

**This Report has been cleared
for submission to the Board by
the Programme Manager F Clinton
Signed: A Keenan Date: 30/05/09**



OFFICE OF CLIMATE, LICENSING &
RESOURCE USE.

INSPECTORS REPORT ON A WASTE WATER DISCHARGE LICENCE APPLICATION

To:	DIRECTORS		
From:	Gavin Clabby	Environmental Programme	Licensing
Date:	31 st July 2009		
RE:	Discharges from agglomerations with a population equivalent of 2,001 to 10,000		

Application Details	
Schedule of discharge licensed:	Discharges from agglomerations with a population equivalent of more than 2000
Licence application received:	22 nd September 2008
Notices under Regulation 18(3)(b) issued:	13 th March 2009
Information under Regulation 18(3)(b) received:	23 rd April 2009
Site notice check:	17 th October 2008
Site visit:	24 th June 2009
Submission(s) Received:	None

1. Agglomeration

1.1 Background

Cobh is located in Cork Harbour on Great Island, approximately 5 miles southeast of Cork City. This application is for the discharge from the *North Cobh* Waste Water Treatment Plant (WWTP), which serves the agglomeration of *North Cobh* and is situated in an area called Ballynoe. (See location maps in Appendix 1) The application was made by Cork County Council Southern Division, which is the Water Service Authority (WSA) for the agglomeration.

This plant was constructed as an interim measure until the Cork Lower Harbour WWTP at Shanbally, near Ringaskiddy, (Cork Lower Harbour Sewerage Scheme), is constructed. This scheme (WWDA Reg. No. D0057-01) is proposed to provide collection systems and a wastewater treatment facility in the Cork Lower Harbour area, servicing the towns of Carrigaline, Ringaskiddy, Shanbally, Coolmore, Cobh, Monkstown/Passage West and Crosshaven, with an overall population equivalence (p.e.) of 80,000. The proposed date for completion of the scheme is Q3/4 2014.

The North Cobh Design Build Operate & Maintain (DBO&M) contractor (Electrical & Pump Services Limited) is currently operating the treatment plant for North Cobh under a five-year contract, with an option to extend this contract pending the development of the Cork Lower Harbour Sewerage Scheme. When this scheme is complete it will accept flows from the North Cobh agglomeration and the North Cobh plant will, in turn, be decommissioned.

For North Cobh, it was decided to build a 4,000 p.e. plant in the initial construction phase and that an expansion to 8,000 p.e. could be facilitated in 2000 p.e. increments, if demand from nearby development was realised. The 4,000 p.e. plant received its first flows in May 2008 and has completed its commissioning phase. The agglomeration population equivalence is currently, only 850.

As part of this assessment a site visit was made on the 24th June 2009. This inspector was received on site by Madeleine Healy of Cork County Council and Vincent Browne of Electrical & Pump Services.

1.2 Waste Water Collection System

The North Cobh agglomeration has (with the exception of twenty houses connected to a combined system) a completely separated wastewater and storm water collection systems. The agglomeration's storm water is discharged directly to a separate outfall at Carrigaloe, Cobh into the River Lee Estuary, West Passage.

Essentially, only wastewater, therefore, flows from the agglomeration (by gravity) to the pumping station, which pumps effluent approximately 100 metres up to the WWTP at Ballynoe. Consequently, the collection system only conveys volumes equivalent to dry weather flow (DWF). The pumping station has the capability to pump up to six times dry weather flow (6DWF) to accommodate any spikes in the waste water flows, but such spikes should be very rare indeed.

1.3 Waste Water Treatment

The WWTP, as required by the Urban Waste Water Treatment Regulations (UWWT), 2001, (S.I. No. 254 of 2001) provides secondary treatment for flows, producing an effluent with less than 25 mg/l BOD₅, 125mg/l COD and 35 mg/l SS. This secondary treatment is provided by a plant design based on two sequence batch reactors (SBR's) supported by a Storm/Balance Tank.

The plant discharges to Sensitive Waters, as designated by the UWWT (Amendment), 2004, (S.I. No. 440 of 2004) However, the North Cobh agglomeration has a population equivalent load of less than 10,000 and is, therefore, not required to comply with the limits for Total Phosphorous (2mg/l) and Total Nitrogen (15mg/l) as set out in the UWWT Regulations, 2001.

1.4 Population Equivalent - Agglomeration

The population equivalence for the North Cobh Area was compiled from the 2003 Cork Development plan and recent planning permissions granted in the area. The applicant estimated the population equivalent load of the agglomeration to be served by the waste water works at 6,000 in 2013. In the present economic climate, it seems doubtful the population equivalent will be much greater than the current 850, during the lifetime of North Cobh's first discharge licence.

The area the WWTP services has been zoned primarily for residential use with a limited amount of "dry" industrial development proposed. Of the 144 hectares zoned within the Development Plan 16.6 hectares are allocated for commercial and light industrial.

1.5 Design Population Equivalent - WWTP

Although there is provision to expand the design capacity to 8,000 p.e., it was understood from the application, given recent trends in construction, that there would not be a need to expand beyond 6,000 during the period of the WWD licence. In reality, it seems unlikely that plant will need to expand beyond its current design p.e. of 4,000.

Furthermore, the site visit on the 24 June 2009, revealed that only one the two SBR's was in use, making the effective capacity of the plant 2,000 p.e. This measure was taken in light of the current low population connected to the network.

2. Discharges to Waters

2.1 Existing Discharges.

The primary and sole discharge for the North Cobh agglomeration is the treated effluent discharge located at Carrigaloe, Cobh (E177535 N067632) and discharges into West Passage in Cork Harbour. There are no secondary discharge points in the North Cobh waste water treatment works, as all effluent (treated and emergency overflows) discharge through the main plant outfall (i.e., the primary discharge point).

There are no storm water overflow points associated with the North Cobh wastewater treatment works, principally as a result of the foul drainage system being a separate one, with rainwater runoff from the agglomeration being diverted away from the foul system.

2.2 Monitoring

The treated effluent discharged is sampled at the treatment plant by means of a 24-hour composite sampler. The final effluent flow is also measured at the same location. The monitoring type and frequency is in accordance with the Urban Waste Water Treatment Regulations 2001.

Schedule B.1 Monitoring of the Primary Waste Water Discharge requires monthly monitoring BOD, COD and Suspended Solids in compliance with above regulations. As the West Passage is designated Sensitive Waters monitoring is required for Total Nitrogen and Total Phosphorous. The regulations for surface water quality are the European Communities Environmental Objectives (Surface Waters) Regulations (S.I. 272 of 2009) (the EQS Regulations). To address key parameters in the EQS Regulations and the EPA's Trophic Status Assessment Scheme, Orthophosphate and Dissolved Inorganic Nitrogen (DIN) have also been included.

2.3 Compliance

Averaged results from Table D.1(i)(b) of the licence application show the effluent discharge is within the limits set in the Urban Waste Water Treatment Regulations 2001. In addition, data from the 16 separate dates supplied in section E.4 of the application show that no individual results failed to conform to the regulations.

2.4 Peak Influent/Storm Water Overflow Provision

In the event of high influent flows to the WWTP, there is provision for an overflow from the inlet works, which is piped to the so-called storm/balance tank, where the overflow is contained for a minimum period of 2 hours at 3DWF for 8,000 p.e. (This containment period would be significantly higher at the current 850 p.e.) Any overflow surplus to the capacity of this tank will divert to the screened emergency overflow pipe, which connects

to the final effluent pipeline. As indicated earlier, there are no storm water flows to the plant.

2.5 Emergency Overflow Provision

If the pumping station's duty or assist pumps fail, the standby unit will operate in its place. Should all of the three inlet pumps fail to operate or the incoming flow is greater than the 6xDWF capacity of the pumping station, the liquid will overflow to the primary discharge outfall pipe by gravity. The emergency outfall is protected by a 5mm brushed screen. A sensor sends an alarm signal when the liquid level reaches the overflow and a meter measures the flow. This screened and monitored emergency overflow discharges into the final effluent pipeline. As there no storm water flows this, would be an exceptional occurrence.

3. Receiving Waters and Impact

The following table summarises the main considerations in relation to the West Passage, Lough Mahon downstream of the primary discharge.

Table 3.1 Receiving Waters Summary

Characteristic	Classification	Comment
Receiving water name and type	West Passage, Lough Mahon, Cork Harbour Transitional Water	Transitional Water
Resource use	Port access	-
Amenity value	Sailing	-
Applicable Regulations	Urban Waste Water Treatment EC Environmental Objectives (Surface Water) Regulations 2009	S.I. 254/2001 and S.I. 440/2004 S.I. 272 of 2009
Designations	Sensitive Waters	Agglomeration p.e. <10,000
EPA monitoring stations	Lough Mahon, Marino Point, LE340 Ringaskiddy, LE380	Upstream Downstream
WFD status	Good	Status year: 2008
WFD Objective	Protect	-
WFD Risk Category	1a	Status year: 2008
WFD protected areas	Lough Mahon, Nutrient Sensitive Waters, PA4_0041 Monkstown Creek Cork Harbour, Water Dependent Habitat and Species PA6_SPA_04030 / NHA_01979	Direct discharge 2km downstream of discharge
Any other important issues	Larger WWTP discharging upstream of North Cobh	Carrigrenan, 413,000 p.e.

3.1 Receiving Waters

Cork Harbour is the second largest natural harbour in the world and the second largest port in Ireland. The harbour is also used extensively for recreational activities. Within the Harbour area there also a number of protected conservation areas and newly designated shellfish areas.

The receiving waters for the North Cobh agglomeration are in the West Passage at the lower end of Lough Mahon, Cork Harbour (See location maps in Appendix 1). The West Passage is a busy shipping channel, as well as a sailing amenity. It is a natural deep water channel approximately 4km long and 400m wide. Although the channel is tidal, it is essentially an extension of the River Lee. The velocity of the water is affected by the tides but the dominant flow of the water is in the direction of the lower harbour and ultimately out to sea. The West Passage is also designated a Sensitive Water under the *Urban Waste Water Treatment Regulations (Amendment) 2004*. However, the Lower Harbour area has no such designation.

The nearest protected conservation area is the Monkstown Creek SPA/NHA, which is 2km downstream of the North Cobh discharge. This SPA/NHA is more directly impacted by the untreated primary and secondary discharges of the Passage West/Monkstown agglomeration, Reg. No. D0129-01. (See location maps)

The lower harbour has two designated shellfish water areas under the recent *Quality of Shellfish Waters Regulations (Amendment), 2009 (S.I. 55 of 2009)*. These are Rostellan North, Rostellan South. However, these designated areas are nine kilometres to the east of the North Cobh discharge and are more directly affected by the discharges from the surrounding agglomerations of Cobh, Midleton, Aghada and Rostellan. The West Passage itself is not a designated Shellfish area under the above regulations. There are also no designated bathing areas within the discharge area. The nearest designated bathing spot is Fountainstown, which is over 10 km from the discharge point and outside the mouth of the harbour. Fountainstown does not have blue flag status for 2009.

3.2 Compliance with Receiving Water Regulations

Table 3.1 below shows results for the downstream EPA monitoring point 2km downstream of the North Cobh discharge. The data used was from the EPA Estuarine Monitoring Programme's summertime campaign of 2007. (The year previous to the North Cobh WWTP's first discharges.)

The results show that the quality of the receiving waters 2km downstream of the discharge is compliant with the EQS Regulations (S.I. 272 of 2009).

Table 3.1 Receiving Waters Summary

Parameter	EQS Regulations 2009	Downstream Result (LE 380 Ringaskiddy)
BOD ₅ (95%ile)	< 4.0 mg O ₂ / l	2.3 O ₂ / l
Molybdate Reactive Phosphorous (95%ile)	≤ 0.040 mg P/ l	0.017 mg P/ l
Dissolved Oxygen saturation (95%ile)	> 80% lower limit < 120% upper limit	113.2%

3.3 Exiting BOD Load and Impact on Receiving Waters

The BOD of the current typical effluent discharge is 4.8 mg O₂/l. At a current typical discharge flow rate of 160 m³/day, this equates to an exiting BOD₅ load of 0.77 kg O₂/day. At the predicted high population scenario of 8,035 persons, the projected exiting BOD₅ load would be 48.21 kg O₂/day. These loads must be regarded as having a negligible impact on the waters of downstream of the discharge, considering the BOD₅ load from the upstream Carrigrennan plant (413,000 p.e., secondary treatment) is shown in mathematical modelling to cause minimal oxygen depletion in the West Passage. (Cork City Council, Carrigrennan, Reg. No. D033-01 application data).

Chapter nine of the EPA's fourth 'State of the Environment' report, *Ireland's Environment 2008*, states that, "The condition of Lough Mahon (Cork Harbour), which was assessed as strongly eutrophic in the last report [2004], has improved substantially and is no longer classed as such." Lough Mahon (Cork Harbour) is now classed as intermediate.

4. Ambient Monitoring

The licence application did not establish a mixing zone, and monitoring points LE 340 Marino Point and LE 380 Ringaskiddy were listed as upstream and downstream locations. However, the receiving waters are classed as transitional and therefore any monitoring should ideally be situated in relation to an established mixing zone and mathematical modelling of tidal flows. However, considering the small volumes of suitably treated effluent discharged by North Cobh, and significantly larger loads discharged by the Carrigrennan and Passage West/Monkstown agglomerations, this assessment considers the data from LE340 and LE 380 as sufficient to indicate the quality of the receiving waters for all the discharges in the area. Furthermore, it is not considered necessary for the water services authority to carry out its own ambient monitoring for the North Cobh discharge.

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

6.1

In the event that the agglomeration's population equivalent exceeds that of the current design capacity of the plant (4,000 p.e.), provision has been made on site for two additional SBR's, each giving an additional 2,000 p.e. capacity. Condition 1.7 of the R.L. states that the licensee shall assess, on annual basis, remaining organic and hydraulic

treatment capacity, and shall notify the Agency for any necessary review of the licence to expand the WWTP.

6.2

The application states that the North Cobh agglomeration will be connected to the Cork Lower Harbour Sewerage Scheme when the Shanbally WWTP is completed thereby discontinuing the North Cobh WWTP discharge. This diversion of the North Cobh discharges shall not be placed as a condition in the licence, pending the assessment and development of the Cork Lower Harbour Sewerage Scheme. However, Condition 6.12 of licence states the water services authority shall notify the Agency upon any cessation of discharges from the North Cobh agglomeration.

7. Compliance with EU Directives and Related Directives

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

Drinking Water Abstraction Regulations [S.I. 294 of 1989]

North Cobh is a transitional water discharge. There are no water abstraction points down stream of the discharge point from the WWTP at North Cobh; therefore the above regulations do not apply.

Sensitive Waters

The North Cobh WWTP discharges into the West Passage, Lough Mahon, Cork Harbour, which is designated as a Sensitive Water under the UWWT Regulations (Amendment) 2004. However, the UWWT Regulations, 2001, (Second Schedule, Part Two) only applies limits for Total Phosphorous and Total Nitrogen to discharges from agglomerations greater than 10,000 p.e. The applicant is seeking a discharge licence not exceeding 6,000. Therefore, these limits do not apply.

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 water, while *Schedule A: Discharges* specifies limit values for those substances contained within the wastewater discharge. Those limits specified in the RL are determined with the aim of protecting the good water quality status.

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

The WWTP, as required by Annex 1.D of the Urban Waste Water Treatment Directive, provides secondary treatment for the North Cobh agglomeration. North Cobh complies with the requirements of the Urban Waste Water Treatment Directive, in terms of the level of treatment provided. The RL, as drafted, has regard to the requirements of the Urban Waste Water Treatment Directive. In particular, *Condition 3 Discharges* provides conditions regulating the discharges to waters, and *Schedule A: Discharges* specifies the limit values for those substances contained within the waste water discharge.

Bathing Water Directive [2006/7/EC]

The West Passage is not designated as a Bathing Water. There are no other bathing areas in the vicinity of the discharge and therefore no further treatment, such as disinfection, is required to comply with the above directive.

EC Freshwater Fish Directive [2006/44/EC]

The River Lee and the West Passage, according to a Flora and Fauna Survey Report submitted with the application, have moderate runs of salmon, which enter the river for spawning purposes. However, as these waters are transitional, they are not designated salmonid waters.

Shellfish Waters Directive [2006/113/EC]

The West Passage itself is not a designated Shellfish area. Therefore the above regulations do not apply.

Note: The nearest designated areas are nine kilometres to the east of the North Cobh discharge (Five kilometres east of Cobh town). Mathematical modelling from the Carrigrenan EIS indicates that a discharge from Marino Point would increase the level of Total Coliforms in the waters off Cobh town by two (2 No.) counts/100ml. It is reasonable to assume, therefore, that a discharge approximately a hundred times smaller coming from the middle of the West Passage would have a negligible impact on the shellfish waters.

Dangerous Substances Directive [2006/11/EC]

The applicant has provided sampling results for 9 of the 19 dangerous substances in the primary discharge for the purposes of the licence application. The measured concentrations are not considered significant. The agglomeration is effectively domestic in nature with zoning for a limited contribution from some 'dry' commercial activities. The initial screen for the application is therefore considered sufficient and the agglomeration is compliant with the Dangerous Substances Regulations (S.I. No. 12 of 2001).

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

There are no discharges from the North Cobh agglomeration directly into any site designated under the E.U. Habitats or Birds Directives. The nearest site is the Monkstown Creek SPA 2km downstream of the discharge. In light of this the Agency requested the applicant screen the development for Appropriate Assessment (AA). The screening exercise submitted showed that an AA was not necessary. This exercise was regarded as having been completed correctly.

Environmental Liabilities Directive [2004/35/EC]

Condition 7.2 of the RD satisfies the requirements of the Environmental Liabilities Directive, in particular, those requirements outlined in Article 3(1) and Annex III of said directive.

Submissions

No submissions were received in relation to this application.

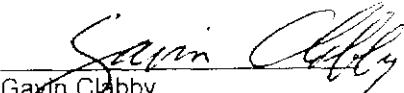
Charges

The RL sets an annual charge for the agglomeration at € 2,854 and is reflective of the monitoring and enforcement regime being proposed for the agglomeration.

Recommendation

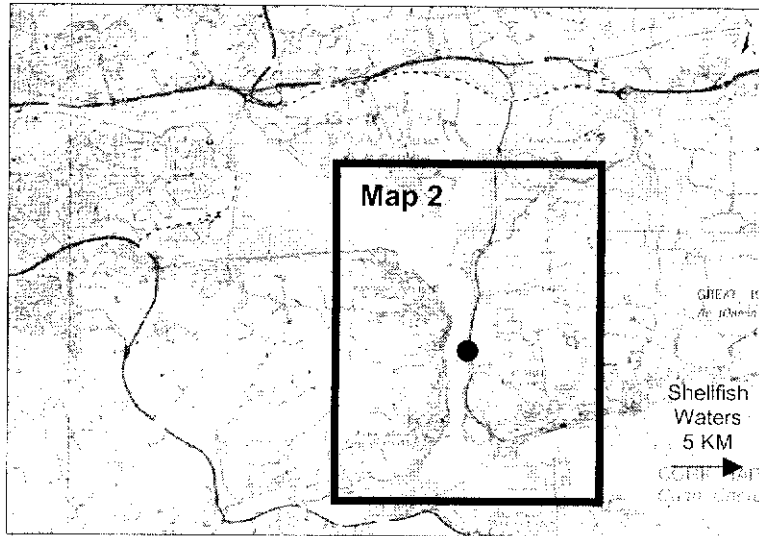
I recommend that a Final Licence be issued subject to the conditions and for the reasons as set out in the attached Recommended Licence.

Signed


Gavin Clabby
Office of Climate, Licensing and Resource Use

Appendix 1

Map 1: Lough Mahon, Upper Cork Harbour



- North Cobh primary discharge ●
- Passage West/ Monkstown primary and secondary discharges ●
- North Cobh ambient monitoring points (EPA) ◆
- Cork City (Carrigrenan) Primary discharge Point (Marino Point) ●
- Agglomeration Boundary ———
- Portion of agglomeration currently developed
- Waste Water Treatment Plant ○

Map 2: West Passage, Lower Lough Mahon

