errill river, Erkina River or the River Nore at the confluence with the lower reaches of the Erkina River (Source: EPA online Envision map).

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4. IMPACT ASSESSMENT

4.1 Introduction

According to the EPA (2008), a discharge from a WwTP would be considered to have a significant adverse effect on the receiving waters if it were to:-

- Cause a deterioration in the chemical status or ecological status (or ecological potential as the case may be) in the receiving body of surface water;
- Cause a deterioration in the chemical status in the receiving body of groundwater;
- Cause the input into groundwater of hazardous substances, except where it is established that the input concerned is in a quantity and concentration so small as to obviate any present or future danger of deterioration in the quality of the receiving groundwater;
- Cause deterioration or result in significant and sustained upward trends in the concentrations of pollutants in groundwater in the case of pollutants that are not hazardous,
- Permanently exclude or compromise the achievement of the objectives established for protected species and natural habitats in the case of European sites where the maintenance or improvement of the status of water is an important factor in their protection or which is inconsistent with the achievement of environmental quality standards established under national Regulations in relation to designated bathing waters, designated shellfish waters, areas designated for the protection of freshwater fish and designated nutrient sensitive areas.

A summary of the receiving water impact assessment is provided in Table 14. The impact on identified receptors is outlined in the following sections.

Table 14 Summary of the receiving waters impact assessment

Receptor	Scale of impact on the Errill River	Scale of impact on the Erkina River	Scale of impact on the River Nore
Water quality	No impact	No Impact	No Impact
Designated conservation Sites	n/a	No Impact	No Impact
Protected flora and fauna	n/a	No Impact	No Impact
Fisheries	No impact	No impact	No Impact
Water abstractions	No impact	No Impact	No Impact
Recreational areas	n/a	n/a	No Impact
Nutrient sensitive areas	n/a	n/a	No Impact
Conclusion	Overall this plant is having no impact on the receiving water.		

4.2 Impact on water quality

The results of the current assessment suggest that the Errill WwTP is having no impact on water quality in the Errill River. The data provided by Laois County Council shows no significant impact downstream of the Errill WwTP. The EPA biological and chemical data is inconclusive. The biological data set has only one station which is downstream of the Errill WwTP therefore no conclusive comparison can be made upstream. The chemical data is both up and downstream of the WwTP however there is outside influences between these two monitoring stations. Firstly to the North of Errill, approximately 0.5km downstream of Errill bridge a 1st order confluences with the Errill River, secondly another 1st order stream joins the Errill River from the south, approximately 1km downstream of Errill bridge and most notably the headwaters of the Erkina River flow in from the south and confluence with the River Errill approximately 3.5km downstream of Errill bridge. Therefore it is possible that there is a cumulative impact from these additional tributaries to the Errill River.

4.3 Impact on areas designated for nature conservation

From the data available there is no evidence that the Errill WwTP is having an impact on any designated conservation site. The River Barrow and River Nore SAC is located approximately 22 km east of the Errill treatment plant, where the lower reaches of the Erkina River are included within the designation. The Errill plant discharges to Errill River which flows for approximately 15km before joining the SAC. During this 15 km reach, any impacts on water quality in the Errill River resulting from the discharges would be reduced prior to reaching the SAC by the recovery process that naturally occurs in rivers.

Using the available water quality monitoring data there is no evidence to indicate that the Errill WwTP or discharge is affecting water quality in the Erkina River / River Nore and Barrow SAC.

4.5 Impact on fisheries

It is concluded that the operation of the plant is having no impact on water quality either on its own or cumulatively on the Erkina and Nore Rivers. Therefore it is concluded that the plant is not having any significant effect on the fisheries of these rivers.

4.6 Impact on water abstractions

There is two water abstraction points to the south west of the village which are in an area of high groundwater vulnerability. Both abstractions points are located upstream of the Errill WwTP discharge point and are not impacted by the operation of the treatment plant.

4.7 Impact on designated recreational areas

The operation of the Errill plant would not be affecting any recreation areas, based on the information considered in the current assessment.

4.8 Impact on designated nutrient sensitive areas

The operation of the Errill plant would not be affecting any Nutrient Sensitive Areas, as this report suggests it is not having any effect on water quality in the Errill River. There is no evidence that the plant would be having any effect on the River Nore.

5. RECOMMENDATIONS

It is recommended that additional chemical water quality monitoring be undertaken on the Errill River upstream and downstream of the treatment plant. Further monitoring would be recommended downstream firstly before the confluence of the 1st order stream with the Errill River which is to the North Errill village, secondly before the confluence of the 1st order stream to the south east of Errill village and finally before the confluence of the Erkina headwaters with the Errill River. It is also recommended that a water quality model be produced for the Errill River. It would be advantageous to undertake biological water quality monitoring at the same sites.

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PLATES



Plate 1 Errill WwTP which operates an activated sludge suspended growth process.



Plate 2 The Erkina River which receives discharge from Errill WwTP.



Plate 3 The discharge point is located at the back right hand corner of the WwTP and is gravity fed to the Erkina river.

Appendix 1 Chemical water quality results for the Erkina River

Table A1.1 2007/2008 chemical water quality results for the Errill River at Errill Bridge located immediately upstream (approximately 30m) of Errill WwTP (Station code 0400) (Neill 2008; Neill, 2009).

Parameter	Temp	Do % Sat	DO mg/l O ₂	BO D mg/L O ₂	Colour Hazen	pH	Cond µS	o-Phos mg/l P	Ammonia mg/l N	Un ion-amm mg/l NH ₃	Nitrite mg/l N	Nitrate mg/l N	Chloride mg/l Cl
Unit	°C	% Sat	mg/l O ₂	mg/L O ₂	Hazen		µS	mg/l P	mg/l N	mg/l NH ₃	mg/l N	mg/l N	mg/l Cl
27/3/07	6.8	96	11.7	1.7	85	8.1	590	0.01	0.04	0.0008	0.019	4.9	20
17/5/07	13.1	95	10	1.4	125	8.2	514	0	0	0	0.019	2.1	17
17/9/07	11.9	92	9.9	1.7	70	7.9	628	0.02	0.02	0.0003	0.0002	3.7	18
28/11/07	9.8	86	9.8	1.1	125	7.9	598	0.08	0.08	0.0015	0.015	1.7	18
20/2/08	5.5	94	11.9	1.2	70	7.8	611	0.03	0.05	0.0005	0.019	3.4	18
21/4/08	7.9	100	11.9	1.1	85	8	625	0.02	0.03	0.0005	0.017	3.3	19
16/6/08	11.5	92	10	<0.3	70	8.1	626	0.01	0.06	0.0018	0.008	2.5	18
26/8/08	14.3	83	8.5	1	100	7.8	632	0.02	0.01	0.0003	0.009	2.3	17
21/10/08	9.6	81	9.2	1.4	106	7.9	621	0.02	0.02	0.0004	0.003	2.2	17
Mean	10.04	91	10.3	1.32	92.8	7.96	605	0.02	0.03	0.0007	0.012	2.9	18
Median	9.8	92	10	1.3	85	7.9	621	0.02	0.03	0.0005	0.015	2.5	18

Table A1.2 2007/2008 chemical water quality results for the Erkina River at the Bridge south east of beachmount (upstream of Rathdowney) located downstream (approximately 4km) of Errill WwTP (Station code 0400) (Neill 2008; Neill, 2009).

Parameter	Temp	Do % Sat	DO mg/l O ₂	BO D mg/L O ₂	Colour Hazen	pH	Cond µS	o-Phos mg/l P	Ammonia mg/l N	Un ion-amm mg/l NH ₃	Nitrite mg/l N	Nitrate mg/l N	Chloride mg/l Cl
Unit	°C	% Sat	mg/l O ₂	mg/L O ₂	Hazen		µS	mg/l P	mg/l N	mg/l NH ₃	mg/l N	mg/l N	mg/l Cl
27/3/07	6.9	103	12.5	1.4	50	8.1	718	0.01	0.02	0.0004	0.012	5.5	21
17/5/07	14	114	11.7	1.4	60	8.4	682	0.05			0.065	3.7	22
17/9/07	12.5	117	12.5	2.5	40	7.9	709	0.03	0.02	0.0005	0.006	4.5	21
28/11/07	10	92	10.4	0.7	70	8.1	734	<0.01	0.01	0.0004	0.014	2.7	20
20/2/08	5.6	92	11.6	0.8	40	8	727	0.04	0.03	0.0005	0.013	4.1	19
21/4/08	8	104	12.3	1	70	8.1	741	2	0.03	0.0007	0.011	4.6	20
16/6/08	12.2	113	12.1	2	30	8.2	725	0.02	0.02	0.0008	0.024	4	22
26/8/08	14.3	89	9.1	1	85	8	743	0.03	0.02	0.0006	0.009	2.8	18
21/10/08	9.3	93	10.7	1.8	78	8	738	0.04	0.02	0.0005	0.005	2.8	18
Mean	10.318	101.8	11.43	1.4	58.11	8.0	724.11	0.27	0.021	0.00055	0.01766	3.855	20.11
Median	10	103	11.7	1.4	60	8.1	727	0.035	0.02	0.0005	0.012	4	20

Appendix 2 Screening Matrix for the Errill WwTP

Screening matrix – Errill WwTP	
Brief description of the project or plan	<i>Continued operation of the existing Waste water treatment plant (WwTP) at Errill, Co. Laois. The WwTP operates conventional activated sludge suspended growth process. This plant discharges treated effluent to the Errill River which flows into the Erkina River. The Erkina River is designated as part of the River Barrow and Nore SAC in its lower reaches. The discharge point is ca. 10-15m from the WwTP.</i>
Brief description of the Natura 2000 site	<i>The Erkina River becomes part of the River Barrow and River Nore SAC in its lower reaches from approximately 7km below Rathdowney, Boston Bridge. Conservation interests of this SAC include the Nore freshwater pearl mussel <i>Margaritifera durrovensis</i> which occurs near the Erkina confluence with the Nore, along with white-clawed crayfish <i>Austroptamobius pallipes</i>, Atlantic salmon <i>Salmo salar</i> and brook lamprey <i>Lampetra planeri</i> which occur in the Erkina itself.</i>
Assessment criteria	
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	<i>Ongoing discharges from the existing Errill WwTP could have a negative impact on water quality in the River Barrow and Nore SAC. In the receiving water impact assessment for the Errill WwTP, it was concluded that the discharge was having no affect on the primary receiving watercourse which is outside the designated area and that there were no impacts further downstream on the SAC.</i>
Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the Natura 2000 site by virtue of: <ul style="list-style-type: none"> • size and scale; • land-take; • distance from the Natura 2000 site or key features of the site; • resource requirements (water abstraction etc.); • emissions (disposal to land, water or air); • excavation requirements; • Transportation requirements; • duration of construction, operation, decommissioning, etc.; • other. 	<i>The Errill WwTP discharge is to surface water approximately 15 km upstream of the boundary of the SAC site so any impacts on the designated area would be indirect. The quantity and quality of discharged effluent together with the distance from the SAC and dilution is such that negative impacts on the SAC are insignificant (This has been demonstrated in the Receiving Water Impact Assessment).</i>
Describe any likely changes to the site arising as a result of: <ul style="list-style-type: none"> • reduction of habitat area; • disturbance to key species; • habitat or species fragmentation; • reduction in species density; • changes in key indicators of conservation value (water quality etc.); • climate change. 	<i>There are currently no proposals to alter or expand the treatment plant at Errill. Changes to the SAC are limited to potential impacts affecting water quality with indirect impacts on aquatic conservation interests.</i> <i>The Errill WwTP discharges directly to the River Errill outside the SAC and the receiving Water Impact Assessment for this plant has demonstrated that the discharge from the Errill WwTP is not adversely affecting water quality in the SAC.</i>
Describe any likely impacts on the Natura 2000 site as a whole in terms of: <ul style="list-style-type: none"> • interference with the key relationships that define the structure of the site; • interference with key relationships that define the function of the site. 	<i>The integrity of the River Nore and Barrow SAC and its key ecological receptors are dependent on water quality. It has been shown that the Errill WwTP is not adversely affecting water. Therefore, the aquatic ecosystem in the SAC would not be altered by the Errill WwTP.</i>
Provide indicators of significance as a result of the identification of effects set out above in terms of: <ul style="list-style-type: none"> • loss; • fragmentation; • disruption/disturbance; • change to key elements of the site (e.g. water quality). 	N/a
Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	<i>On the basis of the Receiving Water Impact Assessment, it has been concluded that significant effects are unlikely to arise as a result of continued operation of the Errill WwTP.</i>

Finding of no significant effects report matrix – Errill WwTP			
Name of project or plan	Errill waste water treatment plant		
Name and location of Natura 2000 site	River Barrow and Nore SAC		
Description of the project or plan	<i>Continued operation of the existing Waste water treatment plant (WwTP) at Errill, Co. Laois. The WwTP operates conventional activated sludge suspended growth process. This plant discharges treated effluent to the Errill River which flows into the Erkina River. The Erkina River is designated as part of the River Barrow and Nore SAC in its lower reaches.</i>		
Is the project or plan directly connected with or necessary to the management of the site (provide details)?	No		
Are there other projects or plans that together with the project or plan being assessed could affect the site (provide details)?	<i>Agricultural activities (slurry spreading, fertiliser application and ploughing of the land) could result in elevation of suspended solids and certain chemicals in the SAC via erosion and runoff.</i>		
The assessment of significance of effects			
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.	<i>There are no impacts on water quality, surface water abstractions or protected aquatic species for which the SAC site has been selected. Impacts are not envisaged with continued operation of the Errill WwTP.</i>		
Explain why these effects are not considered significant.	<ul style="list-style-type: none"> - Discharge is not directly to the SAC - No evidence of deterioration in water quality in the SAC downstream of the tributary to which effluent is discharged. - Small size of the treatment plant - Dilution of the effluent by the immediate receiving water (river outside the SAC) and further dilution within the SAC. - Use of a modern treatment system that is maintained by Laois Co. Co. 		
List of agencies consulted: provide contact name and telephone or e-mail address.	N/a		
Response to consultation.	N/a		
Data collected to carry out the assessment			
Who carried out the assessment	Ecofact Environmental Consultants Ltd.; on behalf of Laois County Council		
	Sources of data	Level of assessment completed	Where can the full results of the assessment be accessed and viewed?
	Laois Co. Co. Central Statistics Office (CSO): http://www.cso.ie Environmental Protection Agency (EPA): http://www.epa.ie National Parks and Wildlife Service (NPWS): http://www.npws.ie Southern Regional Fisheries Board (SRFB): http://www.srfb.ie Southeastern River Basin District http://www.serbd.com	Receiving Water Impact Assessment	Water Services Section of Laois County Council, Aras an Chontae, Portlaoise, Co. Laois. Environmental Protection Agency licensing division
Overall conclusions			
<i>The continued operation of the existing Errill WwTP would not affect the Errill / Erkina River or any element of the River Nore and Barrow SAC provided it continues to operate within the current parameters.</i>			