

SECTION E MONITORING

Advice on completing this section is provided in the accompanying Guidance Note.

E.1 Waste Water Discharge Frequency and Quantities – Existing & Proposed

See Tables E.1(i) and E.1(ii) for existing frequencies and quantities of wastewater and stormwater discharges.

The quantities and frequencies of wastewater and stormwater proposed for discharge in the future are difficult to estimate at present, but depend on factors including :

- The hydraulic load and PE growth rate in the agglomerations being served by the Ringsend Plant
- The extent and speed of implementation of the Greater Dublin Strategic Drainage Study report recommendations including the development of a second wastewater treatment plant
- The potential reductions in wastewater due to metering of the drinking water supply
- The reduction in hydraulic load possible if separation of combined sewers is implemented in the agglomeration
- The minimisation of groundwater and tidal infiltration to the wastewater collection system
- The increased usage of Sustainable Urban Drainage Systems in the agglomerations
- The terms of this licence in relation to effluent emission limit values
- The environmental impacts of a change in effluent plume shape / size due to likely reductions in cooling water discharges in the Liffey Estuary (ESB, Poolbeg Plant – IPPC 718 / 718A)
- The determination of current transitional and coastal water quality status for the Liffey Estuary (Upper and Lower), the Tolka Estuary and Dublin Bay by the EPA and the Marine Institute. Monitoring of these receiving water bodies, which have all been designated as “at risk of not meeting good status” by the National Monitoring Programme for Ireland (October, 2006) under the Water Framework Directive, has not yet commenced
- Global warming impacts on tidal water levels in the Liffey Estuary and Dublin Bay
- Relocation of the existing land based location of the primary discharge point
- Increases/Reductions in trade effluent PE and hydraulic loads in the agglomerations being served

Attachment E.2.

Programmes of Environmental Monitoring

Due to the complex and changing nature of the mixed Primary Ringsend WWTP Effluent / ESB Cooling Water effluent discharge, it is proposed to use a number of monitoring sub-programmes :

- **Primary discharge monitoring**
- **Near field monitoring (downstream of ESB Weir)**
- **Mixing zone boundary monitoring**

Emission limit values will apply to the primary point of discharge and water quality objectives (set by the Water Framework Regulations) will apply at the edge of a mixing zone. Water quality objectives ensuring at least good status in the receiving transitional waters of the Liffey Upper and Lower Estuaries, the Tolka Estuary and the coastal receiving waters of Dublin Bay will apply outside the boundary of the mixing zone defined in the licence.

As the EPA's criteria for definition of an estuarine mixing zone could not yet be advised, a specific receiving water monitoring programme will be defined in liaison with the EPA and the MI (the public authorities assigned monitoring tasks in estuaries and coastal waters under the WFD monitoring programme).

Primary discharge monitoring (in the vicinity of the WWTP Plant)

Points to be monitored include :

1. SW1Dublin - the primary discharge point
This is sampled daily at a location upstream of the UV treatment plant using a 24-hour composite sampler.
During the EU Bathing Season further grab-sampling is carried out to monitor the efficiency of the UV plant.
Effluent Flow is monitored by the Plant Operator on a continuous basis.
2. SW2Dublin – the storm water flow from the works
Effluent Flow is monitored by the Plant Operator.
3. SW3Dublin – the primary influent point to the works
This is sampled daily at a location upstream of the primary treatment plant using a 24-hour composite sampler. Sampling here will quantify the regulation of dangerous substances in the catchment and the removal efficiency
Influent Flow is monitored by the Plant Operator on a continuous basis.
4. SW4Dublin - ESB Cooling Water Discharge U/S Primary Discharge
Cooling water is abstracted from the Liffey Estuary, chlorinated and used for cooling in the power generation processes. The discharge is regulated under IPPC 718, as amended by 718/A. Cooling water flow is monitored by the ESB. It mixes with the Primary effluent discharge in the cooling water channel and the mixed plume travels into the receiving waters. The extent, shape and cross sectional area of the mixed plume depends on the state of the tide and varies continuously.
Sampling will be carried out by Dublin City Council to determine water quality and initial dilution of the Primary Discharge.

Near Field Ambient Monitoring Programme

(River Liffey Upstream and Liffey Estuary downstream of the ESB Weir)

Points to be monitored include :

5. ASW1Dublin - River Liffey (freshwater), U/S Islandbridge Weir.
This is a routine monitoring point under the existing Dangerous Substances Programme. This point is unaffected by the Primary discharge point.
6. ASW2Dublin – Mixed Ringsend Primary Discharge / ESB Cooling Water Downstream of the Weir (25 m north of Poolbeg Wall)
7. ASW3Dublin - Mixed Ringsend Primary Discharge / ESB Cooling Water Downstream of the Weir (50 m north of Poolbeg Wall)
8. ASW4Dublin - Mixed Ringsend Primary Discharge / ESB Cooling Water Downstream of the Weir (75 m north of Poolbeg Wall)
9. ASW5Dublin - Mixed Ringsend Primary Discharge / ESB Cooling Water Downstream of the Weir (100 m north of Poolbeg Wall)

Mixing Zone Boundary Monitoring Programme

To be advised by the EPA when the mixing zone is set. This programme will monitor compliance with licence conditions in terms of receiving water quality objectives (surface / mid / depth). It will be carried out following liaison with the Marine Institute / EPA – the designated authorities for the water bodies impacted by the Primary Discharge, the Liffey Estuary (Upper and Lower), The Tolka Estuary and Dublin Bay.

Dublin City Council Ambient Monitoring Programmes

River Monitoring Programmes

Routine monitoring of the River Liffey in the tidal stretch from Islandbridge Weir to the East Link Toll Bridge is carried out by Dublin City Council. This data is available for Primary Discharge and Storm Overflow impact assessment if required.

Bathing Water Monitoring Programmes

Routine monitoring of designated and non-designated bathing waters in the Dublin Bay area is carried out by Dublin City Council. This data is available for Primary Discharge and Storm Overflow impact assessment if required.

Safe Means of Access to Sampling Points

Environmental samplers in Dublin City Council operate in pairs. Under the Safety, Health and Welfare at Work Act, 2005 and the Safety, Health and Welfare at Work (General Application) Regulations, 2007, protective clothing is provided to samplers. A Safe Working Procedure (Dublin City Council SWP 61) applies to working on or adjacent to Water.

Sampling Methods

A range of sampling methods will be used in the monitoring programmes outlined above and as required by the licence – grab and composite sampling, surface and water column sampling.

Analytical and Quality Control Procedures

Dublin City Council's Central Laboratory is accredited by INAB under ISO/IEC 17025: 2005 2nd. Edition (Registration Number : 079T) for a range of physico-chemical, microbiological and parasitological tests. The date of the last renewal of accreditation was 01/11/2007.

Tests are carried out using standard methods and state of the art quality control procedures. Further details are available if required.

Equipment Calibration and Maintenance

Field test equipment (Dissolved Oxygen / Temperature / Salinity) is calibrated on site and subject to regular maintenance / servicing / replacement. Standard Operating Procedures (SOP's) are used for calibration.

Data Recording Procedures

Field data is recorded on survey sheets that are dated and signed by the samplers carrying out the tests.

Data Reporting Procedures

On return to the Central Laboratory after sample log-in, instrument calibration data and field monitoring data relating to the calibration is entered by the analyst onto the Laboratory Information Management System (LIMS).

E.3. Tabular data on Monitoring and Sampling Points

PT_CD	PT_TYPE	MON_TYPE	EASTING	NORTHING	VERIFIED
SW1Dublin	Primary Discharge Point	S	321073	233814	Y
		M (Flow)			
SW2Dublin	Storm Water Overflow	M (Flow)	320332	233800	Y
SW3Dublin	Primary Influent Point	S			
		M (Flow)			
SW4Dublin	ESB Cooling Water U/S	S			
	Primary Discharge	M (Flow)			
		M (Temperature)			
ASW1Dublin	U/S Primary Discharge	S	311898	234114	Y
ASW2Dublin	Mixed ESB/Primary Discharge D/S Weir	S	Near Field Mixing Zone	Sampling Regime to be	Agreed with EPA
ASW3Dublin	Mixed ESB/Primary Discharge D/S Weir	S			
ASW4Dublin	Mixed ESB/Primary Discharge D/S Weir	S			
ASW5Dublin	Mixed ESB/Primary Discharge D/S Weir	S			
ASWNDublin	D/S Primary Discharge	S River Liffey Tidal	Mixing Zone Boundary	Sampling Regime to be	Agreed with EPA / MI
		S Liffey Estuary Lower			
		S Liffey Estuary Upper			
		S Tolka Estuary			
		S Dublin Bay			

Attachment E.4

Tables D.1(i)(b) and D.1.(i)(c) provide the sampling data relating to the primary discharge from 01/11/06 to 31/10/07 as available.

Monitoring data for the primary discharge is returned to the EPA for each calendar year under Urban Wastewater Regulations. The most recent return for the Ringsend discharge was made for the year 2006.

The primary discharge is currently required to comply with Urban Wastewater Regulations for the parameters Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS). As the receiving waters in the Liffey Estuary are designated as " sensitive to eutrophication ", the discharge will also be required to comply with Total Nitrogen (TN) and Total Phosphorus (TP) limits from 31/05/08.

The primary discharge is sampled using 24-hour composite sampling, 5 days a week. This complies with Urban Wastewater Treatment Regulations in terms of frequency (minimum = 24) and type of sampling.

A summary table details the compliance with required treatment standards for the period 01/11/06 – 31/10/07 :

Parameter	UWW Standard	Number of Samples Tested	Number in Compliance	Percentage Compliance	Pass
BOD	25	139	121	87.06%	✓
COD	125	242	231	95.45%	✓
TSS	35	246	197	80.08%	✗

Individual certificates of analysis are available if required from Dublin City Council's Central Laboratory for each effluent sample summarised in the above table.

The Operator of the plant also monitors the internal processes on a daily basis in an on-site Laboratory.

DCC Table E1_2.xls

Identification Code for Discharge Point	Frequency of Discharge (spills/annum)	Quantity of Waste Water Discharged (m ³ /annum)	Complies with Definition of Storm Water Overflow
SW2Dublin	24	1,304,100	YES
CSO1DCC	118	77274	YES
CSO2DCC	44	19504	YES
CSO3DCC	0	0	YES
CSO4DCC	8	1052	YES
CSO5DCC	74	21414	YES
CSO6DCC	1	82	YES
CSO7DCC	113	12300	YES
CSO8DCC	258	704	YES
CSO9DCC	1	6	YES
CSO10DCC	11	6890	YES
CSO11DCC	99	20870	YES
CSO12DCC	0	0	YES
CSO13DCC	1	6	YES
CSO14DCC	61	37777	YES
CSO15DCC	10	9437	YES
CSO16DCC	0	0	YES
CSO17DCC	0	0	YES
CSO18DCC	7	945	YES
CSO19DCC	6	2733	YES
CSO20DCC	27	30	YES
CSO21DCC	12	1477	YES
CSO22DCC	77	1972	YES
CSO23DCC	4	3561	YES
CSO24DCC	1	119	YES
CSO25DCC	19	2263	YES
CSO26DCC	68	5241	YES
CSO27DCC	29	1792	YES
CSO28DCC	4	2117	YES
CSO29DCC	38	4680	YES
CSO30DCC	23	2863	YES
CSO31DCC	49	64	YES
CSO32DCC	57	5313	YES
CSO33DCC	122	55865	YES
CSO34DCC	217	86542	YES
CSO35DCC	105	6895	YES
CSO36DCC	141	237469	YES
CSO37DCC	0	0	YES
CSO38DCC	1	7	YES
CSO40DCC	0	0	YES
CSO41DCC	0	0	YES
CSO42DCC	0	0	YES
CSO43DCC	4	97	YES
CSO44DCC	0	0	YES
CSO45DCC	16	2909	YES
CSO46DCC	17	4911	YES
CSO47DCC	122	106797	YES
CSO48DCC	83	61269	YES
CSO49DCC	157	156055	YES
CSO50DCC	8	2088	YES
CSO51DCC	119	105743	YES
CSO52DCC	0	0	YES
CSO53DCC	0	0	YES
CSO54DCC	0	0	YES
CSO55DCC	0	0	YES
CSO56DCC	0	0	YES

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CSO57DCC	0	0	YES
CSO58DCC	0	0	YES
CSO59DCC	0	0	YES
CSO60DCC	434	7698	YES
CSO61DCC	3	41	YES
CSO62DCC	72	13208	YES
CSO63DCC	3	848	YES
CSO64DCC	0	0	YES
CSO65DCC	21	8095	YES
CSO66DCC	38	15826	YES
CSO67DCC	0	0	YES
CSO68DCC	1	190	YES
CSO69DCC	209	96482	YES
CSO70DCC	52	521	YES
CSO71DCC	28	5315	YES
CSO72DCC	378	48727	YES
CSO73DCC	42	20351	YES
CSO74DCC	6	651	YES
CSO75DCC	5	865	YES
CSO76DCC	63	3272	YES
CSO77DCC	0	0	YES
CSO78DCC	1	153	YES
CSO79DCC	0	0	YES
CSO80DCC	27	22269	YES
CSO81DCC	88	15783	YES
CSO82DCC	59	1060	YES
CSO83DCC	49	15850	YES
CSO84DCC	197	126886	YES
CSO85DCC	0	0	YES
CSO87DCC	23	7568	YES
CSO88DCC	369	394401	YES
CSO89DCC	451	40352	YES
CSO90DCC	5	247	YES
CSO91DCC	0	0	YES
CSO92DCC	0	0	YES
CSO93DCC	83	13075	YES
CSO94DCC	107	12894	YES
CSO95DCC	0	0	YES
CSO96DCC	0	0	YES
CSO97DCC	20	2566	YES
CSO98DCC	7	236	YES
CSO99DCC	0	0	YES
CSO100DCC	0	0	YES
CSO101DCC	15	369	YES
CSO102DCC	214	47762	YES
CSO103DCC	340	53954	YES
CSO104DCC	0	0	YES
CSO105DCC	0	0	YES
CSO106DCC	0	0	YES
CSO107DCC	3	4946	YES
CSO109DCC	0	0	YES
CSO112DCC	192	17082	YES
CSO114DCC	32	1007	YES
CSO118DCC	125	76157	YES
CSO119DCC	69	7618	YES
CSO120DCC	59	966	YES
CSO122DCC	0	0	YES
CSO124DCC	43	1486	YES

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CSO125DCC	83	8827	YES
CSO126DCC	3	223	YES
CSO128DCC	396	52398	YES
CSO129DCC	4	37	YES
CSO130DCC	4	72	YES
CSO131DCC	7	889	YES
CSO132DCC	0	0	YES
CSO133DCC	0	0	YES
CSO134DCC	10	16565	YES
CSO135DCC	1	47	YES
CSO136DCC	5	1145	YES
CSO139DCC	15	427	YES
CSO140DCC	1	5047	YES
CSO141DCC	10	3345	YES
CSO142DCC	100	14623	YES
CSO143DCC	0	0	YES
CSO144DCC	0	0	YES
CSO146DCC	3	3287	YES
CSO147DCC	78	8765	YES
CSO149DCC	0	0	YES
CSO150DCC	24	1185	YES
CSO151DCC	16	549	YES
CSO152DCC	125	18664	YES
CSO153DCC	1	342012	YES
CSO154DCC	0	0	YES
CSO155DCC	0	0	YES
CSO156DCC	1	1637715	YES
CSO157DCC	3	5	YES
CSO197DCC	21	120	YES
CSO158DCC	0	0	YES
CSO160DCC	0	0	YES
CSO161DCC	4	3182	YES
CSO162DCC	0	0	YES
CSO163DCC	0	0	YES
CSO164DCC	280	30286	YES
CSO165DCC	0	0	YES
CSO166DCC	0	0	YES
CSO167DCC	9	1990	YES
CSO168DCC	169	194860	YES
CSO169DCC	58	17822	YES
CSO170DCC	15	1092	YES
CSO171DCC	203	284186	YES
CSO173DCC	320	23522	YES
CSO174DCC	0	0	YES
CSO175DCC	12	697	YES
CSO176DCC	192	196982	YES
CSO177DCC	97	13220	YES
CSO178DCC	19	2447	YES
CSO179DCC	0	0	YES
CSO180DCC	1	325145	YES
CSO181DCC	32	18722	YES
CSO182DCC	33	5838	YES
CSO183DCC	0	0	YES
CSO184DCC	106	96123	YES
CSO185DCC	0	0	YES
CSO186DCC	483	521299	YES
CSO187DCC	12	1415	YES
CSO188DCC	192	51707	YES

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CSO189DCC	12	898	YES
CSO190DCC	39	8315	YES
CSO195DCC	0	0	YES
CSO196DCC	0	0	YES

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