ROSCOMMON COUNTY COUNCIL

BALLINLOUGH WASTE WATER DISCHARGE LICENCE

ANNEX F

EXISTING ENVIRONMENT & IMPACT OF THE DISCHARGES

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 26-07-2013:14:07:45

F.1. Assessment of Impact on Receiving Surface or Ground Water

An Assessment of the Impact on the Receiving Surface Water – Lough O'Flynn, river Suck & river Island.

The primary outfall (SW1) from the Ballinlough Waste Water Treatment works discharges to the river Lough O'Flynn and the River Suck.

There are three secondary discharge points, SW3 has an emergency overflow – pump station on the Ballinlough WWTP network. The other secondary discharge points have no emergency overflow. SW3 emergency discharge point has the potential to overflow directly to the tributary of Island river. Details of the Secondary Discharge points are presented in attachment C2.

The Lough O'Flynn, the River Suck and the Island river is not designated Salmonid water (under the European Communities (Quality of Salmonid Waters) Regulations, 1998) nor is it identified as sensitive water in terms of the Urban Waste Water Treatment Regulations 2001. However, Lough O'Flynn is a designated a proposed Natural Heritage Area.

For inspection purposes only.
Consent of copyright owner required for any other use.

The Development Applications Unit of the Department of the Environment, Heritage and Local Government commented that Roscommon County Council follow the guidance in DoEHLG Circular L8/08. The Development Applications Unit requested in order to mitigate potential impact on the watercourse they recommend the following conditions be attached to grant of permission:

- Waste Water treatment works should conform to EPA guidelines
- Measurements to be put in place to ensure that in the event of power failures/spillages/overloading etc that any polluting material will be contained in site and allowed to enter surrounding water courses.

Lough O'Flynn is a 300 acre rich limestone lake. The also has significant recreational value and is widely used for brown trout/pike fishing and water sports. This is an important amenity lake. Significant deterioration in water quality would have the potential to negatively impact on these uses.

The drinking water abstraction point highlighted on drawing 15 is used only for emergency purpose only. The primary source is Ballybane springs and is located near Garranlahan, 3.8km southwest of Ballinlough WWTP.

EPA Export 26-07-2013:14:07:45

The following section 5.7.4, table 5.11, table 5.12 & table 5.13 - assimilative capacity is taken from the County Roscommon 16 villages sewerage scheme preliminary report 2005.

5.7.4 Assimilative Capacity Of Lakes

5.7.4.1 Three of the proposed WWTPs will discharge treated effluent to a lake. These are as follows:

- Ballinlough - Lough O'Flynn
- Ballyleague/Lanesborough - Lough Ree
- Hodson Bay - Lough Ree

5.7.4.2 The villages of Ballinlough and Ballyleague are currently served by WWTPs which discharges treated effluent to Lough O'Flynn and Lough Ree respectively. There is also an existing WWTP in Hodson Bay which serves a Hotel and discharges treated effluent to Lough Ree. Wastewater from Lanesborough receives minimal treatment prior to discharge to Lough Ree.

5.7.4.3 Examination of water quality data for both Lough Ree and Lough O'Flynn indicates that the existing discharges do not appear to be having a negative impact on the water quality of the lakes.

5.7.4.4 Currently, Ballinlough WWTP discharges a treated effluent with an average BOD concentration of 22.3mg/l, an average suspended solids concentration of 30.6mg/l and an average total phosphorus concentration of 1.6mg/l (2003 treated effluent analysis results). The WWTP was designed to discharge a treated effluent quality of 25mg/ BOD, 35mg/l Suspended Solids and 2mg/l Total P.

5.7.4.5 Examination of water quality data obtained for Lough O'Flynn for the years 2001-2003 indicates that the current water quality within the lake is very good. Chlorophyll concentrations within the lake ranged from 1mg/m^3 to 4mg/m^3. According to the O.E.C.D. lake classification scheme (used by the EPA to define the trophic status of lakes), lake water quality samples with chlorophyll concentrations of <8mg/m^3 are indicative of Oligotrophic Lakes (i.e. good water quality). Oligotrophic lakes are described by the EPA as having a very low level of pollution.

5.7.4.6 This is further reinforced by examination of water quality data from the River Suck 100m downstream of Lough O'Flynn. According to the latest EPA data available at this location (2002 data), the quality of the water at this location is very good (biological Q rating assigned to this location is Q 4-5 which indicates unpolluted waters).

5.7.4.7 This indicates that the current discharge from Ballinlough WWTP does not appear to be adversely affecting the quality of Lough O'Flynn. There appears to be adequate assimilative capacity within the lake to cope with the current loads.

Consent of copyright owner required for any other use. For inspection purposes only.

EPA Export 26-07-2013:14:07:45

Table 5.11 – Theoretical Wastewater Assimilative Capacity of Discharges to Lake for BOD, ortho-phosphate and ammonia												
Village	Location	Lake	95 Percentile Flow (m3/sec)	Median U/s Conc (mg/l)			Max Permissible Concentration			Assimilative Capacity		
				BOD (mg/l O2)	Ortho-P (mg/l P)	Ammonia (mg N/l)	BOD (mg/l O2)	Ortho-P (mg/l P)	Ammonia (mg N/l)	kg/BOD / day	kg/P/ day	kg/N/ day
Ballinlough	Willsbrook	Lough O'Flynn	.0165*	2	.02	.5**	3	.03	1	1.43	.01	0.71
Ballyleague/ Lanesborough / Hodson Bay	Athlone Burgess Park (LHS)	Lough Ree	22.4	2.9 ***	.029***	.11	3	.03	1	193.5	1.94	1722

**95 percentile flow estimated from the 95% flow recorded at Willsbrook (EPA station no. 26006) by means of relative catchment areas at Willsbrook and Lough O'Flynn. Catchment area at Willsbrook is 192 km^3, area at Lough O'Flynn is estimated at 12 km^3.*

***No data available at Lough O'Flynn. Nominal figure used for purposes of illustration.*

**** When the recorded median BOD value of 3 mg/l O_2 or ortho-P value of .03 mg/l P. is placed in the assimilative capacity equation, it indicates that the river has no assimilative capacity. However, when a slightly smaller nominal value of 2.9 or 0.029 respectively is put in the equation, some indication is available regarding the assimilative capacity available in the river based on minor fluctuations in the measured median concentration of the particular parameter.*

Consent of copyright owner required for any other use. For inspection purposes only.

Table 5.12 – Theoretical discharges of BOD from proposed WWTP's versus assimilative capacity								
WWTP	Design PE	Hydraulic Load (based on 225 litres per PE)	Estimated Discharge					Assimilative Capacity kg/BOD/ day
			kg/day of BOD @ 25mg/l	kg/day of BOD @ 20mg/l	kg/day of BOD @ 15mg/l	kg/day of BOD @ 10mg/l	kg/day of BOD @ 5mg/l	
Arigna	585	131,625	3.29	2.63	1.97	1.32	0.66	12.96
Ballinlough	1,340	301,500	7.54	6.03	4.52	3.02	1.51	1.43

Table 5.13 – Theoretical discharges of ortho-P and ammonia from proposed WWTP's versus assimilative capacity							
WWTP	Design PE	Hydraulic Load (based on 225 litres per PE)	Estimated discharge			Assimilative Capacity of river	
			kg/day Ortho-P @ 2 mg/l	kg/day ammonia @ 5 mg N/l	kg/day ammonia @ 1 mg N/l	kg/P/day	kg/ammonia / day
Arigna	585	131,625	0.26	0.66	0.13	0.13	11.15
Ballinlough	1,340	301,500	0.60	1.51	0.30	0.01	0.71

The identified receiving waters for the treated effluent from Ballinlough WWTP is Lough O'Flynn and treated effluent standards of 25mg/l BOD, 35mg/l SS, 2mg/l Phosphorous and 2mg/l Total Ammonia are recommended.

Annex F: - EXISTING ENVIRONMENT & IMPACT OF THE DISCHARGES

EPA Export 26-07-2013:14:07:45

Biological surveys are carried out by the EPA in the summer-autumn period (June-September) when flows are likely to be relatively low and water temperatures highest. Surveys during this period are likely; therefore, to coincide with the worst conditions to be expected in those reaches affected by waste inputs. Material for examination is obtained by a "kick" sampling technique in the faster-flowing areas of the river and examination and assessment of water quality is made on site. Measurements of DO saturation and water temperature, as well as observations on macrophyte and algal abundance, substratum type, water appearance and other biological and physical features are also recorded. The EPA have two biological quality rating (Q values) sampling points near Lough O'Flynn. They are sampling station number 0030 (Bridge u/s Lough O'Flynn) and sampling station number 0050 (Bridge d/s Lough O'Flynn) and are downstream of SW1.The Island river connects with the river suck in Ballymoe. The EPA have a biological quality rating (Q value) sampling point downstream of this point at station number 0500 (Ballymoe Bridge).

For inspection purposes only.
Content of copyright owner required for any other use.

Biological Quality Rating (Q Values)											
River Suck	Code 26/S/07. Tributary of Shannon										
Station No.	1971	1974	1978	1980	1983	1984	1987	1992	1996	1999	2002
0030	-	-	-	-	-	-	3-4	4	3-4	4	4-5
0050	-	-	-	-	-	-	4	4	4	4-5	4-5
0500	5	4-5	4	4	-	4	4-5	4-5	4	4	4-5

Roscommon County Council monitors the Lough O'Flynn and the River Suck & river Island upstream and downstream of the discharge from the Waste Water Works. These locations are shown on drawing 14 of attachment E3. Samples are collected every month and analyzes for suite of parameters as outlined table D.1(i)(b).

The results of treated effluent indicate generally good water quality with average levels outline in table F.1.

EPA Export 26-07-2013:14:07:45

Parameter Substance	Maximum Value (mg/l)	Max. daily average (mg/l)
Suspended Solids	**35**	39
Ammonia (as N)		9.42
Biochemical Oxygen Demand	**25**	16
Chemical Oxygen Demand	**125**	76
Total Nitrogen (as N)	**15**	11.74
Nitrite (as N)	**0.50**	0.22
Nitrate (as N)	**50**	11.69
Total Phosphorus (as P)	**2**	0.84
Orthophosphate (as P)[Note 1]		0.44
Phenols (sum) [Note 2] (ug/l)		<1.3

Table F1.0 Results of May 2008 – May 2009 emissions to surface waters

In summary, there appears to be adequate assimilative capacity within the lake to cope with the current loads. Physiochemical water quality monitoring in the Lough O'Flynn and the River Suck and River Island both upstream and downstream of the primary and secondary discharges from the waste Water works indicates that the discharges from the works are not having a detrimental impact on the receiving environment.

For inspection purposes only.
Consent of copyright owner required for any other use.

EPA Export 26-07-2013:14:07:45