Laois County Council

RECEIVING WATER IMPACT ASSESSMENT

Swan WwTP

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Prepared on behalf of:

WATER SERVICES
LAOIS COUNTY COUNCIL
County Hall
Portlaoise
Co. Laois

ecofact
Environmental Consultants
Tait Business Centre, Dominic Street, Limerick City, Ireland.
t. +353 61 419477, f. +353 61 414315
e. info@ecofact.ie
w. www.ecofact.ie

EXECUTIVE SUMMARY

This is a receiving water impact assessment report for the Swan 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 Swan WwTP is having a localised imperceptible negative impact on water quality in the Clogh River. This is suggested by the small increase in some parameters (i.e. BOD, orthophosphate and ammonia) downstream of the outfall when referenced to the upstream sampling site monitored by Laois County Council. Clogh River is joined by a 1st order stream to the west, known as the Moyadd stream and also by a 2nd order stream to the east which rises in Slatt Lower. This latter stream receives discharge from Lagan Brick factory, and is located ca 1.5-2km southeast of The Swan WwTP. Both of these streams confluence with Clogh River immediately downstream of the Swan WwTP discharge point. Therefore in addition to the impact of the Swan WwTP, there could also be a cumulative impact from these additional tributaries to Clogh River. It must be noted that this impact is localised and imperceptible as the most recent EPA data available downstream of the discharge point and downstream of the confluence of the Clogh river with the Moyadd and Slatt Lower streams is at monitoring station 0300 – Slatt Bridge. This has a Q4 'good ecological status' rating and is approximately 2.5 river kilometres downstream of the discharge point.

In light of the current information and the lack of EPA data available upstream of the Swan WwTP, it is concluded that the operation of the plant is having a slight localised imperceptible impact on the Clogh watercourse and is not likely to be having any further impact downstream on the Dinin and Nore Rivers. It is also concluded from the Article 6 screening matrix that the continued operation of the existing Swan WwTP would not affect the River Barrow and River Nore SAC provided it continues to operate within the current parameters.

It is recommended that additional chemical water quality monitoring be undertaken on the Clogh River upstream of the Swan WwTP, downstream of the Swan WwTP before the confluence of the Moyadd stream and Slatt Lower stream and further downstream past these confluences. It is also recommended that flows rates be derived for these rivers and a water quality model be produced. It would be advantageous to undertake biological water quality monitoring at the same sites.

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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 the village of Swan, Co. Laois. Swan Village is located on the Regional Road R430 to Carlow at the crossroads of the R430 and R426 Regional Roads, approximately 3km north of Clogh town. The Clogh River flows immediately west of the Swan WwTP and the Swan WwTP discharge point is to this watercourse. The lower reaches of the Clogh River are designated within the River Barrow and River Nore SAC (site code 002162) from approximately 0.5km downstream of Slatt Bridge. The Clogh River joins with the Dinin River which is a main tributary 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 population of Swan village is in the 0-100 population category.

The WwTP serving The Swan village is located at Slatt Lower, within a Laois County Council facility at the western edge of the village. This WwTP has an installation for potable water treatment and is a pumping station site. The height of the treatment plant enclosure does not exceed 4 metres and includes a number of small above ground tanks, a hard standing area and a paladin security fence.

The purpose of the report is to assess whether the existing waste water discharge(s) from the plant in Swan village 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 Surface Waters Regulations, 2009 (S.I. No. 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 Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009).
- 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)

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;
- 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 Swan WwTP was visited on the 23rd of November, 2009 and a walk over assessment was carried out on the plant and receiving water. During the survey, the Clogh River was in flood and it was not possible to identify visual signs of impact to this watercourse downstream of the discharge.

1.3.1 Desktop Review

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 though 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.

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);
- Geological Society of Ireland (GSI).

2. SCHEME DESCRIPTION

2.1 Introduction

The WwTP serving Swan village operates using an activated sludge treatment process. The discharge point of the Swan plant is into the upper reaches of the River Clogh, 100m downstream of the old discharge pipe head. It has a population equivalent capacity of 700 projected to the year 2027. Activated sludge process works by introducing atmospheric air or pure oxygen is to 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.). Waste activated sludge 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. Waste activated sludge 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.

2.2 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

Data for the influent at the Swan WwTP is presented in Table 1 and data for the effluent at Swan WwTP is presented in Table 2 (Derived from data supplied by Laois County Council).

Table 1 Water quality results for the influent at the Swan WwTP during the period 2006/2009 (Derived from data supplied by Laois County Council)

Parameter	Maximum	Minimum	N	Median	Mean	St.dev
Ammonia(NH_3) mg/l	38.76	0.185	24	11.77	12.24	11.27
BOD mg/l	349	12	24	101	113.78	82.23
CODmg/l	992	21	24	196	250.4	224.88
Conductivity @ 25°C	2490	269	24	652	736.3	422.03
Nitrate (NO_3) mg/l	1.939	0	24	0.385	0.588	0.551
Ortho-phosphate mg/l	3.987	0.056	24	1.627	1.533	1.222
pH	8.381	7.19	24	7.828	7.807	0.306
Suspended Solids mg/l	2490	269	24	652	736.3	422.03

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

Parameter	Maximum	Minimum	N	Median	Mean	St.dev
Ammonia(NH_3) mg/l	25.60	0.376	24	11.77	12.241	11.27
BOD mg/l	115	2	24	38	40	30
CODmg/l	274	0	34	87	104.45	74.85
Conductivity @ 25°C	2490	426	24	634	714.12	407.68
Nitrate (NO_3) mg/l	3.891	0	24	0.186	0.700	0.959
Ortho-phosphate mg/l	2.616	0.024	24	0.908	0.943	0.676
pH	7.876	7.312	24	7.56	7.60	0.179
Suspended Solids mg/l	255	0	24	57	77.04	64.48

2.3 Monitoring

Monitoring of the water quality of the outfall from the Swan 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

Swan is located in the Clogh River catchment (EPA river code 15/C/03). The Clogh River flows into the Dinin River (EPA River Code 15/D/02) which eventually flows into the River Nore (EPA river code 15/N/01). The channel length of the Clogh River is approximately 12 km. The headwaters of the Clogh River drain the upland area to the north of Swan village between the townlands of Scotland and Knocklead. The Clogh River is joined by the 3rd order Coolglass Stream which rises in Brennans Hill approximately 2.5 river kilometres after its point of origin. The Clogh River is subsequently joined by three 1st order rivers to the west, one approximately 0.5km upstream of Swan Bridge and two downstream of Swan bridge which both rise in Slatt Lower. The Moyadd stream which is a 2nd order stream joins the Clogh River from the west approximately 1km downstream of Swan Bridge. In its southerly course to the Dinin River, the Clogh River is crossed by the R426 Regional Road upstream of Slatt Bridge (EPA monitoring station 0200). Between Slatt Bridge and Clogh Bridge (EPA monitoring station 0300), a distance of approximately 2 km, the river is met by two 2nd first order streams from the east and west. Approximately 0.5 km upstream of the Dinin River confluence, there is a ford over the river and the EPA monitor biological water quality at this station (EPA monitoring station 0400). After its confluence with the Dinin River (north), the river flows south for approximately 21 km before meeting the River Nore from the east approximately 8 km upstream of Kilkenny. Along this stretch, it is met by the Dinin (south) River (EPA code 15/D/02), Gloshia River and Douglas River.

Soils in the Clogh River catchment are predominantly Acidic Surface water Gleys / Ground water Gleys (AminPD) and Acidic Lithosols / Regosols (AminSW) over Namurian Shales and Sandstone till (TNSSs). There is a small proportion of exposed bedrock at the surface (Rck) in the catchment. There is a small component of Acidic Brown Earth / Brown Podzolic soils (AminDW) and Namurian shales and sandstone sands and gravels (GNSSs) subsoils (EPA mapviewer).

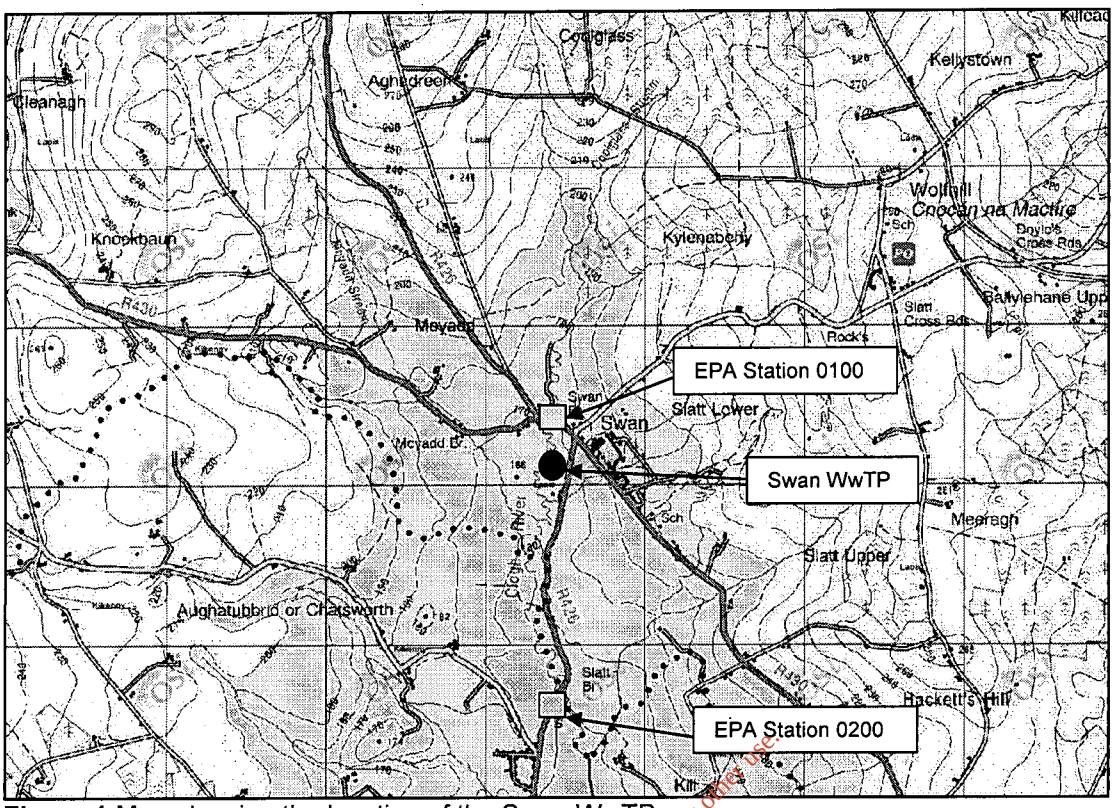

Figure 1 Map showing the location of the Swan WwTP.

3.2 Water quality

3.2.1 Existing information

3.2.1.1 EPA biological water quality data

The Clogh River (EPA code 15/C/03) is monitored by the EPA; however, there are no current monitoring stations located upstream of the Swan WwTP discharge. The upstream sampling station at The Swan Bridge (0100) has not been monitored by the EPA since 1988. Surveys on the Slatt Bridge downstream monitoring station were terminated in 2007, following the implementation of the monitoring programme for the Water Framework Directive. The most recent EPA biological water quality monitoring data for the Clogh River rates the watercourse as being of Class A water quality for approximately 81.8% of its length and Class B for the remaining 18.2%. During the years 1980 to 1988 it achieved a biological quality rating of Q4. The Slatt Bridge monitoring station (station code 15/C/03/0200) is located approximately 2 river kilometers downstream of the Swan WwTP discharge point.

Table 3 presents a summary of the EPA biological water quality data from the Clogh River; while Table 4 presents the results of the EPA biological water quality monitoring on the Clogh River downstream of the Swan WwTP.

Table 3 Summary of EPA water quality results showing overall results for the Clogh 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)
Clogh River (km)	4.5	1	0	0	5.5

Table 4 Clogh River (EPA code 15/C/03) Biological Quality Ratings (Q values) from Slatt Bridge ca. 2 rkm d/s of the Swan WwTP), adapted from EPA website.

Station	Station Location	1995	1998	2001	2005	2007
0200	Slatt Bridge (d/s)	3-4	4	3-4	4	-

Additional biological water quality data was recorded by the EPA on the Clogh River downstream of the Swan WwTP at Clogh Bridge (St. 0300) located approximately 4 river kilometres downstream of the Swan WwTP, i.e. a further 2 kilometres downstream from the Slatt Bridge monitoring station. This station was rated Q4 in 2007; however, it is important to

note that three 2nd order watercourses join the Clogh River between Slatt Bridge and the Clogh Bridge monitoring station, resulting in significant dilution and assimilation between these stations.

3.2.1.2 EPA chemical water quality data

Chemical water quality monitoring on the Clogh River was carried out by the EPA at Clogh Bridge (St. 0300) for the period 2007 and 2008 is provided in Neil (2008) and Neil (2009) and reproduced in Appendix 1. It must noted that the downstream sampling site was sampled on only five occasions during this period (08 September 2008) and no upstream site has been monitored. It is noted therefore that there is insufficient data from both sites to make a comparison; however the available results are discussed for individual parameters below in the absence of a more robust dataset. It is important to note that this monitoring station is located ca. 4 river kilometres downstream of the Swan WwTP discharge and that the Clogh River is joined by a number of tributaries between these points which may be having a cumulative impact on the chemical water quality of the watercourse, with additional impacts on dilution and assimilation capacity within this stretch.

The mean orthophosphate levels downstream were within the high status ≤ 0.045 (95% ile) limits of the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI 272 of 2009). The maximum level reached downstream was 0.06 mg/L P which is within the good status 0.075 (95% ile) limits.

The maximum level of Total Ammonia recorded downstream was 0.35 mg/l N. This can be considered as high. The mean level of Total Ammonia was 0.06 mg/L N which is within the good status limitation of ≤ 0.065 (mean). Therefore this value meets the requirements of the Surface Water Regulations [SI 272/2009], the EC (Drinking Water) (No.2) Regulations, 2007 [SI No. 278 of 2007] which is 0.23mg/l N and the Salmonid Waters Regulations [1988] at 0.78mg/l N.

The BOD (mg/l O_2) level ranged from 0.8 to 3.8 with a mean value of 1.9. This is within the high status ≤ 2.2 (95% ile) limits for the Surface Water Regulations [SI 272/2009]. The mean value also meets the requirements for the EC (Drinking Water) (No.2) Regulations, 2007 [SI No. 278 of 2007] which is 5mg/l O_2 and the Salmonid Waters Regulations [1988] <5 mg/l O_2. The DO levels (%Sat and mg/l O_2) were within the upper limit (95%ile) <120% saturation level and met the requirements for the Surface Water Regulations [SI 272/2009] and the Salmonid Waters Regulations [1988] >9 mg/l O_2.

The pH for the Clogh River ranged in value from 7.9-8.5 with a mean of 8.06, this corresponds to a water hardness of >100 and meets the standards for the Salmonid Waters Regulations [1988], Surface Water Regulations [SI 272/2009] and the EC (Drinking Water) (No.2) Regulations, 2007 [SI No. 278 of 2007].

Waters which show any appreciable amounts of nitrite are regarded as being of highly questionable quality. Levels in unpolluted waters are normally low, below 0.03 mg/l. The level of nitrites downstream of the WwTP did not exceed 0.027 mg/l N and had a mean level of 0.011mg/l N. This nitrite level does not exceed the EC (Drinking Water) (No.2) Regulations, 2007 [SI No. 278 of 2007] limit of 0.5mg/l N nor the Salmonid Waters Regulations [1988] limit of <0.05mg/l for nitrites. The ecological status of the Clogh River is classed as moderate and is 1a 'at risk of not achieving good status' (WFD Maps online).

3.2.1.3 Laois County Council Monitoring Data

Laois County Council monitors chemical water quality in the Clogh River at stations located upstream and downstream of the Swan 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 April 2009 and is provided in Tables 6 and 7. Table 8 presents the mean concentration of parameters measured upstream and downstream of the Swan 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 data upstream of Swan WwTP is presented in Table 6 and water quality data downstream of Swan WwTP is presented in Table 7.

Table 6 Water quality results upstream of the Swan WwTP during the period 2006/2007 (Derived from data supplied by Laois County Council)

Parameter	Maximum	Minimum	N	Median	Mean	St.dev
Ammonia(NH3) mg/l	0.218	0.004	24	0.034	0.045	0.044
BOD mg/l	5	1	24	1	1.59	1.15
CODmg/l	/	/	/	/	/	/
Conductivity @ 25°C	312	114.2	24	188.55	194.46	56.70
Nitrate (NO3) mg/l	2.541	0	24	0.499	0.763	0.616
Ortho-phosphate mg/l	0.122	0.007	24	0.023	0.0265	0.025
pH	8.203	6.851	24	7.734	7.713	0.321
Suspended Solids mg/l	/	/	/	/	/	/

Table 7 Water quality results downstream of the Swan WwTP during the period 2006/2007 (Derived from data supplied by Laois County Council)

Parameter	Maximum	Minimum	N	Median	Mean	St.dev
Ammonia(NH3) mg/l	0.19	0.013	24	0.0795	0.074	0.042
BOD mg/l	6	1	24	1	1.90	1.573
CODmg/l	/	/	/	/	/	/
Conductivity @ 25°C	424	145	24	265	258.1	85.74
Nitrate (NO3) mg/l	2.462	0.561	24	0.804	1.015	0.506
Ortho-phosphate mg/l	0.061	0.014	24	0.0345	0.0342	0.014
pH	8.3	7.4	24	7.86	7.84	0.22
Suspended Solids mg/l	/	/	/	/	/	/

Table 8 Mean concentrations of parameters upstream and downstream of the Swan WwTP showing an increase or decrease of parameters downstream of the outfall during the period January 2006 to April 2009.

Parameter	Upstream (mg/l)	Downstream (mg/l)	Increase/decrease
Ammonia(NH3)	0.045	**0.074**	**Increase**
BOD	1.59	1.90	Increase
COD mg/l	/	/	n/a
Conductivity @ 25°C	194.46	258.1	Increase
Nitrates(NO3)	**0.763**	**1.015**	**Increase**
Ortho-phosphate	**0.0265**	**0.034**	**Increase**
pH	7.713	7.84	Increase
Suspended solids	/	/	n/a (elevated)

Ammonia

During the period January 2006 to April 2009 the mean background level of ammonia in the Clogh River (i.e. at the site located upstream of the Swan outfall) was 0.045 mg/l N. The maximum level recorded at this control site during the study period was 0.218 mg/l N. Ammonia levels >0.14 mg/l N maybe an indication of organic pollution. Both the mean and maximum levels are within the limits for the European Communities (Drinking Water) (No. 2) Regulations, 2007 (SI No. 278 of 2007) and the Salmonid Waters Regulations [1988] however the maximum value exceeds the limit for the Freshwater Fish Directive (78/659/EEC) which is 0.04 mg/l.

During the period January 2006 to April 2009 the mean ammonia concentration recorded downstream of the Swan outfall was 0.074 mg/l N (maximum 0.19 mg/l). This represents an increase in the level ammonia from upstream to downstream of the Swan WwTP. However this value is still within the limits of the European Communities (Drinking Water) (No. 2) Regulations, 2007 (SI No. 278 of 2007), the Salmonid Waters Regulations [1988] and the Freshwater Fish Directive (78/659/EEC) and at mean levels is within the high status ≤0.09 (mean) limit under the 2009 Surface Water Quality Objective 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 ≤0.025mg/l during mean flows or ≤0.045 during 95%ile flows.

'Good status' is assigned if concentrations are ≤0.035 during mean flows or ≤0.075mg/l during 95%ile flows. The maximum value obtained both upstream (0.122mg/l P) exceeded the Surface Water Quality Objective Regulations 2009 limit but decreased downstream to 0.061mg/l P of the WwTP during the period January 2006 to April 2009 and was within the Surface Water Quality Objective Regulations 2009 limit at this value. Mean values were considered to be within the above limits upstream (0.0265 mg/l P) and downstream (0.034mg/l P) of the Swan WwTP, thus suggesting no impact of the discharge from this plant to Ortho-phosphate levels in the Clogh River.

BOD and Dissolved Oxygen

The 2009 Surface Water Quality Objective Regulations provides a BOD limit value of ≤1.3mg/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 April 2009 were higher downstream (1.9mg/l O_2) of the WwTP outfall than upstream (1.59mg/l O_2). The maximum BOD level recorded upstream of the outfall (5 mg/l O_2) during this period was lower than the maximum BOD level recorded downstream (6 mg/l O_2). Un-polluted river waters are likely to have a BOD value <3 mg/l O_2 and values above 4-5 mg/l O_2 indicate possible pollution. The maximum level of BOD downstream is elevated and exceeds the limitations of the European Communities (Drinking Water) (No. 2) Regulations, 2007 (SI No. 278 of 2007), the Salmonid Waters Regulations [1988] and the Freshwater Fish Directive (78/659/EEC).

Nitrates

The mean value of this parameter recorded during the period January 2006 to April 2009 was higher at the downstream site (1.015mg/l), compared to the upstream site (0.763mg/l). The maximum level of nitrates recorded upstream of the WwTP was 2.541mg/l N and downstream was 2.462mg/l N. A limit value of 50 mg/l as NO_3 (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 Swan WwTP is within this threshold value of 5.65 mg/l N.

3.2.2 Dangerous substances

There is no information on dangerous substances available for the current assessment in relation to the Swan WwTP.

3.3 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 9 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 Clogh River at the time of preparing the current report. However, a general appraisal of assimilation capacity of the Clogh River is provided in Table 10.

Table 10 Assimilation capacity assessment for the Clogh River upstream of the Swan WwTP

Date	Mean	Median	Assimilation capacity (Good Status) Mean Flows	95%ile flows	Summary
BOD	1.59	1	No (Mean) Yes (Median)	Yes	Limited no assimilation capacity available
Orthophosphate	0.0265	0.023	Yes (Mean) Yes (Median)	Yes	Significant assimilation capacity available
Total Ammonia	0.045	0.034	Yes (Mean) Yes (Median)	Yes	Significant assimilation capacity available

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 Swan is not located within a designated conservation site. The upper reaches of the Clogh River, which receives the discharge from the WwTP is also not within an area designated for nature conservation. However the lower reaches of the Clogh River approximately 0.5km downstream of Slatt Bridge is within the River Barrow and River Nore SAC (site code 002162). The Dinin River, of which the Clogh River is a tributary, is also within the River Barrow and River Nore SAC. The Clough River confluence with the Dinin River is located approximately 5 river kilometres downstream of the Swan WwTP discharge point

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 daubentoni*, 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 11 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 Swan WwTP and the Clogh River.

Table 11 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	River Nore	Clogh River
Pearl mussel	*Margaritifera margaritifera*	Rare	Absent
White-clawed crayfish	*Austropotamobius pallipes*	Common	Not confirmed

Brook lamprey	*Lampetra planeri*	Common	No confirmed
River lamprey	*Lampetra fluviatilis*	Rare	Absent
Sea lamprey	*Petromyzon marinus*	Rare	Absent
Twaite shad	*Alosa fallax*	Rare	Absent
Atlantic salmon	*Salmo salar*	Common	Likely to occur
Eurasian Otter	*Lutra lutra*	Common	Likely to occur

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) and favour moderate to good water quality with high calcium content. White-clawed crayfish are not likely to be present in the Clogh River, due to the acidic nature of the bedrock and soil that underlies the Clogh River.

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 anadromous[1] 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) and are likely to occur in the Dinin River, as it is one of the main tributaries of the River Nore. Brook and River Lampreys could potentially occur in the Clogh River.

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. Salmon are present throughout the Nore catchment (Lucey 1998) and are present in the Dinin River and are likely to be present in the Clogh 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

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

Harrington 2000). The otter is known to occur on rivers, lakes, canals and coasts throughout the country. Otter are considered to be likely to occur in the Clough River, although the watercourse may not support permanent populations due to its small size.

3.5.6 *Freshwater Pearl-mussel*

Freshwater Pearl-Mussel (*Margaritifera margaritifera*) occurs in the River Nore catchment; however this species is now rare in the main channel of the river (Lucey, 1998). The most recent count of Freshwater Pearl Mussel in the River Nore estimated a total population of around 500 individuals with no evidence of juvenile survival (Moorkens, 2004). According to Lucey (2006) the absence of the Freshwater Pearl Mussel from the tributaries of the Nore, effectively means that natural regeneration and self stocking of the main channel from within the basin cannot occur if, as is being predicted by Moorkens and Costello (1994), the remaining populations suffer the same fate as those of the two other sister rivers, the Suir and the Barrow where pollution, habitat destruction and overfishing have led to their decline in these catchments. The EPA chemical parameters recorded downstream on the River Clogh, in addition to the upstream and downstream parameters recorded by Laois County Council on the River Clogh, would suggest that this river would not support Freshwater Pearl Mussels present due to elevated levels of BOD, Total Ammonia and phosphate present. This species has not been recorded from the River Clogh.

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 Nore catchment, including the Dinin River is an important salmon and trout fishery which was once regarded as being one of the finest salmon rivers in the country (O'Reilly, 2004). The Kilkenny Angling Club on the River Dinin extends upstream from where the River Dinin joins the Nore for one and half miles on the left hand bank and in addition there is about half-a-mile of fishing on the right bank, downstream of the New Dinin Bridge. The River Nore catchment (Fishery Code 38) is classified as a salmon and sea trout fishery (McGinnity *et al,* 2003).

The River Clogh is not mentioned in O' Reilly's '*Fly fishers' guide to the rivers of Ireland*' (2004). However is likely to be of local importance in terms of salmonid spawning and juvenile habitat.

3.7 Water abstractions

There is a water supply source located in Swan village (Laois County Council development plan). According to the GSI online dataset this aquifer has extreme vulnerability in terms of the risk to groundwater quality from human activities in the Swan area. The bedrock in this aquifer is poor and generally unproductive (GSI online datasets).

3.8 Designated recreational and bathing waters

There are no designated recreational or bathing waters on the River Nore (Source: EPA online Envision map).

3.9 Designated nutrient sensitive areas

The River Clogh and the River Dinin are not classed as nutrient sensitive watercourses (Source: EPA online Envision Map).

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 or 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 12. The impact on identified receptors is outlined in the following sections.

Table 12 Summary of the receiving waters impact assessment

Receptor	Scale of impact on the Clogh River	Scale of impact on the Dinin River	Scale of impact on the River Nore
Water quality	No impact	No impact	No impact
Designated conservation Sites	No impact	No impact	No impact
Protected flora and fauna	No impact	No impact	No impact
Fisheries	No impact	No impact	No impact
Water abstractions	Imperceptible negative impact on abstractions from farm animals	No impact	No impacts
Recreational areas	n/a	No impact	No impact
Nutrient sensitive areas	n/a	n/a	No impact
Conclusion	Overall this plant is having a slight imperceptible localised impact on the receiving water.		

4.2 Impact on water quality

The results of the current assessment suggest that the Swan WwTP is having no impact on water quality in the Clogh River as there is no significant increase in key parameters (i.e. BOD, orthophosphate and ammonia) downstream of the outfall when referenced to the upstream sampling site monitored by Laois County Council.

The Clogh River, upstream of the closest EPA Slatt Bridge monitoring station to the Swan WwTP, is joined by a 1st order stream to the west known as the Moyadd stream and also by a 2nd order stream to the east which rises in Slatt Lower. This latter stream receives discharge from Lagan Brick factory, and is located ca 1.5-2km southeast of The Swan WwTP. Both of these streams confluence with Clogh River immediately downstream of the Swan WwTP discharge point. Therefore, in addition to the impact of the Swan WwTP, there could also be a cumulative impact from these additional tributaries to Clogh River.

From the EPA data available at the Slatt Bridge monitoring station it is evident that any water quality impact is localised and imperceptible, as the most recent EPA data available

downstream of the discharge point and downstream of the confluence of the Clogh river with the Moyadd and Slatt Lower streams is at monitoring station 0300 – Slatt Bridge. This has a Q4 'good ecological status' rating and is approximately 2 river kilometres downstream of the discharge point and ca 0.5km upstream of the SAC boundary site. The EPA chemical water quality data for Clogh Bridge, on the Clogh River, ca. 4 river kilometres downstream of the Swan WwTP does not show an increase in nutrient parameters. However it is important to note that the EPA chemical water quality data for this station is inconclusive in determining water quality from the Swan WwTP, as a number of minor tributaries and additional industrial discharges enter the Clogh River between the Swan WwTP site and this monitoring station.

In light of the current information it is considered that the Swan WwTP is not likely to be having any further impact downstream on the lower Clogh River, Dinin River or Nore River.

4.3 Impact on areas designated for nature conservation

It is concluded that the operation of the plant is having a slight localised impact on the water quality of the upper reaches of the Clogh River; however, this is not likely to be impacting the lower reaches of the Clogh River or the Dinin River watercourses due to the good water quality status recorded downstream of the discharge point at Slatt bridge which is ca 0.5km upstream of the SAC boundary site. Therefore it is concluded that the plant is not having any significant effect on the River Barrow and Nore SAC.

4.4 Impact on protected species

Water quality impacts downstream of the Swan WwTP outfall would not be expected to have significant negative impacts on existing brook lamprey, salmon or crayfish populations in the lower reaches of the Clogh River or the River Dinin.

4.5 Impact on fisheries

It is concluded that the operation of the plant is having a slight, localised impact on water quality of the upper reaches of the Clogh River; however the lower reaches of the Clogh River and the Dinin River are unlikely to be impacted by this event. Therefore it is concluded that the plant is not having any significant effect on the fisheries potential of the lower Clogh River, Dinin River or the Nore River.

4.6 Impact on water abstractions

It is possible that the discharge into the Clogh River could be affecting local water supplies for farm animals. There are no surface water abstractions from the Clogh River downstream of the Swan WwTP.

4.7 Impact on designated recreational areas

The operation of the Swan 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 Swan plant would not be affecting any designated Nutrient Sensitive Areas.

5. RECOMMENDATIONS

It is recommended that additional chemical water quality monitoring be undertaken on the Clogh River upstream of the Swan WwTP; downstream of the Swan WwTP before the confluence of the Moyadd stream and Slatt Lower stream; and further downstream past these confluences. It is also recommended that flows rates be derived for these rivers and a water

quality model be produced. It would be advantageous to undertake biological water quality monitoring at the same sites.

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PLATES

Plate 1 Swan WwTP is located at Slatt Lower, within a Laois County Council facility at the western edge of the village and operates an activated sludge treatment process.

Plate 2 Clogh River which receives discharge from Swan WwTP.

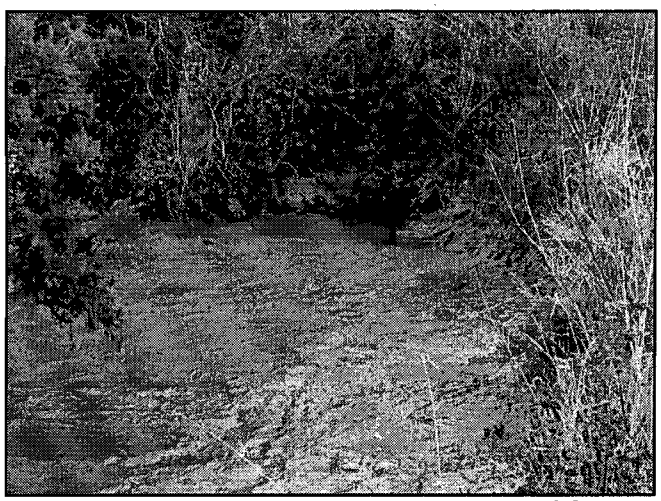

Plate 3 The old discharge point downstream of Swan Bridge, new discharge point is located ca 100m downstream from the old pipe head.

Plate 4 The Swan WwTP, this site and the Clogh River were in flood during the current assessment.

Appendix 1 Chemical water quality analysis for the Clogh River

Table A1.1 2007/2008 chemical water quality results for the Clogh River approximately 4 river kilometers downstream of the Swan WwTP at Clogh bridge (Station code 0300) (Neill 2008; Neill, 2009).

Date	Temp	Do % Sat	DO mg/lO	BOD mg/LO_2	Colour Haze n	pH	Cond µS	O-Phos mg/l P	Ammonia mg/l N	Un ion-Amm mg/lNH_3	Nitrite mg/l I	Nitrate mg/l I	Chloride mg/l Cl
14/2/07	4	102	13.4	1.3	60	8	238	0.03	0.06	0.008	0.008	1.7	14
03/5/07	15.3			3.8	**3.**	8.5	460	<0.01	0.35	0.027	0.027	1.9	15
12/7/07	15.5	111	11.1	2.2	70	7.9	275	0.03	0.03	0.014	0.014	0.8	13
-	15.8	117	11.6	2.5	**40**	8.1	451	0.01	0.02	0.016	0.016	1.7	14
05/11/07	11.2	109	12	1.4	3.	8.3	406	<0.01	0.02	0.012	0.012	0.9	22
06/2/08	4.5	95	12.3	1.4	85	7.8	196	0.06	0.04	0.004	0.004	1.1	14
03/4/08	10.3	91	10.2	0.8		7.9	292	0.02	0.03	0.004	0.004	1.3	16
14/5/08	18.1	128	12.1	2.1	**30**	8.2	441	<0.01	0.03	0.012	0.012	1	16
02/7/08	15	103	10.4	2.7	**70**	8	322	0.05	0.06	0.015	0.015	0.6	18
17/9/08	12.7	99	10.5	1.5	81	8	276	0.04	0.02	0.006	0.0006	0.7	12
15/12/08	4	95	12.5	1.3	52	8	263	0.06	0.09	0.006	0.006	0.5	13
Mean	11.5	105	11.61	1.9	54.8	8.06	329	0.03	0.06	0.011	0.011	1.1	15
Median	12.7	102.5	11.8	1.5	56	8	292	0.03	0.03	0.012	0.012	1	14

Appendix 2 Screening matrix for the Swan WwTP

Screening matrix – Swan WwTP	
Brief description of the project or plan	*Continuation of operation of the existing Waste water treatment plant (WwTP) at Swan, Co. Laois. The WwTP operates an activated sludge treatment process. Effluent from the WwTP is discharged to Clogh River 100m downstream of the old discharge pipe head. The Clogh River flows to the west of the Swan WwTP.*
Brief description of the Natura 2000 site	*The lower reaches of the Clogh River from approximately 0.5 river kilometers downstream of Slatt bridge is part of the River Barrow and River Nore SAC. The River Barrow and River Nore SAC site is selected for a range of protected aquatic species including lampreys, otter, white-clawed crayfish, Atlantic salmon, and freshwater pearl mussel (key aquatic features of the site).*
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.	*Ongoing discharges from the existing Swan WwTP could have a negative impact on water quality in the River Barrow and Nore SAC. However the discharge point is into the upper non designated reaches of the Clogh River.*
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: • 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.	*The Swan WwTP and discharge point is approximately 2 river kilometers from the boundary of the SAC site.* *Discharged effluent from the Swan WwTP could reach the SAC site via the upper reaches of the Clogh River. The discharged effluent is not having an impact on the upper reaches of the Clogh River. Therefore is not likely to have any impact downstream on the lower reaches of the Clogh River, Dinin River or Nore River. (This has been demonstrated in the receiving water impact assessment).*
Describe any likely changes to the site arising as a result of: • 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.	*There are currently no proposals to alter or expand the treatment plant at Swan. Changes to the SAC are limited to potential impacts affecting water quality with indirect impacts on aquatic conservation interests.* *The Swan WwTP discharges directly to surface water. The Receiving Water Impact Assessment for this plant has demonstrated that the discharge from the Swan WwTP would have an insignificant impact on the fisheries and nature conservation value of the SAC (This has been demonstrated in the receiving water impact assessment).*
Describe any likely impacts on the Natura 2000 site as a whole in terms of: • interference with the key relationships that define the structure of the site; • interference with key relationships that define the function of the site.	*The main risk would be disturbance to protected aquatic species including lampreys, otter, white-clawed crayfish, Atlantic salmon, and freshwater pearl mussel.*
Provide indicators of significance as a result of the identification of effects set out above in terms of: • loss; • fragmentation; • disruption/disturbance; • change to key elements of the site (e.g. water quality).	*A significant increase in the quantity of key water quality parameters downstream of the Swan WwTP (BOD, orthophosphate and ammonia).* *-A decrease in key species population*
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.	*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 Swan WwTP.*

Finding of no significant effects report matrix – Swan WwTP			
Name of project or plan	*Swan waste water treatment plant*		
Name and location of Natura 2000 site	*River Barrow and River Nore SAC*		
Description of the project or plan	*Continuation of operation of the existing Waste water treatment plant (WwTP) at Swan, Co. Laois. The WwTP operates an activated sludge treatment process. Effluent from the WwTP is discharged to Clogh River 100m downstream of the old discharge pipe head. The Clogh River flows to the west of the Swan WwTP.*		
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)?	*No information on other projects or plans was made available during the current assessment.*		
The assessment of significance of effects			
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.	*There are no impacts on water quality, surface water abstractions or protected aquatic species for which the SAC site has been selected or any impacts envisaged with continued operation of the Swan WwTP.*		
Explain why these effects are not considered significant.	*- No evidence of deterioration in water quality downstream of the WwTP in Swan in the lower reaches of the Clogh River which is designated as part of the River Barrow and River Nore SAC* *- Small size of the treatment plant* *-Use of a modern treatment system (activated sludge treatment process) 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. *Bord Na Mona: http://www.bnm.ie* *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			
The continued operation of the existing Swan WwTP would not affect the River Barrow and River Nore SAC provided it continues to operate within the current parameters.			

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