This report has been cleared for Submission to the Board by the Programme Manager
F.Clinton
Signed: Kate Hatford Date: 2/09/09

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

OFFICE OF CLIMATE, LICENSING & RESOURCE USE.

INSPECTORS REPORT ON A WASTE WATER DISCHARGE LICENCE APPLICATION

To:	DIRECTORS	
From:	**PATRICK BYRNE**	**Environmental Licensing Programme**
Date:	2nd September 2009	
RE:	Application for a Waste Water Discharge Licence from Dublin City Council for the Greater Dublin Area Agglomeration, Reg. No. D0034-01.	

Application Details	
Schedule of discharge licensed:	Discharges from agglomerations with a population equivalent of more than 10,000.
Licence application received:	14/12/2007
Additional Information received:	12/02/2009
Notices under Regulation 18(3)(b) issued:	19/03/2008
Information under Regulation 18(3)(b) received:	28/07/2008 & 27/04/2009
Notice under Regulation 20(1):	27/11/2008
Information under Regulation 20(1) received:	23/12/2008 & 27/04/2009
Site notice check:	29/12/2007
Site visit:	19/02/2008, 14/11/2008
Submission(s) Received:	One

1. Agglomeration

The application relates to the agglomeration referred to as 'Greater Dublin Area Agglomeration'. The application is submitted by Dublin City Council but the agglomeration includes all of the geographical area of Dublin City Council and parts of Fingal County Council, South Dublin County Council, Dun Laoghaire Rathdown County Council and Meath County Council. The agglomeration is served by one waste water treatment plant (WWTP) at Ringsend (Ringsend WWTP). The average annual flow received at the WWTP, calculated by the Applicant is a *population equivalent* (p.e.) of 1.9 million people, however, the measured p.e. was 2.54 million

for 2006 and 2.87 million for 2007[1]. During a 30 day period in April/May 2008 the average loading to the works was 3.14million p.e. or 192% of the design capacity (design capacity c. 1.64 million p.e).

The Recommended Licence (RL), as drafted, provides regulation and control of discharges from the 'Greater Dublin Area Agglomeration'. It does not deal with the issues of odour, noise or management of the waste water works infrastructure as these matters are regulated under other legislative mechanisms.

The WWTP at Ringsend provides preliminary (initial screening), primary (settlement), and secondary (sequence batch reactors) treatment of the effluent. In addition, ultraviolet (UV) treatment of the discharged effluent is provided during the bathing season. No additional nutrient removal (for nitrogen and/or phosphorus) is currently provided at the WWTP. The treated effluent is discharged (primary discharge point 'SW1Dublin') into the Lower Liffey Estuary after mixing with the cooling water discharged from the Electric Supply Board (ESB) (Poolbeg) Ltd.(power generation plant).

The drainage system in the catchment is characterised by a *combined system* (where both rainfall and waste waters are carried in a single pipe) in the city centre and urbanised areas and a separate system (where rainfall and waste water are carried in two separate pipelines) in the more recent suburban developments. A significant number of storm water overflows are provided within the urbanised area of the catchment to allow excess storm flows discharge to water courses or storm drains and so prevent flooding of property.

There are two secondary discharges, which currently receive inadequate treatment prior to discharge, these will be connected to the Ringsend WWTP in 2009 and 2011 and are discussed further below.

Dublin City Council have contracted a consultant to prepare an extension Design Review Report, scheduled for completion in late 2009. The Design Review Report will allow Dublin City Council to identify their preferred upgrade/extension proposal to advance through planning, tendering, construction, etc. Funds (€60million) have been allocated under the Water Services Investment Programme (WSIP) 2007-2009 for the extension of the Ringsend WWTP.

2. Discharges to Waters

The primary discharge (SW1Dublin) is the discharge from the WWTP at Ringsend. The primary discharge is initially discharged into the cooling water discharge associated with the ESB (Poolbeg) Ltd., Reg. No. P0577-02. The combined discharge of cooling water and treated effluent flows over a weir into the Liffey Estuary. The weir is a quarter circle weir of c.96m and the height of the weir is, based on best information available to the applicant, 'half way between high and low water marks'.

There are two secondary discharges, S4Fingal and S5Fingal, within the Greater Dublin Area Agglomeration (both in Fingal County Council) and these discharges are to be discontinued by 2011 and 2009 respectively by connecting the discharges to the Ringsend WWTP.

[1] Compiled for 2006 and 2007 EPA return, based on maximum weekly average (UWW Regulations, 2001 Methodology)

There are 319 storm water overflows within the agglomeration identified by the applicant, including the storm water overflow associated with Ringsend WWTP which activates when the storm tanks become overloaded. The discharges to water are summarised in table 1 below, the applicant has indicated that the frequency of discharge from the storm overflows has not been clearly enumerated. Dublin City Council had a study completed in 2005 to examine the performance of combined sewer overflows (CSO), entitled "*Greater Dublin Strategic Drainage Study Predicted CSO Spill Performance – Existing & Proposed*". The study identified a significant number of CSOs which are activated at a frequency greater than that specified in the Department of Environment, Heritage and Local Government (DoEHLG) Procedures and Criteria in Relation to Storm Water Overflows. Therefore, some of the discharge points identified as storm water overflows could be regarded as secondary overflows if not upgraded.

Table 1. Discharges to water within Greater Dublin Area Agglomeration

Water Services Authority	**Type of Discharge**	**Identification Code**	**Number of Emission Points** [Note 1]	**Receiving Waters**
Dublin City Council	Primary	SW1Dublin	1	Liffey Estuary
	Storm Water Overflow	SW2Dublin	1	Liffey Estuary
	Storm Water Overflows	SW3Dublin-SW220Dublin	217	Liffey, Tolka, Camac, Dodder, Poddle, Wad, Santry, Naniken, Finglas, Mayne, Walkinstown Stream, Elm Park Stream, Grace Park Stream, Marino Stream, Claremount Stream, Zoo Stream, Cresote Stream, Docks, & Dublin Bay
Fingal County Council	Secondary	S4Fingal and S5Fingal	2	Irish Sea
	Storm Water Overflows	SW21Fingal, 22, 23, 26, 27, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55 and 56 Fingal	29	Santry, Sluice, Mayne, Pinkeen, Tolka & Liffey
South Dublin County Council	Storm Water Overflows	SW01SouthDublin – SW27, SW05a, and SW22a SouthDublin	29	Poddle, Dodder, Camac, Griffeen & Liffey,
Dun Loaghraire	Storm Water	SW1DunLaoghaire Rathdown – SW35	35	Dodder, Slang, Trimelston Steam,

Rathdown County Council	Overflows	DunLaoghaire Rathdown		Booterstown Stream, Deansgrange Stream, Priory Stream, Carysfort Maretimo Stream, Monkstown Stream & Irish Sea,
Meath County Council	Storm Water Overflows	SW1Meath – SW8 Meath	8	Broadmeadow & Ward River

Note 1: The above storm water overflows are based on those identified by the relevant Local Authorities at the time of preparing the licence application.

Primary Discharge

The primary discharge is to the Liffey Estuary, a transitional water that is classified as a Sensitive Area under the Third Schedule of the Urban Waste Water Regulations 2001 (Liffey Estuary - from Islanbridge Weir to Poolbeg Lighthouse, including the River Tolka Basin and South Bull Lagoon). The primary discharge is required under the Urban Waste Water Regulations to comply with the emission limit values specified in Second Schedule, Part 1 (BOD, COD and Total Suspended Solids) and Part 2 (Total Phosphorus and Total Nitrogen (one or both parameters may be applied depending on the local situation)). Currently the discharge does not fully comply with these statutory emission standards. The impact of the primary discharge is considered under *Section 3 Receiving Waters and Impacts* below.

BOD

Between 1st July 2007 and 31st August 2008 the average effluent BOD concentration was 15mg/l (statutory standard of 25mg/l), and the average BOD removal rate by the WWTP was 93.2%. 92.2% of the flow received full secondary treatment. The discharge did not meet the compliance standard of 25mg/l as required for 95% of the time, the WWTP achieved this standard 90.8% of the time. Exceedences occurred during days when the influent loadings exceeded the design load. There were seven dates when the effluent exceeded 50mg/l.

Total Suspended Solids

Between 1st July 2007 and 31st August 2008 the average effluent total suspended solids concentration was 30.1mg/l (statutory standard of 35mg/l). The average total suspended solids removal rate by the WWTP was 87.8% and the effluent achieved compliance with the statutory standard (35mg/l) 81.4% of the time. There were seventeen days when the effluent exceeded 87.5mg/l (150% deviation from statutory standard), these correlate with high influent loading. The applicant has identified that there is correlation between sludge volume index and effluent total suspended solids. Over a twelve-month period there were 77 exceedences of the 35mg/l and c.60% of them occurred when the sludge volume index exceeded 150mg/l. The applicant has proposed an extension to the sludge treatment process, discussed further under *Section 7 Programme of Improvements* below, which they have identified, will result in an improvement in emissions of suspended solids.

Total Nitrogen

In 2007 the total nitrogen and ammonia averaged 22.1mg/l and 4.6mg/l respectively. The WWTP is achieving the ammonia limit (18.75mg/l) as specified in the contract between the operator Celtic Anglian Water and the Dublin City Council (contract

limit is 18.75mg/l). The WWTP is not achieving the 10mg/l Total N specified in the Urban Waste Water Treatment Regulations for emissions to designated sensitive waters and applicable from the 31st May 2008. Dublin City Council have employed a consultant to prepare an 'Extension Design Review Report', scheduled for completion in late 2009. Based on this report Dublin City Council will decide on the preferred upgrading works to progress.

Total Phosphorus
In 2007 the effluent contained an annual mean of 3.6mg/l total phosphorus based on 101 samples. The contract between the operator and the applicant does not include a requirement to meet a limit for total phosphorus. As noted above there is no nutrient removal included in the current WWTP. The Urban Waste Water Treatment Regulations specify a total phosphorus limit of 1mg/l for discharges to designated sensitive waters.

Disinfection
Disinfection (UV treatment) is provided between 1 May and 31 August annually. During this period the target is 100,000 faecal coliforms per 100ml and 80% compliance shall be achieved over an 8 week rolling average. Since 2006 compliance monitoring has involved monitoring for E.Coli rather than faecal coliform, on the basis that there is excellent correlation between E.coli and faecal coliform and the results are more reliable and reproducible. Results indicate that the WWTP has been in compliance with the set target.

Table 2, below provides a summary of emissions from the Ringsend WWTP, as reported to the EPA by Dublin City Council and as presented in the EPA publications, *Urban Waste Water Discharges in Ireland: A Report for the Years 2004 and 2005* and *Urban Waste Water Discharges in Ireland: A Report for the Years 2006 and 2007.*

Table 2: Primary Effluent (SW1Dublin) Monitoring

Year	BOD			COD			Total Suspended Solids		
	No. of Samples	No. of Samples >25mg/l	No. of Samples >50mg/l	No. of Samples	No. of Samples >125mg/l	No. of Samples >250mg/l	No. of Samples	No. of Samples >35mg/l	No. of Samples >87.5mg/l
2004	83	16	1	246	19	5	246	83	11
2005	148	20	3	239	24	5	240	89	23
2006	134	50	21	237	51	12	238	110	44
2007	135	10	2	239	8	1	241	37	6

Secondary Discharges

On 11th September 2008, the ECJ ruled that Ireland had breached the EU Waste Water Treatment Directive on the following grounds:

> *"by failing, first, in respect of discharges from the agglomerations known as IE22, Bray, **IE31, Howth**, IE34, Letterkenny, IE40, Shanganagh, IE41, Sligo, and IE45, Tramore, to ensure that, before discharge, waste water entering collecting systems was made subject to secondary treatment or an equivalent treatment at the latest by 31 December 2000 and by failing, second, to ensure that the discharge of that waste water satisfied the relevant requirements of Annex I.B to Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment by the said deadline, Ireland has failed to fulfil its obligations under Article 4(1) and (3) of that directive."*

The Dublin Bay Project has to date involved the connection of much of the effluent arising in the agglomeration referred to as the 'Howth Agglomeration' to the Ringsend WWTP through the Sutton Pumping Station. There are two existing identified secondary discharges within the agglomeration, these discharge to the Irish Sea at 'Doldrum Bay' (S4Fingal) and the 'nose of Howth' (S5Fingal). Fingal County Council have estimated that the discharge from S4Fingal is c.41m^3 and S5Fingal is c.2,458m^3. The secondary discharges are to be connected to the Ringsend WWTP in 2009 (S5Fingal) and 2011 (S4Fingal). The RL includes a requirement for these two secondary discharges to be discontinued by the dates proposed by the applicant.

Storm Overflows (Combined Sewer Overflows)

As identified above there are a significant number of storm overflows within the agglomeration. While Dublin City Council and the other joint applicants have invested in the sewer network there is considerable further investment necessary.

Fingal County Council, on behalf of the seven local authorities within the greater Dublin region, completed in 2008, a Strategic Environmental Assessment (SEA) entitled, "*The Greater Dublin Strategic Drainage Study (GDSDS)*". The study is a strategic analysis of the existing and the future foul and surface water systems requirements in the greater Dublin region. One of the key strategy recommendations of the GDSDS is the development of a regional WWTP on the Donabate and Portrane peninsula. Another of its major recommendations is the development of an orbital sewer to transport waste water to this regional plant. While implementation of one or more of the strategy recommendations would reduce the loading to the Ringsend WWTP and the existing sewer network, the timeframe for implementing such recommendations is likely to take a number of years (i.e., the time from agreement of strategy recommendations, through planning, funding, tendering, construction, etc.). The applicant has identified that the extent of implementation of the strategy recommendations will have implications on the future loading received at the Ringsend WWTP.

In 2005 a Greater Dublin Strategic Drainage Study (GDSDS) was completed for Dublin City Council on behalf of the other Local Authorities in the greater Dublin region. The report also identified the need for an additional treatment facility in Fingal. The report included a model in relation to the performance of storm overflows.

The Eastern River Basin District Report Surface Waters – CSO Source Loadings, August 2007, provided a re-modelling of the model prepared under the GDSDS. The report identifies, based on remodelling, that there are 251 overflows, 11,982 annual spills and the total volume of annual spills is c. 6.9million cubic meters. The applicant identifies a number of network improvements which are currently being undertaken and should address the performance of some of the storm overflows, these are discussed further under *Section 7 Programme of Improvements*.

3. Receiving Waters and Impact

The following table summarises the main considerations in relation to the Liffey Estuary, into which the primary effluent is discharged, and the adjacent Tolka Estuary and Dublin Bay.

Table 3.0 Receiving Waters

Characteristic	Classification	Comment
Receiving water name and type	Lower Liffey Estuary	See Appendix 1 for location map
Amenity value	Bathing and water sports, see *Section 8 Compliance with EU Directives.* Designated Recreational/Bathing Waters: Dollymount Strand, Sandymount Strand, Merrion Strand, Seapoint and Killiney.	UV treatment provided during bathing season.
Applicable Regulations	Quality of Bathing Waters Regulations 1992 (S.I. 155 of 1992) & Bathing Water Quality Regulations 2008 (SI No. 79 of 2008). European Communities Environmental Objectives (Surface Waters) Regulations 2009	See *Section 8 Compliance with EU Directives*
Designations	Liffey Estuary designated as 'Sensitive' under Urban Waste Water Treatment Regulations, 2001. North Dublin Bay and South Dublin Bay are designated candidate Special Areas of Conservation (cSAC) and the North Bull Island and South Dublin Bay and River Tolka Estuary are designated as Special Protected Areas (SPA).	Third Schedule, Sensitive Areas, Part 2.
EPA Trophic Status	Liffey Estuary - Intermediate Dublin Bay - Unpolluted	2002-2006
WFD status	Moderate	Dublin Bay Liffey Estuary Lower Tolka Estuary
	Poor	River Liffey
WFD Risk Category	Transitional water risk score 1a 'at risk'	Liffey Estuary Tolka Estuary
	Coastal water body risk score 1a 'at risk'	Dublin Bay
	Sub Basin water body risk score 1a 'at risk'	River Liffey

The Liffey Estuary has undergone a marked improvement in water quality in recent years with most of the observed improvement a result of the upgraded WWTP at Ringsend (existing WWTP commissioned in 2003). The trophic status of the estuary has improved from eutrophic in 1995-1999, to potentially eutrophic in 1999-2003 and most recently to intermediate in 2002-2006. The improvement in status is mainly due to a reduction in the levels of Dissolved Inorganic Nitrogen (DIN), although since 2003 there are indications that the concentration of oxidised nitrogen has increased.

Since 2004 oxygen conditions have improved with reduced levels of BOD, and since 2005, levels of dissolved oxygen have shown little evidence of disturbance. Levels of phosphorus (Molybdate-Reactive Phosphate (MRP)) in winter remain elevated and in breach of the Environmental Quality Standard (EQS)[2], Ringsend WWTP discharge is a likely source of the phosphorus.

Monitoring observations, in 2007, show a noticeable improvement in dissolved oxygen conditions, with very few exceedences of either the super-saturation or under-saturation criteria.

A comparison of the molar ratios of DIN and MRP indicates, theoretically, that the Liffey Estuary is phosphorus limited along most of its length and therefore emission of phosphorus must be limited. P limitation in the estuary is likely to occur between salinities of 0-33.5psu[3] in winter and 0-29.5psu in summer. Waters with salinities outside these ranges are likely to be nitrogen limited. The Ringsend WWTP discharges to waters with salinities ranging between 21.6 – 34.4psu which means that depending on salinity conditions at the time of discharge the receiving water may either be P or N limited. Under these conditions both nutrient elements are likely to be important in ensuring that the potential for eutrophication to occur in the estuary and adjacent coastal waters are minimised. A comparison of the calculated nutrient load from the Ringsend WWTP and the River Liffey, indicates that the annual loading of MRP from Ringsend WWTP is an order of magnitude greater than from the River Liffey (O'Higgins T.G.and O'Boyle S. (2005)).[4]

The EPA and Dublin City Council initiated a monitoring programme to determine nutrient (N & P) loading to the Liffey Estuary and Dublin Bay in August 2008. The monitoring programme involves monitoring water quality at a number of locations in the Liffey Estuary, Dublin Bay, Tolka Estuary, monitoring of freshwater inflows and nutrient inputs from storm overflows. The monitoring programme is to run for at least 12 months and thereafter the monitoring results will require analysis and interpretation. The Agency (OEA Aquatic Environment) is to provide input to the analysis and interpretation of the monitoring results.

The Local Authorities are taking measures within the agglomeration and beyond to reduce the phosphorus loading to the estuary from surface waters in accordance with the Water Framework Directive. The measures include improvements to storm overflows, identification and correction of misconnections, addressing diffuse pollution, etc. The RL includes an emission limit value of 1mg/l for Total Phosphorus (as P), it is considered that such an emission limit value along with other measures to be taken in parallel by the Local Authorities will assist towards achieving compliance with the Environmental Quality Standard.

Model of Primary Discharge (SW1Dublin) and Storm Overflow (SW2Dublin)

The applicant prepared a model of the existing Ringsend WWTP primary discharge (SW1Dublin) and the storm overflow at the WWTP (SW2Dublin) to examine the impact of worst case scenario discharges on the Liffey and Tolka Estuaries and

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[2] European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. 272 of 2009)

[3] Practical salinity units

[4] Above commentary on Liffey Estuary has been based on an assessment completed by the Office of Environmental Assessment, December 2007.

Dublin Bay. The model used was a MIKE3 model previously established for the Ringsend Waste to Energy Plant (EPA Waste Licence Reg. No. W0232-01) and further developed for the pre-feasibility study for the protection system of flood defence barrages in Dublin Bay.

The model was run for three two-week simulations to characterise the impact of the plant during periods which include extreme discharge conditions. The simulations are based on actual discharges recorded during 2006/2007. The simulations involve two runs (with and without wind effects) of each of the following:

- A high concentration wastewater discharge during the winter season from SW1Dublin and SW2Dublin (2 overflow events);
- A high concentration wastewater discharge during the summer season from SW1Dublin and SW2Dublin (8 overflow events) in the bathing season; and
- An extreme high concentration wastewater discharge from SW2Dublin (6 overflow events) with normal discharge from SW1Dublin.

Model Inputs

The primary discharge mixes with the cooling waters (thermal discharge) from ESB (Poolbeg) Ltd. (P0577-02). The cooling water has an elevated temperature (average temperature increase of 7.6°C) and this results in an increased buoyancy effect and dilution. The conservative long-term thermal discharge is $10m^3$/sec. The storm overflow tanks at the WWTP have a capacity of c.$58,600m^3$. During the period 1st December 2006 and 20 August 2007 there were 16 overflows from SW2Dublin - the duration of each overflow event is not recorded. The concentration of discharges from SW1Dublin is based on analysis results for the simulations modelled. For SW2Dublin discharge parameter concentrations are based on grab samples taken for BOD, COD, Total Suspended Solids, E. Coli and faecal coliforms. MRP and DIN are assumed to be as per samples taken from the influent to the WWTP.

The outputs from the model have been compared to the EQS specified in the European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009) (physiochemical standard for transitional and coastal waters), The Bathing Water Regulations 1992 and the standard for the Blue Flag Programme (An Taisce). The model was run based on the assumption that the discharges were into receiving waters that had zero concentration of pollutants. This assumption was made for the purpose of identifying the impact of the discharges. The above assumption means that the actual concentrations at certain locations will most likely be higher than the model results.

Results

The results generally showed that the impact of the WWTP discharge (SW1Dublin) and the storm overflow discharge (SW2Dublin) for BOD, Total Suspended Solids and Faecal Coliforms is largely restricted to the Liffey and Tolka Estuaries. The discharge parameters MRP and DIN do impact the estuaries and Dublin Bay.

Total suspended solids: the impact of total suspended solids in the simulations was found to be local to the mixing zone (distance of c.500-750metres). It should be noted that the total suspended solids can be re-suspended and spread over a long period and that the effect shown in the model is a short-term effect.

BOD: the environmental quality standard (EQS) was only exceeded in the mixing zone immediately adjacent to the discharge outfalls after which dilution occurs.

Faecal coliforms: the bathing water standards were only surpassed in the mixing zone immediately adjacent to the discharge outfalls and entirely within the estuary. The modelled simulations did not indicate an impact on the bathing water beaches.

DIN: dispersion of DIN extends from the outfalls into the Liffey and Tolka Estuaries and in some cases reaching the North Bull Island Estuary. There is no EQS set for DIN in transitional (estuarine) waters. The model results show exceedences of the EQS for coastal waters around the mouth of the Liffey.

MRP: The EQS is exceeded in the Liffey and Tolka Estuaries, there is no EQS set for coastal waters.

The above results do not include background monitoring data and the results show the effects of periods of high discharge and loadings and not the everyday running of the WWTP. In addition the emission concentrations used in the model are the actual discharges for the model simulations rather than those specified in the RL. The EQS apply to a full year of data and the Bathing Water Regulations and Blue Flag programme apply to the full bathing water season.

Storm Overflows

The storm overflows, as identified above in Table 1, discharge to a number of surface water bodies within the agglomeration. A significant number of the identified storm overflows are not performing in accordance with the DoEHLG guidelines. Table 1 above identifies the receiving waters for the storm overflows. Storm overflows which fail to operate appropriately have the potential to negatively impact on the receiving waters. Water quality in the receiving waters across the agglomeration is variable, however, based on EPA water quality monitoring the Q rating in a number of rivers decreases as the river progresses through the more built up areas of the agglomeration. The following are examples of the Q-rating in a number of selected rivers within the agglomeration:

Camac River: Q4-5 upstream of Saggart, Q2 Camac Close, Emmet Road;
Dodder River: Q4 Firhouse, Q3 Milltown;
Tolka River: Q3-4 upstream of Clonee, Q2 Abbatstown Bridge, Q3 Finglas; and
Santry River: Q2-3 Clonshaugh Road Bridge, Q2/0[5] Bettyglen.

The RL requires the applicant to identify storm overflows which are not performing in accordance with DoEHLG 'Procedures and Criteria in Relation to Storm Water Overflows' and take remedial measures to address their non performance.

4. Ambient Monitoring

Dublin City Council and the joint applicant Local Authorities, as well as the EPA undertake significant monitoring within the agglomeration. The monitoring undertaken to date includes river water quality monitoring, bathing water monitoring, estuarine monitoring, etc. The RL includes requirements for the monitoring of the ambient environment, however the applicant can fulfil some of the ambient

[5] Suffix '0' added where a toxic affect is apparent or suspected.

monitoring requirements of the RL by use of existing monitoring programmes, i.e., bathing water quality monitoring.

Dublin City Council identify that they undertake routine monitoring of the River Liffey in the tidal stretch from Islandbridge Weir to the East Link Toll Bridge. The RL requires monitoring at four locations downstream of Island Bridge Weir. The applicant proposes monitoring in the vicinity of the primary discharge (25, 50, 75 and 100 metres north of Poolbeg Wall), the RL includes these points and also requires a monitoring programme to be agreed with the Agency in the estuary and coastal waters following examination and interpretation of the intensive 12 month monitoring programme currently on-going. The intensive monitoring programme includes 8 locations in the Lower Liffey Estuary, 8 locations in Dublin Bay, and 6 locations in the Tolka Estuary, to be taken monthly at spring and neap tides.

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.

Dublin City Council have not yet decided upon a proposal for the upgrade of the Ringsend WWTP, however they have engaged consultants to identify the upgrading/extension options. Therefore the Applicant did not complete an assessment of the impact of such a future scenario. Such an impact assessment shall be completed as part of any future Environmental Impact Assessment. The Agency will review the licence for the Greater Dublin Area Agglomeration, as necessary (or within six years at the latest), based on future development/upgrading proposals decided upon by Dublin City Council and the joint licensees. It is considered likely that this licence may require review after Dublin City Council decide upon a proposal for upgrade of the WWTP, particularly if the proposal includes a change in the location of the primary discharge point. The RL as drafted gives effect to the principle of the Combined Approach as defined in S.I. No. 684 of 2007.

6. Discharges from agglomerations where no treatment or insufficient treatment is in place

As identified above the Ringsend WWTP is receiving a p.e. loading in excess of its design capacity. In addition the WWTP does not include nutrient removal and therefore does not meet the statutory limits for total phosphorus and total nitrogen as specified for designated sensitive waters in the Urban Waste Water Treatment Regulations.

Dublin City Council have acknowledged that the Ringsend WWTP requires significant upgrading to address the loading and the statutory emission limit values. Therefore they have employed a consultant to prepare an extension Design Review Report, scheduled for completion in late 2009. Based on this report Dublin City Council will decide on the preferred upgrading and commence work to have an EIS, planning approvals, etc, within a timeframe to have the upgrading completed and

commissioned prior to 22nd December 2015. Dublin City Council are not in a position to identify the detail of the Ringsend WWTP upgrading as part of this licence application. The Water Services Investment Programme 2006-2009 allocated €60million to the Ringsend WWTP (extension), which is to advance through planning.

Dublin City Council and the joint applicant Local Authorities, are undertaking a number of sewer network improvement projects which will assist in addressing excess surface water entry, inappropriately operating storm overflows, etc. The proposed improvements are addressed under *Section 7 Programme of Improvements* below.

The RL includes the emission limit values as specified in the Urban Waste Water Treatment Regulations, including the emission limit values for total phosphorus and total nitrogen.

7. Programme of Improvements

Dublin City Council and the Ringsend WWTP operator have, since commissioning in 2003, optimised operation of the facility. Dublin City Council acknowledges that the Ringsend WWTP requires upgrading to meet the effluent loading and meet the emission limit values specified in the Urban Waste Water Treatment Regulations. Upgrade of the WWTP shall be completed by December 2015 in accordance with the Water Framework Directive. In addition Dublin City Council has identified the following measures which they consider will address exceedences of the emissions from the primary discharge:

Extension to the sludge treatment process

Dublin City Council will be adding three additional surplus activated sludge thickeners, which will result in a doubling of the surplus activated sludge thickening capacity and reduce the quantity of surplus activated sludge that is co-thickened with primary sludge in the lamella settlers. This project is scheduled to be commissioned in mid 2010.

Measures to reduce wind impact on Sequence Batch Reactors

Dublin City Council proposes to install windscreens on the upper deck of the sequence batch reactors to reduce the wave action caused by high winds. The wave action has the effect of mixing the water column and re-suspending settled solids, resulting in total suspended solids exceedences. It is anticipated that the windscreens will allow the operating level in the sequence batch reactors to be returned to original design levels. Dublin City Council proposes to trial windscreens on one basin (four tanks) prior to installing infrastructure on all the upper level basins. It is projected that the windscreens will be installed prior to mid 2010.

Final Effluent Filters

Dublin City Council consider that the above two measures will address total suspended solids, however as a precaution they are also prepared to install final effluent filters for a proportion of the flow from the upper levels of the sequenced batch reactor, if necessary. The timeframe for this proposal have not yet been decided upon.

Denitrification

Dublin City Council states that it has been determined that a denitrification system will need to be installed. Dublin City Council propose that design of the denitrification facilities will commence upon completion of the extension Design Review Report, due to be completed in late 2009.

Other Network Improvement Works

Dublin City Council has a number of network improvements which they have commenced, are due to commence or are to advance through planning under the 2007-2009 Water Services Investment Programme (WSIP). These schemes include the following that have commenced or are due to commence: North King Street Sewerage Scheme (surface/foul separation), relocation of Grand Canal Surface Water Outfall, and Ringsend Sewerage Scheme (main lift pumping station). The following schemes are to be advanced through planning: City Centre Sewerage Scheme Feasibility Study, Docklands Sewerage Scheme Feasibility Study, and Rathmines and Pembroke Sewerage Scheme (low level catchment drainage area plan and high level catchment sewerage works). Dublin City Council have also identified further improvements which they are seeking to be advanced to the next WSIP including Clontarf/Drumcondra Drainage Relief Scheme, and Camac Valley sewer. Each of these network improvement works and future works will address inadequate sewerage infrastructure and storm overflows which are not functioning in accordance with DoEHLG guidelines for storm overflows.

The other Local Authorities, joint applicants, who direct effluent to Ringsend have similar infrastructure improvements identified or funded under the WSIP. All the relevant Local Authorities continue to undertake upgrading works to the collection system, including: gully cleaning, monitoring of pumping stations, fats oils and grease programme, standarised drainage planning policies, programme of separation of foul from storm water and river cleaning crews.

As acknowledged by Dublin City Council in their licence application, while interim measures may improve emission parameters and optimise treatment capacity, an extension of the existing facility is necessary.

The RL requires Dublin City Council to provide, within six months of the date of grant of the licence, and thereafter every six months unless otherwise agreed with the Agency, a report in relation to progress towards completion of the upgrade to the Ringsend WWTP, such reports shall include a projection towards commissioning the extension and compliance with the Urban Waste Water Treatment Regulations emission limit values, as specified in the RL, prior to 22nd December 2015.

8. Compliance with EU 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

There are no drinking water abstractions downstream of the discharges from the Greater Dublin Area Agglomeration.

Sensitive Waters

The Liffey Estuary is a sensitive water under the Urban Waste Water Treatment Regulations. The Second Schedule, Part 2 specifies emission limits for Total Phosphorus and Total Nitrogen of 1mg/l and 10mg/l respectively subject to the following '*One or both parameters may be applied depending on the local situation.*' It is considered appropriate based on water quality monitoring in the estuaries (Liffey and Tolka) and Dublin Bay and the modelling report submitted by the applicant that emission limit values for total phosphorus and total nitrogen as specified in the Urban Waste Water Treatment Regulations should apply. The existing Ringsend WWTP cannot achieve the specified emission limits which have applied since 31 May 2008. The RL includes the emission limit values for total nitrogen and total phosphorus.

Water Framework Directive [2000/60/EC]

The draft classification for Dublin Bay and the Liffey and Tolka Estuary under the Water Framework Directive is 'moderate'.

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. In acknowledgment that the requirements of the RL represent a significant challenge for Dublin City Council and the joint applicants the RL requires six monthly updates from Dublin City Council. The six monthly updates shall provide a regular update of progress towards completing the necessary WWTP upgrades and a means for Dublin City Council to demonstrate that appropriate efforts are being made towards achieving compliance with the conditions of the RL and the requirements of other legislation including the Water Framework Directive.

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

Ringsend WWTP does not comply with the requirements of the Urban Waste Water Treatment Directive in terms of the level of treatment provided, i.e., non-compliance with the emission limit values for BOD, COD, Total Suspended Solids. The Urban Waste Water Treatment Regulations, which implement the Directive in Ireland, specify emission limits for total nitrogen and total phosphorus which shall be complied with by the 31st May 2008 (one or both parameters may be applied depending on the local situation). Currently the primary discharge cannot comply with either of the specified emission limits (1mg/l total phosphorus and 10mg/l total nitrogen) or minimum percentage reductions. It is considered appropriate based on water quality monitoring in the estuaries (Liffey and Tolka) and Dublin Bay and the modelling report submitted by the applicant that emission limit values for total phosphorus and total nitrogen as specified in the Urban Waste Water Treatment Regulations should apply.

Dublin City Council acknowledge that an extension to the existing Ringsend WWTP is necessary and as part of any extension they will have to consider total phosphorus and total nitrogen reduction.

On-going investment and improvement works are being undertaken by Dublin City Council and the other Local Authorities to design, construct and maintain the collection system in accordance with best technical knowledge not entailing excessive

costs notably regarding limitation of pollution of receiving water due to storm overflows.

The RL, as drafted, has regard to the requirements of the Urban Waste Water Treatment Directive and requires the licensee to upgrade the Ringsend WWTP by 22nd December 2015.

Bathing Water Directive [2006/7/EC]
There are 5 designated bathing waters in the Dublin area which may be impacted on by the primary, secondary or storm overflows from the Greater Dublin Area Agglomeration. These are:
Dollymount Strand (Bathing Zone), Sandymount Strand, Merrion Strand, Seapoint, and Killiney. In addition there are 6 non-designated bathing waters: Bull wall, Half Moon, Blackrock, Sandycove, Coliemore Harbour, and Corbane Lane.

Dublin City Council and Dun Laoghaire Rathdown County Council monitor these bathing waters intensively during the bathing season and less intensively all year round.
The Quality of Bathing Water in Ireland A Report for the Year 2008, published by the EPA identifies that Merrion Stand, Sandymount Strand and Killiney as failing the EU Guide Values, however all the designated bathing waters passed the less stringent mandatory values. Merrion Strand failed the EU Guide Value for faecal coliforms and total coliforms and Sandymount Strand and Killiney failed the EU Guide Value for faecal coliforms.

In June 2009 An Taisce released its 'blue flags[6]' for bathing waters. Of note in relation to the Greater Dublin Area Agglomeration is that Killiney lost its blue flag because of failure to meet the quality standards specified, Seapoint did not apply for a blue flag for 2009 and Dollymount retained its blue flag.

During the bathing season UV treatment of the primary discharge is provided, therefore storm overflows are indicated to be the most likely cause of exceedences of the standards for bathing waters.

The RL includes a condition requiring the LAs to identify storm overflows which are not performing in accordance with DoEHLG 'Procedures and Criteria in Relation to Storm water Overflows, 1995. Further works at the Ringsend waste water treatment plant to increase treatment capacity and provide nutrient removal shall improve emission quality. *Schedule B: Monitoring* of the RL requires monitoring of the designated bathing waters for bacteriological contamination and visual inspection. The monitoring may already be undertaken by the Local Authorities to demonstrate compliance with the Bathing Water Regulations and may be used to fulfil the licence requirements.

EC Freshwater Fish Directive [2006/44/EC]
The Liffey is not designated a salmon water under the Freshwater Fish Directive, however it does support a salmon and sea trout population.

[6] The Blue Flag Scheme is a voluntary scheme administered in Ireland by An Taisce. To receive a blue flag, a bathing site, in addition to maintaining a high standard of water quality, must meet specific objectives with regard to the provision of safety services and facilities, environmental management of the beach area and environmental education.

Shellfish Waters Directive [2006/113/EC]
There are no designated shellfish production areas in the marine waters adjacent to the Greater Dublin Area Agglomeration. The nearest designated shellfish production area is 'Malahide' which is c. 15km north of the Ringsend WWTP discharge and therefore not considered likely to be subject to impacts from discharges associated with the agglomeration.

Dangerous Substances Directive [2006/11/EC]
The applicant has provided sampling results for 16 of the 19 dangerous substances in the primary discharge for the purposes of the licence application. The number of samples taken for each parameter varies between 1 and 16 samples. The measured concentrations are not considered significant given the dilution provide in the receiving water.

The RL requires further screening of the primary discharge for the presence of organic compounds and metals, such screening shall involve taking a samples once per month for a period of six months from the date of grant of licence. If such substances are detected at significant levels, the RL requires an investigation of the sources and requires Dublin City Council to take such measures as are necessary to minimise the discharge of dangerous substances from the waste water works.

Dublin City Council and the joint applicants shall continue to submit, to the Agency, implementation reports in accordance with the Dangerous Substances Regulations, S.I. No. 12 of 2001.

Birds Directive [79/409/EEC] & Habitats Directive [92/43/EEC]
Dublin Bay contains a number of designated conservation sites (Natura 2000 Sites) including North Dublin Bay and South Dublin Bay which are designated candidate Special Areas of Conservation (cSAC) and the North Bull Island and South Dublin Bay and River Tolka Estuary are designated as Special Protected Areas (SPA).

North Dublin Bay cSAC, Annex I habitats include fixed dunes, marram/shifting dunes, embryonic shifting dunes, dune slack, annual vegetation of drift lines, salicornia mud and sand flats, Atlantic salt meadows, Mediterranean salt meadows, mud and sand flats. Annex II species include petalwort. The site overlaps with North Bull Island SPA.
South Dublin Bay cSAC, Annex I habitats include sand and mudflats. The largest stand of eelgrass occurs at Merrion Gates and embryonic dunes and a sand pit are developing south of Merrion Gates. The site overlaps with South Dublin Bay and River Tolka Estuary.

South Dublin Bay and River Tolka Estuary SPA, is of special conservative interest for a number of bird species (including Light Bellied Brent Goose, Oystercatcher, Ringed Plover, GreyPlover etc.) and is important for wintering wildfowl and wintering gulls. The site and its associated water bodies are of special conservation interest.

North Bull Island SPA, the island developed after construction of the North Bull Wall and is covered in dune grassland. Other ecosystems associated with the island are salt marsh and mud flats. The island is of international and national importance based on the number of waterfowl supported, including Brent Goose, Bar tailed Godwit, Shelduck, Teal etc.

The applicant was required to complete an 'appropriate assessment' in accordance with Article 6(3) and (4) of the Habitats Directive. The assessment is of the existing discharge to the Liffey Estuary and surrounding habitats.

The assessment identifies that the conservation objective is to maintain the favourable status of the species listed in Annex I of the EU Birds Directive and Annex II of the EU Habitats Directive and habitats listed on Annex I of the EU Habitats Directive as well as other important species and habitats. The assessment considered species and habitats of interest that have potential to be impacted directly (i.e., aquatic habitats) and that have the potential to be impacted indirectly (i.e., wildfowl and wading bird species).

The primary effect of the discharge is to elevate the nutrient levels in the receiving waters of the bay, particularly dissolved inorganic nitrogen. The report concluded that there were no significant effects on the Natura sites. The impacts are summarised as:

- The water quality in the bay is reported to be 'unpolluted', EPA Water Quality in Ireland 2008 and 'Moderate', WFD classification.
- There is no evidence of the qualifying interests or conservation objectives being directly impacted. The Natura 2000 sites are reported to have favourable status.
- There have been no reported reductions in the number of birds in the SPAs. It is considered unlikely, by the applicant, that the slightly elevated nutrients would result in a reduction in the food sources available.
- The improvement in the discharge quality since construction of the existing WWTP has reduced the potential impact on the Natura sites, this potential impact will be reduced further once further improvements are made at the Ringsend WWTP to meet the requirements of the Urban Waste Water Treatment Regulations.

The records of the 'Irish Whale and Dolphin Group' (group dedicated to the conservation and better understanding of whales, dolphins and porpoise in Irish waters) identify minke whales, dolphins and harbour porpoises in the Dublin Bay area. There however appears to be no resident populations in the bay or estuary. Improvements in the quality of the discharge reflect the Conservation Plan for Irish Cetaceans, Department of Environment, Heritage and Local Government (May 2009).

Environmental Liabilities Directive [2004/35/EC]
The RL satisfies the requirements of the Environmental Liabilities Directive in particular those requirements outlined in Article 3(1) and Annex III of 2004/35/EC.

9. Submissions
One submission was received in relation to this licence application.
The main issue raised by Mrs Cavendish relates to the possibility that a 'heavy cream/buff coloured foam aggregating along the shore line at Sandymount' may be related to the discharge from Ringsend WWTP. She notes that she has seen similar soapy looking suds prior to the new WWTP opening in June 2003. Mrs Cavendish also identifies that in June and July the nearby beaches are used by families.

Response:

The water quality at Sandymount Strand is monitored by Dublin City Council in accordance with the Bathing Water Quality Regulations. The EPA report on *The Quality of Bathing waters in Ireland A Report for the Year 2008* identifies that Sandymount Strand failed the EU Guide Value for faecal coliforms. It has been indicated that the failure was caused by discharges to streams from storm water overflows rather than the primary discharge from Ringsend WWTP. Ringsend WWTP provides UV treatment of the final effluent prior to discharge to the Lower Liffey Estuary during the Bathing Season. The RL includes condition in relation to programmes of improvements in relation to the waste water works (including storm overflows) and requires monitoring of water quality at eight sampling locations including Sandymount Strand.

The original submission should be referred to at all times for greater detail and expansion of the issue raised.

Public Authority Enforcement have issued a number of letters under Section 63(1) of the Environmental Protection Agency Acts in relation to breaches of Quality of Bathing Water Regulations, Urban Waste Water Treatment Regulations, odour nuisance and quality of effluent discharges. In addition the Ringsend WWTP has been audited by the Agency (Public Authority Enforcement) - such reports have required Dublin City Council to propose corrective measures to address non-compliances identified.

10 Site Visits

Ringsend Waste Water Treatment Plant was visited on two occasions following receipt of the licence application, 19th February 2008 and 14th November 2008. During the site visits staff at the facility provided an overview of the facility, treatment provided on-site, remedial infrastructure installed, etc. Thereafter a guided walk around the facility was provided from the effluent inlet to the primary discharge point and the storm overflow discharge point associated with the WWTP. At the primary discharge point we met with a representative from ESB (Poolbeg) Ltd, as the primary discharge mixes with the cooling water from ESB (Poolbeg) at discharge to the Lower Liffey Estuary. The WWTP appears to be well managed to optimise the treatment capacity available.

11. Charges

The RL sets an annual charge for the agglomeration at €9,808 and is reflective of the monitoring and enforcement regime being proposed for the agglomeration.

12. Recommendation

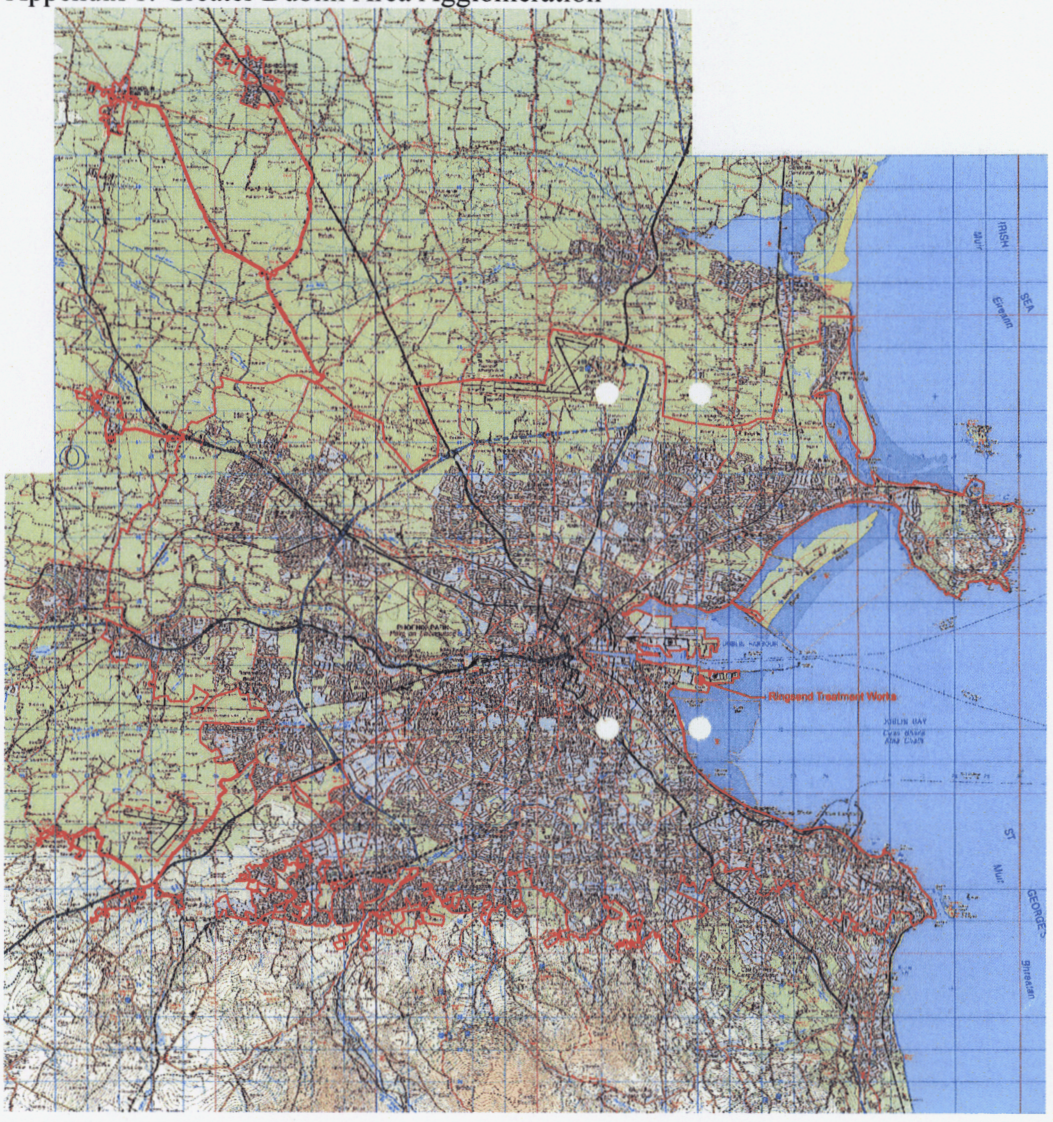
I recommend that a Final Licence be issued subject to the conditions and for the reasons as set out in the attached Recommended Licence.

Signed

Patrick Byrne

Office of Climate, Licensing and Resource Use

Appendix 1: Greater Dublin Area Agglomeration



Appendix 2: Ringsend Waste Water Treatment Plant