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for submission to the Board by
the Assistant Programme Manager Karen Creed
Signed: [signature] Date: 3/12/09

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

E OF CLIMATE, LICENSING
& RESOURCE USE

INSPECTOR'S REPORT ON A WASTE WATER DISCHARGE LICENCE APPLICATION

To:	DIRECTORS	
From:	Ewa Babiarczyk	**Environmental Licensing Programme**
Date:	3rd December 2009	
RE:	Application for a Waste Water Discharge Licence from Carlow County Council, for the agglomeration named Fenagh, Reg. No. D0246-01	

Application Details	
Schedule of discharge licensed:	Discharges from agglomerations with a population equivalent of 1,001 to 2,000
Licence application received:	27th February 2009
Notices under Regulation 18(3)(b) issued:	5th August 2009
Information under Regulation 18(3)(b) received:	28th August 2009, 25th September 2009
Regulation 18 Compliance:	25th September 2009
Site notice check:	18th March 2009
Site visit:	None
Submission(s) received:	None

1. Agglomeration

The village of Fenagh is situated approximately 16 km southeast of Carlow Town on a tributary of the Burren River. The village is served by the Fenagh waste water treatment plant (WWTP) which discharges to the Burren River. The estimated current population equivalent (p.e.) of the agglomeration is 550. The original WWTP in Fenagh was built in 1974 with a capacity of 200 p.e. However, this plant had become overloaded and a new WWTP, with a design capacity of 1,500 p.e., was constructed on the site of the original plant. The plant was subsequently commissioned and completed in October 2008. The upgrade works included the following:

- an inlet screen with by-pass-manual stainless screen, wash water and automatic sampler,
- grit classifier and blower,

- aeration tank with aeration wheel, D.O. probe and ferric sulphate dosing point,
- final settling tank with half bridge scraper and scum pump,
- forward feed pumping station,
- Return activated sludge (RAS)/Waste activated sludge (WAS) pumps,
- tertiary treatment consisting of sand filtration,
- ferric dosing system,
- sludge holding tanks,
- storm water holding tank with capacity to hold 3DWF for 2 hours, and;
- flow measurement of flow to full treatment, storm water overflow and sludge being removed from the site.

At present, planning permission has been granted for 50 units (90% domestic and 10% non-domestic) that have not yet been constructed. Even though it is estimated that this would add another 150 p.e. loading to the WWTP, the total future p.e. would still be below the plant's design capacity. However, Carlow County Council anticipates that these units are unlikely to be constructed for at least another couple of years.

2. Discharges to waters

There are currently two discharge points from the Fenagh WWTP: the primary discharge (SW1) and the storm water overflow point (SW2). There are no secondary discharges from the plant. The final effluent at SW1 discharges through a 180 mm diameter pipe to the Burren River c. 1.4 km downstream of the WWTP. SW2, which is situated at the plant, discharges through a 225 mm diameter pipe to a local unnamed tributary of the Burren River.

All inlet flows are screened and de-gritted and then any storm water flow above 3DWF ($35m^3/hr$) overflows to the storm water holding tank. This tank has a storage capacity of 2 hours at 3DWF which equates to a storage volume of 80 m^3. If the tank reaches capacity then settled, screened and de-gritted storm water overflows to the receiving water, via a baffled overflow pipe and discharges through SW2. The remaining storm water in the tank is returned to the forward feed pumping station and pumped back through the plant, as inlet flows permit. There are no pumping stations in the Fenagh catchment.

The applicant has stated in their application that the plant has been designed to achieve the following final effluent standards:

Table 2.1 WWTP final effluent design standards for 95%'ile flow

Parameter	Specifications for the Ballon WWTP
BOD	10 mg/l
Suspended Solids	10 mg/l
Ammonia	5 mg/l
Total Phosphorous	1 mg/l

The combined approach has been adopted for several parameters when setting emission limit values for the discharges at SW1. The Fenagh WWTP's specifications for BOD, Suspended Solids and Total Phosphorous outlined in Table 2.1 above have been retained in *Schedule A.1: Primary Waste Water Discharge* in the RL. Even though the plant's specification for Total Ammonia (as N) is 5 mg/l, the ambient monitoring results submitted in the application indicate that the plant is capable of treating Total Ammonia (as N) to a higher standard. Therefore, it is proposed to set the ELV for this parameter at 2 mg/l.

3. Receiving waters and impact

The following table summarises the main considerations in relation to the river downstream of the primary discharge.

Table 3.1 Receiving waters

Characteristic	Classification	Comment
Receiving water name and type	The Burren River (primary discharge SW1) Unnamed tributary of the Burren River (storm water discharge SW2)	Approx. 35 km long river, a tributary of the Barrow River. Approx. 6 km long stream, a tributary of the Burren River.
Resource use	Drinking water	The nearest downstream abstraction (Register code: 0100PUB1142) is located on the Burren River at the Sion Cross Water Treatment Plant c. 19.3 km downstream of the primary discharge from the Fenagh WWTP.
Amenity value	Fishing	
Applicable Regulations	EQS Regulations [Note 1]	Not designated as either a Salmonid River or Sensitive Water.
EPA monitoring stations	Station No. 14B050100 Station No. 14B050200	Located on the Burren River c. 35 m upstream of SW1. Located on the Burren River c. 5.7 km downstream of SW1.
Biological quality rating (Q value)	Q3-4 c. 35 m upstream of SW1 and Q3-4 c. 5.7 km downstream of SW1	The nearest upstream Agency's biological quality monitoring location on the Burren River is located c. 35 m upstream of the primary discharge and shows Q3-4 value (last monitoring at this location conducted in 2009). The nearest downstream Agency's biological quality monitoring location is on the Burren River, c. 5.7 km downstream of the primary discharge, and shows Q3-4 value (last monitoring conducted in 2009).
Target Q	4	
WFD status	Moderate	
WFD Risk Category	1a - At risk of not achieving good status	
WFD protected areas	None	The closest downstream candidate Special Area of Conservation (cSAC) is the River Barrow and River Nore (site code: 002162), c. 23 km downstream from the primary discharge.

		An approx. 2 km stretch of the Burren River (including the source of this river) is within the Blackstairs Mountains cSAC (site code: 000770) which is c. 10 km upstream of the primary discharge.

Note 1: European Communities Environmental Objectives (Surface waters) Regulations, 2009 (S.I. No. 272 of 2009)

The Burren River rises on the northern slopes of Mount Leinster and flows in a northerly and then easterly direction to discharge into the Barrow River in Carlow Town. The Burren River is c. 35 km long and confluences with the Barrow River c. 23 km downstream of the primary discharge (SW1) from the Fenagh WWTP. The confluence of the Burren and Barrow Rivers is within a candidate Special Area of Conservation (cSAC) named *River Barrow and River Nore* (site code: 002162).

Under the WFD the location of the primary discharge is included within the area which has a moderate quality and is at risk of not achieving good water quality status by 2015. The Agency's most recent biological quality monitoring of the Burren River was conducted in 2009. The results of this monitoring show that the water is slightly polluted (Q3-4) at the nearest upstream monitoring station (Station No. 14B050100) which is located c. 35 m upstream of SW1. The same Q value for the water quality was also recorded at this station in 2006. The results of the biological quality monitoring at the nearest downstream monitoring location (Station No. 14B050200) c. 5.7 km downstream from SW1 show that there has been a slight deterioration in water quality from unpolluted (Q4) in 2006 to slightly polluted (Q3-4) in 2009. However, no change in Q values at the upstream and downstream monitoring locations in 2009 indicates that that the quality of water in the Burren River is not altered by the discharges from the Fenagh WWTP and that the discharges from the plant do not reduce the water quality in the river. The nearest station to the Barrow River, where the most recent biological quality monitoring was conducted, is located c. 0.75 km upstream of the confluence of the Burren and Barrow Rivers (Station No. 14B050485). The monitoring results for 2009 show that the water quality at this station is slightly polluted (Q3-4). The same Q value was registered at this station in 2006.

The Agency's most recent biological quality monitoring of the Barrow River was conducted in 2009. The results of this monitoring show that the water is slightly polluted (Q3-4) at the nearest upstream monitoring location (Station No. 14B012200), c. 1.4 km upstream of the confluence with the Burren River. The nearest downstream monitoring station, where the most recent biological monitoring took place, is located c. 2.8 km downstream of the confluence with the Burren River (Station No. 14B012455). Monitoring results here show that there has been a slight deterioration in water quality from unpolluted (Q4) in 2006 to slightly polluted (Q3-4) in 2009 at this location.

Table 3.2 Assimilative Capacity

Parameter (mean) [mg/l]	PE	Available capacity %	95%ile background concentration [mg/l]	Proposed ELVs for discharge from SW1 [mg/l]	Contribution from primary discharge [mg/l]	Predicted downstream quality [mg/l]	Relevant standard [mg/l]
BOD (Existing)	550	46.54	1.390 Note 2	10 Note 4	1.377	2.767	≤2.6 Note 5
BOD (Proposed)	1100	46.54	1.390 Note 2	10 Note 4	2.375	3.765	≤2.6 Note 5
Suspended Solids (Existing)	550	-	9.200 Note 3	10 Note 4	0.128	9.328	-
Suspended Solids (Proposed)	1100	-	9.200 Note 3	10 Note 4	0.221	9.421	-
Total Ammonia (as N) (Existing)	550	67.14	0.046 Note 2	2	0.312	0.358	≤0.140 Note 5
Total Ammonia (as N) (Proposed)	1100	67.14	0.046 Note 2	2	0.539	0.585	≤0.140 Note 5
MRP Note 1 (Existing)	550	17.60	0.062 Note 2	0.50	0.070	0.132	≤0.075 Note 5
MRP Note 1 (Proposed)	1100	17.60	0.062 Note 2	0.50	0.121	0.183	≤0.075 Note 5

Note 1: Molybdate Reactive Phosphorous (as P) (Orthophosphate).

Note 2: Data from the EPA monitoring.

Note 3: Data from the Applicant's monitoring.

Note 4: WWTP design specification.

Note 5: European Communities Environmental Objectives (Surface waters) Regulations, 2009 (S.I. No. 272 of 2009). All standards based on 95%ile flow.

The Assimilative Capacity calculations in Table 3.2 above include the main parameters in the discharge from the Fenagh WWTP to the Burren River. The 95%ile flow rate in the Burren River at the primary discharge is 0.073 m^3/s and the 50%ile flow rate is 0.476 m^3/s. The 95%ile flow of 0.073 m^3/s has been used in the assimilative capacity calculations. To ensure that the contribution for BOD from the primary discharge will not exceed the relevant standard of 2.6 mg/l or less, it is proposed to limit the loading from the plant to 1,100 p.e.

Monitoring results for Molybdate Reactive Phosphorous (as P) from the period after the upgrade of the plant were not submitted with the licence application. Therefore, and having regard to the plant's design specification for treatment of Total Phosphorous (Table 2.1 above), in order to control levels of Molybdate Reactive Phosphorous (as P) in the primary discharge it is proposed to set the ELV for this parameter at 0.50 mg/l. Even though, the results of the downstream water quality monitoring conducted by the Agency in 2009 show that concentrations for BOD, and Orthophosphate (as P) do not exceed the relevant standards of 2.6 mg/l and 0.075 mg/l respectively, and the concentrations for Total Ammonia (as N) do not exceed 0.04 mg/l, the ELVs set out above aim at ensuring a high level of protection for the waterbody. Additionally, *Condition 5.1(d) and 5.1(e)* of the RL require the licensee to reduce Total Phosphorous and Total Ammonia loadings in the discharge to the maximum possible extent.

According to the report for the Burren River which is based on the *Draft River Basin Management Plan for the South Eastern River Basin District (December 2008)* discharges authorised under Section 4 of the *Water Pollution Acts, 1977 (as ammended),* which are controlled by Local Authorities, contribute to the Burren River being at risk of not achieving good water quality status by 2015.

The ELVs imposed in the *Schedule A.1: Primary Waste Water Discharge* and the monitoring requirements listed in *Schedule B.1: Monitoring of Primary Waste Water Discharge* and *Schedule B.3: Receiving Water Monitoring* of the RL will help to provide an improvement in water quality. However, to achieve good water quality status by 2015 and consequently satisfactory biological conditions downstream of the primary discharge from the Fenagh WWTP, a holistic approach to water quality management in the Burren River is required. This should include effective management of all point source inputs to the waterbody from agriculture or single media licences, and the minimisation of diffuse pollution from agricultural sources. Management of the waterbody must be carried out in accordance with the provisions of the relevant regulations along with the *Draft River Basin Management Plan for the South Eastern River Basin District (December 2008)*.

4. Ambient Monitoring

The current upstream ambient monitoring results, submitted in the application, are taken from a point located c. 3.3 km upstream from SW1 and upstream of locations where two unnamed streams discharge to the Burren River. Therefore, in order to more accurately ascertain the quality of the receiving water upstream of the primary discharge, the upstream ambient monitoring point should be located downstream of any confluences with the Burren River (ie. as close to SW1 as possible).

Similarly, the current downstream monitoring location is c. 2.7 km downstream of SW1 and downstream of locations where four unnamed streams discharge to the Burren River. Therefore the downstream ambient monitoring point should be located upstream of any discharges from the local streams to the Burren River, yet outside of the mixing zone at SW1.

Condition 4.3 of the RL requires the applicant to agree a location for the new ambient upstream and downstream monitoring points with the Agency within three months of date of grant of this licence. *Schedule B.3: Receiving Water Monitoring* of the RL includes monitoring of the receiving water upstream and downstream of the primary discharge in order to ensure the discharges from the agglomeration are not having a detrimental effect on the quality of the receiving water.

5. Combined Approach

The Waste Water Discharge Authorisation Regulations, 2007 (S.I. No. 684 of 2007) specify that a 'combined approach' in relation to licensing of waste water works must be taken, whereby the emission limits for the discharge are established on the basis of the stricter of either or both, the limits and controls required under *the Urban Waste Water Treatment Regulations (S.I. No. 254 of 2001)* and the limits determined under statute or Directive for the purpose of achieving the environmental objectives established for surface waters, groundwater or protected areas for the water body into which the discharge is made. The RL as drafted gives effect to the principle of the Combined Approach as defined in *S.I. No. 684 of 2007*.

6. Programme of Improvements

The existing WWTP was commissioned and completed in October 2008 and no programme of improvements for the plant is planned.

7. Compliance with EU Directives

In considering the application, regard was held to the requirements of Regulation 6(2) of the *Waste Water (Discharge) Authorisation, Regulations, 2007 (S.I. No. 684 of 2007)* notably:

Water Framework Directive [2000/60/EC]

The RL, as drafted, transposes the requirements of the Water Framework Directive. In particular, *Condition 3: Discharges* provides conditions regulating discharges to waters while *Schedule A: Discharges* specifies limit values for those substances contained within the waste water discharge. Those limits specified in the RL are determined with the aim of achieving good water quality status by 2015.

Urban Waste Water Treatment Directive [91/271/EEC]

The RD as drafted addresses the requirements of the Urban Waste Water Treatment Directive. In particular, *Condition 3 Discharges* provides conditions regulating discharges to waters and *Schedule A: Discharges* specifies limit values for those substances contained within the waste water discharge.

Dangerous Substances Directive [2006/11/EC]

The applicant has provided sampling results for all of the 19 dangerous substances in the primary discharge for the purposes of the licence application. The results for Toluene, Tributylin, Chromium, Copper, Cyanide, Zinc, Cadmium and Mercury exceeded the relevant standards given in *the European Communities Environmental Objectives (Surface waters) Regulations, 2009 (S.I. No. 272 of 2009)*.

Condition 4.11 of the RL requires further testing of the discharges from the treatment plant for the presence of the metals and organic compounds. Additionally, it requires the licensee to investigate the sources of the dangerous substances and take the necessary measures to comply with the limits set in *the Environmental Quality Objectives (Surface Water) Regulations, S.I. 272 of 2009)* for the discharge of such substances from the waste water works.

The RL as drafted provides a high level of protection for the receiving water by ensuring that all discharges from the agglomeration will be provided with an appropriate level of treatment, as per *Condition 3: Discharges* and *Schedule A: Discharges*. However, to achieve good water quality status and consequently satisfactory biological conditions downstream of the plant the holistic approach in relation to water quality management is required. Therefore, the effective management of all diffuse or point source inputs to the water body from agricultural or single media licences must be carried out in accordance with the provisions of the relevant regulations *(European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2009* and the *Water Pollution Acts, 1977 to 1990)* along with the relevant river basin district management plans.

Birds Directive [79/409/EEC] & Habitats Directive [92/43/EEC]

There are no discharges from the Fenagh agglomeration directly into any site designated under the *E.U. Habitats* or *Birds Directives*. However, at the confluence of the Burren and Barrow Rivers, c. 23 km downstream of SW1, there is one cSAC, the River Barrow and River Nore (site code: 002162).

This cSAC is selected for its important habitats such as alluvial wet woodlands, petrifying springs, 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 the *E.U. Habitats Directive.* Additionally, this site has been selected as it supports populations of the following species listed in Annex II of this Directive: Sea Lamprey, River Lamprey, Brook Lamprey, Freshwater Pearl Mussel, Nore

Freshwater Pearl Mussel, Crayfish, Twaite Shad, Atlantic Salmon, Otter, *Vertigo moulinsiana* and the plant Killarney Fern.

The assessment of impact of the primary discharge on the River Barrow and River Nore cSAC (site code: 002162), submitted as part of this licence application, states that discharges from the Fenagh waste water works are unlikely to adversely affect this protected area due to its distance from the River Barrow and the cSAC, the high level of treatment of the effluent and the good dilution in the receiving waters.

Drinking Water Abstraction Regulations

The nearest abstraction (Register code: 0100PUB1142) is located on the Burren River c. 19 km downstream of the primary discharge at the Sion Cross Water Treatment Plant (WTP). The application states that in the design of the Fenagh WWTP this abstraction point was one of the items factored into the design criteria for the new plant. The 2008 cryptosporidium risk assessment for the Sion Cross (WTP) takes into account WWTPs with a capacity of 500 to 5,000 p.e. However, these plants are not named in the scoring. The overall result of this risk assessment shows a significant improvement from the high risk in 2005 to the low risk in 2008.

Environmental Liabilities Directive [2004/35/EC]

Condition 7.2 of the RL satisfies the requirements of *the Environmental Liabilities Directive* in particular those requirements outlined in Article 3(1) and Annex II of *2004/35/EC*.

Charges

The RL sets an annual charge for the agglomeration at €2,752 and is reflective of the monitoring and enforcement regime being proposed for the agglomeration.

Recommendation

I recommend that a Final Licence be issued subject to the conditions and for the reasons as set out in the attached Recommended Licence.

Signed

Ewa Babiarczyk
Inspector
Office of Climate, Licensing and Resource Use

Annex 1: Fenagh WWTP and the receiving waters