Annual Environmental Report 2015

Agglomeration Name:	**Cork City**
Licence Register No.	**D0033-01**

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Section 1. Executive Summary and Introduction to the 2015 AER

1.1 Summary report on 2015

1. This Annual Environmental Report has been prepared for D0033-01, Cork City, in accordance with the requirements of the wastewater discharge licence for the agglomeration. There are no outstanding specified assessments for 2015, but comment and reviews are included in the AER as follows:

   - Priority Substances Assessment : Appendix 7.5 Results of selective testing

2. The Agglomeration is served by a wastewater treatment plant at Carrigrennan Little Island with a Design PE of 413,200. The works consists of essentially two treatment activities, namely Wastewater Treatment and Solids Treatment.

   The Wastewater Treatment process includes the following:-
   - Screening (5mm) and De-gritting: Local flows only,- flows from City previously screened and de-gritted at Ballinure Header Chamber.
   - InFlow Measurement & Sampling
   - Storm Water Treatment: 4 Tanks (storage/settlement/return/overflow)
   - Pre-Aeration, with odour control treatment of removed gases
   - Primary Clarification: 2 Settlement Tanks, (covered) sedimentation/ removal of settable solids
   - Secondary Treatment: Sequencing Batch Reactor, 8 Rectangular basins
   - OutFlow Measurement & Sampling
   - Effluent Discharge

   The Solids Treatment process includes the following:-
   - Sludge Treatment
   - Thickening
   - Digestion
   - Dewatering and Drying

   The sludge is anaerobically digested during which Biogas is produced. This Biogas is used on site to mix the sludge in the digestors, heat the sludge as it is re-circulated, and pasteurise and dry the sludge to 90% dry solids. The Sludge contains 5% Nitrogen, 5% Phosphorous and it has no significant heavy metals making it ideal for agricultural use.

3. The final effluent from the Primary Discharge Point was non- Compliant with the Emission Limit Values in 2015.

   The following parameters exceeded the emission limit values in 2015:-
   - Total Nitrogen
   - Total Phosphorus

4. 2,670,600 kgs sludge (as kgs dry solids) were removed from the wastewater treatment plant in 2015. 867,700 kgs, (total offsite weight), was as dewatered digested sludge wetcake (Biocake) while 2,712,000 kg (total offsite weight), was as the dried biosolid granule product Biogrow. All thermally treated granules (biogrow) are exported for controlled use as a fertilizer on

agriculture. Digested Sludge which is dewatered only, i.e. wetcake (Biocake) is treated to a class A standard before being utilised in a similar manner. All Sludge products were transferred for use in agriculture via a secure and tightly controlled system .

5. There were no major capital or operational changes, undertaken in 2015.

An Annual Statement of Measures is included in **Appendix 7.1.**

Section 2. Monitoring Reports Summary

2.1 Summary report on monthly influent monitoring

Table 2.1 - Influent Monitoring Summary

	BOD	COD	TSS	TP	TN	Hydraulic Loading	Organic Loading
	mg/l	mg/l	mg/l	mg/l	mg/l	m3/d	PE/day
Number of Samples	260	261	261	28	28	365	260
Annual Max.	330.0	1,500	490	6.40	40.0	238,997	513,667
Annual Mean	151.0	374	179	3.35	26.57	109,053	250,011
					Flow Weighted Annual Mean PE		

Significance of results
The annual mean hydraulic loading is less than the Treatment Plant Capacity as detailed further in Section 3.2.

The annual maximum hydraulic loading is less than the Treatment Plant Capacity as detailed further in Section 3.2.

The annual maximum organic loading is greater than the Treatment Plant Capacity as detailed further in Section 3.2.

The annual mean organic loading is less than the Treatment Plant Capacity as detailed further in Section 3.2.

The plant is able to meet peak loads.

A detailed discussion of I**nfluent** and **Effluent** issues, quantity, quality and impacts are outlined in **Appendix 7.1A** ***Influent & Effluent Monitoring.*** The impacts of rainfall, tidal infiltration and compliance with UWWT standards are tabulated together with historic data to demonstrate the evolution of the inflows and discharges since the construction of the WWTP.

2.2 Discharges from the agglomeration

Table 2.2 - Effluent Monitoring Summary

D0033-01 Licence Compliance												
2015	Flow	pH	cBOD	COD	Suspended Solids	Total N (as N)	TON (as N)	Total Ammonia (as N)	Total P (as P)	Orthophosphate (as P)	Visual Inspection	Comments
	m3/d	units	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)		
WWDL ELV (Schedule A)	N/A	6-9	25	125	35	10**	N/A	N/A	2.5**	N/A	N/A	** Annual Mean
WWDL ELV with Condition 2 interpretation included, (Composite samples)	N/A	6-9	50	250	87.5	12	N/A	N/A	3.0	N/A	N/A	
8 out of 10 samples, < or = ELV	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
No. of samples required by licence, B.1	Continuous	Daily	26	26	26	26	26	26	26	26	Daily	
No. of Samples Taken	365	264	262	264	264	28	26	26	28	26	264	
No. sample results which may exceed ELV, B.3	25	19	19	19	19	3	3	3	3	3	19	
No.sample results above WWDL ELV	N/A	**0**	**5**	**4**	**9**	N/A	N/A	N/A	N/A	N/A	N/A	
No Samples above WWDL ELV with condition 2 interpretation included	N/A	0	0	0	0	**25**	N/A	N/A	**4**	N/A	N/A	
8 out of 10 samples, < or = ELV	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Condition removed from Total N & P in Tech. Amendment June 2014
Annual Mean (For Parameters where a mean ELV applies)	N/A	N/A	N/A	N/A	N/A	**19.93***	N/A	N/A	**2.09***	N/A	N/A	* Flow Weighted Annual Mean
Overall Compliance	Pass	Pass	Pass	Pass	Pass	Fail	N/A	N/A	Fail**	N/A	N/A	**Exceeded no. of samples above 120%ELV

Significance of results

The WWTP was non-compliant with the ELV's set in the wastewater discharge licence for Total Nitrogen and Total Phosphorus. The Annual Mean for Total Nitrogen exceeded the emission limit value and 25 individual samples also exceeded the emission limit value by more than 20%. In contrast, the annual mean for Total Phosphorus was in compliance with the ELV but 4 individual samples exceeded the ELV by more than 20% when the allowable number was 3 samples. Non-compliance is due to the WWTP not being designed for Nutrient Removal. The impact on receiving waters is assessed further in Section 2.3.

2.3 Ambient monitoring summary

Table 2.3A - Ambient River Monitoring Report Summary

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference Easting:	Northing:	EPA Feature Coding Tool Code	Current EQS Status (Extrapolated)	Does assessment of the ambient monitoring results indicate that the discharge is impacting on water quality Yes/No, List impact(s) for each Yes answer	Comment
M01 Curraheen Road Bridge	162,843	69,176	RS19T050890	Poor	No	Upstream of any city discharge
M02 Carrigrohane Bridge	162,863	71,034	RS19C120110	Poor	No	
M03 County Hall	165,003	71,212	RS19C120740	Poor	Yes -See below, Curraheen River	
M04 Bandon Road	164,101	68,782	RS19G040140	Poor	No	Upstream of any city discharge
M05 Woodhaven Estate	164,344	69,415	RS19G040190	Poor	No / slight	
M06 GLASHEEN (Cork City) - Sandbrook Estate	165,278	69,503	RS19G040300	Poor	Yes -See below, Glasheen River	
M07 Clashduv Road	165,697	70,336	RS19G040490	Poor	Yes -See below, Glasheen River	
M08 Glasheen Bridge	165,401	70,768	RS19G040700	Poor	Yes -See below, Glasheen River	
M09 Blackstone Bridge	165,691	74,463	RS19B140110	Moderate *	No	Upstream of any city discharge
M10 Kilnap	166,291	74,796	RS19G880990	Moderate *	No	Upstream of any city discharge
M11 BRIDE (Cork City) - Fitz's Boreen	166,925	74,246	RS19B140300	Moderate *	No	
M12 Blackpool (Bride RS19B14)	167,422	73,340	RS19B140800	Moderate *	No	
M13 Glen Rec. Park	168,942	73,453	RS19G090400	Moderate *	Yes-See below, Glen River	
M14 Spring Lane	167,868	73,539	RS19G090800	Moderate *	No	
M15 leitrim Street (Bride(RS19B14)	167,496	72,342	RS19K750900	N/Q	Yes- See below, Kiln River	
All river monitoring was carried out in the same locations in 2015 as previous years						
* Good -EPA 2011						

The results for the Network River Monitoring are included in **Appendix 7.2 .**

Significance of results

There are no ELV's set in the discharge Licence, D0033-01, with respect to Network discharges.

Discharges from the wastewater network have a possible observable negative impact on the River water quality status as discussed in detail in **Appendix 7.2**.

Table 2.3B - Ambient Transitional and Coastal Waters Monitoring Report Summary

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference Easting:	Irish Grid Reference Northing:	EPA Feature Coding Tool Code	Current Trophic/ EQS Status	Does assessment of the ambient monitoring results indicate that the discharge is impacting on water quality Yes/No, List impact(s) for each Yes answer	Comment
C9 Tivoli	170,242	72,195	TW04003159LE2006	Intermediate / Moderate	No	Water Quality is improving in Estuary since construction of WWTP
C7 Blackrock Castle	172,537	72,182	TW04003159LE2005	Intermediate / Moderate	No	
C8 Mid Lough Mahon	174,650	70,440	TW05003157LE4004	Intermediate / Moderate	No	
C6 End Lough Mahon	177,040	69,408	TW05003157LE4005	Intermediate / Moderate	No	
C5 Haulbowline	178,090	65,386	CW05003150LE8004	Unpolluted / Good	No	

The results for the Transitional and Coastal Waters Monitoring are included in **Appendix 7.2A** .

Significance of results

The WWTP was non-compliant with the ELV's set in the wastewater discharge licence for Total Nitrogen, and Total Phosphorus, as detailed in Section 2.2

The discharge from the Wastewater Treatment Plant does not have an observable negative impact on the water quality status. This is discussed in detail in **Appendix 7.2A**

2.4 Data collection and reporting requirements under the Urban Waste Water Treatment Directive

The electronic submission of WWTP Influent data to EDEN was completed on: 14th January 2016
The electronic submission of WWTP Effluent data to EDEN was completed on: 7th January 2016

Authorisation of data on EDEN was upgraded to include EPA on: 14th January 2016

The electronic submission of Ambient River Monitoring data, including EPA share authorisation, was completed on: 4th January 2016
The electronic submission of Ambient Harbour (Transitional and Coastal Waters) Monitoring data including EPA share authorisation, was completed on: 4th January 2016.

2.5 Pollutant Release and Transfer Register (PRTR) - report for previous year

The PRTR Report for 2015 was submitted to the EPA on 12th February 2016. This was verified as accepted by the EPA data system on 13th February 2016.

The following Notes are for Clarification in evaluating the 2015 PRTR Report and comparing it with the PRTR Report submitted for 2014 and previous years.

- Inflows and outflows to the site in 2015 were less than those of 2014, mainly due to patterns of rainfall in the catchment. Treated effluent quantities were reduced to 94.2% of 2014 quantities.
- Storm overflows in 2015 were half that of 2014 and more in line with previous years, 2013 and 2012.
- In 2015, in addition to using Toolset Version 5.0, testing was carried out on a suite of Priority Substance parameters that had been identified for further investigation after screening, as a follow on to the testing that had been done in 2014.
- There were a number of +/- 50% warnings from the PRTR workbook in the comparison to 2014 figures submitted, due to the decrease in quantities of storm overflows over 2014.
- There were also variations in test results over 2015 versus 2014 which are detailed more fully in the Priority Substance report in Appendix 7.5. There was a query regarding some results as Effluent results for PAH were in general higher than Influent results. This may be a reflection of the variation in the nature of the influent from day to day and the duration of the WWTP treatment process. NonylPhenol results were reported as less than LOD (LOD in 2015 6microg/l vs 0.6 microg/l in 2014). There was not sufficient confidence in the results to include these in the PRTR
- Number Employed: DBO: Northumbrian Water: Directly employed number is 21. This reduced to 20 for part of the year but was complemented with an additional contract employee. The number was restored to 21 by November 2015
- Diesel Usage was again reduced in 2015 over 2013 as it was not used at any time in 2015 to generate electricity under WPDRS whereas it had been used up to November in 2013.
- Normal sludge operations continued in 2015. The amount of Wetcake versus Biogrow Pellets produced in 2015 reduced to normal operational process proportions.
- While the majority of sludge is treated and dried into a clean pellet format (Biogrow) on the site, it is landspread for agricultural use offsite in Ireland, i.e. location of treatment is designated as “off-site in Ireland”
- Wet Cake and Dried Pellet quantities are shown separately on the Waste return.

A Copy of the 2015 PRTR report is included in **Appendix 7.3 – PRTR Summary Sheets**

Section 3 Operational Reports Summary

3.1 Treatment Efficiency Report

A summary presentation of the efficiency of the treatment process including information for all the parameters specified in the licence is included below:-

Table 3.1 - Treatment Efficiency Report Summary
Table 3.1A

2015	Flow M3	cBOD (Kg/yr)	COD (Kg/yr)	TSS (Kg/yr)	Total Phosphorus (Kg/yr)	Total Nitrogen (Kg/yr)	Comment
Influent Mass Loading (kg/year)	39,804,499	5,475,238	13,606,639	6,617,424	100,665	812,567	
Effluent Mass Emmission (kg/year)	42,251,970	496,887	3,038,716	733,909	88,517	816,792	Effluent Weir Flow Meter Vs influent Magno Flow Meters
% Efficiency (%reduction of Influent load)	-6.1%	90.9%	77.7%	88.9%	12.1%	-0.5%	

The main flows into the works are measured using electromagnetic flow meters, averaging the data from two meters operating in series. The outlet flows are measured using flumes. Influent flow data is taken to be more representative of the actual flow to the WWTP due to the better accuracy of the electromagnetic flow meters.

Table 3.1B
Figures as above but re-worked to correlate Inflow to Outflow

2015 Adjusted to Correlate Outflow To Inflow	Flow M3/day	cBOD (Kg/yr)	COD (Kg/yr)	TSS (Kg/yr)	Total Phosphorus (Kg/yr)	Total Nitrogen (Kg/yr)	Comment
Influent Mass Loading (kg/year)	39,804,499	5,475,238	13,606,639	6,617,424	100,665	812,567	
Effluent Mass Emmission (kg/year)	39,804,499	468,105	2,862,697	691,397	83,390	769,479	Outflow reduced prorata to match inflow
% Efficiency (%reduction of Influent load)	0.0%	91.5%	79.0%	89.6%	17.2%	5.3%	

3.2 Treatment Capacity Report

Table 3.2 - Treatment Capacity Report Summary

2015	M3 / day	M3 / year	Comment
Hydraulic Capacity- Design / As Constructed -DWF	59,359	21,666,035	Multiple of Daily Figure
Hydraulic Capacity- Design / As Constructed Peak Flow	359,592	131,251,080	
Hydraulic Capacity- Current Loading -Dry Weather Flow	77,295	28,212,675	
Hydraulic Capacity- Current Loading - Average Daily Flow to Treatment	111,639	40,748,235	Design based on Daily figures not Yearly
Hydraulic Capacity- Peak Flow	238,997	87,233,905	
Hydraulic Capacity- Remaining DWF	- 17,936	- 6,546,640	
Hydraulic Capacity- Remaining Peak Flow	120,595	44,017,175	
Will the Hydraulic Capacity be exceeded in the next 3 years	Yes		DWF
	No		Peak

77,295m3/day is estimated/calculated DWF 2015.

2015	PE	Comment
Organic Capacity- Design / As Constructed (PE)	413,200	
Organic Capacity- Current Loading (PE) - Annual Mean (Flow Related)	250,011	
Organic Capacity- Current Loading (PE) - Max. Average Weekly Load	358,852	**
Organic Capacity- Remaining (PE)	163,189	Note: using Annual Mean
Will the Organic Capacity be exceeded in the next 3 years	No	

3.3 Extent of Agglomeration Summary Report

In this section Irish Water is required to report on the amount of urban waste water generated within the agglomeration. It does not include any waste water collected and treated in a private system and discharged to water under a Section 4 Licence issued under the Water Pollution Acts 1977 (as amended):

Table 3.3 - Extent of Agglomeration Summary Report

2015	City	County	% of PE Load Generated in the Agglomeration	% of PE Load Collected in the Sewer Network	Note
Total Load Generated in the Agglomeration	64.4%	35.6%	100%		
Load Generated in the Agglomeration that is Collected in the Sewer Network	99.69%	98.1%	99.1%		
Load Generated in the Agglomeration that is Collected in the Sewer Network	64.8%	35.2%		100.0%	
Load Collected in the Sewer Network but discharged through SWO,EO***	12.73%	2.0%	**8.87%**	**8.95%**	A
Load Collected in the Agglomeration that enters the Treatment Plant			90.26%	91.05%	B
Load that enters the treatment Plant that is treated to Secondary Level	99.30%				
Load Collected in the Agglomeration that is treated to Secondary Treatment Level			89.6%	90.41%	
Load entering the Treatment Plant that is discharged through Storm Overflow, i.e. After primary/ preliminary treatment	0.70%		**0.64%**	**0.64%**	C = Storm BOD Vs Influent BOD
Load Collected in the Sewer Network but discharged without treatment (or with Primary/Preliminary Treatment only)			**9.51%**	**9.59%**	A + C

*** Estimate only as no Network Hydraulic Model or CSO monitoring available currently

Load generated in the agglomeration that is collected in the sewer network is the total load generated and collected in the municipal network within the boundary of the agglomeration.

Load collected in the agglomeration that enters treatment plant is that portion of the previous figure which enters the waste water treatment plant

Load collected but discharged without treatment is that portion of the first figure which is discharged without treatment**.**

The data in Table 3.3 above is based on influent monitoring as detailed in Section 2.1 above and **Appendix 7.1A.**

3.4 Complaints Summary

A summary of complaints of an environmental nature is included below.

Table 3.4 – WWTP Complaints Summary Table:

Table 3.4 - Complaints Summary Table:

Number	Date & Time	Nature of Complaint	Cause of Complaint	Actions taken to resolve issue	Closed (Y/N)
None					

There were no complaints relating to discharges.

3.5 Reported Incidents Summary

A summary of reported incidents is included below.

Table 3.5.1 - Summary of Incidents

Incident Type	Incident Description	Cause	No.Of Incidents	Corrective Action	Authorities contacted	Reported to EPA	Closed	EPA Ref
Non-Compliance	ELV exceedences for Total Phosphorous and Total Nitrogen	Plant not designed for Nutrient Removal	1, Ongoing	PR for upgrade Prepared, Review Characterisation of Harbour carried out and presented to EPA. Awaiting DECLG decision regarding de-designation or otherwise of Lough Mahon.	No	Yes, Quarterly reports via EDEN	No	INCI000092
Spillage	Overflow from sewer	Temporary use of undersized sewer due to substandard drainage from Housing Estate not Taken in Charge	1	Public Sewer repaired, Overflow cleaned up, Awaiting remediation of estate sewer by receiver	Yes	Yes	No	INCI006507
Uncontrolled Release	Back up of sewage in drains and flooding of property	Pump Station unable to cope with inflows due to unprecedented rainfall	1	Increased pumping to maximum, used suction tanker to clean spill and used portable pump to prevent flooding to properties	Yes (L.A.)	Yes	No	INCI009446
Uncontrolled Release	Overflow from sewer	Blocked sewer was surcharged and when released overflowed to paved areas adjacent to houses and near underfloor vents.	1	Used Suction tanker to clean spill and wash down paved areas	Yes (L.A.)	Yes	No	INCI009448

Table 3.5.2 - Summary of Overall Incidents

No. of Incidents in 2015	4
No of Incidents reported to the EPA via EDEN in 2015	4
Explanation of any discrepancies between the two numbers above	N/A

3.6 Sludge / Other inputs to the WWTP

'Other inputs' to the waste water treatment plant are summarised in Table 3.6 below.

Table 3.6 - Other Inputs

Input type	m3/year	PE/year	% of load to WWTP	Is there a leachate/sludge acceptance procedure for the WWTP? (Y/N)	Is there a dedicated leachate/sludge acceptance facility for the WWTP? (Y/N)
Domestic /Septic Tank Sludge	0	0	0	N/A	N
Industrial / Commercial Sludge	0	0	0	N/A	N
Landfill Leachate (delivered by tanker)	0	0	0	N/A	N
Landfill Leachate (delivered by sewer network)	98,369	60,305	0.09%	Y*	N
		(165 PE/day)			
Other (specify)	0	0	0	N/A	N

Notes:

1. Other Inputs include; septic tank sludge, industrial /commercial sludge, landfill leachate and any other sludge that is collected and added to the treatment plant.
2. Sludge that is added to a dedicated sludge reception facility at a waste water treatment plant not included in Table 3.6. Only include sludge which is added to the waste water treatment process stream. Enter zero where there are no inputs

Note: *Discharge to WWTP is via Sewer network only, in accordance with a Discharge to Sewer Licence.

Section 4. Infrastructural Assessments and Programme of Improvements

4.1 Storm water overflow identification and inspection report

A detailed Storm Water Overflow Identification & Inspection report was included in the **2013 AER**. There have been no changes to the Storm Water overflows included in the 2013 report.

The SWO assessment submitted in the **2013 AER** identified that one Storm Water Overflow submitted in the original application list, Table B.5, has been eliminated, and there are 8 further Storm Water Overflows that were not identified as such in the Licence Application. These will be addressed by Technical Amendment application to be submitted by Irish Water.

There is no monitoring equipment installed at the Combined Sewer Overflow Structures (CSOs) to determine the number of times each is activated, the volume discharged or the percentage of the total effluent generated at each CSO which is discharged. At pump Stations metered data was utilised where available or alternately pump run hours were used to calculate flows

A detailed study was carried out on the Drainage Network GIS Records to produce catchment mapping for each CSO. This information was fed into the Assessment report and was very informative in carrying out the assessment. However, in order to produce data of the kind requested, short of installing equipment at each CSO and monitoring same, it would be necessary to model the full drainage network itself. The Network GIS system is not adequate for this at this time.

Project

Irish Water is progressing with a Drainage Area Plan (DAP) for the Agglomeration, with a view to constructing a model of the network. Tendering for Consultants to construct and validate the model is nearing completion. The Consultant will be appointed in Q2 2016. The outputs from this model will quantify the overflows from each Storm Water Overflow and hence verify if they are problematic or not.

Table 4.1.1 - SWO Identification and Inspection Summary Report

CSO Cork City Co.Name	WWDL Storm Overflow Code	Storm Overflow /Outfall Location		Included in Schedule A4 of the WWDL	Significance of the Overflow	Compliance with DoEHLG Criteria	No. Of Times Activated in 2015 (No. of Events)	Total Volume discharged in 2015 (m3)	Total Volume discharged in 2015 (P.E.)	Estimated / Measured Data
		EASTING	NORTHING		High/Medium/ Low					
01A Our lady's Hospital	S01	165012	71470	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
02 Eikpa Lodge Sunday's Well	S02	165720	71689	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
03 Hazelhurst Sunday's Well	S03	165987	71722	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
04 Wyse's Hill	S04	166770	72081	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
05 Rock Cottages North Mall	S05	166968	72156	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
06 Shandon Street	S06	167053	72191	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
07 John Redmond Street	S07	167462	72137	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
08 Upper John Street	S08	167438	72568	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
09 Cathedral Walk				Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
10 Gerald Griffin Street	S09	167401	72902	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
11 great Wm O'Brien Street	S47	167443	73019	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
13 wherelands Lane	S10	167409	73411	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
14 Pophams Road	S11	167498	73710	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
~~15 Pole Field~~	S12	167573	73855	Yes	N/A	N/A	N/A	N/A	N/A	N/A
18 Thomas Davis Street	S13	167458	73280	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
19 Assumption road	S14	167456	73163	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
20 Popes Road	S15	167418	72804	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required

CSO Cork City Co.Name	WWDL Storm Overflow Code	Storm Overflow /Outfall Location		Included in Schedule A4 of the WWDL	Significance of the Overflow	Compliance with DoEHLG Criteria	No. Of Times Activated in 2015 (No. of Events)	Total Volume discharged in 2015 (m3)	Total Volume discharged in 2015 (P.E.)	Estimated / Measured Data
		EASTING	NORTHING		High/Medium/ Low					
21 Fever Hospital Steps	S16	167446	72643	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
22 Hardwick Street	S17	167558	72134	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
23 Bridge Street	S18	167666	72128	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
24 York Street	S19	168076	72050	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
25 Summerhill North				Yes	Medium	Unlikely	Unknown	Unknown	Unknown	Further Investigation required
26 Lower Glanmire Road				Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
27 Grattan Hill	S20	168779	72116	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
28 Beales Hill	S21	169332	72302	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
29 Trafalgar Hill	S22	170473	72263	Yes	Medium	Inconclusive	Unknown	Unknown	Unknown	Further Investigation required
30 Silversprings Lane	S23	170700	72265	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
33 Park Ave	S24	170275	72110	Yes	Medium	Unlikely	Unknown	Unknown	Unknown	Further Investigation required
34 Springville blackrock road	S25	168322	71868	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
35 Boreenmanna Road, (Ashton)				Yes	Medium	Unlikely	Unknown	Unknown	Unknown	Further Investigation required
37 Victoria Hospital	S26	167915	71717	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
38 Southern Road				Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
39 High Street				Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
40 Summerhill South				Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required

CSO Cork City Co.Name	WWDL Storm Overflow Code	Storm Overflow /Outfall Location		Included in Schedule A4 of the WWDL	Significance of the Overflow	Compliance with DoEHLG Criteria	No. Of Times Activated in 2015 (No. of Events)	Total Volume discharged in 2015 (m3)	Total Volume discharged in 2015 (P.E.)	Estimated / Measured Data
		EASTING	NORTHING		High/Medium/ Low					
41 Mary Street	S27	167535	71537	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
42 Travers Street	S28	167470	71546	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
43 Barrack street	S29	167261	71523	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
44 Keyser's Hill	S30	167183	71501	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
45 St Finbarr's Place				Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
46 Bishop street				Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
47 O'Donovan Rossa Road	S31	166415	71482	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
48 Gaol Walk	S32	165980	71327	Yes	Medium	No	Unknown	Unknown	Unknown	Further Investigation required
49 woodbrook Gurrane Lane	S33	164346	69421	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
50 Rossa Ave PS	location as SD04	163233	69984	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
51 Skehard Rd	S34	171677	69812	Yes	Medium	Unlikely	Unknown	Unknown	Unknown	Further Investigation required
52 Glasheen Bridge	S35	165283	71154	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
53 Dennehy's Cross				Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
54 Flannery's Pub	S36	165591	70436	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
55 Glendale	S37	165647	70387	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
56 Deanrock, Summerston Lane	S38	165705	69790	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
58 South Ring road, Tramore rd	S39	166288	69283	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required

CSO Cork City Co.Name	WWDL Storm Overflow Code	Storm Overflow /Outfall Location		Included in Schedule A4 of the WWDL	Significance of the Overflow High/Medium/ Low	Compliance with DoEHLG Criteria	No. Of Times Activated in 2015 (No. of Events)	Total Volume discharged in 2015 (m3)	Total Volume discharged in 2015 (P.E.)	Estimated / Measured Data
		EASTING	NORTHING							
59 Rosebank	S40	168667	69892	Yes	Moderate	Inconclusive	Unknown	Unknown	Unknown	Further Investigation required
60 Riverbank, Douglas	S41	170018	69669	Yes	High	No	Unknown	Unknown	Unknown	Further Investigation required
61 Douglas Hall Lawn	S42	170037	70060	Yes	Medium	Inconclusive	Unknown	Unknown	Unknown	Further Investigation required
62 Sunview Place East	S43	168818	73442	Yes	Low	Yes	Unknown	Unknown	Unknown	Further Investigation required
64 Convent Road	S44	171626	71862	Yes	Medium	Inconclusive	Unknown	Unknown	Unknown	Further Investigation required
65 Convent Ave				Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
66 Ursuline Convent				Yes	Medium	Inconclusive	Unknown	Unknown	Unknown	Further Investigation required
67 St Finbarr's Hospital	S45	168133	70154	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
68 Turner's Cross				Yes	Moderate	Inconclusive	Unknown	Unknown	Unknown	Further Investigation required
71 Carrigrennan WWTP	S48N & S48S (Primary Discharge)	176683	69726	Yes	High	No	74	1,503,880	642,050	Measured
		176746	69736	Yes	High					Av. 8,676 P.E. per event
Atlantic Pond PS-PS01	S49W	170768	72079	Yes	High	No	59	1,070,190	456,971	Measured Flow, Est. Load
	S49E	170863	72054	Yes	High					(Av.7,745 P.E. per event, 18,138m3)
Gillabbey Pump Station overflow	location as SD03	166628	71487	Yes	Low	Possible	None known	0	0	Estimated
Coal Quay PS -PS20	same location as SD20	167273	72119	Yes	High	No	Daily, Average 3 hours pump/day	979,704	262,399	Est. (719, 14% of PE Per day, and 87% of inFlow)
Grand Parade PS-PS21	same location as SD21	167386	71575	Yes	High	No	Daily, Average 8 hours pump/day	2,395,008	538,524	Est. (1,475,34.5% of PE per day, and 56% of inflow)

CSO Cork County Co.Name	WWDL Storm Overflow Code	Storm Overflow /Outfall Location		Included in Schedule A4 of the WWDL	Significance of the Overflow	Compliance with DoEHLG Criteria	No. Of Times Activated in 2015 (No. of Events)	Total Volume discharged in 2015 (m3)	Total Volume discharged in 2015 (P.E.)	Estimated / Measured Data
		EASTING	NORTHING		High/Medium/ Low	Sensitive Waters				
70 Rear Tesco Douglas/ Belgard	S46	170473	69690	Yes	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
Ronaynes Court PS	SD35	172404	69758	No	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
Rochestown Inn PS	SD36	173107	69468	No	High	No	Unknown	Unknown	Unknown	Further Investigation required
Glanmire PS	S50 (new)	172792	74164	No	High	No	Unknown	Unknown	Unknown	Further Investigation required
East Glounthane PS	S51 (new)	177297	73288	No	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
West Glounthane PS	S52 (new)	175983	72981	No	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
Little Island PS					Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
Flaxfort Rd PS	SD32	175349	71503	No	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
Wallingstown PS	SD33	174489	71167	No	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required
Courtstown PS	SD34	177512	71475	No	Low	Possible	Unknown	Unknown	Unknown	Further Investigation required

Table 4.1.2 - SWO Identification and Inspection Summary Report

How much Sewage was discharged via SWOs in the Agglomeration in the year ? (m3/yr)	4,444,902 m3/yr (excl WWTP) known/estimated, + Unknown from CSOs
How much Sewage was discharged via SWOs in the Agglomeration in the year? (P.E.)	1,257,894 PE (excl WWTP) known/estimated + Unknown from CSOs
What % of the Total volume of sewage generated in the Agglomeration was discharged via SWOs in the agglomeration in 2015?	Guesstimated Table 3.3 as 8.9% of Total Agglomeration, of which *known* (i.e.1,257,894 PE) makes up approx 13% and *CSOs unknown* is approx 87%
Is each SWO identified as non-compliant with DoEHLG Guidance included in the programme of Improvements?	Programme of Improvements in preparation
The SWO assessment includes the requirements of Schedule A3 &C3	No A3 : N/A : Secondary Discharge St Patrick St. C3 : SO Improvement Programme Not incl. In SO Report
Have the EPA been advised of any additional SWOs/changes to schedule C3 and A4 under condition 1.7?	No. Submission to be made by Irish Water

4.2 Report on progress made and proposals being developed to meet the improvement programme requirements.

The Improvement Programme is included in Appendix 7.5

The Improvement Programme report included in Appendix 7.5 addresses the **Specified Improvement Programmes** as detailed in Schedules A3 and C of the WWDL. It also details other improvements identified through assessments required under the licence

Table 4.2.1 - Specified Improvement Programme Summary

	Specified Improvement Programmes (under Schedule A and C of WWDL)	Licence Schedule (A or C)	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	% Construction Work Completed	Licensee Timeframe for Completing the work	Comments
	Discharge to be discontinued							
1	SD02, St Patrick's Bridge	**A.3**	22-Dec-15	**Y**	Culvert Investigative Survey underway, due for completion Q3 2016, Remediation works to follow	0%	Q4 2017	as per 4 below
	Improvement Programme for Primary Discharge							
2	Infiltration and Inflow Programme	**C.1**	22-Dec-15	**Y**	Tender Process Completed for Consultant Appointment to undertake Drainage Area Plan for full agglomeration, Q2 2016	0%	Q3 2018	Output as per 3 below also
3	Improvement in operation of and a reduction in frequency of discharge via, CSO71 (S48N and S48S)	**C.1**	To be Agreed	**N/A**	Contractor due for appointment for upgrade & optimisation of operation of Atlantic Pond & Ballinure Header Chamber with a view to optimising flows to WWTP	0%	Q4 2016	Ref Also 2 above, Network Model to inform re infiltration with a view to reduction of same
	Improvement Programme for Secondary discharge							
4	Cessation of Discharge from SD02	**C.2**	22-Dec-15	**Y**	Culvert Investigative Survey underway, due for completion Q3 2016, Remediation works to follow	0%	Q4 2017	As per 1 above
	Improvement Programme for Storm Water Overflows							
5	Meet requirements of DoEHLG "Procedures and criterai in relation to storm water overflows" 1995	C.3	22-Dec-15	**Y**	Ref DAP, item 2, Hydraulic Model of Network to inform Storm Overflows and identification of requirements	0%	Q3 2018	Ref Also 6 below as de-designation of Sensitive Water would reduce Storm Overflow limits and requirements

Table 4.2.2 - Improvement Programme Summary

	Non Specified Improvements	Licence Schedule (A or C)	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	% Construction Work Completed	Licensee Timeframe for Completing the work	Comments
6	Upgrade of Treatment Plant to comply with Nutrient Removal Licence & UWWT Directive		01-Jan-11	**Y**	Awaiting DECLG decision regarding de-designation of Sensitive Waters	0%		Ref Section 4.2
7	Assesment of impact on shellfish & implementation of recommendations from same		Jun-11	**Y**	Included in draft PR for WWTP upgrade	0%		WWTP Scheme is under review, IW
8	Cessation of Discharges to Kiln River Culvert		To be Agreed	**N/A**	Ref DAP, item 2, Hydraulic Model of Network to inform	0%		Submission to be made to EPA
9	Docklands Sewerage Scheme			**N/A**	Not a priority requirement /Lack of Need	0%		
10	Tramore River Valley Study			**N/A**	Ref DAP, item 2, Hydraulic Model of Network to inform Storm Overflows and identification of requirements	0%		Relevant to C.1 & C.3,
11	Glanmire/Riverstown/Little Island, Stormwater seperation Study			**N/A**	Ref DAP, item 2, Hydraulic Model of Network to inform Storm Overflows and identification of requirements	0%		Relevant to C.1 & C.3,

Table 4.2.3 - Sewer Integrity Risk Assessment Tool Summary

The Improvement Programme should include an assessment of the integrity of the existing wastewater works for the following:	**Risk Assessment Rating (High, Medium, Low)**	**Risk Assessment Score**	**Reference to relevant Section of AER** (e.g.Appendix 2 Section 4)	**Specified Improvements**	**Comment**
Hydraulic Risk Assessment Score	*High Risk*	*140*	*AER Section 4.2*	*DAP under Tender, Start Q1 2016*	*Agglomeration does not have a Hydraulic Model*
Environmental Risk Assessment Score	*Low Risk*	*248*		*DAP will inform*	*Good Data available, Compliance of Storm Overflows Required*
Structural Risk Assessment Score	*Medium Risk*	*95.32*		*DAP will inform*	*Large Network, Small percentage CCTVs Vs Total length of Network*
Operation & Maintenance Risk Assessment Score	*Medium Risk*	*125*	*AER Section 4.2 & Appendix 7.1*	*Upgrade to Atlantic Pond PS, Suppressed Capital Maintenance*	*Large Network equates values at highest end of scale*
Overall Risk Score for the agglomeration	*High Risk*	*608.32*			
Comment where score from tool is not considered to be accurate reflection of reality					

Issues with the Sewer Integrity Tool / Agglomeration Details section prohibited input of extensive data for Storm Overflows. This information was previously submitted as part of the Storm Water Overflow Assessment Report in 2014.

Section 5. Licence Specific Reports

Licence Specific Reports Summary Table

Licence Specific Report	Never Required by Condition 5 in Licence	Required in this AER or outstanding from previous AER	Included in this AER/Remains Outstanding	Reference to previous AER containing report or relevant section of this AER
Priority Substances Assessment	No	No	No	Appendix 7.7 2015: Report on monitoring for particular substances identified from assessment in 2012/3 AERs
Drinking Water Abstraction Point Risk Assessment	Yes	No	N/A	
Habitats Impact Assessment	Yes	No	N/A	
Shellfish Impact Assessment	No	No	No	Submitted 3rd AER 2012
Pearl Mussel Report	Yes	No	N/A	
Toxicity/Leachate Management	Yes	No	N/A	
Toxicity of the Final Effluent Report	No	No	No	Submitted 2nd AER 2011

Licence Specific Reports Summary of Findings

Licence Specific Report	Recommendations in Report	Summary of Recommendations in Report	Status of Recommendations
Priority Substances Assessment	(2012/3) Yes	Additional Annual Testing of four substances	Carried out
Drinking Water Abstraction Point Risk Assessment	N/A	No	N/A
Habitats Impact Assessment	N/A	No	N/A
Shellfish Impact Assessment	(2012) Yes	Update on progress of works required	Refer to 2014 AER Section 7.10
Pearl Mussel Report	N/A	No	N/A
Toxicity/Leachate Management	N/A	No	N/A
Toxicity of the Final Effluent Report	No	No	No

5.1 Priority Substances Assessment

Screening of the WWTP primary discharge effluent for organic compounds and metals (Priority Substances) is conditioned to be carried out within twelve months of the date of grant of licence, i.e. by 17th Dec 2010.

The Environmental Protection Agency undertook an Effluent Characterisation with consultants Mott MacDonald Ireland Ltd, and 88 pollutants, (including all the priority substances) were monitored on a quarterly basis at 11 WWTPs around Ireland, including Cork City WWTP. This study's objective was to determine which pollutants are likely to be found in Irish WWTPs and also to refine the UWW Calculation Tool for PRTR reporting purposes.

It was agreed with the EPA that Cork City did not have to carry out further sample testing for the Priority Substances, i.e. Organic Compounds and Metals, as this testing was included in the Effluent Characterisation monitoring for Cork City WWTP. The final report for this WWTP Characterisation was produced in July 2012.

A summary of the findings of the report with relevance to Carrigrennan WWTP was attached in **2012 AER Report as Appendix 1: Priority Substances.** The **2013 AER** reported on the requirement for a monitoring programme under paragraph 4.12 and schedule B1 note 3 of the licence.

Conclusion

The results of the WWTP Characterisation were reviewed against the Annual Average Environmental Quality Standard (AA-EQS) for Other Surface Waters as set out in Tables 10 to 12 in S.I No.272 of 2009 and as amended in S.I. No. 373 of 2012.

No impact on the Receiving Waters was identified from the substances tested.

The majority of parameters were below the Annual Average Environmental Quality Standard (AA-EQS) for Other Surface Waters as set out in Tables 10 to 12 in S.I No.272 of 2009 and as amended in S.I. No. 373 of 2012.

Overall it was considered that given the location of the outfall from the WWTP in the Lower Estuary there is adequate dilution for the concentration of substances where detected above the Annual Average Environmental Quality Standard.

From the review however, four substances are recommended to be tested on an annual basis to verify that there is no deterioration in effluent quality.

1) **Cyanide** presented as exceeding the AA-EQS (Other) in two samples of effluent of four tested at levels of 22 and 16, Vs standard of 10microgramme/litre.
2)**Zinc** had one exceedance at 45.5microgramme/litre Vs AA-EQS (Other) standard of 40 microgramme/ litre.
3) **Nonylphenol and Nonylphenol Ethoxylates** (NP/NPEs) had one test value of the four above the AA-EQS (Other) standard of 0.3microgramme/litre. This test result was however at a level of 3.65 microgramme /litre which warrants further test, in particular given the type of industries adjacent to the WWTP.
4)**Di(2-ethylexyl)phthalate** had all four test values below the AA-EQS (Other) standard of 1.3microgramme/litre, the highest test value coming in at 1.11microgramme/litre. It is close enough to the standard to warrant retest on an annual basis in conjunction with the other three substances above.

Monitoring 2015:

Samples were collected and tested in November 2015 from the influent and Effluent at the WWTP. These samples were tested for **Zinc, Glyphosate, PAHs, Nonylphenols** and **DEHP**. The Results are discussed, compared to results for 2014 and tabulated in Appendix 7.5 and Table 7.7.1 of the appendix respectively.

5.2 Drinking Water Abstraction Point Risk Assessment.

This assessment is not required for D0033-01 Cork City

5.3 Shellfish Impact Assessment Report.

The Cork City scheme is currently being reviewed and part of the review will include an assessment of nutrient removal requirements and impacts on shellfish waters. A shellfish assessment was undertaken by Cork City Council and submitted to the EPA as part of the 2012 Annual Environmental Report. This report is currently being reviewed. It is proposed to undertake a review of the dispersion modelling of the discharge from Carrigrennan to assess potential impacts of the discharge from the wastewater treatment plant. The 2017-2021 investment plan includes a proposal to provide UV treatment at Carrigrennan if the updated discharge modelling shows that it is necessary to protect the shellfish water quality. The 2017-2021 investment plan also includes a proposal to provide nutrient removal at Carrigrennan.

5.4 Toxicity / Leachate Management

There is no specific condition in the D0033-01 licence concerning Landfill Leachate.

Leachate from the Kinsale Road Landfill site is discharged directly to the sewer network (City) on a daily basis. During 2015, 98,369 m3 in total was discharged to the sewer, making up **0.247%** of the total influent to the WWTP, a little less than the equivalent of one day's intake overall.

The leachate is quite weak in strength, typifying that of an older landfill. The P.E. per day in 2015 was 165 or **0.066%** of daily load.

5.5 Toxicity of the Final Effluent Report

A full Toxicity report was included as part of the second **AER Report 2011**

5.6 Pearl Mussel Measures Report

This assessment is not required for D0033-01 Cork City

5.7 Habitats Impact Assessment Report

This assessment is not required for D0033-01 Cork City

Section 6. Certification and Sign Off

Table 6.1 - Summary of AER Contents

Does the AER include an executive summary?	Yes
Does the AER include an assessment of the performance of the Waste Water Works (i.e. have the results of assessments been interpreted against WWDL requirements and or Environmental Quality Standards)?	Yes
Is there a need to advise the EPA for consideration of a technical amendment / review of the licence?	Yes
List reason **SWO eliminated** **Additional SWOs identified** **Secondary Discharges to Kiln River**	 1 No. 8 No.
Is there a need to request/advise the EPA of any modifications to the existing WWDL? Refer to Condition 1.7 (changes to works/discharges) & Condition 4 (changes to monitoring location, frequency etc.)	As above
List reason e.g. failure to complete specified works within dates specified in the licence, changes to monitoring requirements *(insert lines as required)*	N/A
Have these processes commenced? (i.e. Request for Technical Amendment / Licence Review / Change Request)	IW to progress
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER?	N/A
List outstanding reports *(insert lines as required)*	None

Declaration by Irish Water

The AER contains the following;

- Introduction and background to 2015 AER
- Monitoring reports summary.
- Operational reports summary.
- Infrastructural Assessment and Programme of Improvements.
- Licence specific reports.
- Certification and Sign Off
- Appendices

I certify that to the best of my knowledge the information given in this Annual Environmental Report is truthful, accurate and complete:

Signed:  Date: 10/03/16

Gerry Galvin
Chief Technical Advisor

Section 7. Appendices

Appendix 7.1 - Annual Statement of Measures

Appendix 7.1A -Influent & Effluent

Appendix 7.2 - Ambient River monitoring summary

Appendix 7.2A -Ambient Transitional and Coastal Waters monitoring summary

Appendix 7.3 - Pollutant Release and Transfer Register (PRTR) Summary Sheets

Appendix 7.4 – Sewer integrity tool output

Appendix 7.5 – Specified Improvement Programme

Appendix 7.6 - Priority Substances Assessment: Monitoring Review

Appendix 7.1 - Annual Statement of Measures

Statement of Measures

Cork City Council and Cork County Council operate under a Service Level Agreement as agents of Irish Water to operate the Network, pump Stations and Waste Water Treatment Plant for the Cork City Agglomeration.

WWTP

The Cork City Waste Water Treatment plant at Carrigrennan is operated by Northumbrian Water Projects Ltd on behalf of Consort Joint Venture on a twenty year contract, novated to Irish Water, from 2004. Full Performance Management Systems, independently certified to ISO 9001 and ISO 14001, are in place, with appropriate controls and monitoring for the operation, and maintenance of the plant and equipment. Carrigrennan WWTP is operated to the highest standards for secondary treatment of effluent and all environmental monitoring required by the licence is undertaken. Process monitoring is also undertaken and alarm and call-out systems are in place to address any accidents/incidents should they arise.

The proposed upgrade of the WWTP to meet Tertiary Treatment Standards is on temporary hold, pending the decision or otherwise of the DoECLG to de-designate Lough Mahon Estuary. Works associated with shellfish impacts will be considered in line with the other WWTP upgrade proposals.

Network

Atlantic Pond Pump Station and the Ballinure Header Chamber are the key items of infrastructure on the system apart from the Treatment Plant. They are operated and maintained under separate contract, and are under constant surveillance. A review is underway by Irish Water since late 2014 of the operation of Ballinure Header Chamber and Atlantic Pond Pump Station. A contract to optimise equipment, e.g. by installing variable speed drives on pumps, etc., to be carried out in 2016 together with upgrade of controls and Scada/ Telemetry, that improvements will be achieved in flow regimes to the WWTP. This should assist in reducing peak flows and also reduce some overflows from the WWTP

Staff from Cork City Council plant and Machinery Dept. carries out maintenance of the older City pump stations, (pre Cork Main Drainage). The department operates a callout system for fitters and electricians. This call out system has been enhanced with the upgrade of all the control panels which includes a text alert system which is activated by alarm set points. The remaining pump stations, constructed more recently within the Cork Main Drainage projects are inspected regularly, up to twice weekly, depending on risk level attached to the installation, by City Council technicians. A maintenance programme is in place and service and repairs are carried out as required by contractors.

Pump replacement and refurbishment is an ongoing feature of the preventive maintenance carried out under both systems. This results in any pump station failures being mitigated. Irish Water Programmes for *like for like* replacement of pumps and equipment, i.e. Suppressed Capital Maintenance programme have been utilised in 2015 and are targeted further in 2016. Repair, Replacement and upgrade of flow monitors and telemetry equipment are also being prioritised under these programmes.

Cork City Council on behalf of Irish Water operates and maintains the Drainage Network within the City. Regular inspection, repair and maintenance are carried out by the Drainage maintenance staff, responding to all complaints that are received from Irish Water concerning the network operation. A specialist crew inspects and cleans all Combined Sewer Overflows on a fortnightly basis. Cork City Council on behalf of Irish Water also operates a call-out /emergency response system for out- of- hour's problems that arise.

Cork County Council on behalf of Irish Water via their Area Network Maintenance Divisions, operate and maintain the County Council Drainage Network which discharges to Carrigrennan WWTP.

Appendix 7.1A – Influent & Effluent Monitoring Incl. UWWT Compliances

Table of Contents

Monitoring Reports Summary: Detailed

Summary Report on Monthly Influent Monitoring

Flows

Influent and effluent flow is measured on a continuous daily basis at the plant. Summary flow statistics on the influent to and effluent from the plant during 2015 based on the 365 (daily) flow measurements are tabulated below.

Total influent data represents influent water from the agglomeration arriving at the Carrigrennan Waste Water Treatment Plant. It does not include wastewater lost in combined sewer overflows in the upstream waste water works of the agglomeration.

Month	Inflow to Primary Tanks	Inflow to Storm Tanks	Total Inflow	Dischage to Effluent Outfall	Storm Tank Overflow to Storm Outfall	Total Discharge	2015 Rainfall	30 year Mean Rainfall (1981-2010)
January 2015	3,827,684	9,440	3,837,124	4,094,970	17,420	4,112,390	117.1	131.4
February 2015	2,728,430	880	2,729,310	2,909,820	200	2,910,020	52.4	97.8
March 2015	3,342,256	53,300	3,395,556	3,537,080	55,690	3,592,770	88.8	97.6
April 2015	2,436,195	-	2,436,195	2,538,580	-	2,538,580	16.0	76.5
May 2015	3,226,510	38,780	3,265,290	3,416,270	45,100	3,461,370	137.3	82.3
June 2015	2,434,193	12,330	2,446,523	2,570,750	9,530	2,580,280	54.3	80.9
July 2015	2,962,360	45,860	3,008,220	3,152,530	38,620	3,191,150	158.8	78.8
August 2015	3,001,402	29,330	3,030,732	3,172,460	30,310	3,202,770	101.1	96.8
September 2015	3,050,197	3,310	3,053,507	3,190,670	45,740	3,236,410	97.6	94.6
October 2015	3,002,565	6,290	3,008,855	3,139,350	51,900	3,191,250	82.5	138.2
November 2015	3,708,462	19,610	3,728,072	3,989,010	36,230	4,025,240	139.3	120.0
December 2015	5,318,477	546,640	5,865,117	5,036,600	1,173,140	6,209,740	402.2	133.1
Annual flow Year 2015	39,038,729	765,770	**39,804,499**	40,748,090	1,503,880	**42,251,970**	**1,447.4**	**1,228.0**
Average Daily flow 2015	106,955	2,098	**109,053**	111,639	4,120	**115,759**		
Max Daily flow 2015	189,057	49,940	**238,997**	175,350	78,230	**250,570**		
Min Daily flow 2015	69,949	-	**69,949**	63,650	90	**63,650**		
Max. Daily Flow 2015			**3.42**			**3.94**		
Min Daily Flow 2015								

Comments:

The discrepancy between inflow measured compared to discharge is a reflection of the method of flow measurement employed at the respective measurement locations. Discharges from the site are measured via Flume readings. The readings from two Mag. Flow meters in sequence are averaged and combined with a flume meter to the Storm overflow Tanks to calculate the inflow.

Outflows as measured by *Storm Tank overflow to Storm Outfall* (1,503,880m3 Total for 2015) are not directly comparable to the Inflows measured by *Inflow to Storm Tanks* (765,770 m3 for 2015) which is included as part of Total Inflow in Summary Table above. As part of the treatment process, overflows after Primary Treatment, i.e. over and above 1.83m3/sec, also flow to the Storm Tanks adding to the quantities that make up the outflows and similarly as flows vary/decrease over a time period, additional storm water will be added back into the effluent going for secondary treatment.

Original Design Data for the Carrigrennan WWTP, based on 2020 figures is as follows:

2.1.1 Crude Sewage Flow (Excluding the returns)	M3/day	M3/Hr	M3/sec
Crude Sewage Dry Weather Flow (DWF)	59,359	2,473.3	0.687
Crude Sewage Maximum Flow (WWF)	359,592	14,983	4.16
Design Factor, WWF/ DWF	6.06		
2.1.2 Flow to Primary Treatment	M3/day	M3/Hr	M3/sec
DWF	59,359		
Multiplier	3		
Maximum Flow	178,077	7,420	2.06
Excess flows are diverted to Storm Tanks			
2.1.3 Flow to Secondary Treatment	M3/day	M3/Hr	M3/sec
DWF	59,359		
Multiplier	2.5		
Infiltration	9,741		
Maximum Flow (2.5*DWF+ I)	158,139	6,589	1.83
Excess flows are diverted to Storm Tanks			
2.1.4 Annual Average Peak Flow	M3/day	M3/Hr	M3/sec
DWF	59,359	2,473.3	0.687
The Average Daily Flow (ADF) is assumed to be 1.2 *DWF	71,231	2,968	0.824
Average Daily Flow Peak (ADFP) is assumed to be 1.6* ADF	**113,969**	4,749	1.319

Flow Capacity

Comparing the Maximum Daily flow in 2015 at 238,997 m3/day with the design maximum daily flow design flow 359,592 m3/day, the flow received at the WWTP in 2015, at 66.4%, is well within the total flow capacity of the plant. The maximum design flow to secondary treatment is 158,139m3/day but during 2015 the maximum treated was 175,350 m3/day measured at the discharge outfall. Over the year 96.44% of all effluent discharges underwent Secondary Treatment.

Dry Weather Flow, Rainfall, Infiltration & Tidal Influences

The maximum hydraulic flow to the Carrigrennan plant during 2015 was a factor of 3.42 times higher than the minimum flow. This quantifies the range of influent flows experienced in the plant, variations being caused mainly by inflow, surface water ingress after rainfall via the combined sewer systems in the agglomeration, and infiltration into the waste water network through various means, from groundwater and sea water ingress experienced at higher tides. The groundwater and tidal influence is most evident by the infiltration experienced in periods of dry weather.

The rainfall received in Cork in 2015, at 1447mm, was 18% greater than the 30 year mean for Cork of 1228mm. Compared to 2013 and 2012 however, which were both at or near the 30 year mean, the storm overflows from the WWTP were the same, i.e. 1,503,880 for 2015 compared to 1,553,510 in 2013 and 1,523,940 in 2012.

December 2015 was a period of exceptional rainfall, (300% of the 30 year mean for December) and accounted for over 78% of the volume of Stormwater overflows for the year. There was consistent rain, over a sustained period, which led to increased inflow and an overflow situation. Isolated rainfall events may not necessarily cause overflows as the capacity in the storm tanks may suffice and the storm water can be fed back for treatment. Due to low runoff conditions, moderate rainfall in a dry period may not result in overflows at the WWTP and this was the case for most of 2015.

Apart from the month of December, 2015, all things considered, was a quite favourable year for Stormwater Overflows.

Overall in 2015 there were only 74 days when there were overflows, while there were 268 days when there was rain. (97 rain free days). This compares to 107 overflow days and 266 days of rain respectively in 2014). There were however stormwater overflows on 29 of the 31 days of December 2015.

Graphs illustrated over, show the influence of rainfall on inflows to the plant, the increase in treated effluent, and the overflows during periods of high rainfall.

Definition for DWF :
“The average Daily flow during seven consecutive days without rain (excluding a period which includes public or local holidays) following seven days during which the rainfall did not exceed 0.25mm on any one day” (Ref. IWEM 1993)

There were no periods in 2015 which qualified under the above definition, but a period between, 20th June to 25th June 2015 was close to qualification. Analysis of inflows gave an average DWF of 76,700 m3/day. Calculation of the 10%ile of flow for the year which has correlated quite closely in the past, would have given an estimated DWF of 77,295m3/day. Both these figures are in the order of previous estimates of 78,000 m3/day.

Cork Main Drainage Theoretical DWF /Design flow for 2015 was 56,487m3/day, including 9,280m3/d estimated for infiltration. The estimated DWF of 77,295m3/day indicates there was excess infiltration into the network of **20,800** m3/day over and above the design estimated infiltration. This represents 37% over and above the DWF design flow.

The flows received at the WWTP are most likely reflecting the location of the City which is at the head of the Estuary. A good proportion of the city centre, is either land reclaimed from the original marsh at the mouth of the River Lee, is within the tidal range, or is surrounded or adjacent to water. The majority of sewers in the centre city were re-laid /separated during the Cork Main Drainage projects but questions arise as to the integrity of the older drain connections to these new sewers.

Infiltration by tidal waters is reinforced by the varying levels of Chloride that have been measured in the inflows to the WWTP. These Chloride levels increase incrementally at times of higher tides, i.e. normally on a fortnightly basis, and are particularly noticeable at Spring and Neap tides. Excavations in the city centre have traditionally been tide-dependent, and in fact this was a feature of work programmes for Cork Main Drainage.

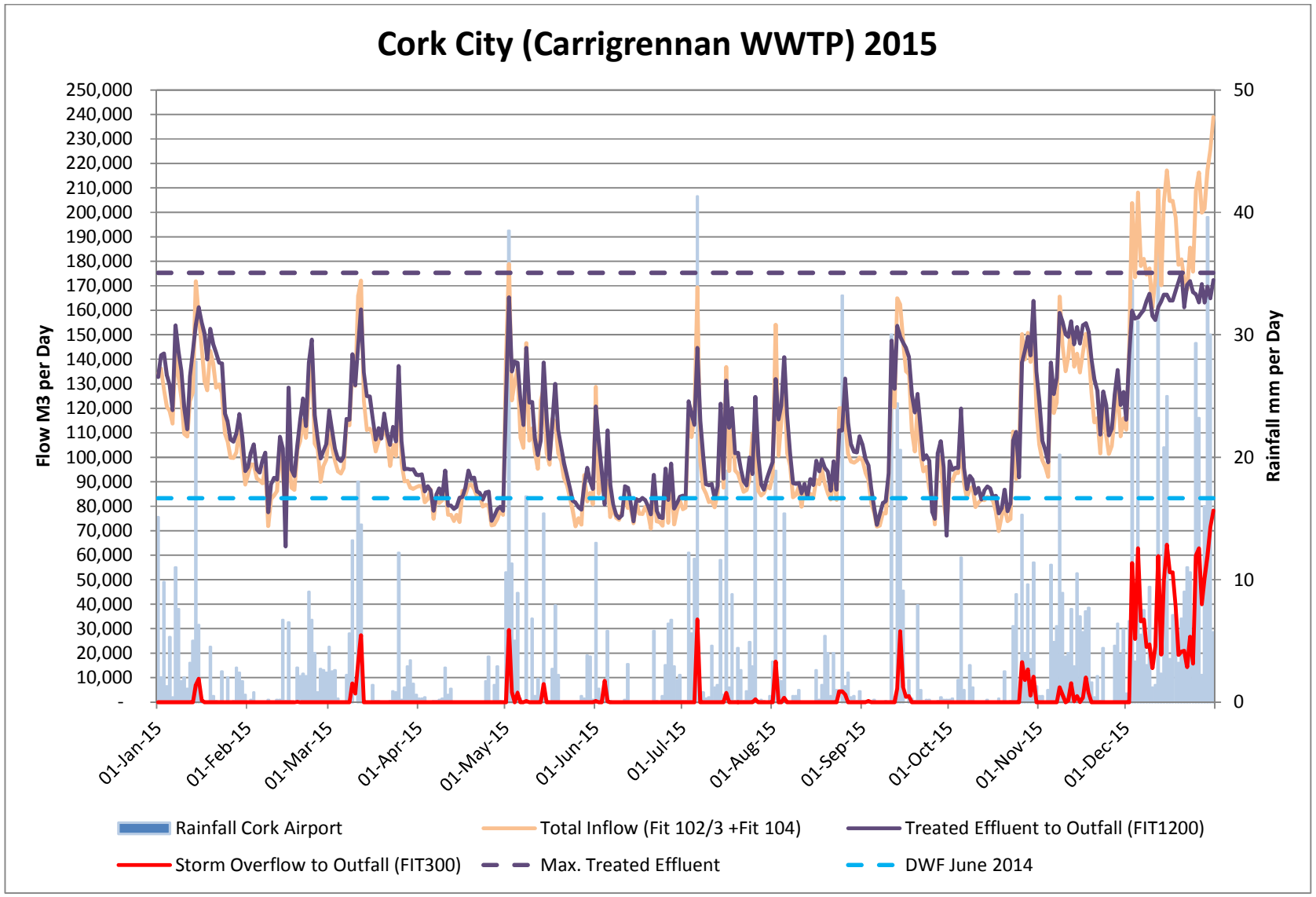
The drainage network in Cork City is composed of 54% of combined sewers versus 46% separated foul sewers. The inflows to the WWTP trend parallel to the trend of rainfall in the catchment, i.e. increasing at times of rainfall, see graph over, *Variation of Inflow with Rainfall*. This also highlights the relationship of storm overflow discharges to increase in rainfall.

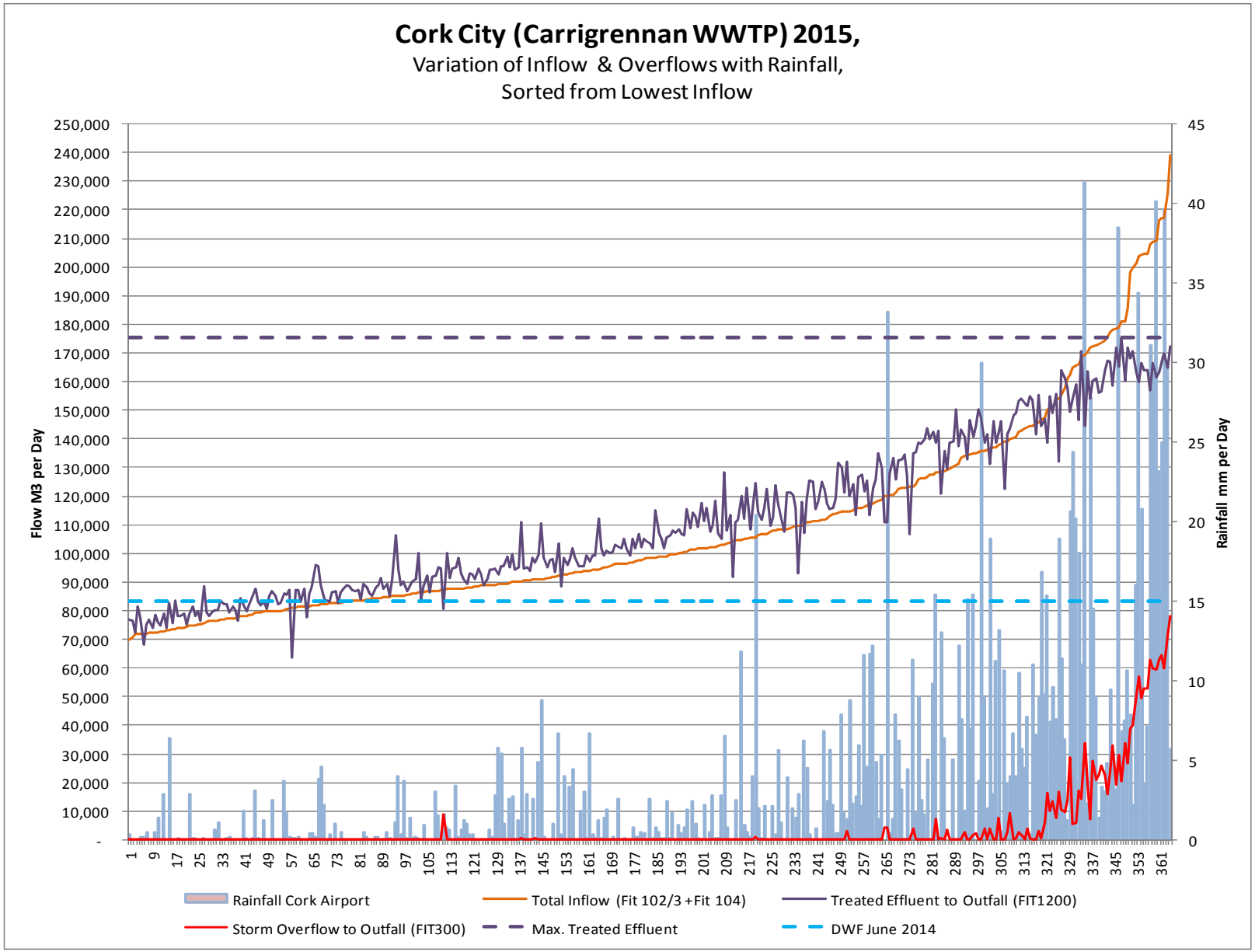
The tidal/groundwater infiltration quantities received at the WWTP are steady and consistent, unlike storm inflows which are related to rainfall events in the catchment.

Summary Table of Yearly Flow Values

	Total Influent				Treated Effluent				Storm Overflow			Cork Airport
Year	Total Annual inflow	Annual Average Daily inflow	Annual Maximum Daily inflow	Annual Minimum Daily inflow	Total Annual Treated Effluent	Annual Average Daily Treated Effluent	Annual Max. Daily Treated Effluent	Annual Min. Daily Treated Effluent	Total Annual Storm Overflow	Annual Average Daily Storm overflow	Annual Max. Daily Storm overflow	Rainfall
	M3/Yr	M3/day	M3/day	M3/day	M3/Yr	M3/day	M3/day	M3/day	M3/Yr	M3/day	M3/day	mm / year
2015	**39,804,499**	**109,053**	**238,997**	**69,949**	**40,748,090**	**111,639**	**175,350**	**63,650**	**1,503,880**	**4,120**	**78,230**	1,447
2014	43,642,816	119,569	226,018	70,145	43,236,670	118,457	168,660	73,700	3,023,090	8,282	78,020	1,392
2013	40,708,897	111,531	229,190	67,893	41,744,290	114,368	164,850	70,680	1,553,510	4,256	80,870	1,244
2012	40,104,506	109,575	230,622	66,649	41,168,400	112,482	167,440	68,270	1,523,940	4,164	86,740	1,228
2011	36,400,786	99,728	222,637	64,478	38,045,275	104,234	163,840	22,480	475,300	1,302	76,010	1,023
2010	35,337,991	96,816	237,172	54,487	36,439,570	99,834	161,840	45,120	807,460	2,212	87,900	903
2009	39,773,146	108,968	251,556	57,938	40,381,480	110,634	162,330	63,230	1,872,230	5,427	106,700	1,572
2008	36,963,177	101,269	209,152	32,442	38,802,080	106,307	157,120	34,800	541,830	1,484	67,860	1,341
2007	34,090,510	93,399	230,191	60,809	34,735,070	95,165	162,000	63,990	840,410	2,302	88,700	1,057
2006	35,363,499	96,886	229,681	57,670	35,877,800	98,295	163,310	58,770	1,061,790	2,909	79,600	1,197
2005	33,423,368	91,571	210,380	34,107	34,149,730	93,561	173,310	43,203	580,960	1,592	52,720	1,192
Average	**37,783,018**	**103,488**	**228,691**	**57,870**	**38,666,223**	**105,907**	**165,459**	**55,263**	**1,253,127**	**3,459**	**80,305**	**1228 ***
										*1981-2010		30 yr mean

Inflows, Discharges and Rainfall charted over Time




Cork City (Carrigrennan WWTP) 2015,
Variation of Inflow & Overflows with Rainfall,
Sorted from Lowest Inflow
Flow M3 per Day
Rainfall mm per Day
250,000
240,000
230,000
220,000
210,000
200,000
190,000
180,000
170,000
160,000
150,000
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
-
45
40
35
30
25
20
15
10
5
0
1 9 17 25 33 41 49 57 65 73 81 89 97 105 113 121 129 137 145 153 161 169 177 185 193 201 209 217 225 233 241 249 257 265 273 281 289 297 305 313 321 329 337 345 353 361
Rainfall Cork Airport
Total Inflow (Fit 102/3 +Fit 104)
Treated Effluent to Outfall (FIT1200)
Storm Overflow to Outfall (FIT300)
Max. Treated Effluent
DWF June 2014

Influent Quality - Sampling

Influent samples are monitored on 5 out of each 7 days for each of the parameters COD, TSS and cBOD using a 24-hr composite sampler. Samples are collected from the composite sampler at 9.00 am each day, Monday to Friday. Results are as tested by the Accredited Laboratory on site

This information is presented in **2015 AER Table 2.1 Influent Monitoring Summary** and in more detail on page 11 of this Appendix in the Influent Monitoring -Monthly Summary Table. A total of 261 samples of influent were analysed during 2015 for COD and TSS and 259 for cBOD. Values given below are the Annual Maximum and Average (Mean).

Hydraulic inflows are measured daily, i.e. 365 flow readings for 2015, and again the results are as tabulated.

pH and Visual Inspection results were reported in 2015, in all 264 inspections were reported for the year.

A total of 28 samples each were monitored for Total N and Total P during 2015. The results of this monitoring is summarised in **2015 AER Table 2.1**.

Significance of Results

There was a minor reduction in strength of the inflow for 2015, i.e. the P.E equivalent was **250,011** with an inflow of 39,804,499 m3, compared to P.E. Equivalent of **250,784** for 2014, when there was a greater quantity of inflow of 43,642,816 m3. It also shows a reduction in P.E. Equivalent from **276,405** for 2013, **284,696** P.E. for 2012 and **302,842** P.E. for 2011. All these P.E. values were calculated similarly using daily flow weighted annual mean values.

The decrease in hydraulic inflow in 2015 over the previous year follows the rainfall pattern, i.e. is proposed as being mainly weather related.
The average daily values for COD, cBOD and TSS in **2015 AER Table 2.1 Influent Monitoring Summary** are representative of a medium to weak strength urban wastewater. Despite the proportion of industrial effluent included in the total composition which should increase the strength of the influent considerably, the average values monitored support the argument for large volumes of infiltration into the system, thereby weakening the resultant strength. The Annual Max COD value in 2015 was 1,500mg/l, comparable to the maximum of 1300mg/l experienced in 2013. That value was measured during the dry summer months and was reflective of industrial activity in the *local flows*.

Influent strength depends on discharges of wastewaters from the upstream agglomeration within any 24 hour sampling period. The 24 hour composite influent sewage quality is strongly influenced by rainfall, high tides and other infiltration prior to and during the sample collection period. The levels of Chloride measured give an indication of the level of influence of tidal inflows into the system. These chloride levels can be seen to fluctuate with the tides, having the largest values at times of the higher tides in particular. Months of high rainfall can show a dilution in the chloride concentrations

reflecting the different relative influences in proportion of infiltration. Chloride is included in table for reference.

There are "*Local Flows*" to Carrigrennan WWTP, comprised of inflows from the largely industrial area of Little Island. These are not the only industrial flows to the WWTP but they are identified and measured. The Local flows comprise of 8.9% of the total hydraulic inflow but produce 23.8% of the Total organic (BOD) loading of the plant, 21.1% of the COD loading and 14.6% of the Total Suspended Solids. At design it was estimated that Overall Industrial inputs, from the Area designated as "City" as well as the "Local" area would make up 52.85% of BOD loading, 50.85% of COD loading and 41.52% of TSS loading.

Leachate from the Kinsale Road Landfill site is discharged directly to the sewer network (City) on a daily basis. During 2015, 98,369 m3 in total was discharged to the sewer, making up 0.247% of the total influent to the WWTP, a little less than the equivalent of one day's intake overall. The leachate is quite weak in strength, typifying that of an older landfill. The P.E. /day from the Landfill in 2015 was 165.

Landfill Leachate 2015			mg/l	Kg	mg/l	Kg	mg/l	Kg	mg/l	Kg
DATE	**M3**	**pH**	**NH4**	**NH4**	**B.O.D.**	**BOD**	**Sulphate**	**Sulphate**	**Sus.Sols.**	**Sus.Sols.**
Sample related Total	3,554			407.5		130.7		10.2		40.3
Av. Conc mg/l			114.67		36.78		2.87		11.34	
Annual Total	**98,369**			11,280		3,618		283		1,116
Equiv.Per Day	269.50	7.6		30.90		9.91		0.77		3.06

WWTP Influent Monitoring - Flow and Loads

2015 INFLUENT MONITORING - Monthly Summary

Parameter	Type	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec	Annual Values 2015	
COD	No. of Samples	21	20	23	22	21	22	22	22	22	21	22	23	261	
mg/l	Max	410	600	660	740	540	750	770	1,500	530	680	420	370	1,500	
	Mean	285	443	378	463	370	505	388	449	363	410	297	157	374	
BOD	No. of Samples	21	20	23	22	20	22	22	22	22	21	22	23	260	
mg/l	Max	200	270	330	300	250	280	200	230	230	300	200	150	330	
	Mean	129	173	165	195	149	208	142	156	143	168	126	63	151	
TSS	No. of Samples	21	20	23	22	21	22	22	22	22	21	22	23	261	
mg/l	Max	230	330	260	300	410	290	330	220	490	300	220	260	490	
	Mean	152	203	182	222	194	209	190	171	192	199	156	87	179	
Hydraulic Loading	Max	171,781	140,188	172,100	89,080	178,954	128,748	169,398	154,138	164,921	155,129	165,667	238,997	238,997	
m3/d	Mean	123,778	97,475	109,534	81,206	105,332	81,551	97,039	97,766	101,784	97,060	124,269	189,197	109,053	
(Total Inflow)	Min	88,901	71,863	87,045	72,213	71,777	70,865	78,746	79,750	71,749	69,949	91,983	111,226	69,949	
	Monthly Total	3,837,124	2,729,310	3,395,556	2,436,195	3,265,290	2,446,523	3,008,220	3,030,732	3,053,507	3,008,855	3,728,072	5,865,117	39,804,499	
Organic Loading	No. Of Weeks	5	4	4	5	4	4	5	4	4	5	4	5	53	
Average Weekly PE	Max	294,623	324,411	358,852	271,387	266,903	316,104	263,377	281,431	245,908	293,584	322,241	245,889	**358,852**	**
PE/day	Mean	254,065	278,310	305,328	256,771	246,679	280,024	224,445	258,609	225,293	248,434	252,377	187,959	249,903	***
Organic Loading	No. of Samples	21	20	23	22	21	22	22	22	22	21	22	23	261	
(Daily Calc.)	Max	396,533	474,890	513,667	391,590	390,064	358,715	367,856	379,862	336,151	398,648	388,423	363,093	513,667	
PE/day	Mean	261,157	278,310	295,295	260,639	245,190	280,364	219,463	255,001	224,815	253,949	249,072	185,518	250,410	
Chlorides	No. of Samples	21	20	23	22	21	22	22	22	22	21	22	23	261	
mg/l	Max	1,200	2,400	2,300	3,100	2,500	2,900	3,100	3,700	3,800	2,900	1,800	600	3,800	
	Mean	640	1,264	859	1,626	1,264	1,798	1,732	1,789	1,353	1,639	733	148	1,232	

PE/day

** Council Directive 91/271/EEC of 21 May 1991

*** Flow Weighted Calculations, load averaged weekly

Note **250,011** is Calculated Flow Weighted Annual Mean Value

Compliance with WWTP Design

cBOD, COD and TSS are within the Daily Design Loads for the WWTP.

Hydraulic Inflows exceed the Daily Design Load but are within the overall Total Design Capacity of the plant. 96.44 % of all discharges from the plant in 2015 underwent Secondary Treatment.

Carrigrennan WWTP is not designed for Nutrient Removal and is not capable of treating the Total Nitrogen loading received at the plant. While similarly not designed to treat Total Phosphorus, the loadings received are substantially reduced by the existing Secondary Treatment.

Mass Loading Measurement

		Full Flow Weighted Crude Sewage Loads to Site (inc storm)		
Year 2015	Total Inflow	Flow Weighted COD	Flow Weighted BOD	Flow Weighted TSS
	M3	**Kg**	**Kg**	**Kg**
2015 Annual Totals	39,804,499	13,606,639	5,475,238	6,617,424
2015 Average Daily Value	109,053	37,278	**15,001**	18,130
Daily Design Loads Carrigrennan	71,231	49,938	**24,792**	23,320
Design P.E. Carrigrennan			**413,200**	
2015 Calculated P.E	(based on 1 P.E. to 60g BOD/day)		**250,011**	
2015 Average Daily Value, As % of Daily Design Load	**153%**	**75%**	**61%**	**78%**

Discharges from the Agglomeration

Effluent Quality -Sampling

Significance of Results

2015 AER Table 2.2 Effluent Monitoring Summary refers

Discharge Licence- Compliances

While there were individual results that were non-compliant, overall compliance was achieved for parameters **COD**, **cBOD**, and **Suspended Solids**.

4 tests for COD, and 5 tests for Suspended Solids exceeded the ELV but not the 120% ELV.

pH values were within a range of 7.0 minimum to 7.6 maximum (ELV range 6 to 9). All **visual inspections** were reported as "Clear" and "Odourless". This is indicative of a steady and stable treatment process. 264 samples of pH were carried out versus the agreed number of 261 (5 per week Vs "Daily"). Visual Inspection was recorded for Colour and Odour on all 264 occasions

There are no Emission Limit Values in the licence for **Total Oxidised Nitrogen** (as N), **Total Ammonia** (as N), or O**rthophosphate** (as P). The parameters were sampled and tested in accordance with the monitoring frequency in the Licence, i.e. fortnightly, 26 samples per annum.

Discharge Licence- Non Compliances

Total Nitrogen is Non-compliant in all counts, only 1 sample for the year being within the ELV limit and a further 2 within the 120%ELV limit. The Annual Mean was 20.56mg/l (19.33mg/l flow weighted) compared to a mean ELV of 10mg/l.

Total Phosphorus was non-compliant in 2015 for individual sample exceedences. 6 of the 28 samples taken for Total P exceeded the ELV and 4 tests exceeded the 120% ELV, whereas the allowed number to exceed the latter was 3. The flow weighted annual mean for Total Phosphorus was compliant with the mean ELV.

The condition for **Total Phosphorus** and Total Nitrogen to have 8 out of 10 samples to be less than or equal to the ELV was removed in a Technical Amendment to the licence issued in June 2014.

Storm Discharges, Treated Discharges & Combined Discharge

Stormwater and Treated Effluent are discharged via the same outfall from Carrigrennan WWTP. There were 46 instances of tested Stormwater parameter results exceeding an ELV in 2015, and 3 of these results exceeded ELV condition 2.

When Treated effluent and Storm Discharge flows and loads are combined and Combined Effluent quality compared, there are no discharges above the ELV limits in 2015 for these parameters beyond the allowable number, i.e. all within the allowed compliance limits.

2015	Storm Discharge to Outfall				Treated Discharge to Outfall during Storm Discharge				Combined Discharge to Outfall (same outfall)			
Date	Storm Overflow to Outfall	Storm COD	Storm SS	Storm cBOD	Treated Effluent Discharge to Outfall	Treated Outfall COD	Treated Outfall SS	Treated Outfall cBOD	Combined Storm & Treated Outfall Flow	Combined Storm & Treated COD	Combined Storm & Treated SS	Combined Storm & Treated cBOD
	m3	mg/l	mg/l	mg/l	m3	mg/l	mg/l	mg/l		mg/l	mg/l	mg/l
ELV		125	35	25		125	35	25		125	35	25
ELV (Cond. 2)		250	87.5	50		250	87.5	50		250	87.5	50
Sample Related Flow	1,020,865				8,134,920				9,155,785			
Total Flows	1,503,880				11,088,940				12,592,820			
No Days in which overflows took place	74											
No.Samples Taken		54	54	54		54	54	54		Calculated (54)		
No Samples which may exceed ELV		6	6	6		6	6	6		6	6	6
No.Samples Above ELV		2	14	30		0	0	0		1	4	2
No.Samples Above ELV Cond. 2		1	1	1		0	0	0		0	0	0
Overall Compliance										Pass	Pass	Pass
Max. Value mg/l		270	100	140		120	34	22		149	43	33
Mean Value mg/l		85.7	32.6	28.0		56	16	10		63.6	20.3	12.9

Interpretation of Sampling Results -Total N and Total P

The discharge point from Carrigrennan Waste Water Treatment Plant, i.e. The Lee Estuary/Lough Mahon, was designated a sensitive area in July 2004 under the Urban Waste Water Treatment (Amendment) Regulations, 2004.

Cork City (Carrigrennan) Waste Water Treatment Plant was not designed for Nutrient Removal Treatment when it was commissioned in 2004.

The ELV Exceedances as tabulated below for Total Nitrogen and Total Phosphorus. While demonstrating compliance with the Annual Mean ELV in the discharge licence for Total Phosphorus, the table reflects the fact that the plant is not designed for Nutrient removal. The table also illustrates that Total Nitrogen is not compliant with the UWWT regulations conditions including percentage reductions.

Sample Date	Mixed Crude Sewage	Final Effluent	Final Vs Crude	Mixed Crude Sewage	Final Effluent	Final Vs Crude
	Total Nitrogen (mg/L)	Total Nitrogen (mg/L)	% Reduction Total Nitrogen	Total Phosphorus (mg/L)	Total Phosphorus (mg/L)	% Reduction Total Phosphorus
Check Limits	ELV	10.0	70-80 (UWWT)	ELV	2.5	80
	120% ELV	12.0		120% ELV	3.0	(N/A UWWT)
06/01/2015	23.00	17.00	26%	2.5	1.6	36%
13/01/2015	24.00	13.00	46%	2.9	2.2	24%
20/01/2015	13.00	19.00	-46%	1.5	1.9	-27%
27/01/2015	25.00	21.00	16%	3.1	2.1	32%
03/02/2015	33.00	24.00	27%	2.0	2.4	-20%
17/02/2015	34.00	25.00	26%	4.4	2.3	48%
03/03/2015	31.00	28.00	10%	3.8	2.0	47%
17/03/2015	19.00	19.00	0%	3.0	2.2	27%
30/03/2015	34.00	27.00	21%	4.5	2.6	42%
14/04/2015	40.00	31.00	23%	5.5	2.9	47%
28/04/2015	36.00	30.00	17%	6.4	3.4	47%
12/05/2015	22.00	19.00	14%	3.3	2.3	30%
26/05/2015	34.00	30.00	12%	4.8	3.8	21%
09/06/2015	35.00	48.00	-37%	5.2	4.8	8%
23/06/2015	31.00	21.00	32%	4.7	2.0	57%
07/07/2015	20.00	22.00	-10%	1.8	1.4	22%
21/07/2015	20.00	16.00	20%	3.5	2.4	31%
04/08/2015	29.00	6.60	77%	1.9	2.0	-5%
18/08/2015	29.00	18.00	38%	4.7	2.1	55%
01/09/2015	29.00	17.00	41%	3.7	2.0	46%
15/09/2015	20.00	11.00	45%	1.8	2.0	-11%
29/09/2015	28.00	13.00	54%	4.2	2.5	40%
13/10/2015	32.00	18.00	44%	4.7	3.3	30%
27/10/2015	21.00	21.00	0%	1.7	1.2	29%
10/11/2015	24.00	16.00	33%	1.4	1.3	7%
24/11/2015	25.00	20.00	20%	3.3	1.5	55%
08/12/2015	19.00	13.00	32%	1.6	1.2	25%
22/12/2015	14.00	12.00	14%	1.9	1.5	21%
Number Samples	**28**	**28**		**28**	**28**	
Annual Mean 2015	**26.57**	**20.56**	**23%**	**3.35**	**2.25**	**33%**
Max	40.00	48.00		6.40	4.80	
Min	13.00	6.60		1.40	1.20	
WWDLicence		**Not Compliant**			**Compliant**	
UWWT		**Not Compliant**	**Not Compliant**		**N/A**	**N/A**
>ELV						
>120% ELV	Note: Reduction % shown based on Sample/Mean Values only, not Flow Related					
		Total Nitrogen (mg/L)			Total Phosphorus (mg/L)	
Flow Weighted Mean		**19.33**			**2.09**	

UWWTD Compliance

The relevant parameters are tabulated below. This table outlines the ELV limits and % reductions achieved, for COD, cBOD, Suspended Solids and Total Nitrogen compared to UWWT regulation conditions. This results in no additional non-compliances.

Nutrient Parameter that applies (SI-48/2010) is TN

16 samples for **Total Nitrogen** of the 28 taken were within the Daily Average Emission Limit Value of 20mg/l. 1 sample was less than 10mg/l. While the maximum reduction achieved in a Total Nitrogen sample was 77%, the average reduction in Total Nitrogen, based on mean values, not flow weighted, was 23% for 2015, and related to the load this was reduced to5.3% i.e. non compliant in both cases.

Non-Compliances are reported quarterly, by agreement, to the EPA on the EDEN web based system, LMA, Licence Management Application.

UWWT Compliance 2015

									UWWTD Compliance				
2015	cBOD	COD	Susp. Solids	Total N (as N)	cBOD	COD	Susp. Solids	Total N (as N)	cBOD	COD	Susp. Solids	Total N (as N)	Comments
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	% Reductions				ELV **OR** % Reduction				
UWWT ELV or Percentage Reduction	25	125	35	10*	70	75	90	70-80	<25 or 70%	<125 or 75%	<35 or 90%	<10 or 70%-80%	Total N is applied to D0033-01 for UWWT -Sensitive Waters
ELV with Condition 2 interpretation included, (Composite samples)	50	250	87.5	N/A									
No. of samples required UWWT	24	24	24	24	24	24	24	24	24	24	24	24	
No. of Samples Taken	262	264	264	28	259	261	261	26	259	261	261	26	
Total No. sample results which may exceed ELV or below Percentage Reduction	19	19	19	N/A	19	19	19	N/A	19	19	19	N/A	
No.sample results above ELV or Below Percentage Reduction	**5**	**4**	**9**	N/A	2	57	101	N/A	**0**	**3**	**9**	N/A	No. cases where **both** ELV and % Reduction in non-compliance
No Samples above WWDL ELV with condition 2 interpretation included	0	0	0	N/A	0	0	0	N/A	0	0	0	N/A	
Annual Mean (For Parameters where a mean ELV applies)	N/A	N/A	N/A	19.93*	N/A	N/A	N/A	5.3%*	N/A	N/A	N/A	Neither	* Flow Weighted Annual Mean & Flow Weighted Mean % Reduction
Total UWWTD Non Compliances	0	0	0	Yes	0	38	82	Yes	**0**	**0**	**0**	Both Criteria	Allowed exceedences subtracted
Overall Compliance	Pass	Pass	Pass	Fail	Pass	Pass	Fail	Fail	Pass	Pass	Pass	Fail	
Annual Mean Flow Rated Percentage Reductions					91.5%	79.0%	89.6%	5.3%					

Appendix 7.2 – Ambient River Monitoring Summary

Table 2.3A Ambient River Monitoring Summary 2015

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference Easting:	Northing:	EPA Feature Coding Tool Code	Current EQS Status (Extrapolated)	Does assessment of the ambient monitoring results indicate that the discharge is impacting on water quality Yes/No, List impact(s) for each Yes answer	Comment
M01 Curraheen Road Bridge	162,843	69,176	RS19T050890	Poor	No	Upstream of any city discharge
M02 Carrigrohane Bridge	162,863	71,034	RS19C120110	Poor	No	
M03 County Hall	165,003	71,212	RS19C120740	Poor	Yes -See below, Curraheen River	
M04 Bandon Road	164,101	68,782	RS19G040140	Poor	No	Upstream of any city discharge
M05 Woodhaven Estate	164,344	69,415	RS19G040190	Poor	No / slight	
M06 GLASHEEN (Cork City) - Sandbrook Estate	165,278	69,503	RS19G040300	Poor	Yes -See below, Glasheen River	
M07 Clashduv road	165,697	70,336	RS19G040490	Poor	Yes -See below, Glasheen River	
M08 Glasheen Bridge	165,401	70,768	RS19G040700	Poor	Yes -See below, Glasheen River	
M09 Blackstone Bridge	165,691	74,463	RS19B140110	Moderate *	No	Upstream of any city discharge
M10 Kilnap	166,291	74,796	RS19G880990	Moderate *	No	Upstream of any city discharge
M11 BRIDE (Cork City) - Fitz's Boreen	166,925	74,246	RS19B140300	Moderate *	No	
M12 Blackpool (Bride RS19B14)	167,422	73,340	RS19B140800	Moderate *	No	
M13 Glen Rec. Park	168,942	73,453	RS19G090400	Moderate *	Yes-See below, Glen River	
M14 Spring Lane	167,868	73,539	RS19G090800	Moderate *	No	
M15 leitrim Street (Bride(RS19B14)	167,496	72,342	RS19K750900	N/Q	Yes- See below, Kiln River	

All river monitoring was carried out in the same locations in 2015 as previous years
* Good -EPA 2011

Monitoring Overview

River Monitoring for D0033-01 CorkCity Agglomeration assesses the impact of the Wastewater Network on the river systems within the city.

The results of the River Ambient Monitoring are attached together with a Summary Table of Monitoring Results with associated graphs.

Monitoring is conditioned to be carried out at a frequency of 10 samples per year at locations designated M1 to M15 along the 5 water bodies under surveillance.
The Glasheen Stream (points M04 to M08) is a tributary of the Curraheen River (M01 to M03). The Glasheen Stream joins the Curraheen River downstream of point M03.
The Kiln River, (M15), is made up of the confluence of the both the Bride (M09, M11 & M12) and the Glen (M13 & M14) Rivers. These rivers join at Blackpool, downstream of M12 on the Bride and M14 on the Glen. M15, on the Kiln, is the only point monitored that theoretically incorporates both flows. This monitoring point however is adjacent to the mouth of a channel which carries a small portion of the combined flow and monitoring may not be representative of the main flow. M10 is on the Glenamought River, a tributary of the Bride, upstream of M11.
M01 on the Curraheen, M04 on the Glasheen, M09 on the Bride and M10 on the Glenamought are situated close to the boundary of the city. At these locations they represent rivers that have experienced an increasingly urban pressure as they approach the city proper. The first monitoring point on the Glen, M13, is a good distance into the city.

Compliance with Standards

The 5 river water bodies have not been individually monitored and assessed for status under the WFD. Under WFD, *Full Report for Waterbody*, the Curragheen has been stated as being monitored but it is not. All Waterbodies have been assigned overall ecological status by extrapolation. Both the Bride and the Glen are deemed *Moderate* and the Curragheen & Twopot, which is upstream of the Curraheen, are classified as *Poor*. The catchment of the Glasheen is also rated as *Poor*. No rating has been assigned to the Kiln. These status designations are based on Data produced prior to *Report to Europe 2010*. However in Monitoring carried out by the EPA in 2011, the donor waterbody for the Bride & Glen, IE_SW_755 Glashaboy Upper, has been attributed as *Good*.

These rivers do not have any other designation attached to them, Pearl Mussel, Bathing water etc.

Significance of Monitoring Results

There are no ELVs set in the Wastewater Licence for River Monitoring. Full details and discussion of significance of results are set out in the following paragraphs. Discharges from within the City have varying impacts on water quality

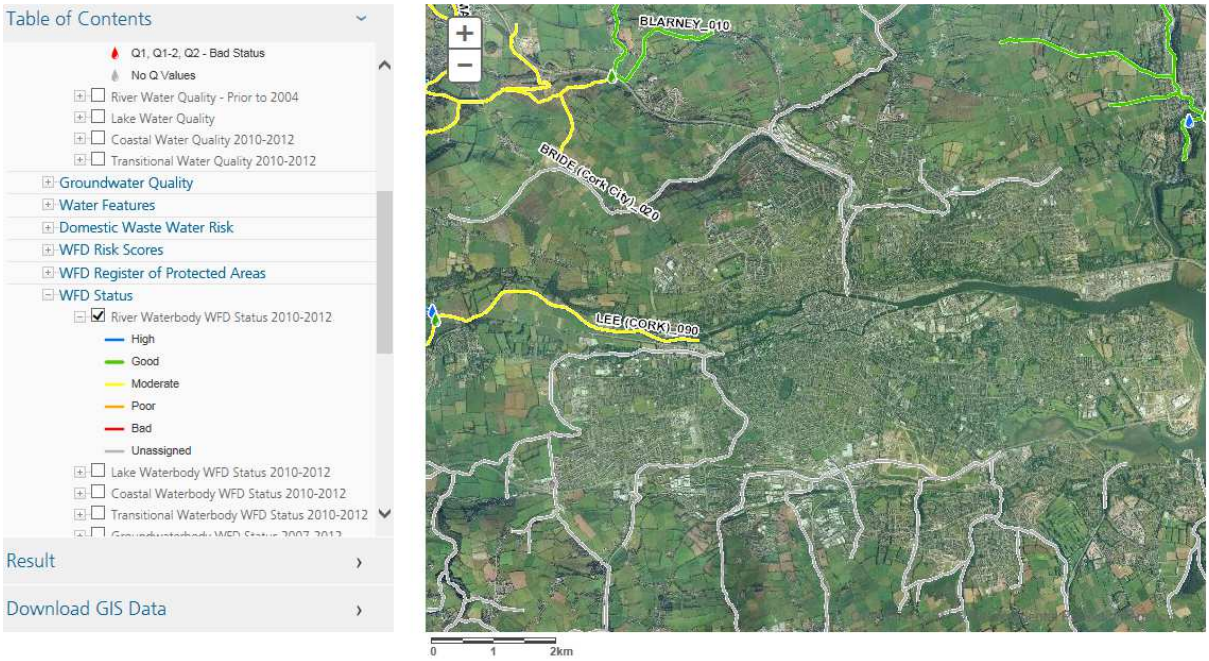


Table of Contents
Q1, Q1-2, Q2 - Bad Status
No Q Values
River Water Quality - Prior to 2004
Lake Water Quality
Coastal Water Quality 2010-2012
Transitional Water Quality 2010-2012
Groundwater Quality
Water Features
Domestic Waste Water Risk
WFD Risk Scores
WFD Register of Protected Areas
WFD Status
River Waterbody WFD Status 2010-2012
High
Good
Moderate
Poor
Bad
Unassigned
Lake Waterbody WFD Status 2010-2012
Coastal Waterbody WFD Status 2010-2012
Transitional Waterbody WFD Status 2010-2012
Result
Download GIS Data
BLARNEY_010
BRIDE (CORK CITY)_020
LEE (CORK)_090
0
1
2km

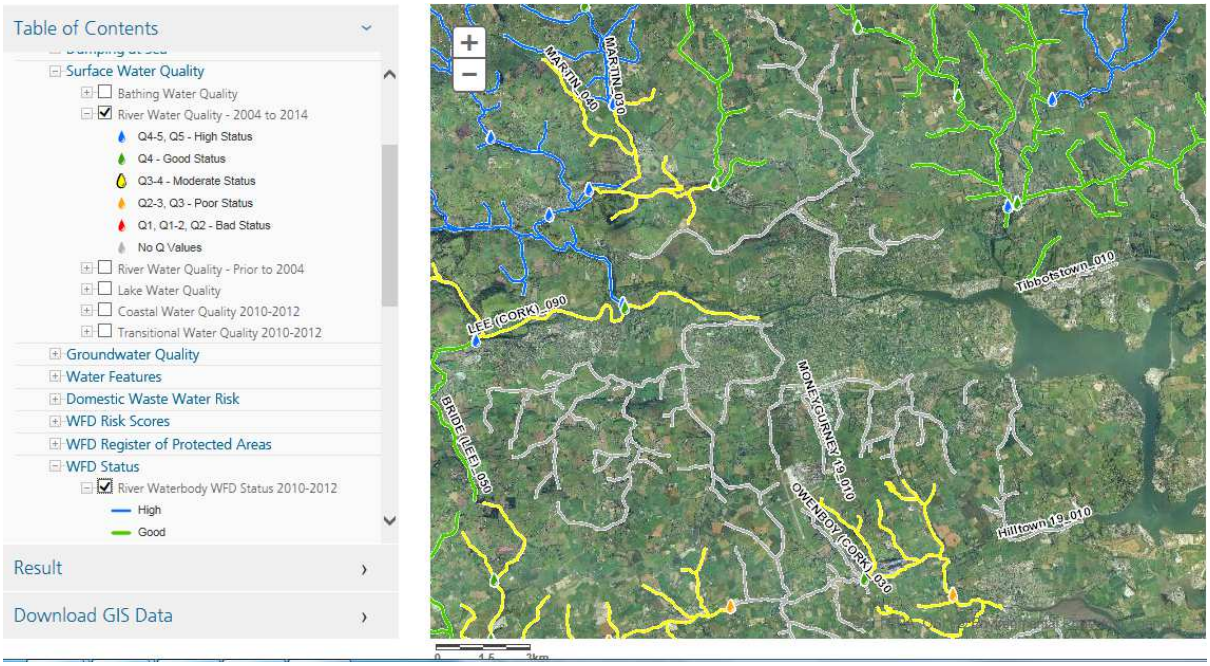


Table of Contents
Surface Water Quality
Bathing Water Quality
River Water Quality - 2004 to 2014
Q4-5, Q5 - High Status
Q4 - Good Status
Q3-4 - Moderate Status
Q2-3, Q3 - Poor Status
Q1, Q1-2, Q2 - Bad Status
No Q Values
River Water Quality - Prior to 2004
Lake Water Quality
Coastal Water Quality 2010-2012
Transitional Water Quality 2010-2012
Groundwater Quality
Water Features
Domestic Waste Water Risk
WFD Risk Scores
WFD Register of Protected Areas
WFD Status
River Waterbody WFD Status 2010-2012
High
Good
Result
Download GIS Data
MARTIN_030
MARTIN_040
LEE (CORK)_090
BRIDE (LEE)_050
MONEYCURRENY 19_010
OWENBOY (CORK)_030
Tibbotstown_010
Hilltown 19_010

Monitoring Summary

Refer to **Summary Table of Monitoring Results 2015** and **Graphs** depicting trends for various parameters as highlighted, together with threshold conditions under S.I.272 of 2009. In order to better show trends, the colour codes for the WISE SOE classification, as per Water Framework Directive, are included in the Table where applicable.

Station No.	Station Name	Sample Code	Irish Grid Reference		StationCode	DATE	Temp.	D.O.Sat	B.O.D.	pH	Ortho-Phosphate (as P)	TON	Total Nitrogen	Ammonia-N
			Easting:	Northing:		Sampled	C	%	mg/l	pH units	mg/l	mg/l	mg/l N	mg/l N
M01	Curragheen Road Bridge	CCRW/15/10001	162,843	69,176	RS19T050890	20/01/2015	6.8	66.15	1.25	7.67	0.050	2.58	2.87	0.093
M01	Curragheen Road Bridge	CCRW/15/10002	162,843	69,176	RS19T050890	10/02/2015	6.3	81.35	1.49	7.99	0.043	3.14	3.35	0.034
M01	Curragheen Road Bridge	CCRW/15/10003	162,843	69,176	RS19T050890	20/05/2015	10.4	79.05	1.10	7.64	0.048	1.85	2.09	0.023
M01	Curragheen Road Bridge	CCRW/15/10004	162,843	69,176	RS19T050890	11/06/2015	11.1	76.44	1.10	7.91	0.053	7.84	7.99	0.031
M01	Curragheen Road Bridge	CCRW/15/10005	162,843	69,176	RS19T050890	01/07/2015	14.7	76.85	1.92	7.62	0.072	3.05	3.47	0.077
M01	Curragheen Road Bridge	CCRW/15/10006	162,843	69,176	RS19T050890	21/07/2015	14.2	75.43	1.36	7.93	0.067	1.89	2.20	0.001
M01	Curragheen Road Bridge	CCRW/15/10007	162,843	69,176	RS19T050890	11/08/2015	13.7	78.46	1.26	7.92	0.062	4.42	4.95	0.001
M01	Curragheen Road Bridge	CCRW/15/10008	162,843	69,176	RS19T050890	08/09/2015	12.7	72.59	0.78	7.99	0.050	4.06	4.27	0.010
M01	Curragheen Road Bridge	CCRW/15/10009	162,843	69,176	RS19T050890	13/10/2015	8.9	81.47	1.08	7.95	0.052	3.92	4.14	0.015
M01	Curragheen Road Bridge	CCRW/15/10010	162,843	69,176	RS19T050890	02/12/2015	11.6	75.40	1.27	7.84	0.200	3.20	4.13	0.109
M02	Carrigrohane Bridge	CCRW/15/10011	162,863	71,034	RS19C120110	20/01/2015	6.6	65.65	1.65	7.72	0.056	3.16	3.50	0.086
M02	Carrigrohane Bridge	CCRW/15/10012	162,863	71,034	RS19C120110	10/02/2015	6.7	84.22	1.81	7.67	0.042	3.08	3.14	0.034
M02	Carrigrohane Bridge	CCRW/15/10013	162,863	71,034	RS19C120110	20/05/2015	10.2	84.47	1.10	7.69	0.037	3.33	3.42	0.004
M02	Carrigrohane Bridge	CCRW/15/10014	162,863	71,034	RS19C120110	11/06/2015	11.4	86.13	1.15	7.68	0.043	3.81	3.94	0.023
M02	Carrigrohane Bridge	CCRW/15/10015	162,863	71,034	RS19C120110	01/07/2015	15.0	78.34	1.31	7.65	0.067	2.83	3.16	0.052
M02	Carrigrohane Bridge	CCRW/15/10016	162,863	71,034	RS19C120110	21/07/2015	14.6	72.55	1.61	7.73	0.075	2.60	2.80	0.001
M02	Carrigrohane Bridge	CCRW/15/10017	162,863	71,034	RS19C120110	11/08/2015	13.3	77.10	1.17	7.67	0.060	2.91	3.13	0.001
M02	Carrigrohane Bridge	CCRW/15/10018	162,863	71,034	RS19C120110	08/09/2015	12.7	74.76	0.96	7.71	0.050	5.60	5.81	0.008
M02	Carrigrohane Bridge	CCRW/15/10019	162,863	71,034	RS19C120110	13/10/2015	9.3	73.80	0.94	7.72	0.050	4.54	4.63	0.012
M02	Carrigrohane Bridge	CCRW/15/10020	162,863	71,034	RS19C120110	02/12/2015	11.7	78.52	1.53	7.73	0.123	3.51	4.06	0.025
M03	County Hall	CCRW/15/10021	165,003	71,212	RS19C120740	20/01/2015	6.6	65.65	1.64	7.72	0.062	2.77	3.19	0.296
M03	County Hall	CCRW/15/10022	165,003	71,212	RS19C120740	10/02/2015	7.0	76.78	1.88	7.55	0.040	3.02	3.15	0.163
M03	County Hall	CCRW/15/10023	165,003	71,212	RS19C120740	20/05/2015	10.7	80.06	1.34	7.54	0.053	3.86	4.18	0.163
M03	County Hall	CCRW/15/10024	165,003	71,212	RS19C120740	11/06/2015	12.1	64.17	1.29	7.50	0.040	4.08	4.40	0.296
M03	County Hall	CCRW/15/10025	165,003	71,212	RS19C120740	01/07/2015	15.4	60.22	1.98	7.36	0.062	2.94	3.59	0.438
M03	County Hall	CCRW/15/10026	165,003	71,212	RS19C120740	21/07/2015	14.8	60.73	1.90	7.48	0.082	3.22	3.75	0.345
M03	County Hall	CCRW/15/10027	165,003	71,212	RS19C120740	11/08/2015	13.4	65.59	1.21	7.49	0.055	4.48	4.75	0.149
M03	County Hall	CCRW/15/10028	165,003	71,212	RS19C120740	08/09/2015	12.9	62.21	1.27	7.48	0.048	2.18	2.49	0.187
M03	County Hall	CCRW/15/10029	165,003	71,212	RS19C120740	13/10/2015	9.6	71.70	1.30	7.59	0.080	4.51	4.67	0.210
M03	County Hall	CCRW/15/10030	165,003	71,212	RS19C120740	02/12/2015	11.7	76.58	0.66	7.60	0.073	3.20	3.67	0.171

Station No.	Station Name	Sample Code	Irish Grid Reference		StationCode	DATE	Temp.	D.O.Sat	B.O.D.	pH	Ortho-Phosphate (as P)	TON	Total Nitrogen	Ammonia-N
			Easting:	Northing:		Sampled	C	%	mg/l	pH units	mg/l	mg/l	mg/l N	mg/l N
M04	Bandon Road	CCRW/15/10031	164,101	68,782	RS19G040140	20/01/2015	9.0	66.26	1.06	7.47	0.048	3.02	3.07	0.070
M04	Bandon Road	CCRW/15/10032	164,101	68,782	RS19G040140	10/02/2015	8.2	85.27	1.28	7.42	0.035	3.22	3.23	0.030
M04	Bandon Road	CCRW/15/10033	164,101	68,782	RS19G040140	20/05/2015	10.9	74.91	1.23	6.91	0.050	2.80	2.84	0.006
M04	Bandon Road	CCRW/15/10034	164,101	68,782	RS19G040140	11/06/2015	11.0	75.63	1.10	7.08	0.062	3.08	3.64	0.047
M04	Bandon Road	CCRW/15/10035	164,101	68,782	RS19G040140	01/07/2015	13.4	73.83	1.85	7.05	0.050	3.78	3.93	0.019
M04	Bandon Road	CCRW/15/10036	164,101	68,782	RS19G040140	21/07/2015	13.8	77.87	1.36	7.45	0.048	3.91	4.26	0.001
M04	Bandon Road	CCRW/15/10037	164,101	68,782	RS19G040140	11/08/2015	13.3	80.83	1.12	7.73	0.035	5.71	5.79	0.001
M04	Bandon Road	CCRW/15/10038	164,101	68,782	RS19G040140	08/09/2015	13.0	75.55	0.88	7.56	0.050	3.14	3.16	0.002
M04	Bandon Road	CCRW/15/10039	164,101	68,782	RS19G040140	13/10/2015	10.6	77.27	0.96	7.29	0.042	3.08	3.10	0.016
M04	Bandon Road	CCRW/15/10040	164,101	68,782	RS19G040140	02/12/2015	12.4	75.19	0.54	7.08	0.063	1.78	2.23	0.062
M05	Woodhaven Estate	CCRW/15/10041	164,344	69,415	RS19G040190	20/01/2015	8.1	60.52	1.33	7.65	0.055	2.80	3.03	0.093
M05	Woodhaven Estate	CCRW/15/10042	164,344	69,415	RS19G040190	10/02/2015	7.7	74.09	1.69	7.81	0.047	2.66	2.70	0.058
M05	Woodhaven Estate	CCRW/15/10043	164,344	69,415	RS19G040190	20/05/2015	11.0	70.55	1.10	7.35	0.075	2.27	2.45	0.070
M05	Woodhaven Estate	CCRW/15/10044	164,344	69,415	RS19G040190	11/06/2015	11.6	70.62	1.18	7.45	0.058	4.87	5.05	0.039
M05	Woodhaven Estate	CCRW/15/10045	164,344	69,415	RS19G040190	01/07/2015	14.4	38.57	7.62	7.73	0.399	2.60	4.75	3.189
M05	Woodhaven Estate	CCRW/15/10046	164,344	69,415	RS19G040190	21/07/2015	14.4	64.51	1.63	7.58	0.065	2.44	2.75	0.013
M05	Woodhaven Estate	CCRW/15/10047	164,344	69,415	RS19G040190	11/08/2015	13.3	75.77	1.63	7.67	0.055	3.05	3.31	0.010
M05	Woodhaven Estate	CCRW/15/10048	164,344	69,415	RS19G040190	08/09/2015	13.7	66.03	1.16	7.79	0.058	2.80	3.02	0.023
M05	Woodhaven Estate	CCRW/15/10049	164,344	69,415	RS19G040190	13/10/2015	11.0	72.00	0.90	7.68	0.055	3.64	3.85	0.020
M05	Woodhaven Estate	CCRW/15/10050	164,344	69,415	RS19G040190	02/12/2015	11.9	73.88	0.48	7.54	0.130	2.40	3.09	0.124
M06	Sandbrook Estate	CCRW/15/10051	165,278	69,503	RS19G040300	20/01/2015	7.8	50.41	1.44	7.55	0.052	2.63	2.88	0.140
M06	Sandbrook Estate	CCRW/15/10052	165,278	69,503	RS19G040300	10/02/2015	8.0	49.90	1.22	7.49	0.053	2.18	2.42	0.148
M06	Sandbrook Estate	CCRW/15/10053	165,278	69,503	RS19G040300	20/05/2015	11.6	50.66	1.30	7.36	0.077	1.46	1.73	0.145
M06	Sandbrook Estate	CCRW/15/10054	165,278	69,503	RS19G040300	11/06/2015	12.1	30.04	6.43	7.29	0.334	3.53	6.33	2.956
M06	Sandbrook Estate	CCRW/15/10055	165,278	69,503	RS19G040300	01/07/2015	14.9	21.57	10.96	7.17	0.364	1.34	5.95	3.858
M06	Sandbrook Estate	CCRW/15/10056	165,278	69,503	RS19G040300	21/07/2015	14.7	30.84	2.34	7.22	0.108	1.87	2.52	0.375
M06	Sandbrook Estate	CCRW/15/10057	165,278	69,503	RS19G040300	11/08/2015	13.9	31.47	5.38	7.22	0.222	2.66	4.80	1.750
M06	Sandbrook Estate	CCRW/15/10058	165,278	69,503	RS19G040300	08/09/2015	14.0	31.73	6.78	7.23	0.307	3.22	6.24	2.956
M06	Sandbrook Estate	CCRW/15/10059	165,278	69,503	RS19G040300	13/10/2015	11.4	41.46	11.12	7.22	0.357	3.36	7.00	3.267
M06	Sandbrook Estate	CCRW/15/10060	165,278	69,503	RS19G040300	02/12/2015	11.8	59.02	4.97	7.53	0.290	3.27	5.39	0.856

Station No.	Station Name	Sample Code	Irish Grid Reference		StationCode	DATE	Temp.	D.O.Sat	B.O.D.	pH	Ortho-Phosphate (as P)	TON	Total Nitrogen	Ammonia-N
			Easting:	Northing:		Sampled	C	%	mg/l	pH units	mg/l	mg/l	mg/l N	mg/l N
M07	Clashduv Road	CCRW/15/10061	165,697	70,336	RS19G040490	20/01/2015	7.3	48.05	2.84	7.53	0.052	2.38	2.65	0.163
M07	Clashduv Road	CCRW/15/10062	165,697	70,336	RS19G040490	10/02/2015	7.7	52.72	1.87	7.53	0.058	2.46	2.80	0.124
M07	Clashduv Road	CCRW/15/10063	165,697	70,336	RS19G040490	20/05/2015	11.6	67.03	1.24	7.43	0.075	2.88	3.15	0.109
M07	Clashduv Road	CCRW/15/10064	165,697	70,336	RS19G040490	11/06/2015	12.8	28.91	4.36	7.42	0.319	1.71	5.11	3.578
M07	Clashduv Road	CCRW/15/10065	165,697	70,336	RS19G040490	01/07/2015	15.8	22.90	7.02	7.30	0.708	1.37	5.37	3.578
M07	Clashduv Road	CCRW/15/10066	165,697	70,336	RS19G040490	21/07/2015	15.2	28.58	2.11	7.36	0.150	1.22	2.17	0.727
M07	Clashduv Road	CCRW/15/10067	165,697	70,336	RS19G040490	11/08/2015	14.4	24.77	5.08	7.28	0.294	1.82	4.58	2.333
M07	Clashduv Road	CCRW/15/10068	165,697	70,336	RS19G040490	08/09/2015	14.3	20.32	4.96	7.28	0.527	2.66	6.57	4.044
M07	Clashduv Road	CCRW/15/10069	165,697	70,336	RS19G040490	13/10/2015	10.7	24.77	4.45	7.26	0.621	3.14	5.56	3.111
M07	Clashduv Road	CCRW/15/10070	165,697	70,336	RS19G040490	02/12/2015	11.9	58.88	2.09	7.55	0.140	2.53	3.48	0.521
M08	Glasheen Bridge	CCRW/15/10071	165,401	70,768	RS19G040700	20/01/2015	7.2	51.33	1.33	7.71	0.050	3.53	3.81	0.194
M08	Glasheen Bridge	CCRW/15/10072	165,401	70,768	RS19G040700	10/02/2015	7.5	55.13	1.22	7.66	0.047	2.35	2.60	0.132
M08	Glasheen Bridge	CCRW/15/10073	165,401	70,768	RS19G040700	20/05/2015	11.7	63.04	1.35	7.54	0.077	2.58	2.74	0.117
M08	Glasheen Bridge	CCRW/15/10074	165,401	70,768	RS19G040700	11/06/2015	12.7	39.41	5.24	7.49	0.270	1.62	4.95	2.956
M08	Glasheen Bridge	CCRW/15/10075	165,401	70,768	RS19G040700	01/07/2015	15.9	29.32	5.15	7.43	0.627	1.01	5.12	3.858
M08	Glasheen Bridge	CCRW/15/10076	165,401	70,768	RS19G040700	21/07/2015	15.0	47.40	2.40	7.48	0.145	2.29	2.94	0.537
M08	Glasheen Bridge	CCRW/15/10077	165,401	70,768	RS19G040700	11/08/2015	13.9	39.41	4.99	7.42	0.252	2.77	5.48	2.263
M08	Glasheen Bridge	CCRW/15/10078	165,401	70,768	RS19G040700	08/09/2015	14.2	40.06	5.69	7.42	0.496	4.51	8.36	3.889
M08	Glasheen Bridge	CCRW/15/10079	165,401	70,768	RS19G040700	13/10/2015	10.4	35.41	7.49	7.37	0.577	0.78	4.19	2.956
M08	Glasheen Bridge	CCRW/15/10080	165,401	70,768	RS19G040700	02/12/2015	11.9	63.97	1.94	7.48	0.154	2.36	3.73	0.778
M09	Blackstone Bridge	CCRW/15/10081	165,691	74,463	RS19B140110	13/01/2015	6.4	73.52	1.00	7.76	0.047	4.45	4.74	0.008
M09	Blackstone Bridge	CCRW/15/10082	165,691	74,463	RS19B140110	03/02/2015	5.8	80.88	1.00	7.71	0.043	4.06	4.28	0.047
M09	Blackstone Bridge	CCRW/15/10083	165,691	74,463	RS19B140110	03/03/2015	5.8	88.88	1.00	7.78	0.043	4.03	4.39	0.004
M09	Blackstone Bridge	CCRW/15/10084	165,691	74,463	RS19B140110	14/04/2015	11.7	98.15	1.00	8.09	0.023	5.04	5.13	0.039
M09	Blackstone Bridge	CCRW/15/10085	165,691	74,463	RS19B140110	12/05/2015	11.9	94.06	1.10	7.93	0.015	3.70	3.98	0.039
M09	Blackstone Bridge	CCRW/15/10086	165,691	74,463	RS19B140110	03/06/2015	12.3	83.43	2.00	7.97	0.042	4.06	4.36	0.031
M09	Blackstone Bridge	CCRW/15/10087	165,691	74,463	RS19B140110	01/07/2015	15.7	69.86	3.20	7.86	0.139	2.38	2.78	0.054
M09	Blackstone Bridge	CCRW/15/10088	165,691	74,463	RS19B140110	18/08/2015	14.7	63.75	2.90	7.49	0.060	3.72	4.23	0.031
M09	Blackstone Bridge	CCRW/15/10089	165,691	74,463	RS19B140110	01/09/2015	12.3	70.16	1.00	7.79	0.033	3.78	4.20	0.004
M09	Blackstone Bridge	CCRW/15/10090	165,691	74,463	RS19B140110	06/10/2015	13.1	70.67	1.00	7.77	0.033	2.04	2.40	0.008

Station No.	Station Name	Sample Code	Irish Grid Reference		StationCode	DATE	Temp.	D.O.Sat	B.O.D.	pH	Ortho-Phosphate (as P)	TON	Total Nitrogen	Ammonia-N
			Easting:	Northing:		Sampled	C	%	mg/l	pH units	mg/l	mg/l	mg/l N	mg/l N
M10	Kilnap	CCRW/15/10091	166,291	74,796	RS19G880990	13/01/2015	6.5	81.43	1.70	7.84	0.047	2.72	3.21	0.023
M10	Kilnap	CCRW/15/10092	166,291	74,796	RS19G880990	03/02/2015	5.5	85.98	1.10	7.79	0.077	2.80	3.05	0.039
M10	Kilnap	CCRW/15/10093	166,291	74,796	RS19G880990	03/03/2015	5.4	93.59	1.10	7.95	0.070	3.30	3.76	0.004
M10	Kilnap	CCRW/15/10094	166,291	74,796	RS19G880990	14/04/2015	11.2	100.40	2.30	8.26	0.092	5.18	5.39	0.031
M10	Kilnap	CCRW/15/10095	166,291	74,796	RS19G880990	12/05/2015	11.4	89.97	1.30	8.07	0.072	4.31	4.83	0.031
M10	Kilnap	CCRW/15/10096	166,291	74,796	RS19G880990	03/06/2015	11.7	87.00	2.60	8.17	0.087	4.37	4.79	0.004
M10	Kilnap	CCRW/15/10097	166,291	74,796	RS19G880990	01/07/2015	15.8	82.62	1.10	8.00	0.080	2.77	3.19	0.047
M10	Kilnap	CCRW/15/10098	166,291	74,796	RS19G880990	18/08/2015	14.5	86.52	1.00	7.98	0.118	2.94	3.56	0.023
M10	Kilnap	CCRW/15/10099	166,291	74,796	RS19G880990	01/09/2015	12.7	89.56	1.00	7.91	0.115	4.68	5.11	0.008
M10	Kilnap	CCRW/15/10100	166,291	74,796	RS19G880990	06/10/2015	13.3	81.02	1.20	7.79	0.125	2.74	3.21	0.004
M11	Fitz's Boreen	CCRW/15/10101	166,925	74,246	RS19B140300	13/01/2015	6.8	80.08	1.19	7.76	0.082	3.89	4.34	0.031
M11	Fitz's Boreen	CCRW/15/10102	166,925	74,246	RS19B140300	03/02/2015	6.1	84.40	1.00	7.77	0.063	2.69	2.96	0.062
M11	Fitz's Boreen	CCRW/15/10103	166,925	74,246	RS19B140300	03/03/2015	6.2	86.96	1.30	7.89	0.073	3.78	4.15	0.004
M11	Fitz's Boreen	CCRW/15/10104	166,925	74,246	RS19B140300	14/04/2015	11.8	98.37	1.10	7.92	0.060	5.60	5.91	0.047
M11	Fitz's Boreen	CCRW/15/10105	166,925	74,246	RS19B140300	12/05/2015	11.8	82.58	1.00	7.98	0.063	5.68	6.07	0.054
M11	Fitz's Boreen	CCRW/15/10106	166,925	74,246	RS19B140300	03/06/2015	11.8	80.64	1.10	7.91	0.072	4.23	4.50	0.031
M11	Fitz's Boreen	CCRW/15/10107	166,925	74,246	RS19B140300	01/07/2015	15.9	76.83	1.20	8.12	0.115	2.55	3.01	0.054
M11	Fitz's Boreen	CCRW/15/10108	166,925	74,246	RS19B140300	18/08/2015	14.7	82.86	1.60	7.94	0.120	2.97	3.47	0.163
M11	Fitz's Boreen	CCRW/15/10109	166,925	74,246	RS19B140300	01/09/2015	13.0	83.23	1.00	7.90	0.100	2.66	3.14	0.012
M11	Fitz's Boreen	CCRW/15/10110	166,925	74,246	RS19B140300	06/10/2015	13.9	85.10	1.00	7.79	0.098	4.79	5.21	0.016
M12	Blackpool	CCRW/15/10111	167,422	73,340	RS19B140800	13/05/2015	6.8	81.07	1.11	7.42	0.072	3.70	4.07	0.016
M12	Blackpool	CCRW/15/10112	167,422	73,340	RS19B140800	03/02/2015	5.7	83.71	1.00	7.40	0.072	2.30	2.59	0.039
M12	Blackpool	CCRW/15/10113	167,422	73,340	RS19B140800	03/03/2015	5.6	82.62	1.00	8.08	0.063	3.25	3.67	0.004
M12	Blackpool	CCRW/15/10114	167,422	73,340	RS19B140800	14/04/2015	10.5	90.08	1.00	7.36	0.058	6.08	6.30	0.023
M12	Blackpool	CCRW/15/10115	167,422	73,340	RS19B140800	12/05/2015	10.8	82.14	1.00	7.55	0.060	4.82	5.24	0.023
M12	Blackpool	CCRW/15/10116	167,422	73,340	RS19B140800	03/06/2015	10.9	77.54	1.00	7.98	0.063	3.98	4.24	0.039
M12	Blackpool	CCRW/15/10117	167,422	73,340	RS19B140800	01/07/2015	15.4	73.22	1.40	8.04	0.120	3.02	3.37	0.039
M12	Blackpool	CCRW/15/10118	167,422	73,340	RS19B140800	18/08/2015	14.4	72.92	1.00	7.60	0.102	3.50	3.87	0.023
M12	Blackpool	CCRW/15/10119	167,422	73,340	RS19B140800	01/09/2015	12.5	84.27	1.00	7.93	0.090	3.75	4.12	0.008
M12	Blackpool	CCRW/15/10120	167,422	73,340	RS19B140800	06/10/2015	13.7	80.30	1.00	7.32	0.098	3.86	4.29	0.109

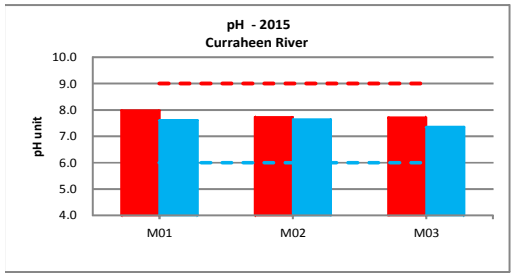
Station No.	Station Name	Sample Code	Irish Grid Reference		StationCode	DATE	Temp.	D.O.Sat	B.O.D.	pH	Ortho-Phosphate (as P)	TON	Total Nitrogen	Ammonia-N
			Easting:	Northing:		Sampled	C	%	mg/l	pH units	mg/l	mg/l	mg/l N	mg/l N
M13	Glen Rec. Park	CCRW/15/10121	168,942	73,453	RS19G090400	13/05/2015	6.5	79.81	1.25	7.57	0.097	4.06	4.52	0.039
M13	Glen Rec. Park	CCRW/15/10122	168,942	73,453	RS19G090400	03/02/2015	5.5	87.80	1.75	7.52	0.105	2.72	3.16	0.156
M13	Glen Rec. Park	CCRW/15/10123	168,942	73,453	RS19G090400	03/03/2015	5.6	78.01	4.00	7.93	0.144	4.68	5.80	0.498
M13	Glen Rec. Park	CCRW/15/10124	168,942	73,453	RS19G090400	14/04/2015	10.6	81.94	1.00	7.79	0.098	4.56	4.86	0.117
M13	Glen Rec. Park	CCRW/15/10125	168,942	73,453	RS19G090400	12/05/2015	10.6	82.48	1.20	7.86	0.087	4.65	5.04	0.086
M13	Glen Rec. Park	CCRW/15/10126	168,942	73,453	RS19G090400	03/06/2015	11.2	78.26	1.40	7.89	0.078	3.67	4.04	0.148
M13	Glen Rec. Park	CCRW/15/10127	168,942	73,453	RS19G090400	01/07/2015	14.4	70.77	1.60	8.17	0.167	3.08	3.50	0.070
M13	Glen Rec. Park	CCRW/15/10128	168,942	73,453	RS19G090400	18/08/2015	14.3	77.36	1.60	7.96	0.144	2.66	3.12	0.062
M13	Glen Rec. Park	CCRW/15/10129	168,942	73,453	RS19G090400	01/09/2015	12.4	73.22	1.00	7.81	0.133	2.18	2.64	0.101
M13	Glen Rec. Park	CCRW/15/10130	168,942	73,453	RS19G090400	06/10/2015	13.4	80.53	2.13	7.66	0.145	0.98	1.63	0.039
M14	Spring Lane	CCRW/15/10131	167,868	73,539	RS19G090800	13/01/2015	6.5	82.82	1.35	7.51	0.093	4.28	4.69	0.039
M14	Spring Lane	CCRW/15/10132	167,868	73,539	RS19G090800	03/02/2015	5.3	80.65	1.00	7.50	0.093	2.74	2.95	0.101
M14	Spring Lane	CCRW/15/10133	167,868	73,539	RS19G090800	03/03/2015	5.2	82.80	1.60	7.93	0.118	4.82	5.44	0.101
M14	Spring Lane	CCRW/15/10134	167,868	73,539	RS19G090800	14/04/2015	10.9	87.94	1.00	7.70	0.108	4.48	4.74	0.062
M14	Spring Lane	CCRW/15/10135	167,868	73,539	RS19G090800	12/05/2015	11.0	81.89	1.00	7.73	0.095	4.51	4.92	0.070
M14	Spring Lane	CCRW/15/10136	167,868	73,539	RS19G090800	03/06/2015	12.0	77.94	1.20	8.02	0.078	3.25	3.54	0.062
M14	Spring Lane	CCRW/15/10137	167,868	73,539	RS19G090800	01/07/2015	15.4	75.22	1.40	7.89	0.150	2.04	2.41	0.062
M14	Spring Lane	CCRW/15/10138	167,868	73,539	RS19G090800	18/08/2015	14.5	88.68	1.30	7.78	0.147	2.52	2.96	0.039
M14	Spring Lane	CCRW/15/10139	167,868	73,539	RS19G090800	01/09/2015	12.4	79.78	1.00	7.87	0.122	2.77	3.24	0.054
M14	Spring Lane	CCRW/15/10140	167,868	73,539	RS19G090800	06/10/2015	13.7	79.33	1.20	7.63	0.115	3.84	4.44	0.023
M15	Leitrim St.	CCRW/15/10141	167,496	72,342	RS19K750900	13/01/2015	7.3	84.65	3.47	6.91	0.123	4.26	4.71	0.047
M15	Leitrim St.	CCRW/15/10142	167,496	72,342	RS19K750900	03/02/2015	6.6	80.42	2.43	7.09	0.127	2.10	2.42	0.086
M15	Leitrim St.	CCRW/15/10143	167,496	72,342	RS19K750900	03/03/2015	7.3	79.18	22.00	7.87	0.407	4.51	5.35	0.101
M15	Leitrim St.	CCRW/15/10144	167,496	72,342	RS19K750900	14/04/2015	11.4	60.77	28.00	6.96	9.500	4.98	6.24	0.288
M15	Leitrim St.	CCRW/15/10145	167,496	72,342	RS19K750900	12/05/2015	11.2	62.41	7.00	7.16	0.126	3.42	4.21	0.117
M15	Leitrim St.	CCRW/15/10146	167,496	72,342	RS19K750900	03/06/2015	12.0	51.03	11.20	7.31	0.327	3.28	4.04	0.241
M15	Leitrim St.	CCRW/15/10147	167,496	72,342	RS19K750900	01/07/2015	16.3	38.03	60.00	7.44	0.607	1.20	6.42	1.867
M15	Leitrim St.	CCRW/15/10148	167,496	72,342	RS19K750900	18/08/2015	14.8	75.24	2.10	7.40	0.120	5.35	5.77	0.047
M15	Leitrim St.	CCRW/15/10149	167,496	72,342	RS19K750900	01/09/2015	13.4	78.90	2.10	7.05	0.159	4.26	4.73	0.062
M15	Leitrim St.	CCRW/15/10150	167,496	72,342	RS19K750900	06/10/2015	14.7	70.94	23.70	6.91	0.038	4.23	5.04	0.109

Summary Table of Monitoring Results 2015

Ambient River Monitoring 2015								Curraheen River			Glasheen Stream					Bride River				Glen River		Kiln River
		SI 272 of 2009	WFD					Curragheen Road Bridge	Carrigrohane Bridge	County Hall	Bandon Road	Woodhaven Estate	Sandbrook Estate	Clashduv Road	Glasheen Bridge	Blackstone Bridge	Kilnap	Fitz's Boreen	Blackpool	Rec Park	Spring Lane	Leitrim Street
Licence	Parameter	Threshold	High	Good	Moderate	Poor	Bad	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12	M13	M14	M15
10 /yr	Samples Taken			Number of Samples				10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
pH	pH - Max	9.0						8.0	7.7	7.7	7.7	7.8	7.6	7.6	7.7	8.1	8.3	8.1	8.1	8.2	8.0	7.9
	pH - Min	6.0						7.6	7.7	7.4	6.9	7.4	7.2	7.3	7.4	7.5	7.8	7.8	7.3	7.5	7.5	6.9
DO	DO % Sat. - 5%ile Lower	80						69.0	68.8	60.4	69.7	48.4	25.4	21.5	32.1	66.5	81.2	78.3	73.0	71.8	76.4	43.9
	DO % Sat - 95%ile Upper	120						81.4	85.4	78.6	83.3	75.0	55.3	63.4	63.6	96.3	97.3	93.2	134.0	132.5	88.3	82.7
BOD	BOD - Annual Mean	1.5 (Good)	<1.4	1.4-2.0	2.0-4.0	4.0-5.0	>5.0	1.3	1.3	1.4	1.1	1.9	5.2	3.6	3.7	1.5	1.4	1.1	1.1	1.7	1.2	16.2
	BOD - 95%ile	2.6 (Good)						1.7	1.7	1.9	1.6	5.0	11.0	6.1	6.7	3.1	2.5	1.5	1.3	3.3	1.5	45.6
Temp.	Temp. - Max	Not > 1.5C rise mixing zone						14.7	15.0	15.4	13.8	14.4	14.9	15.8	15.9	15.7	15.8	15.9	15.4	14.4	15.4	16.3
	Temp. - Min							6.3	6.6	6.6	8.2	7.7	7.8	7.3	7.2	5.8	5.4	6.1	5.6	5.5	5.2	6.6
Orthophosphate (as P)	MRP -P - Annual Mean	0.035 (Good)	<0.02	0.02-0.05	0.05-0.1	0.1-0.2	0.2-0.4	0.070	0.060	0.060	0.048	0.100	0.216	0.294	0.270	0.048	0.088	0.085	0.081	0.123	0.112	1.153
	MRP-P - 95%ile	0.075 (Good)						0.142	0.102	0.081	0.063	0.278	0.361	0.668	0.605	0.103	0.122	0.118	0.113	0.158	0.149	5.498
TON (as N)	TON - N Annual Mean							3.6	3.5	3.4	3.4	3.0	2.6	2.2	2.4	3.7	3.6	3.9	3.8	3.2	3.5	3.8
	TON-N - 95%ile							6.3	5.1	4.5	4.9	4.3	3.5	3.0	4.1	4.8	5.0	5.6	5.4	4.6	4.7	5.2
	Nitrate - N Annual Mean		<0.8	0.8-2.0	2.0-3.6	3.6-5.6	5.6-11.3															
Total Nitrogen (as	Total N - N Annual Mean							3.9	3.8	3.8	3.5	3.4	4.5	4.1	4.4	4.0	4.0	4.3	4.1	3.7	3.9	4.9
	Total N-N - 95%ile							6.6	5.3	4.7	5.1	4.9	6.7	6.1	7.1	5.0	5.3	6.0	5.6	5.4	5.2	6.3
Ammonia	Ammonia - N Annual Mean	0.065 (Good)	<0.04	0.04-0.1	0.1-0.2	0.2-0.4	>0.4	0.039	0.024	0.242	0.025	0.364	1.645	1.829	1.768	0.026	0.021	0.047	0.034	0.139	0.061	0.296
	Ammonia-N - 95%ile	0.14 (Good)						0.102	0.070	0.396	0.067	1.810	3.592	3.834	3.875	0.051	0.043	0.118	0.081	0.361	0.101	1.156

Summary

Graphs of Monitoring Results 2015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Curraheen River
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8.0
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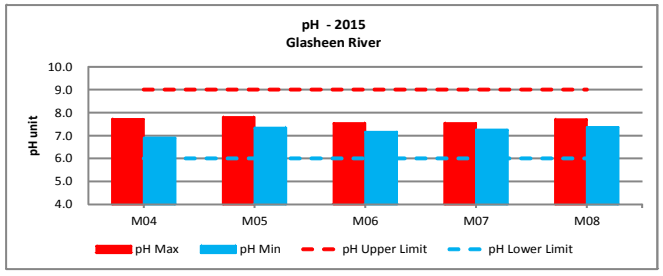
M01
M02
M03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8.0
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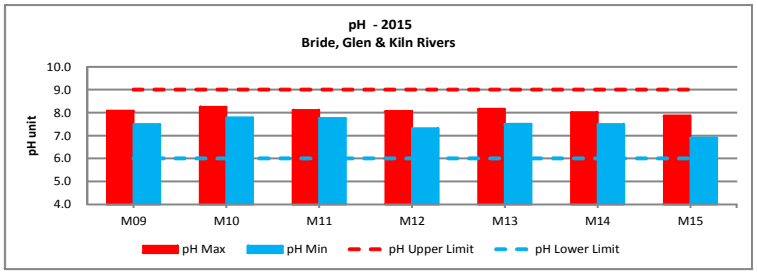
M04
M05
M06
M07
M08
pH Max
pH Min
pH Upper Limit
pH Lower Limit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Bride, Glen & Kiln Rivers
pH unit
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9.0
8.0
7.0
6.0
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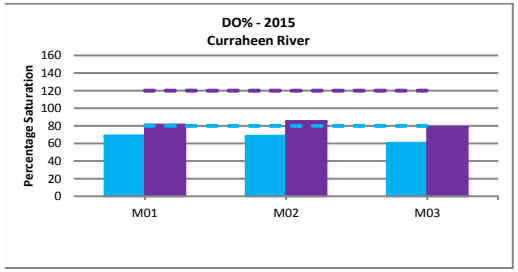
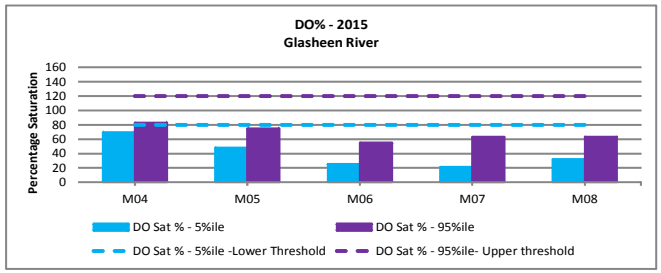
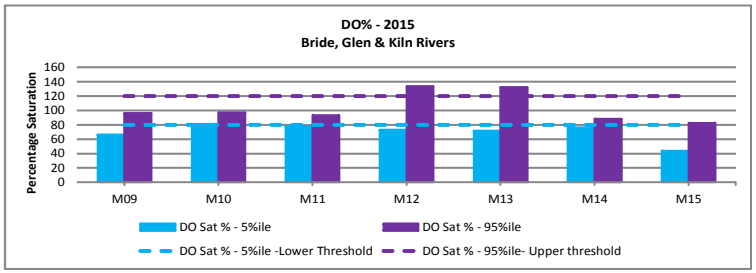
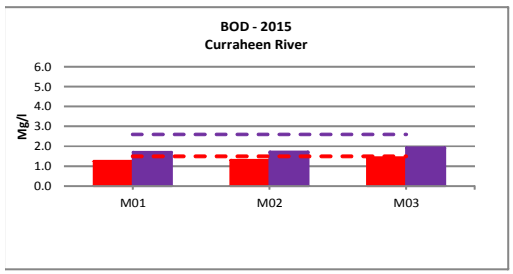
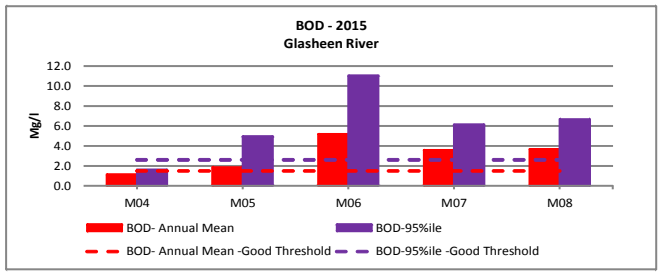
M09
M10
M11
M12
M13
M14
M15
pH Max
pH Min
pH Upper Limit
pH Lower Limit

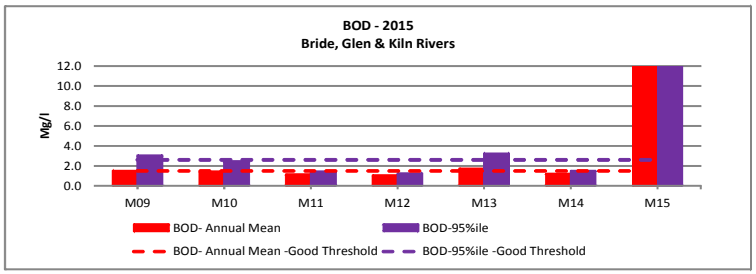

DO% - 2015
Curraheen River
Percentage Saturation
160
140
120
100
80
60
40
20
0
M01
M02
M03

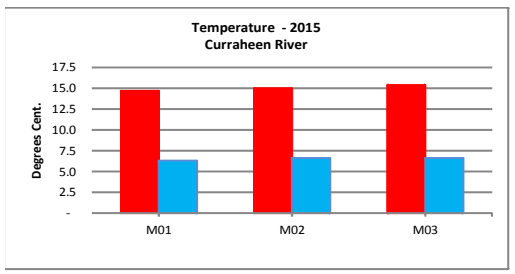

DO% - 2015
Glasheen River
Percentage Saturation
160
140
120
100
80
60
40
20
0
M04
M05
M06
M07
M08
DO Sat % - 5%ile
DO Sat % - 95%ile
DO Sat % - 5%ile -Lower Threshold
DO Sat % - 95%ile- Upper threshold

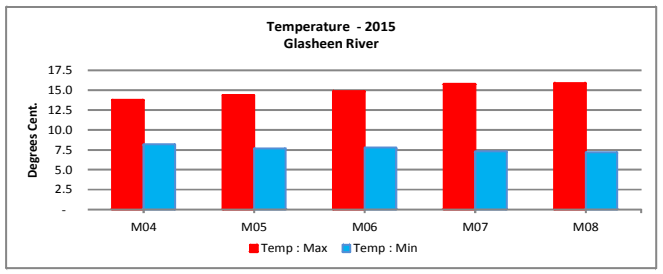

DO% - 2015
Bride, Glen & Kiln Rivers
Percentage Saturation
160
140
120
100
80
60
40
20
0
M09
M10
M11
M12
M13
M14
M15
DO Sat % - 5%ile
DO Sat % - 95%ile
DO Sat % - 5%ile -Lower Threshold
DO Sat % - 95%ile- Upper threshold

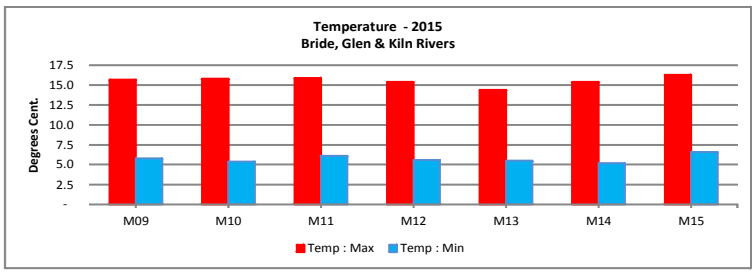

BOD - 2015
Curraheen River
Mg/l
6.0
5.0
4.0
3.0
2.0
1.0
0.0
M01
M02
M03

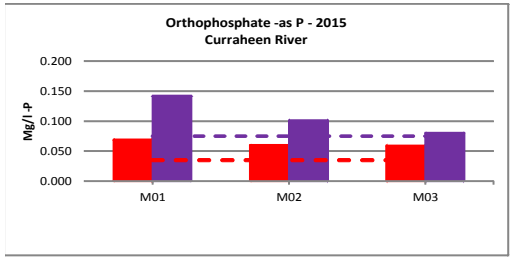

BOD - 2015
Glasheen River
Mg/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
M04
M05
M06
M07
M08
BOD- Annual Mean
BOD-95%ile
BOD- Annual Mean -Good Threshold
BOD-95%ile -Good Threshold

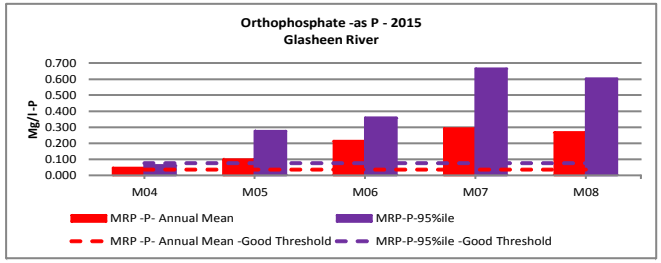

BOD - 2015
Bride, Glen & Kiln Rivers
Mg/l
12.0
10.0
8.0
6.0
4.0
2.0
0.0
M09
M10
M11
M12
M13
M14
M15
BOD- Annual Mean
BOD-95%ile
BOD- Annual Mean -Good Threshold
BOD-95%ile -Good Threshold

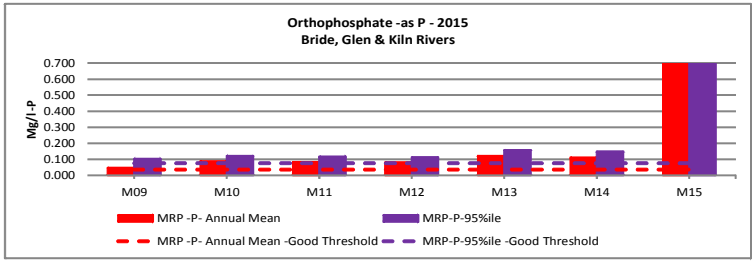

Temperature - 2015
Curraheen River
Degrees Cent.
17.5
15.0
12.5
10.0
7.5
5.0
2.5
-
M01
M02
M03

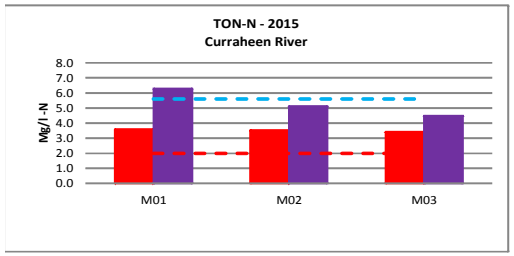

Temperature - 2015
Glasheen River
Degrees Cent.
17.5
15.0
12.5
10.0
7.5
5.0
2.5
-
M04
M05
M06
M07
M08
Temp : Max
Temp : Min

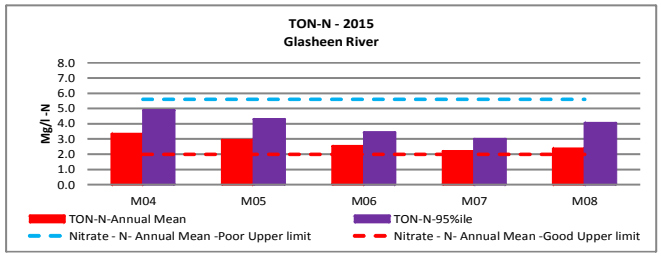

Temperature - 2015
Bride, Glen & Kiln Rivers
Degrees Cent.
17.5
15.0
12.5
10.0
7.5
5.0
2.5
-
M09
M10
M11
M12
M13
M14
M15
Temp : Max
Temp : Min

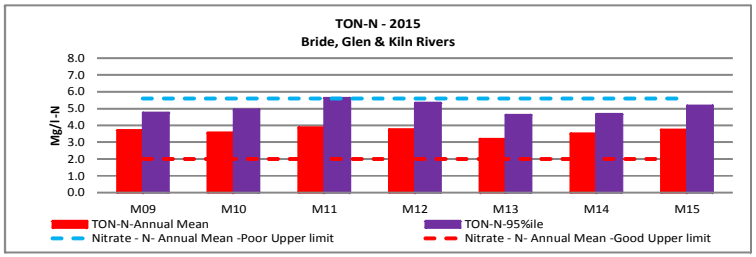

Orthophosphate -as P - 2015
Curraheen River
Mg/l -P
0.200
0.150
0.100
0.050
0.000
M01
M02
M03

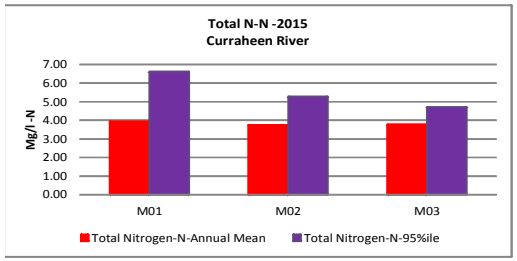

Orthophosphate -as P - 2015
Glasheen River
Mg/l -P
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
M04
M05
M06
M07
M08
MRP -P- Annual Mean
MRP-P-95%ile
MRP -P- Annual Mean -Good Threshold
MRP-P-95%ile -Good Threshold

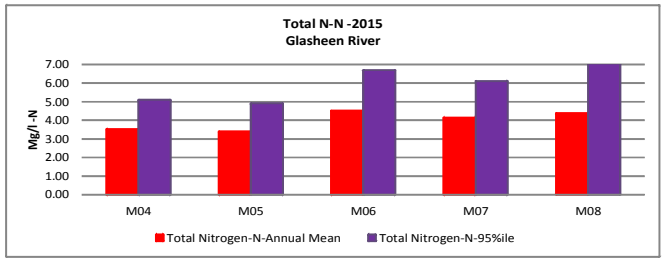

Orthophosphate -as P - 2015
Bride, Glen & Kiln Rivers
Mg/l -P
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
M09
M10
M11
M12
M13
M14
M15
MRP -P- Annual Mean
MRP-P-95%ile
MRP -P- Annual Mean -Good Threshold
MRP-P-95%ile -Good Threshold

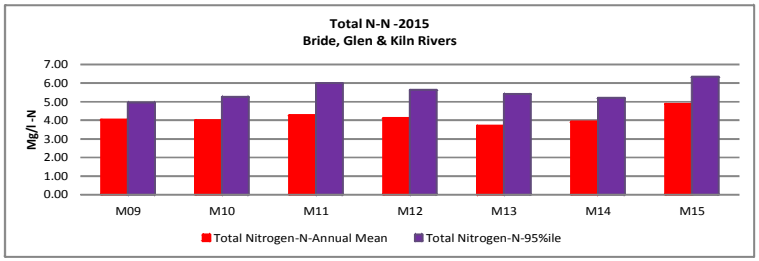

TON-N - 2015
Curraheen River
Mg/l -N
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
M01
M02
M03

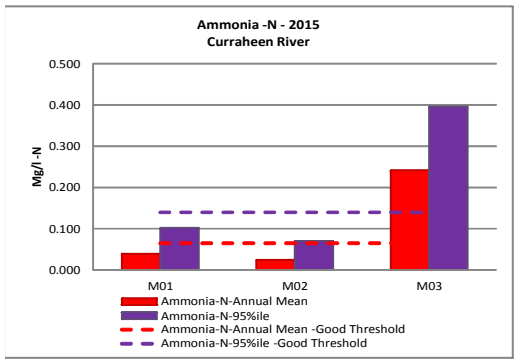

TON-N - 2015
Glasheen River
Mg/l -N
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
M04
M05
M06
M07
M08
TON-N-Annual Mean
TON-N-95%ile
Nitrate - N- Annual Mean -Poor Upper limit
Nitrate - N- Annual Mean -Good Upper limit

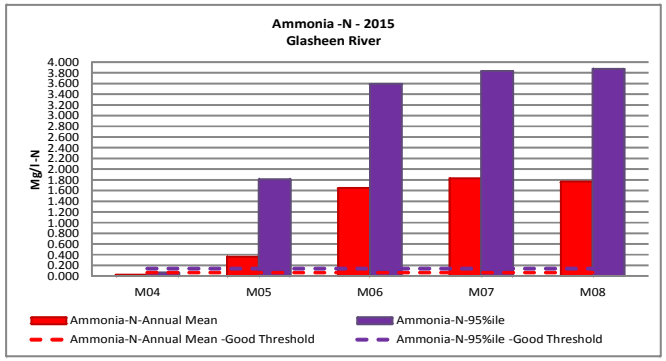

TON-N - 2015
Bride, Glen & Kiln Rivers
Mg/l -N
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
M09
M10
M11
M12
M13
M14
M15
TON-N-Annual Mean
TON-N-95%ile
Nitrate - N- Annual Mean -Poor Upper limit
Nitrate - N- Annual Mean -Good Upper limit

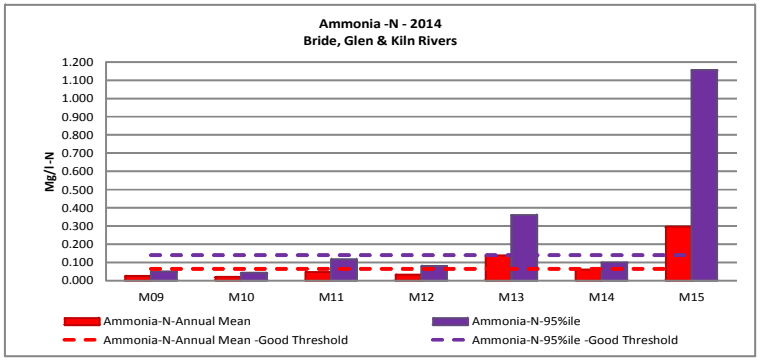

Total N-N -2015
Curraheen River
Mg/l -N
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
M01
M02
M03
Total Nitrogen-N-Annual Mean
Total Nitrogen-N-95%ile


Total N-N -2015
Glasheen River
Mg/l -N
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
M04
M05
M06
M07
M08
Total Nitrogen-N-Annual Mean
Total Nitrogen-N-95%ile

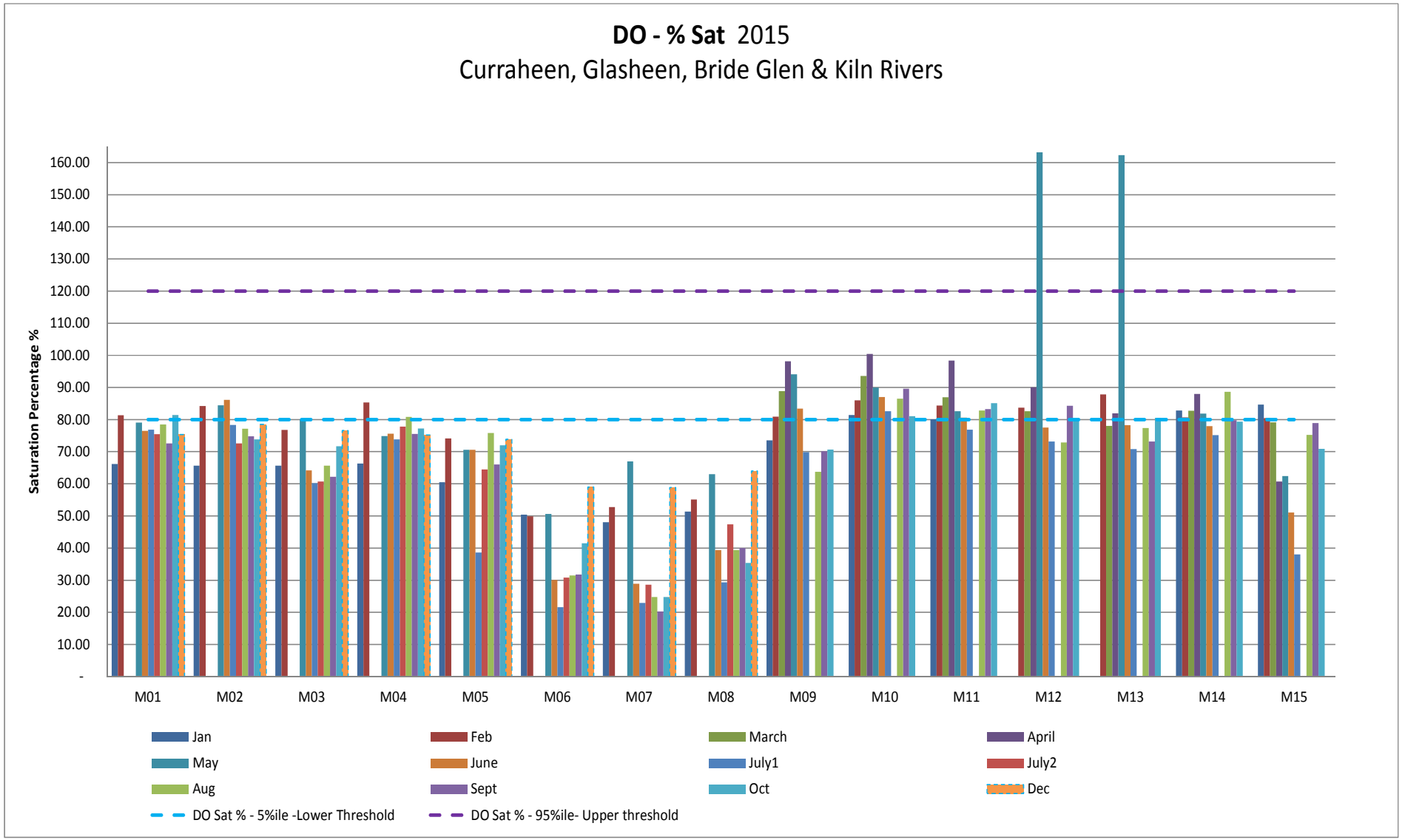

Total N-N -2015
Bride, Glen & Kiln Rivers
Mg/l -N
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
M09
M10
M11
M12
M13
M14
M15
Total Nitrogen-N-Annual Mean
Total Nitrogen-N-95%ile

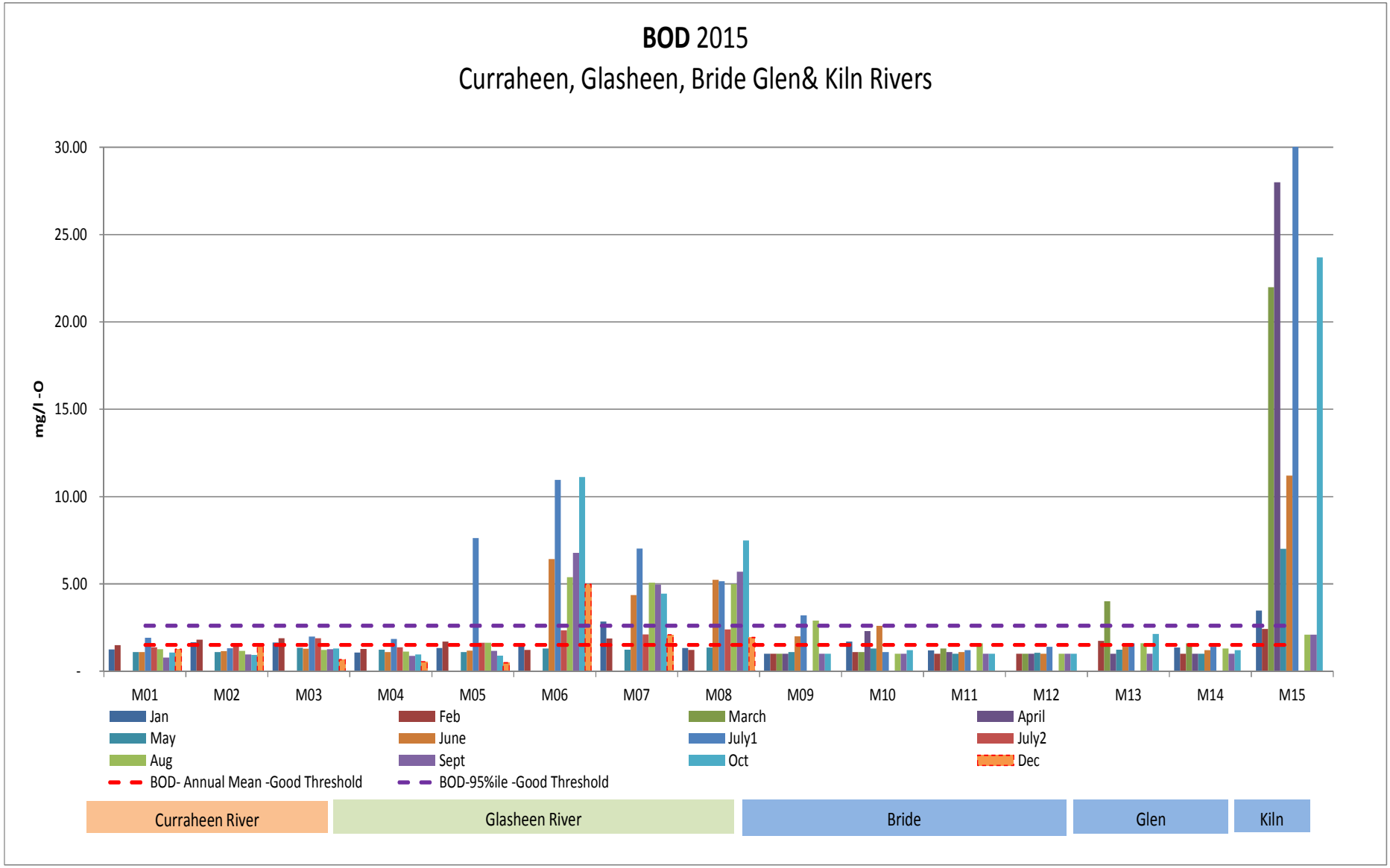

Ammonia -N - 2015
Curraheen River
Mg/l -N
0.500
0.400
0.300
0.200
0.100
0.000
M01
M02
M03
Ammonia-N-Annual Mean
Ammonia-N-95%ile
Ammonia-N-Annual Mean -Good Threshold
Ammonia-N-95%ile -Good Threshold

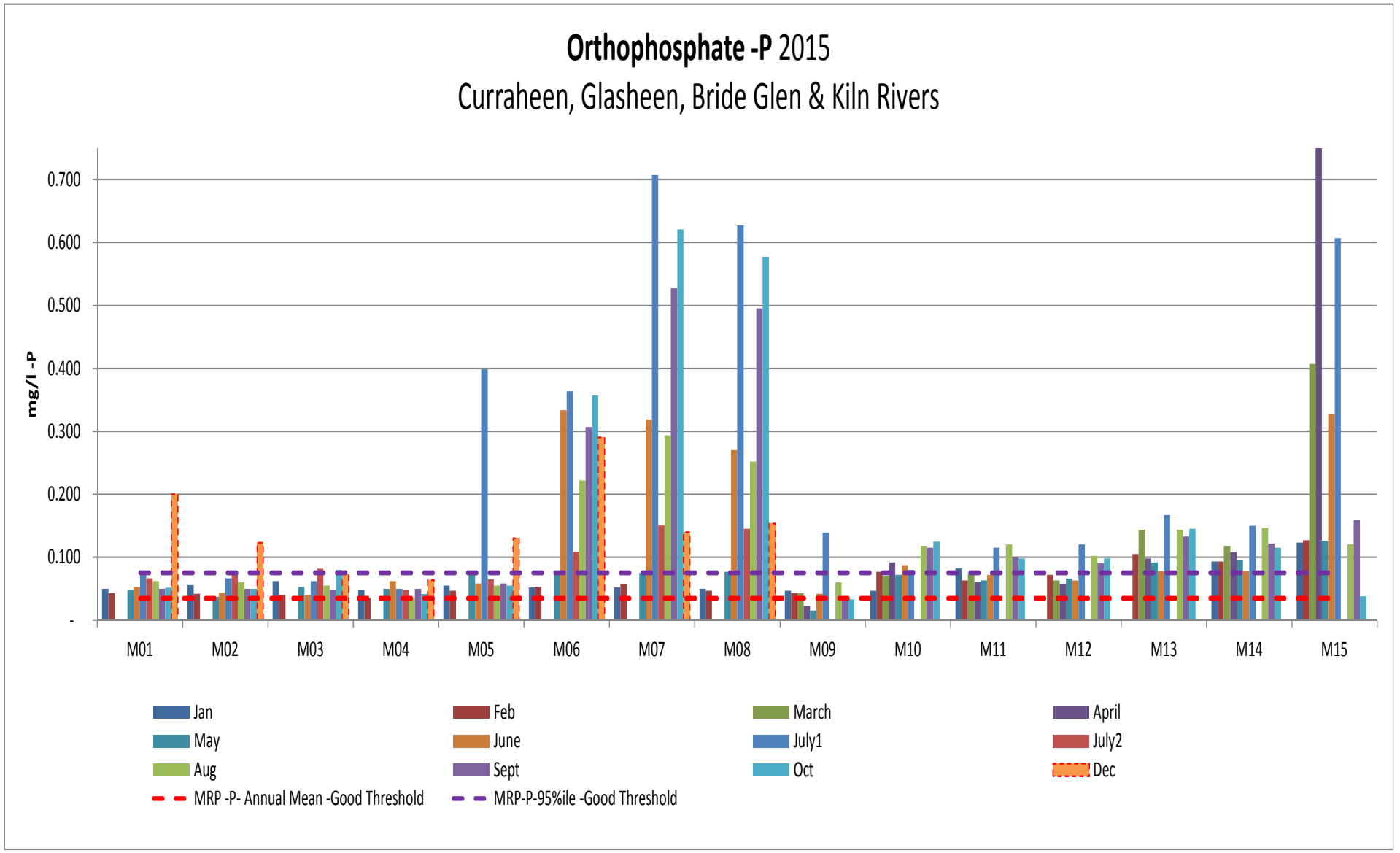

Ammonia -N - 2015
Glasheen River
Mg/l -N
4.000
3.800
3.600
3.400
3.200
3.000
2.800
2.600
2.400
2.200
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
M04
M05
M06
M07
M08
Ammonia-N-Annual Mean
Ammonia-N-95%ile
Ammonia-N-Annual Mean -Good Threshold
Ammonia-N-95%ile -Good Threshold

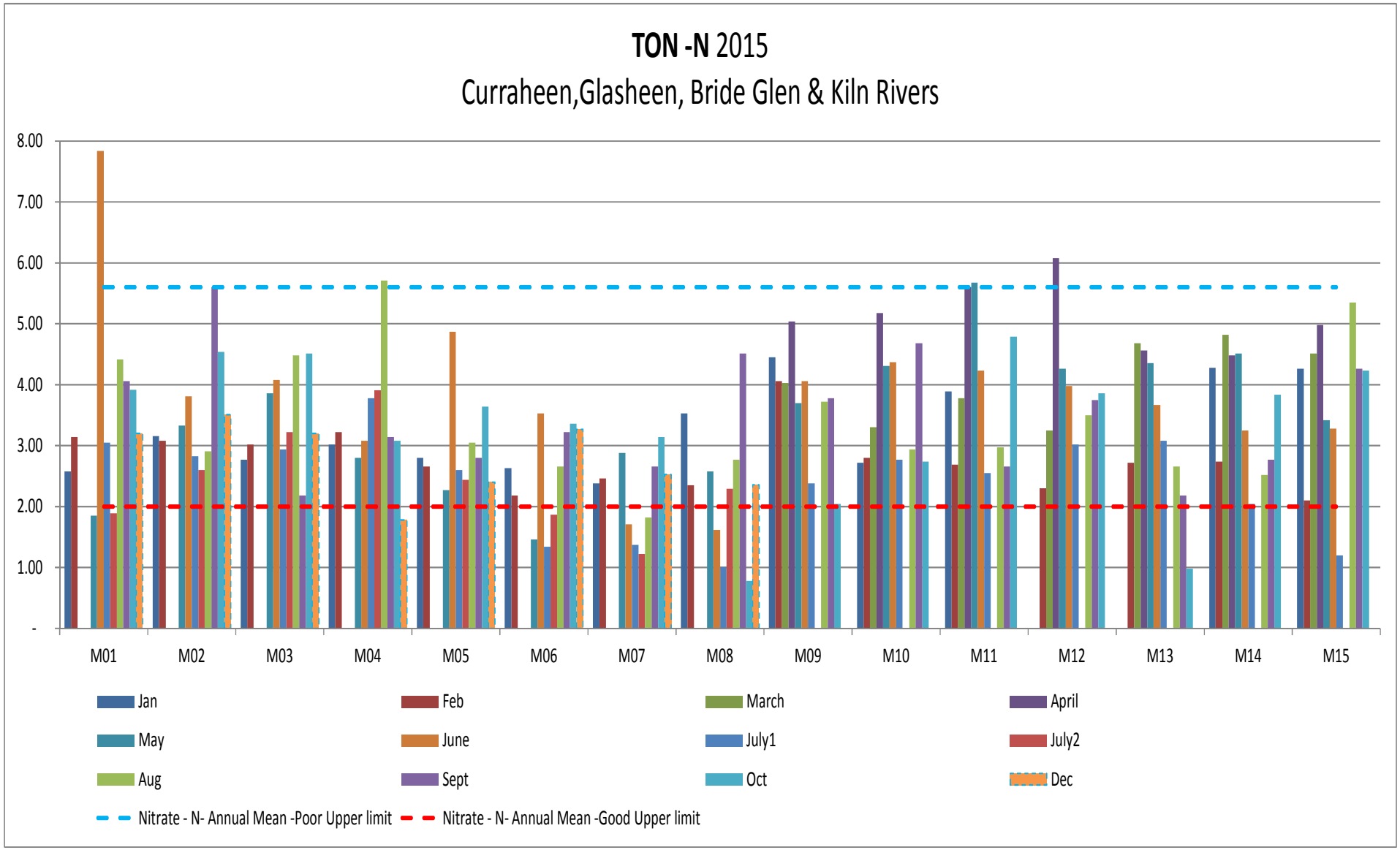

Ammonia -N - 2014
Bride, Glen & Kiln Rivers
Mg/l -N
1.200
1.100
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
M09
M10
M11
M12
M13
M14
M15
Ammonia-N-Annual Mean
Ammonia-N-95%ile
Ammonia-N-Annual Mean -Good Threshold
Ammonia-N-95%ile -Good Threshold

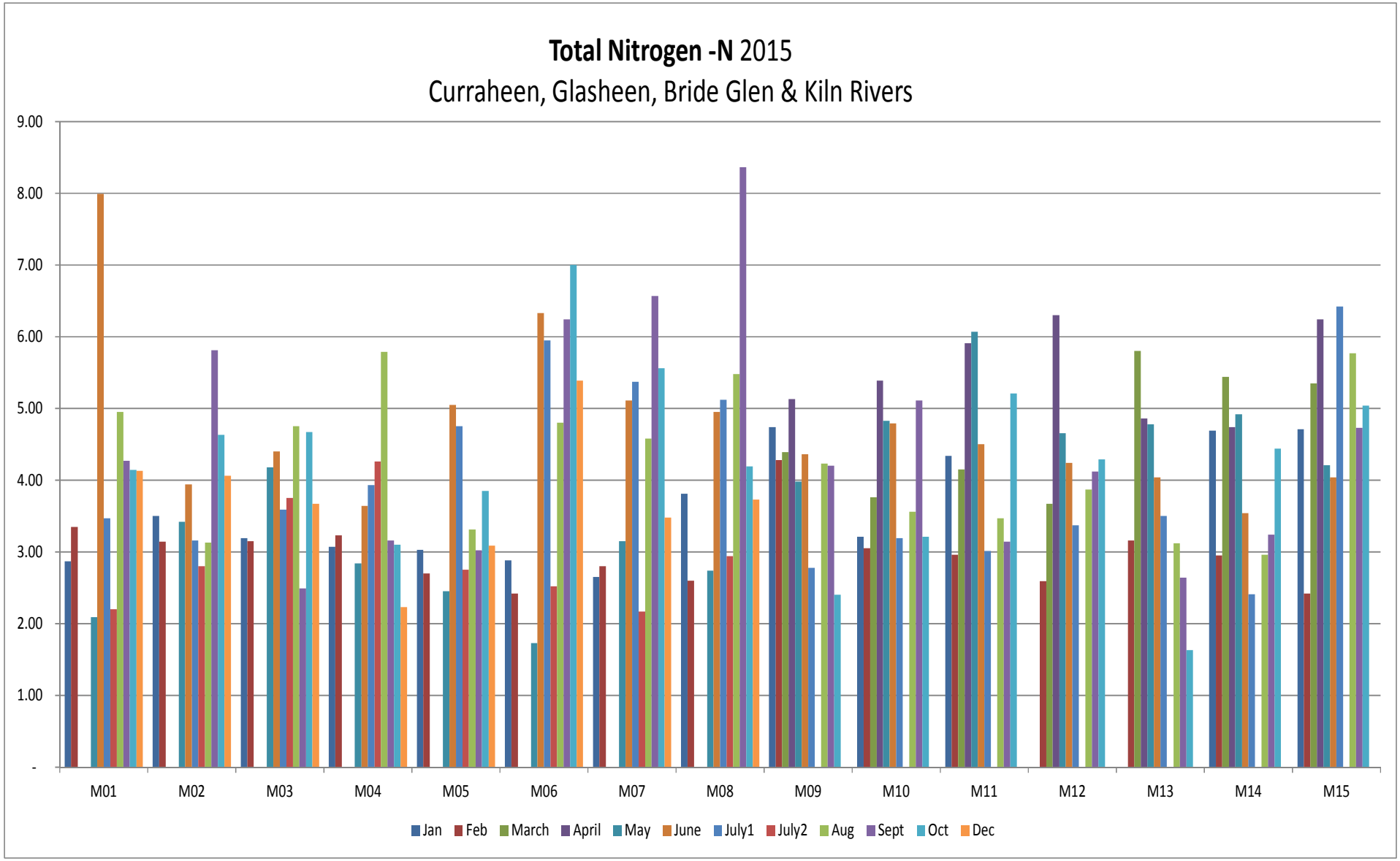
All Monitoring Results 2015

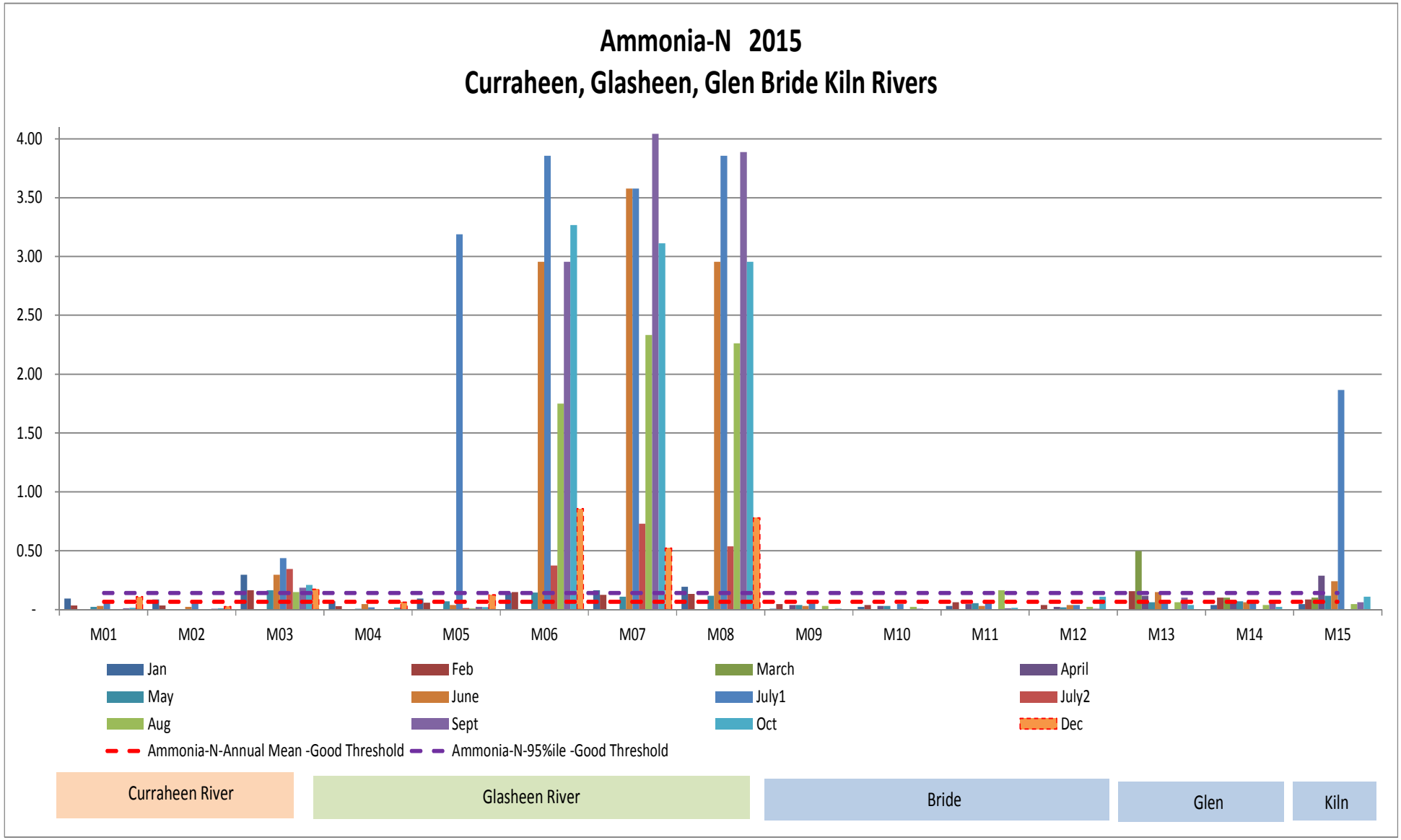



BOD 2015
Curraheen, Glasheen, Bride Glen& Kiln Rivers
mg/l -O
30.00
25.00
20.00
15.00
10.00
5.00
-
M01
M02
M03
M04
M05
M06
M07
M08
M09
M10
M11
M12
M13
M14
M15
Jan
Feb
March
April
May
June
July1
July2
Aug
Sept
Oct
Dec
BOD- Annual Mean -Good Threshold
BOD-95%ile -Good Threshold
Curraheen River
Glasheen River
Bride
Glen
Kiln


Orthophosphate -P 2015
Curraheen, Glasheen, Bride Glen & Kiln Rivers
mg/l -P
0.700
0.600
0.500
0.400
0.300
0.200
0.100
-
M01
M02
M03
M04
M05
M06
M07
M08
M09
M10
M11
M12
M13
M14
M15
Jan
Feb
March
April
May
June
July1
July2
Aug
Sept
Oct
Dec
MRP -P- Annual Mean -Good Threshold
MRP-P-95%ile -Good Threshold


TON -N 2015
Curraheen,Glasheen, Bride Glen & Kiln Rivers
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
-
M01
M02
M03
M04
M05
M06
M07
M08
M09
M10
M11
M12
M13
M14
M15
Jan
Feb
March
April
May
June
July1
July2
Aug
Sept
Oct
Dec
Nitrate - N- Annual Mean -Poor Upper limit
Nitrate - N- Annual Mean -Good Upper limit


Total Nitrogen -N 2015
Curraheen, Glasheen, Bride Glen & Kiln Rivers
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
-
M01
M02
M03
M04
M05
M06
M07
M08
M09
M10
M11
M12
M13
M14
M15
Jan
Feb
March
April
May
June
July1
July2
Aug
Sept
Oct
Dec


Ammonia-N 2015
Curraheen, Glasheen, Glen Bride Kiln Rivers
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
-
M01
M02
M03
M04
M05
M06
M07
M08
M09
M10
M11
M12
M13
M14
M15
Jan
Feb
March
April
May
June
July1
July2
Aug
Sept
Oct
Dec
Ammonia-N-Annual Mean -Good Threshold
Ammonia-N-95%ile -Good Threshold
Curraheen River
Glasheen River
Bride
Glen
Kiln

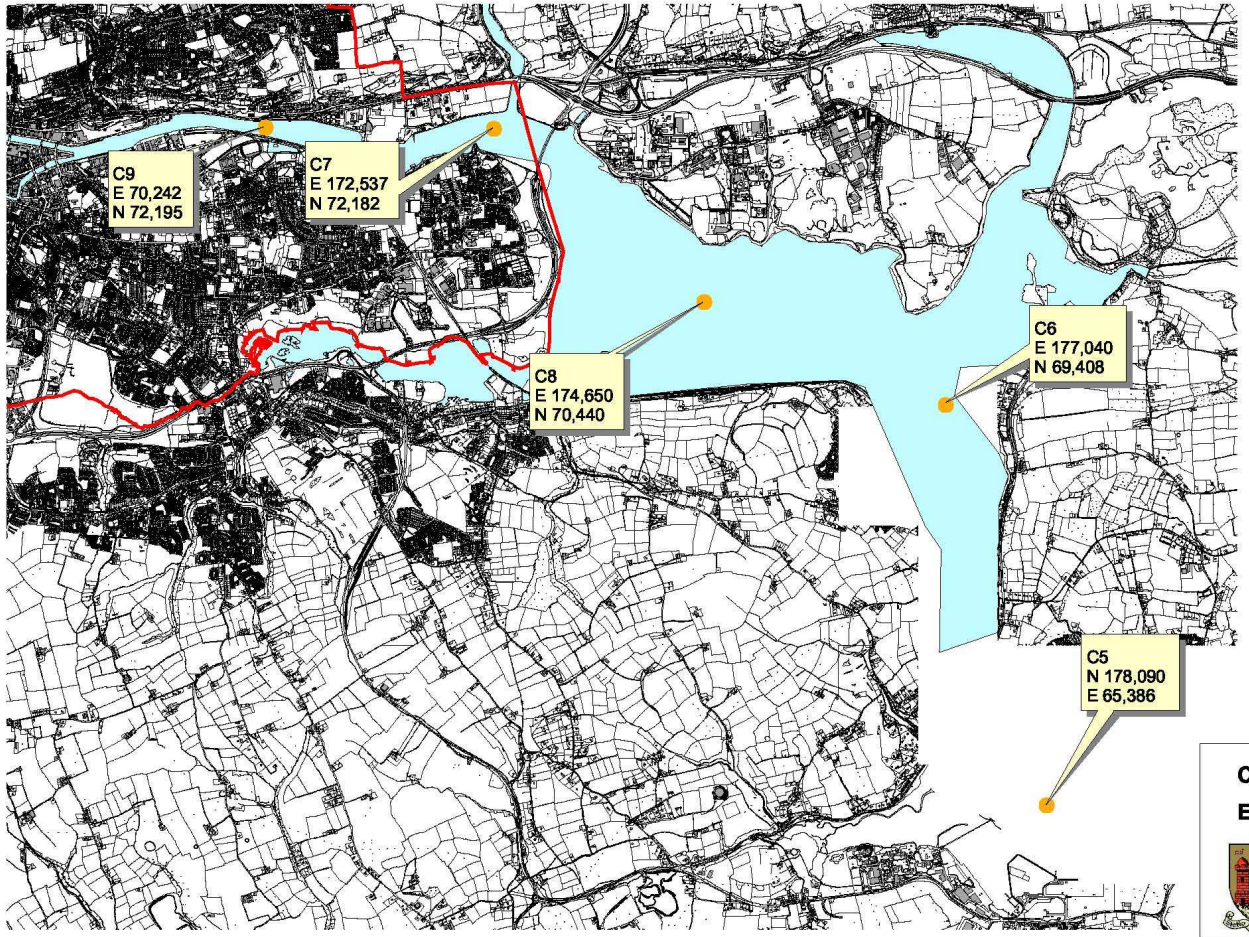
Appendix 7.2A – Ambient Transitional & Coastal Monitoring Summary

Harbour Monitoring Summary 2015

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference Easting:	Irish Grid Reference Northing:	EPA Feature Coding Tool Code	Current Trophic/ EQS Status	Does assessment of the ambient monitoring results indicate that the discharge is impacting on water quality Yes/No, List impact(s) for each Yes answer	Comment
C9 Tivoli	170,242	72,195	TW04003159LE2006	Intermediate / Moderate	No	Water Quality is improving in Estuary since construction of WWTP
C7 Blackrock Castle	172,537	72,182	TW04003159LE2005	Intermediate / Moderate	No	
C8 Mid Lough Mahon	174,650	70,440	TW05003157LE4004	Intermediate / Moderate	No	
C6 End Lough Mahon	177,040	69,408	TW05003157LE4005	Intermediate / Moderate	No	
C5 Haulbowline	178,090	65,386	CW05003150LE8004	Unpolluted / Good	No	

Note: Error: C9 should be E 170,242 - N 72,195

E.P.A. Waste Water Licence Application
E3 Monitoring & Sampling Points



CORK CITY COUNCIL
ENVIRONMENT DIRECTORATE

Water Services
Drainage Section

shp file ref: m/Dir/Env/Drain/GisData

Date :- 24-11-2008	Prepared by : B.O'F.	Drg. No. WWLA-059

Cork Harbour

Western Celtic Sea (HAs 18:19:20)

Harbour Monitoring Overview

Monitoring is conditioned to be carried out at a frequency of 10 samples per year at locations designated C5 to C9 within the Harbour. C5, *Haulbowline*, is located in the outermost point monitored, in the Coastal zone of Cork Harbour, C6, *End Lough Mahon* and C8, *Mid Lough Mahon* are in Transitional Waters, with C6 nearest the coastal zone. C8 is quite close to the location of the discharge outfall for the WWTP at Carrigrennan. C7, *Blackrock Castle* and C9, *Tivoli* are in the *Lower Lee Estuary*, Transitional Waters, with C9 being the most upstream monitoring point.

Monitoring was carried out on 10 dates between January & December 2015, at each location. For C5, C6, C7 & C8 a sample was taken at High and Low Tide, at Bottom, Middle and Top levels in the water. For C9 a sample was taken at High and Low Tide, at Bottom and Top levels in the water. In all, 60 samples were taken at C5, C6, C7,& C8 and 40 were taken at C9, rather than the 10 samples as indicated in the licence, albeit at 10 sampling occasions.

Trophic Status Assessment Scheme

The Status of individual estuarine and coastal water bodies is assessed using the EPA's Trophic Status assessment Scheme (TSAS). The scheme compares the compliance of individual parameters against a set of criteria indicative of trophic state. These criteria fall into three different categories which broadly capture the cause –effect relationship of the euthrophic process, namely Category A, Nutrient Enrichment (DIN & MRP), Category B, Accelerated plant growth (Chlorophyll & Macroalgae) and Category C, Disturbance to the level of dissolved oxygen normally present (DO % Saturation).

Eutrophic water bodies are those in which each of the criteria are breached, i.e. where elevated nutrient concentrations, accelerated growth of plants and undesirable water quality disturbance occur simultaneously;

Potentially Eutrophic water bodies are those in which two of the criteria are breached and the third falls within 15 per cent of the relevant threshold value;

Intermediate Status water bodies are those which do not fall into the Eutrophic or Potentially Eutrophic classes but in which breaches one or two of the criteria occur;

Unpolluted waterbodies are those which do not breach any of the criteria.

Assessment

The Status of each individual test location as monitored is assessed using the Trophic Status Assessment Scheme (TSAS) with the exception that tests were not carried out for Microalgae.

Thresholds are broadly in line with the limits set out in Table 8 (Biological Quality Elements) & Table 9 (Physico-Chemical conditions supporting the Biological elements) of S.I. 272 of 2009

S.I.272 of 2009

DIN is only assessed for Coastal Water bodies and not Transitional Water bodies. TSAS Thresholds are consistent with "Good" Status for Coastal waters in Table 9.

Molydate Reactive Phosphorous (MRP) is used to assess Transitional Water Bodies and not Coastal. TSAS Thresholds are consistent with Transitional water limits in Table 9

Chlorophyll limits for the Good to Moderate Boundary conditions in Table 8 are lower than those used as TSAS thresholds, i.e. 5 to 10 microg/l (Median) and 10 to 20 microg/l (90%ile) versus TSAS values of 10 to 15 median and 20 to 30 (95%ile).

DO % Sat, 95%iles, Upper and Lower limits. TSAS Thresholds are consistent with Transitional water limits in Table 9. In addition, TSAS Thresholds, dictated by salinity values, result in consistency with Coastal water limits in Table 9.

In addition

BOD (95%ile) value < or =4 mg/l applies to Transitional water bodies only in Table 9

Compliance with Standards

Trophic Status Assessment

Refer to Summary, 2015-2010 Trophic Status Tables of Results and in addition graphs of individual parameters for years 2010 to 2015. Note: While 2015 Threshold values are given in the graphs and are indicative of quality overall, they are relevant for 2015 only and reference should be made to tables only for pass/failure of particular years parameters.

Category A: Nutrient Enrichment

DIN: Dissolved Inorganic Nitrogen, (Ammonium plus Nitrate & Nitrite)

Winter DIN test results in 2015 exceeded the Thresholds at C9 Tivoli, and C7 Blackrock Castle, (C7 marginally), the locations nearest Cork City. This is a dis-improvement from recent years as demonstrated by Tables and Graph of Winter DIN- Median between 2010 and 2015 inclusive, whereby Winter DIN threshold was exceeded at C9 only in 2012 and all Winter DIN thresholds were exceeded each year in each location prior to that, 2011, 2010 etc.

Summer DIN results for 2015 were all in compliance with Thresholds.

MRP, Orthophosphate:

Both Summer and Winter MRP values for 2015 were in compliance with thresholds.

Category B: Accelerated Growth

Chlorophyll-a

All Chlorophyll-a concentration results (median and 90%ile) in 2015 for each of the 5 locations were in compliance with thresholds for TSAS and all, except the 90%ile for C7 Blackrock Castle, were also in compliance with Table 8 of SI 272 of 2009, Good-Moderate boundary conditions, ranking as Good.

Category C: Undesirable Disturbance

DO% Saturation

In 2015, 5%ile DO % Saturation results were below the lower threshold for compliance with standards, comparable to values in 2014. There was a trend in values, lowest being at C7 Blackrock Castle improving to best of 69.59% at C5, Cork Harbour.

The 2015 95%ile DO% Saturation results were in all in compliance. There was a trended increase in percentage saturation from Lough Mahon out to the Harbour but still within allowable limits by a good margin. This was an improvement over 2014 and 2013 when there were elevations above the limits.
In past years coastal blooms of *Phaeocystis Pouchetti or a.sanguinea* have explained DO % Sat. 95%ile values above the threshold limits.

BOD

All mean and 95%ile values were within the Good status requirements of SI 272 of 2009 for all 5 monitoring locations in 2013.

Trends

The trend for most parameters in general is for an improvement in water quality as one travels downstream from the smaller water body towards the larger water body and from the more dense settlement towards the more diffuse population.

Overall Trophic Status

The locations tested by Cork City Council, C9, C7, C8, C6 & C5, qualify as ***Intermediate*** *S*tatus in 2015, as was the case also for 2014 and back to 2011 inclusive.

The locations tested by Cork City Council, C7, C8, C6 & C5, qualified as ***Unpolluted*** *S*tatus in 2012. C9 at Tivoli, nearest the city qualified as ***Intermediate*** Status

The locations tested by Cork City Council, C5 to C9, qualify as ***Intermediate*** status in 2011 and 2009.

In 2010 however the values for C8, Mid Lough Mahon and C7, Blackrock Castle, Lower lee Estuary result in a ***Potentially Eutrophic*** status, due to the exceedances of the Category B, Chlorophyll parameters, unlike other years tested. C9 was on the balance point in 2010 between *Intermediate* and *Potentially Eutrophic,* when salinity is taken into consideration as explained previously. The Category B, Chlorophyll, parameters did not exceed the thresholds by more than 15%.

Comparison with EPA /WFD monitoring

EPA Monitoring Data: No data was available from the EPA for 2015 at time of writing, however 2014 data is analysed and attached.

EPA Sample data for 2014, indicate that the area around C9 Tivoli, (Lower Lee Estuary) is Eutrophic, failing in all three categories. Lough Mahon passes as *Intermediat*e status whereas on EPA data Cork Harbour and Outer Cork Harbour are deemed *Unpolluted*. This is at varience with the City Council data for that period with respect to status, which indicates the status for all four water bodies Lower Lee Estuary, Lough Mahon and Cork Harbour and outer Cork Harbour as *Intermediate.*

Drilling further into the information for Lower Lee Estuary, there is only one sampling location, LE160, which fails as Eutrophic, while the other three locations LE150, LE170 and LE180 all are deemed intermediate. LE160 is the only location which exhibits an excessively high value for the 90%ile of Chlorophyll-A although LE 170 has indications of stress.

Other Monitored Parameters

Acidification Status, pH

pH for all locations and seasons ranged between a maximum of 8.2 and a minimum of 7.6. This is well within the range between 6.0 and 9.0 cited in IS 272 of 2009 Table 9

Temperature

Temperature ranged from a maximum of 18.1 degrees C. in summer, to a minimum of 11.0 degrees C. in winter. Differences which are noted in temperatures, at the nearest points to Primary discharge at each sampling event, changes with sampling depth, and are not dissimilar to comparable changes at other sampling locations.

Total Ammonia

There is no standard requirement for Transitional or Coastal waters for Total Ammonia in SI 272 of 2009. For River water, the Good status, mean and 95%ile limits, is Less than or equal to 0.065 and 0.14 mg/l respectively. When ammonia is present in levels much above 0.1 mg/l N, sewage or industrial contamination may be indicated. All Summer & Winter 95%ile values were above this level, and also the SI 272 95%ile Limit.

TON, Total Oxidized Nitrogen (Nitrate + Nitrite)

Given that Nitrite concentrations are normally only 1-2 % of Nitrate, the value of TON generally reflects the concentration of nitrate in the water. High levels of nitrate in rivers can indicate significant run off from agricultural land but also can indicate the presence of sewage. Monitoring of tributaries contributing to the Lee within the City shows that Nitrate levels are quite high, i.e *Bad*, or close to *Bad* (in excess of 5.6 mg/l N,) at levels of 4.8 to7.9 mg/l N, as these rivers enter the city from the agricultural land surrounding it. Data from EPA monitoring of the River Lee itself at the waterworks, before it enters the city, LE040, (2012, latest data available) has a mean TON of 2.74 and 95%ile of 3.8 mg/l N. Both Median and 95%ile values for Summer TON, generally decrease gradually with distance from the city, i.e. from C9 to C5, reflecting increased dilution factors in moving from the smaller to the larger water bodies, from the Estuary, to Lough Mahon, to Cork

Harbour, the exception in 2015 being C7 Blackrock Castle which showed slight increases. This could be due to the influence of inflows from the Glashaboy Estuary opposite Blackrock Castle. Summer 95%ile concentrations at C9 Tivoli in 2015 are 2.3 mg/l whereas concentration is 0.1mg/l N at C5, Cork Harbour. Winter TON 95%ile values vary throughout, ranging from 3.288mg/l at C9, Tivoli, reducing to 0.41 mg/l at C5, Cork Harbour.

Total Nitrogen (organically bound Nitrogen incl Ammonia, plus Nitrate and Nitrite)

Concentration values are not dissimilar to TON with increases reflecting the addition of ammonia. The impact of nitrate concentrations would appear to make up the largest percentage of the Total Nitrogen impact on the waters. i.e. 2015 Worst case, winter 95%ile values at C7 Blackrock Castle, of 3.9mg/l for Total Nitrogen Vs 0.377mg/l for Ammonia and 2.3 mg/l for TON at same location.

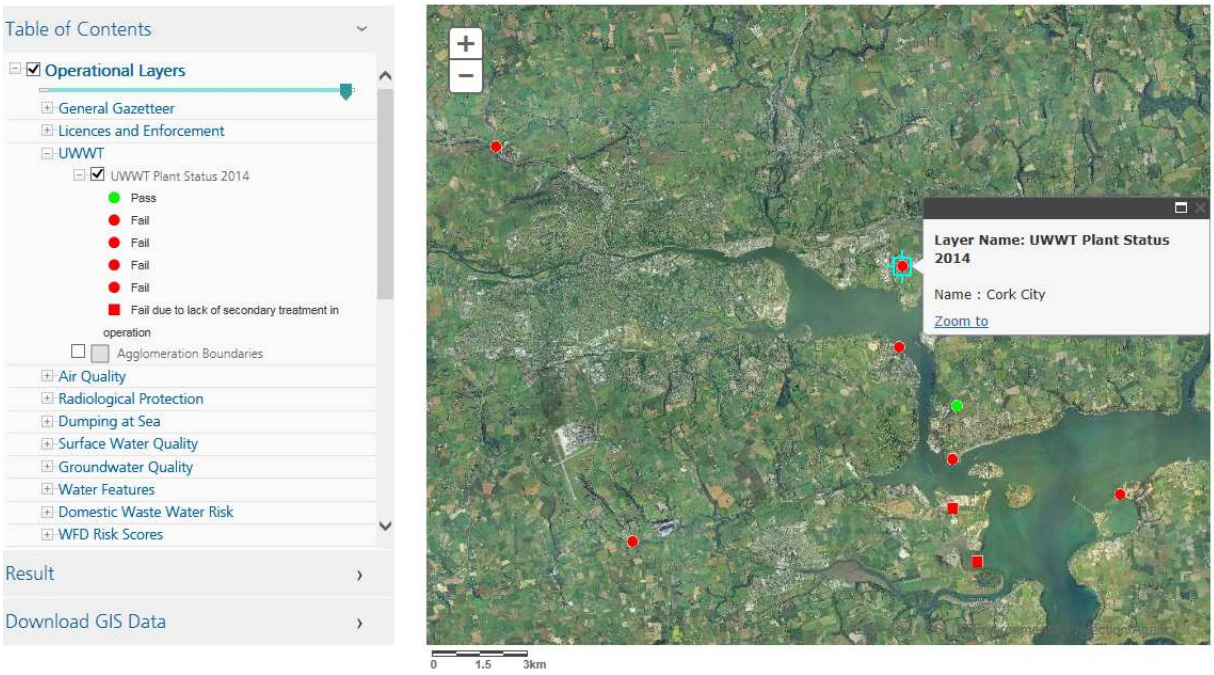
Conclusions

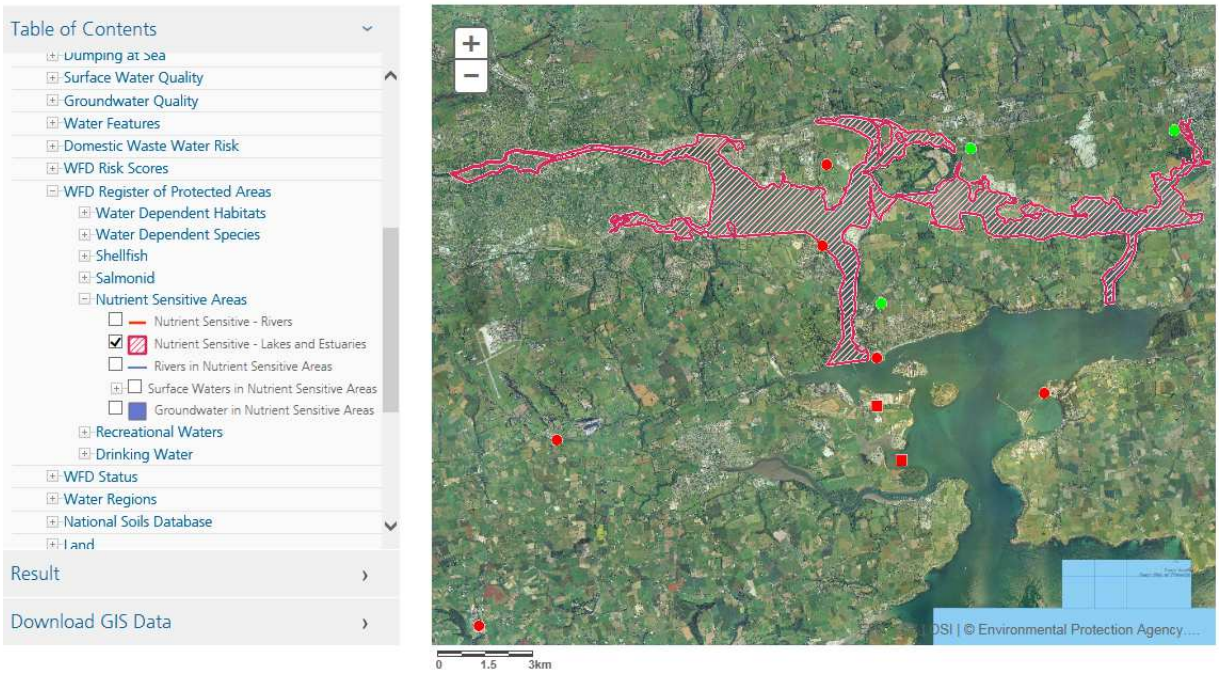
While conditions are not yet ideal, major improvement has been made to the Trophic Status of the Lee Estuary and Cork Harbour. This improvement should be attributed in the main to the construction of the Carrigrennan WWTP, as well as other treatment plant improvements in the area. Due to the complexity of the Harbour it is difficult to assign responsibility for parameter improvements or indeed exceedances to any particular input, being a product of the diffuse inputs into the water body. Nitrate levels in the rivers before entry to the city would appear to be a factor in the levels of Nitrate, DIN etc monitored in the Lower Lee Estuary and would also indicate similar Nitrate inflows from other river sources are also a possibility within the Harbour itself.

The Primary Discharge from Cork City is into Lough Mahon at Carrigrennan. This is the water body that has shown the greatest improvement in water quality over the past number of years since construction of the WWTP. The effects of secondary discharges are still evident in the poorer quality of water parameters in the Lower Lee Estuary. This area is closest to the City population and the bulk of the secondary discharges and is an area also influenced by inflows from the Glashaboy River. The Glashaboy estuary has been indicated as Potentially Eutrophic in the 2010-2012 EPA Trophic Status report and may be contributing to the raised levels being experienced in the adjacent Blackrock Castle, C7 monitoring location.

UWWT Plant Status 2014

Cork City fails in UWWT Plant Status due to a lack of Tertiary Treatment, as discharge from the WWTP at Carrigrennan is into designated Nutrient Sensitive Waters

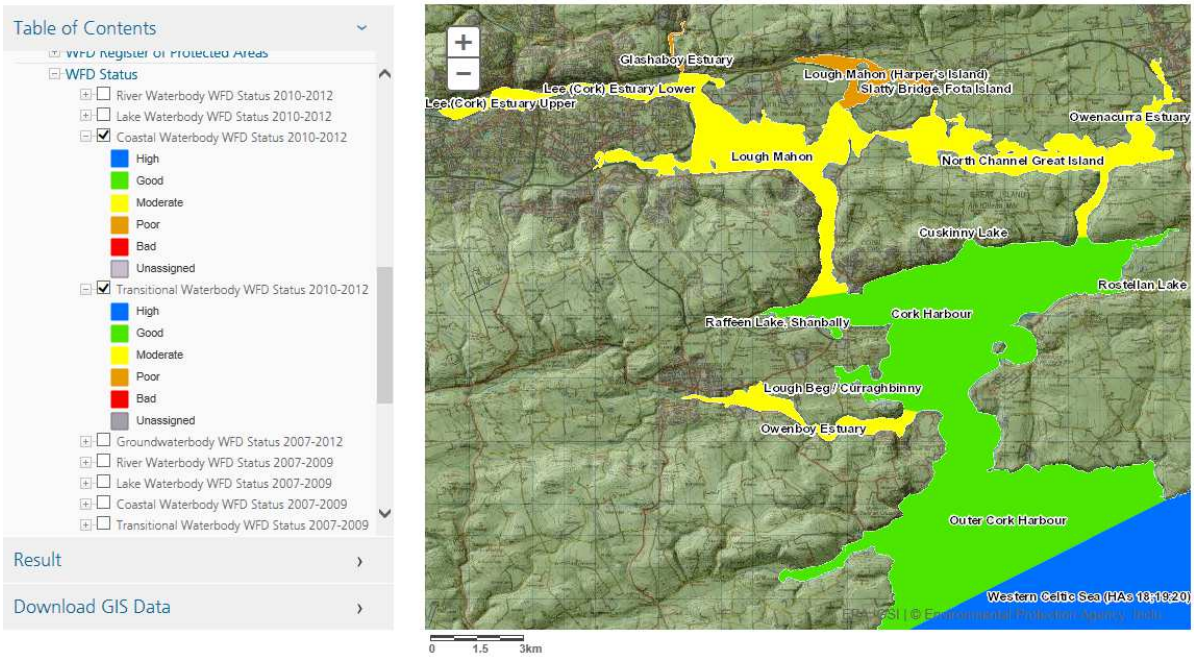




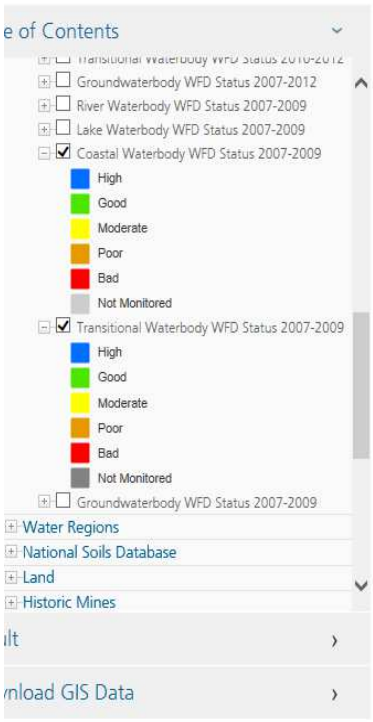
Ecological Status

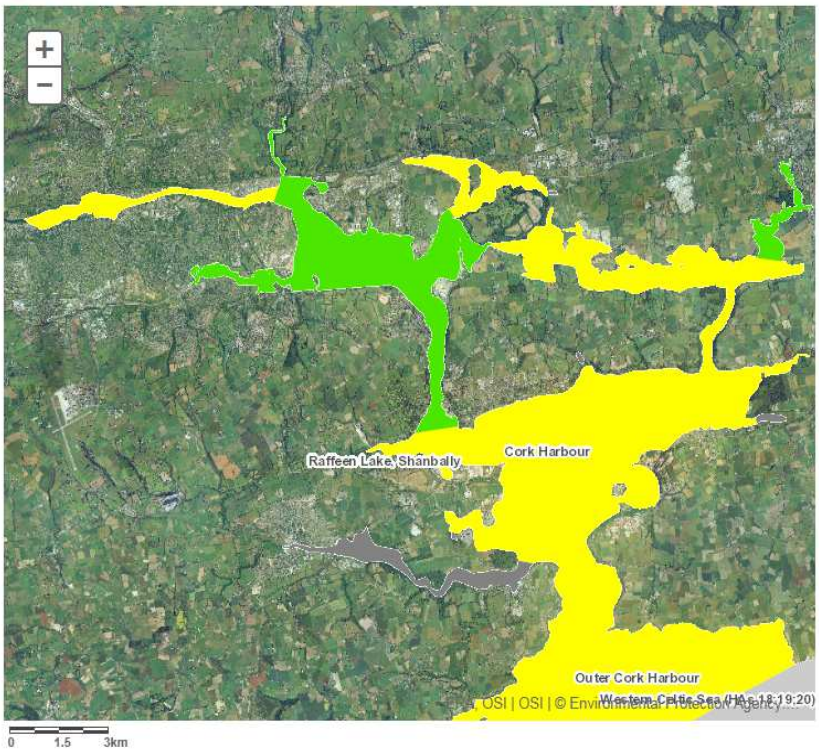
The most recent **Water Framework Directive** information, 2010 to 2012, available on the EPA Envision Website, designates the overall status of the Upper and Lower Lee Estuaries, Lough Mahon, North Channel Great Island and Owenacurra Estuary as Transitional Water Body – **Moderate**- Status. The Glashaboy Estuary and Harpers Island are designated as **Poor** Status. This is a dis-improvement from the previous 2007-2009 WFD Status where Lough Mahon and Glashaboy and Owenacurra Estuaries were both designated **Good** and all other Transitional waters designated **Moderate**. In contrast Cork Harbour and Outer Cork Harbour, Coastal waters, in 2010-2012 are designated as **Good** Status whereas previously in 2007-2009 they were designated **Moderate**. The overall objective is to restore waters to Good status by 2021. They are all designated at Risk Level 1a-At Risk. Ref *Water Matters SWRBD July 2010.*

2010-2012

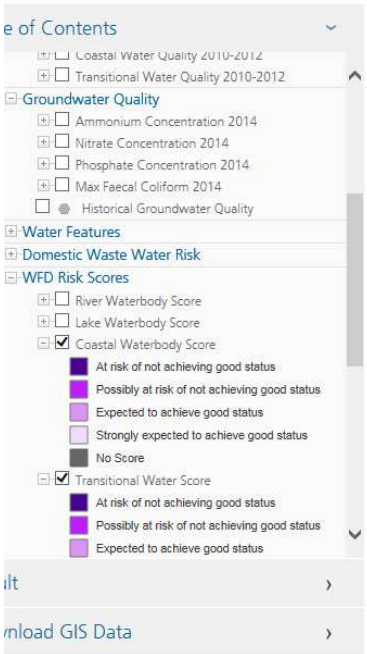


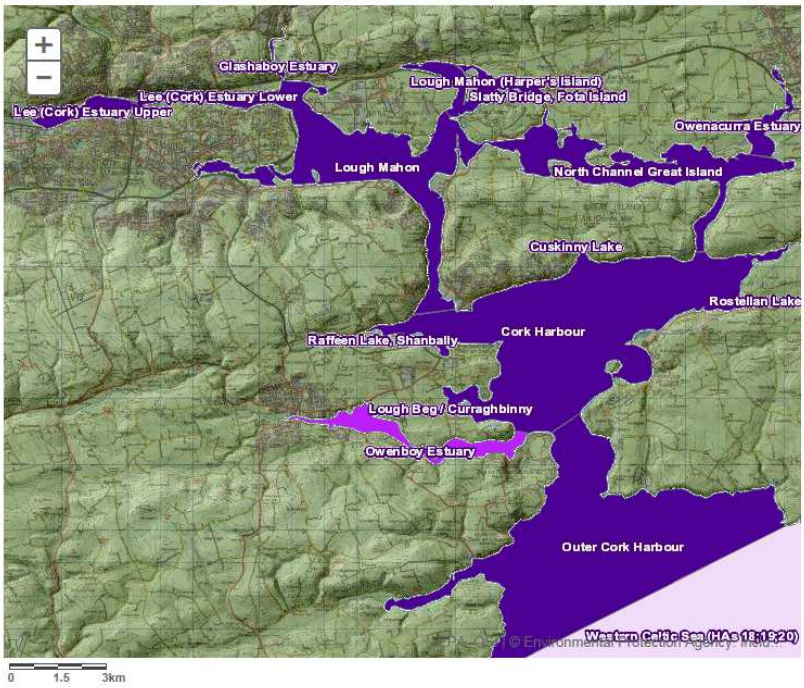
2007-2009





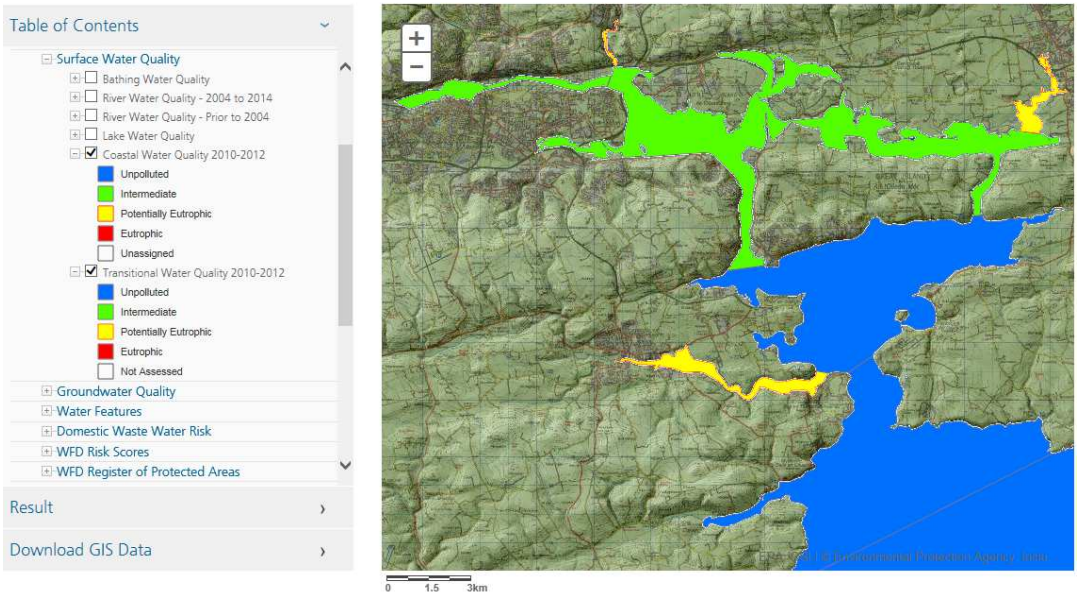
Risk Levels



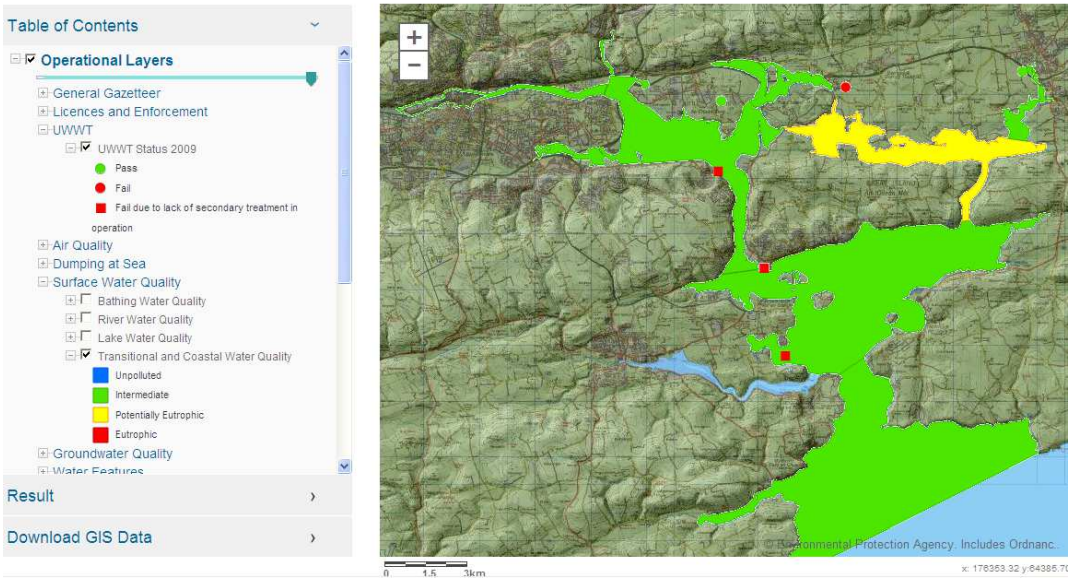


Trophic Status

The latest Update, for the period **2010-2012,** the **Surface Water Quality** information available on the EPA Envision website designated the Lower Lee Estuary and Lough Mahon as Transitional Water Body –**Intermediate**- Status, North Channel Great Island was designated also as Transitional Water Body –**Intermediate**- Status, and Cork Harbour, Coastal waterbody was designated as **-Unpolluted** –Status



For the period **2008-2010** the **Surface Water Quality** information available on the EPA Envision website designated the Lower Lee Estuary and Lough Mahon as Transitional Water Body –**Intermediate**- Status, North Channel Great Island was designated as Transitional Water Body –**Potentially Eutrophic**- Status, and Cork Harbour, Coastal waterbody as –**Intermediate -**Status.



An assessment of the Trophic Status of estuaries and bays in Ireland, was completed by the EPA in March 2001, before the WWTP was constructed at Carrigrennan for the Cork city agglomeration. In the Lee Estuary/Lough Mahon the criteria for DIN, MRP and Chlorophyll were exceeded and there was de-oxygenation which breached the lower limit (5%ile) for dissolved oxygen. With all three elements of the criteria breached the area was assessed as ***Eutrophic*** at that time.

Shellfish

The Shellfish Directive (2006/113/EC) is enacted in Ireland under S.I. 268 EC (Quality of Shellfish Waters) regulations 2006 and as amended by S.I. 55 0f 2009 and S.I 464 0f 2009. Shellfish Waters Mandatory and Guide values for parameters are listed in schedules 2 and 4 respectively of SI 268 of 2006.

There are 4 designated Shellfish areas in Cork Harbour. The nearest shellfish area to the WWTP discharge location is Cork Great Island North Channel. The shortest pathway to this from the Primary Discharge outfall, via the Belvelly Channel, a narrow tidal passage, measures a distance of 4.7 km to the Shellfish Great Island North Channel designated site. The alternative pathway to this Shellfish water is via Marloag Point and the main Ballynacorra River Channel, a distance of 16.8 km. There are also three designated shellfish areas in the adjacent tidal waters at Rostellan, namely Rostellan North, Rostellan South, and Rostellan West, These are 13.3 km, 13.27 km and 12.2 km, respectively, distant from the Cork City Primary discharge.

Shellfish Quality

Cork Harbour is currently Classified “B” for Oysters in the Shellfish classification based on E.Coli Monitoring,(<4,600 *E.coli* MPN $100g^{-1}$ shellfish flesh), i.e. Must be depurated, heat treated or relayed to meet class A requirements.

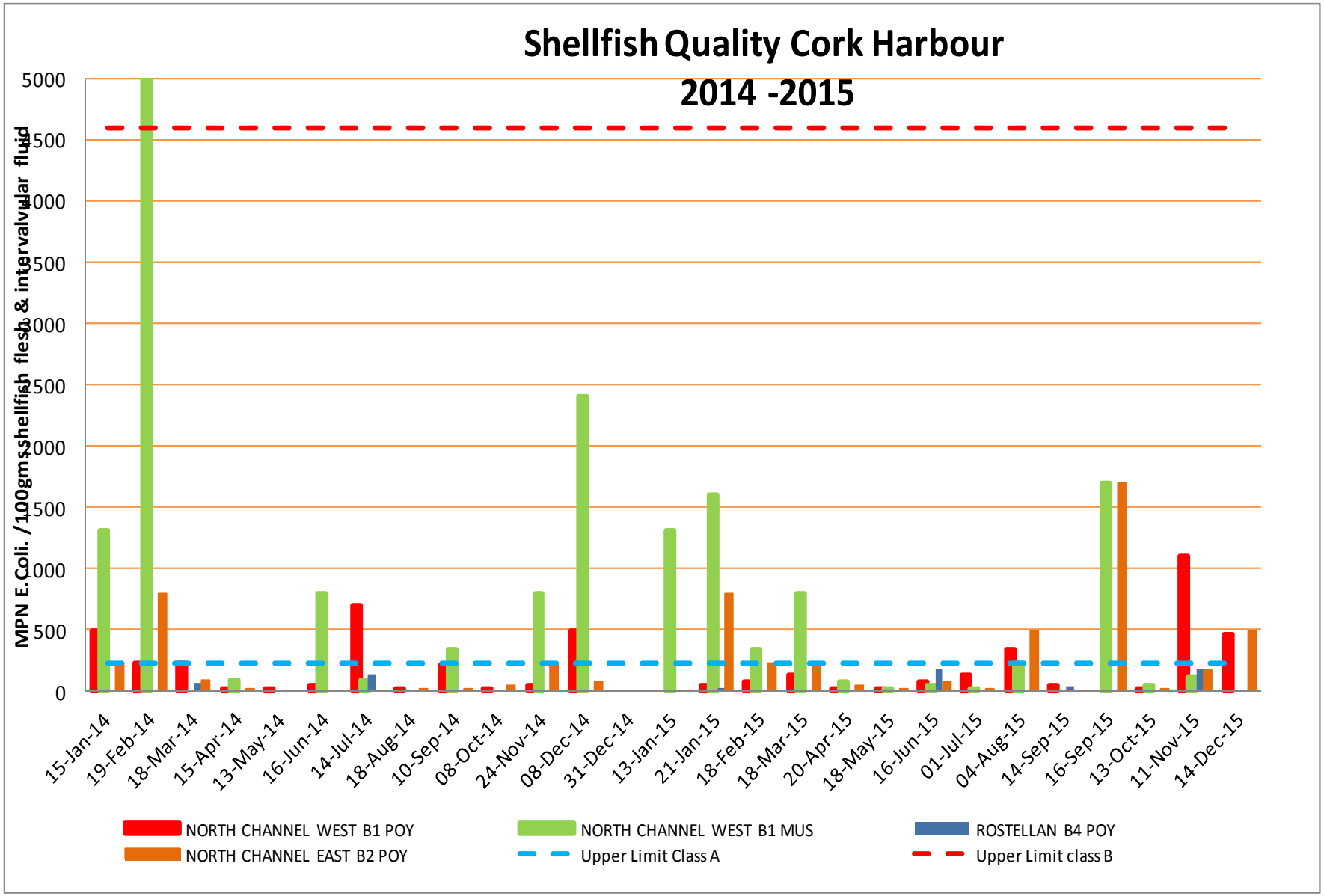
The Guide value under S.I.268 of 2006 for Faecal Coliforms is 300 MPN 100g-1 Shellfish flesh.

There is no mandatory value given for Faecal Coliforms.

Monitoring

The Sea Fisheries Protection Agency samples three sites within Cork Harbour as follows:
Cork Harbour North Channel East: Oysters (Area is closed and not in production)
Cork Harbour North Channel West: Oysters and mussels
Rostellan: Oysters. (Sampled on a quarterly basis as the site has not been in production for some time, and SFPA are now experiencing difficulties in finding live oysters for analysis.)
Results of Monitoring are shown in the attached graph.

Results of monitoring for 2015 would indicate that all areas and species tested complied with the Upper limit Class B but not Upper Limit Class A


Shellfish Quality Cork Harbour
2014 -2015
MPN E.Coli. /100gms shellfish flesh & intervalvular fluid
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
15-Jan-14
19-Feb-14
18-Mar-14
15-Apr-14
13-May-14
16-Jun-14
14-Jul-14
18-Aug-14
10-Sep-14
08-Oct-14
24-Nov-14
08-Dec-14
31-Dec-14
13-Jan-15
21-Jan-15
18-Feb-15
18-Mar-15
20-Apr-15
18-May-15
16-Jun-15
01-Jul-15
04-Aug-15
14-Sep-15
16-Sep-15
13-Oct-15
11-Nov-15
14-Dec-15
NORTH CHANNEL WEST B1 POY
NORTH CHANNEL WEST B1 MUS
ROSTELLAN B4 POY
NORTH CHANNEL EAST B2 POY
Upper Limit Class A
Upper Limit class B

Ambient Monitoring, C5 to C9

Lee Estuary, Lough Mahon & Cork Harbour

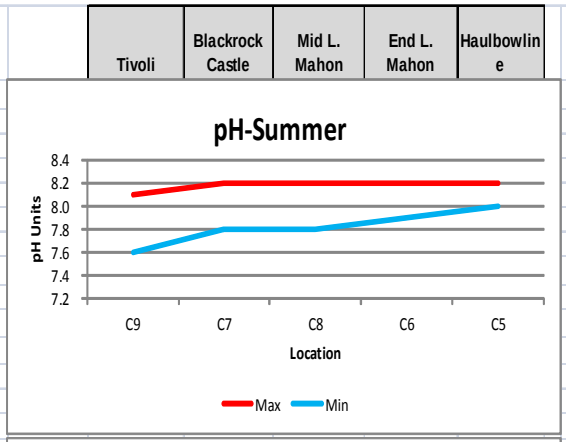
Monitoring Test Results Summary

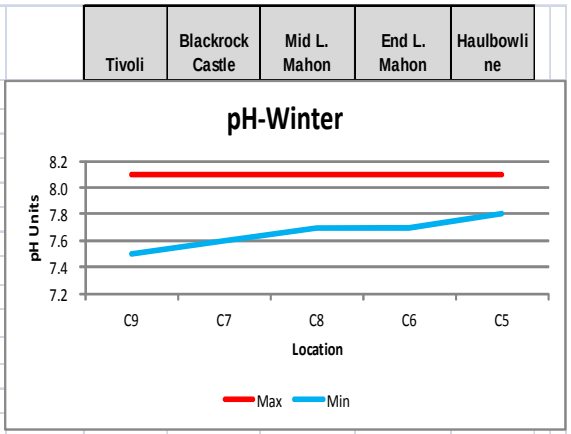
Cork City Council Data 2015

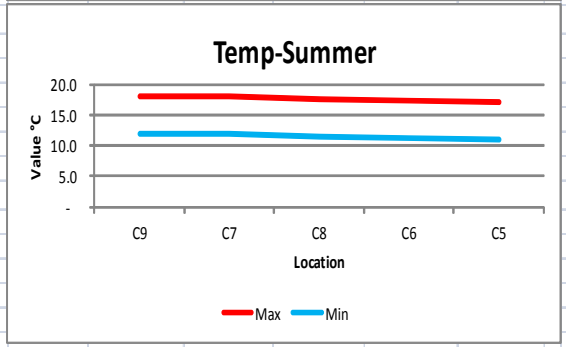
and

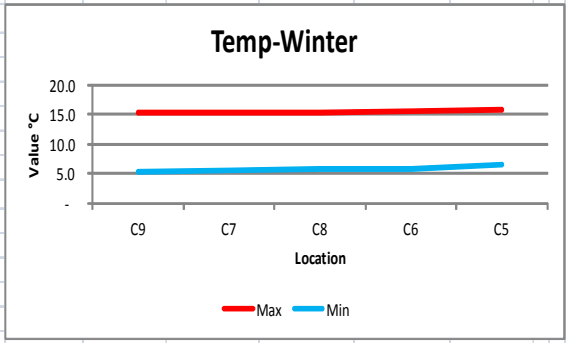
Summary 2015-2010 Trophic Status

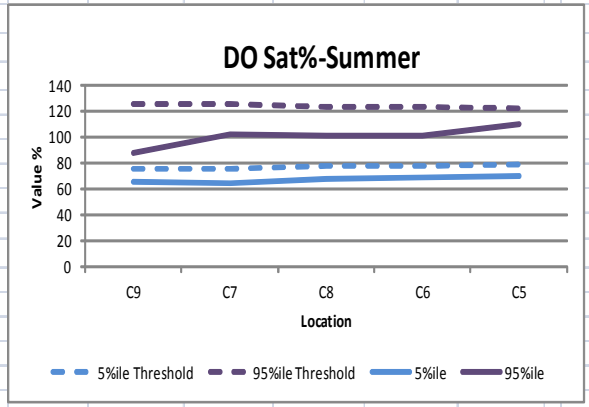
Season	Tivoli	Blackrock Castle	Mid L. Mahon	End L. Mahon	Haulbowline
pH -Summer	**C9**	**C7**	**C8**	**C6**	**C5**
5%ile	7.7	7.8	8.0	8.0	8.0
95%ile (90%ile Chlor)	8.1	8.2	8.2	8.2	8.2
Max	8.1	8.2	8.2	8.2	8.2
Median	8.0	8.1	8.1	8.1	8.1
Min	7.6	7.8	7.8	7.9	8.0
No.Samples	24	36	36	36	36
pH -Winter	**C9**	**C7**	**C8**	**C6**	**C5**
5%ile	7.5	7.6	7.8	7.8	7.8
95%ile (90%ile Chlor)	8.0	8.1	8.1	8.1	8.1
Max	8.1	8.1	8.1	8.1	8.1
Median	7.9	8.0	8.0	8.0	8.1
Min	7.5	7.6	7.7	7.7	7.8
No.Samples	16	24	24	24	24
Temp -Summer	**C9**	**C7**	**C8**	**C6**	**C5**
5%ile	12.2	12.5	11.9	11.6	11.6
95%ile	17.5	17.9	17.4	17.3	16.9
Max	18.1	18.0	17.6	17.4	17.1
Median	16.2	15.9	15.5	15.2	14.4
Min	12.0	11.8	11.4	11.2	11.0
No.Samples	24	36	36	36	36
Temp -Winter	**C9**	**C7**	**C8**	**C6**	**C5**
5%ile	5.5	6.0	5.9	6.3	6.7
95%ile	15.1	15.1	15.3	15.3	15.8
Max	15.2	15.2	15.3	15.4	15.8
Median	9.2	9.2	9.1	9.3	8.9
Min	5.4	5.5	5.7	5.8	6.5
No.Samples	16	24	24	24	24
DO sat% - Summer	**C9**	**C7**	**C8**	**C6**	**C5**
5%ile Threshold	**75**	**75**	**77.1**	**77.2**	**78**
95%ile Threshold	**125**	**125**	**122.9**	**122.8**	**122**
5%ile	65.0	63.9	67.4	68.6	69.6
95%ile	87.5	102.3	100.5	101.2	109.0
Max	99.1	106.5	106.2	105.5	113.2
Median	73.9	78.7	80.2	82.1	87.1
Min	62.4	61.8	65.4	67.2	63.8
No.Samples	24	36	36	36	36
DO sat% -Winter	**C9**	**C7**	**C8**	**C6**	**C5**
5%ile	62.6	63.6	63.9	65.4	61.4
95%ile	98.9	114.9	102.3	102.7	113.5
Max	104.5	121.5	109.4	107.1	117.8
Median	80.3	80.9	79.6	79.2	83.7
Min	61.7	62.3	62.5	61.2	4.2
No.Samples	16	24	24	24	24

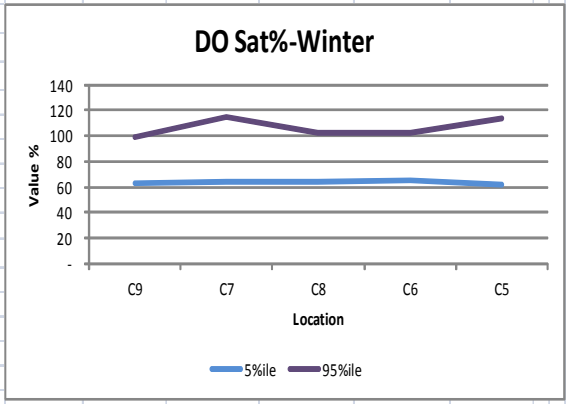




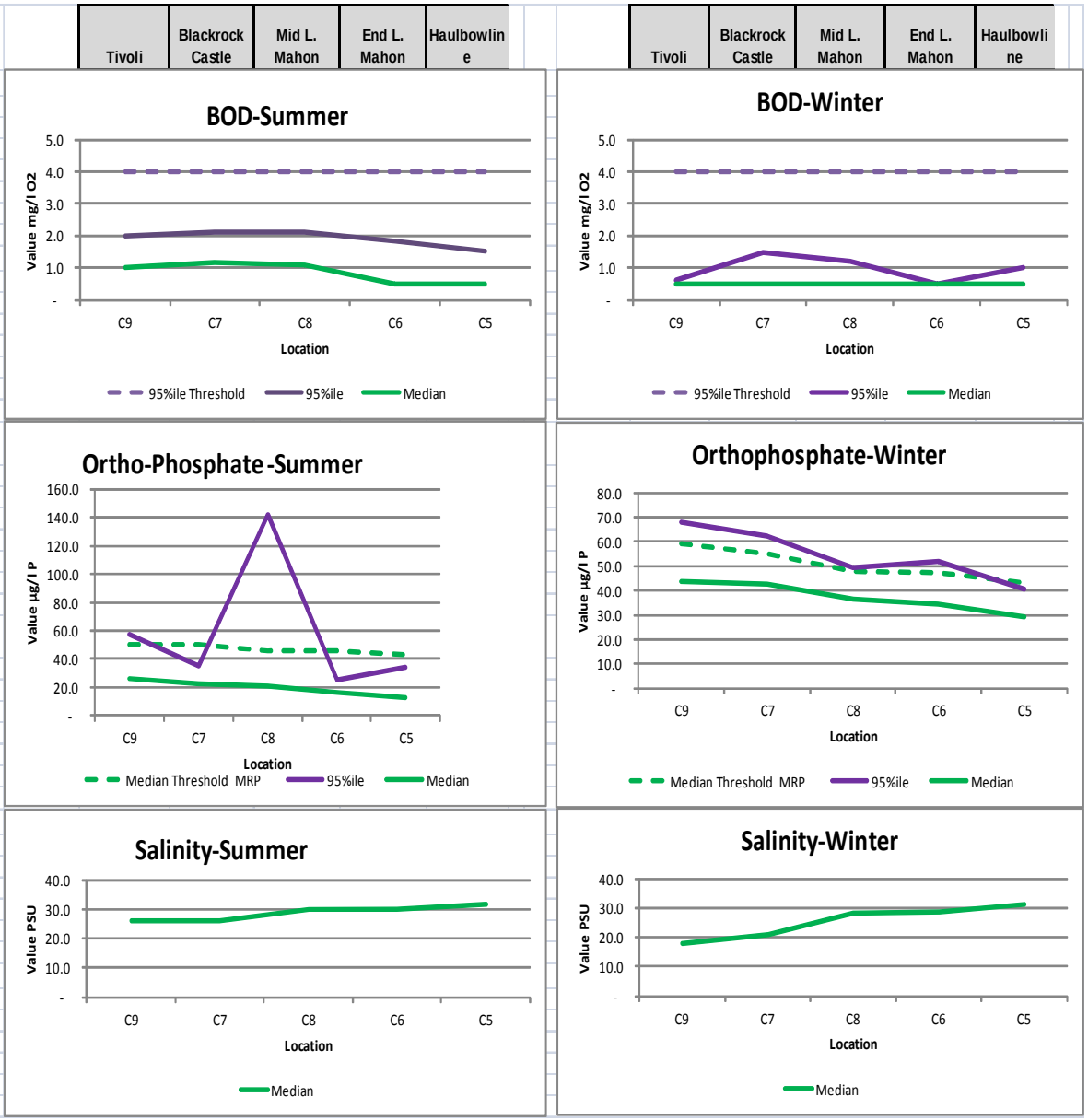




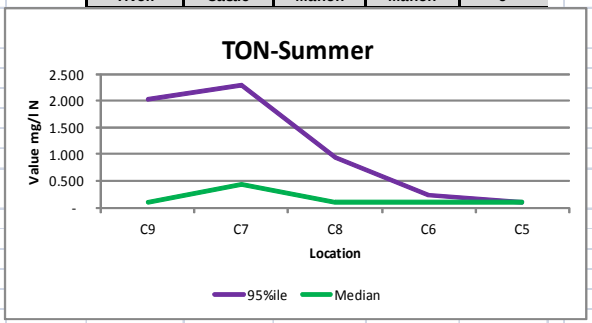


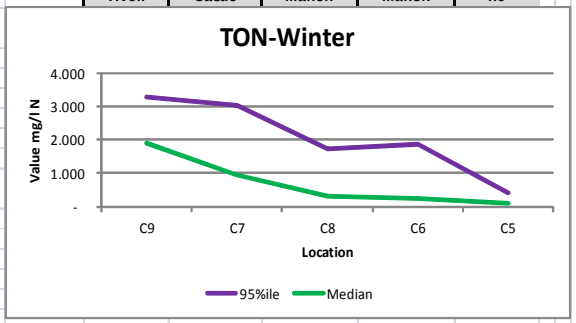


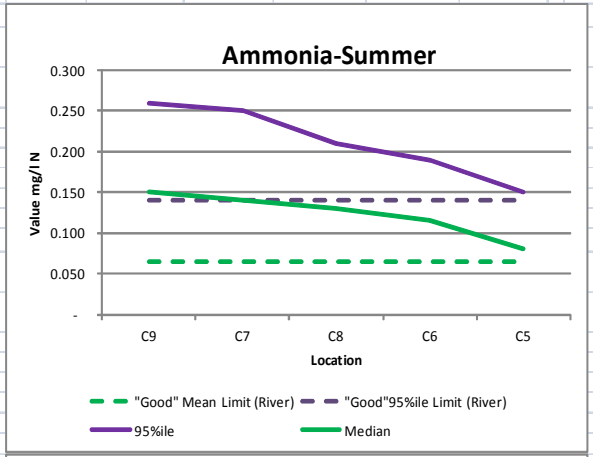
	Tivoli	Blackrock Castle	Mid L. Mahon	End L. Mahon	Haulbowline
BOD -Summer	C9	C7	C8	C6	C5
95%ile Threshold	4.0	4.0	4.0	4.0	4.0
5%ile	0.5	0.5	0.5	0.5	0.5
95%ile	2.0	2.1	2.1	1.8	1.5
Max	2.2	2.6	2.2	1.9	1.6
Median	1.0	1.2	1.1	0.5	0.5
Min	0.5	0.5	0.5	0.5	0.5
No.Samples	24	36	36	36	36
BOD -Winter	C9	C7	C8	C6	C5
95%ile Threshold	4.0	4.0	4.0	4.0	4.0
5%ile	0.5	0.5	0.5	0.5	0.5
95%ile	0.6	1.5	1.2	0.5	1.0
Max	1.0	1.6	1.6	1.1	1.1
Median	0.5	0.5	0.5	0.5	0.5
Min	0.5	0.5	0.5	0.5	0.5
No.Samples	16	24	24	24	24
Ortho-Phosphate - Summer	C9	C7	C8	C6	C5
Median Threshold MRP	**50.0**	**50.0**	**45.8**	**45.6**	**43.1**
5%ile	17.5	10.0	5.0	5.0	5.0
95%ile	57.3	35.0	141.8	25.0	34.0
Max	84.0	46.0	207.0	36.0	167.0
Median	26.0	22.5	21.0	16.5	13.0
Min	16.0	5.0	5.0	5.0	5.0
No.Samples	24	36	36	36	36
Ortho-Phosphate-Winter	C9	C7	C8	C6	C5
Median Threshold MRP	**59.1**	**55.2**	**48.0**	**47.4**	**43.3**
5%ile	26.5	25.5	24.6	20.3	12.8
95%ile	68.0	62.3	49.4	51.9	40.9
Max	74.0	67.0	54.0	79.0	42.0
Median	43.5	42.5	36.5	34.5	29.0
Min	19.0	22.0	22.0	16.0	10.0
No.Samples	16	24	24	24	24
Salinity-Summer	C9	C7	C8	C6	C5
5%ile	2.2	3.5	20.5	25.0	28.2
95%ile	31.3	30.2	32.4	33.3	34.2
Max	31.7	31.0	32.5	33.6	34.4
Median	26.0	26.0	30.1	30.2	31.9
Min	1.3	1.7	4.3	8.5	26.6
No.Samples	24	36	36	36	36
Salinity -Winter	C9	C7	C8	C6	C5
5%ile	2.7	6.0	16.7	16.4	26.7
95%ile	30.9	30.2	30.8	32.3	34.3
Max	31.4	30.2	31.4	32.5	34.5
Median	17.9	21.0	28.2	28.5	31.1
Min	2.2	5.4	13.1	15.0	21.4
No.Samples	16	24	24	24	24

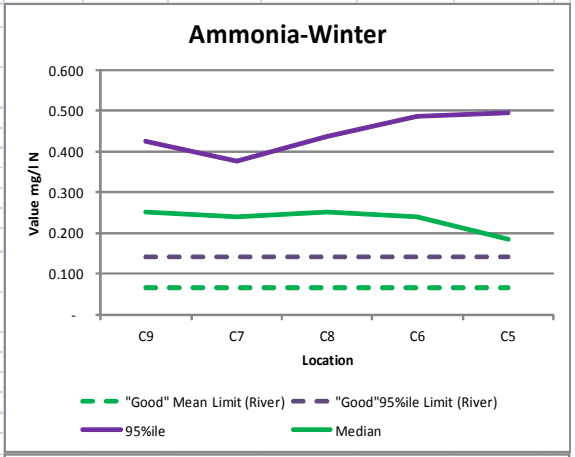


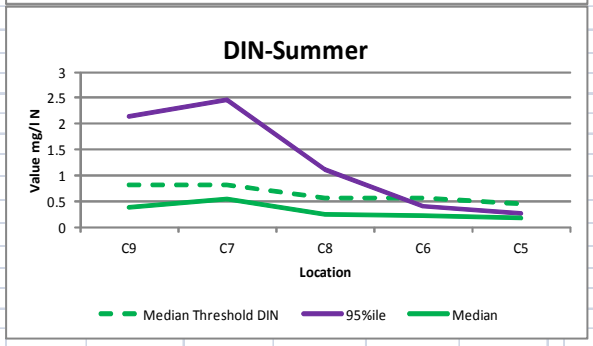
	Tivoli	Blackrock Castle	Mid L. Mahon	End L. Mahon	Haulbowline
Total Oxidised Nitrogen - Summer	**C9**	**C7**	**C8**	**C6**	**C5**
5%ile	0.100	0.100	0.100	0.100	0.100
95%ile	2.030	2.300	0.950	0.245	0.100
Max	3.720	3.280	2.400	3.140	0.500
Median	0.100	0.425	0.100	0.100	0.100
Min	0.100	0.100	0.100	0.100	0.100
No.Samples	24	36	36	36	36
Total Oxidised Nitrogen - Winter	**C9**	**C7**	**C8**	**C6**	**C5**
5%ile	0.100	0.100	0.100	0.100	0.100
95%ile	3.288	3.040	1.730	1.849	0.410
Max	3.460	3.930	2.440	2.000	1.070
Median	1.905	0.960	0.325	0.240	0.100
Min	0.100	0.100	0.100	0.100	0.100
No.Samples	16	24	24	24	24
Ammonia -Summer	**C9**	**C7**	**C8**	**C6**	**C5**
"Good" Mean Limit (River)	**0.065**	**0.065**	**0.065**	**0.065**	**0.065**
"Good"95%ile Limit (River)	**0.140**	**0.140**	**0.140**	**0.140**	**0.140**
5%ile	0.072	0.060	0.070	0.055	0.028
95%ile	0.259	0.250	0.210	0.190	0.150
Max	0.300	0.270	0.330	0.220	0.200
Median	0.150	0.140	0.130	0.115	0.080
Min	0.050	0.050	0.050	0.030	0.010
No.Samples	24	36	36	36	36
Ammonia -Winter	**C9**	**C7**	**C8**	**C6**	**C5**
"Good" Mean Limit (River)	**0.065**	**0.065**	**0.065**	**0.065**	**0.065**
"Good"95%ile Limit (River)	**0.140**	**0.140**	**0.140**	**0.140**	**0.140**
5%ile	0.100	0.082	0.153	0.122	0.062
95%ile	0.425	0.377	0.437	0.485	0.496
Max	0.470	0.470	0.580	0.630	0.510
Median	0.250	0.240	0.250	0.240	0.185
Min	0.070	0.070	0.150	0.080	0.060
No.Samples	16	24	24	24	24
DIN-Summer	**C9**	**C7**	**C8**	**C6**	**C5**
Median Threshold DIN	**0.825**	**0.825**	**0.563**	**0.556**	**0.448**
5%ile	0.235	0.223	0.170	0.155	0.128
95%ile	2.137	2.455	1.115	0.413	0.263
Max	3.840	3.550	2.530	3.280	0.560
Median	0.380	0.540	0.235	0.215	0.180
Min	0.210	0.150	0.150	0.130	0.110
No.Samples	24	36	36	36	36
DIN-Winter	**C9**	**C7**	**C8**	**C6**	**C5**
Median Threshold DIN	**1.342**	**1.119**	**0.697**	**0.658**	**0.461**
5%ile	0.360	0.366	0.273	0.223	0.162
95%ile	3.463	3.150	2.007	2.065	0.776
Max	3.530	4.150	2.700	2.260	1.340
Median	2.040	1.160	0.615	0.585	0.285
Min	0.330	0.320	0.250	0.180	0.160
No.Samples	16	24	24	24	24

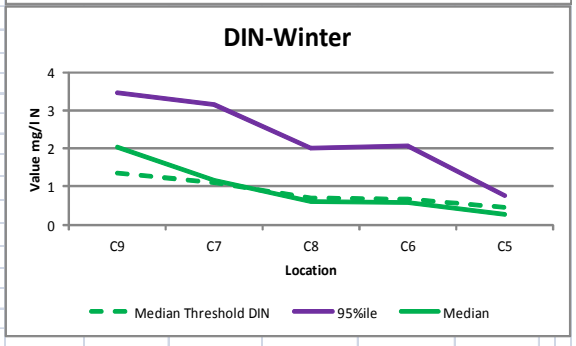




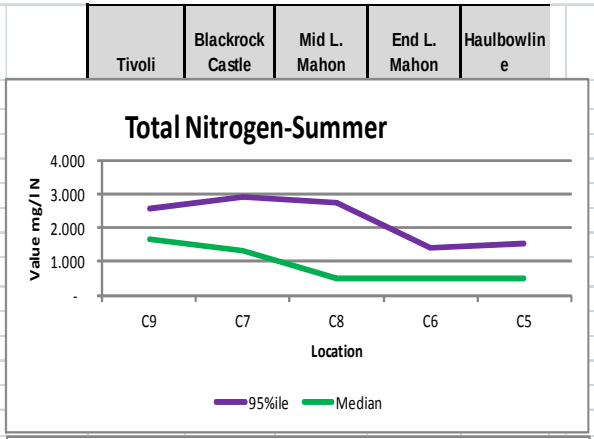


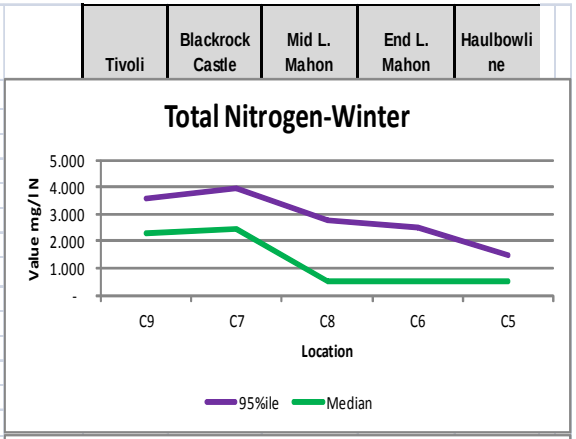


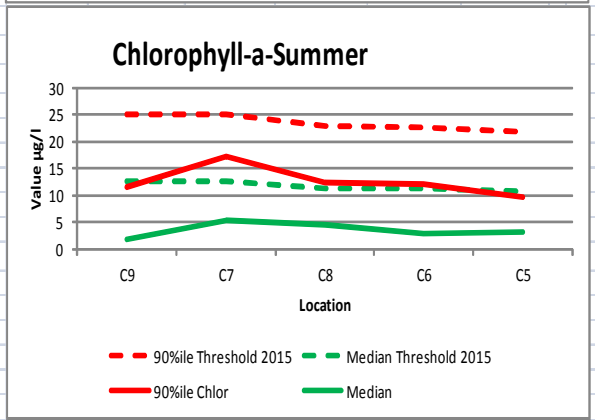


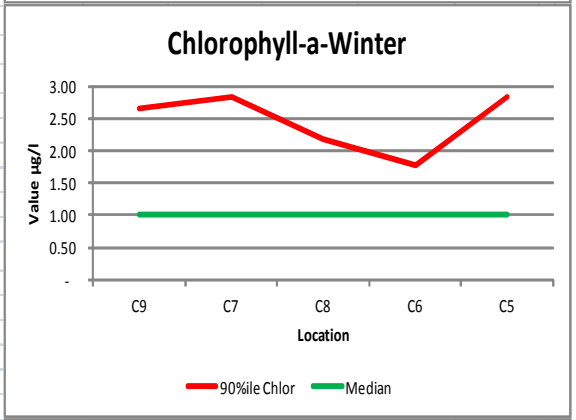


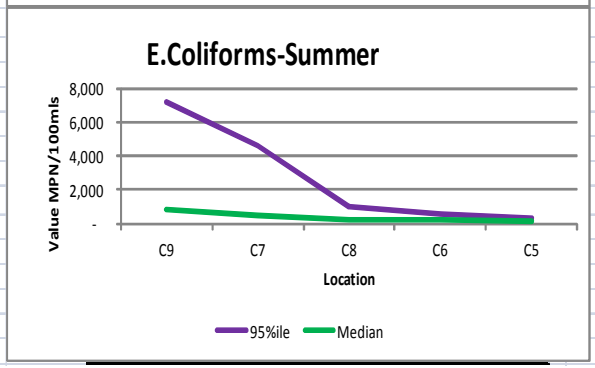
	Tivoli	Blackrock Castle	Mid L. Mahon	End L. Mahon	Haulbowline
Total Nitrogen-Summer	C9	C7	C8	C6	C5
5%ile	0.500	0.500	0.500	0.500	0.500
95%ile	2.570	2.925	2.725	1.425	1.525
Max	4.100	4.600	5.200	4.000	2.000
Median	1.650	1.300	0.500	0.500	0.500
Min	0.500	0.500	0.500	0.500	0.500
No.Samples	24	36	36	36	36
Total Nitrogen-Winter	C9	C7	C8	C6	C5
5%ile	0.500	0.500	0.500	0.500	0.500
95%ile	3.600	3.940	2.795	2.500	1.500
Max	3.900	4.400	3.400	2.800	1.900
Median	2.300	2.450	0.500	0.500	0.500
Min	0.500	0.500	0.500	0.500	0.500
No.Samples	16	24	24	24	24
Chlorophyll-a _Summer	C9	C7	C8	C6	C5
90%ile Threshold 2015	**25**	**25**	**22.74**	**22.68**	**21.75**
Median Threshold 2015	**12.5**	**12.5**	**11.37**	**11.34**	**10.83**
5%ile	1.00	1.00	1.00	1.00	1.00
90%ile Chlor	11.64	17.25	12.40	12.15	9.75
Max	17.10	21.60	16.30	16.80	14.70
Median	1.85	5.20	4.50	2.90	3.20
Min	1.00	1.00	1.00	1.00	1.00
No.Samples	24	36	36	36	36
Chlorophyll-a -Winter	C9	C7	C8	C6	C5
5%ile	1.00	1.00	1.00	1.00	1.00
90%ile Chlor	2.65	2.84	2.19	1.77	2.84
Max	3.20	4.00	3.20	3.20	6.70
Median	1.00	1.00	1.00	1.00	1.00
Min	1.00	1.00	1.00	1.00	1.00
No.Samples	16	24	24	24	24
E. Coliforms -Summer	C9	C7	C8	C6	C5
5%ile	66	122	36	39	20
95%ile	7,210	4,611	969	542	332
Max	19,863	5,794	1,500	1,576	384
Median	874	521	226	252	122
Min	31	86	10	10	10
No.Samples	24	36	36	36	36
E. Coliforms -Winter	C9	C7	C8	C6	C5
5%ile	305	424	353	250	119
95%ile	5,328	4,315	2,046	4,112	1,551
Max	5,794	4,611	6,867	4,611	2,247
Median	662	839	596	538	344
Min	266	272	327	175	52
No.Samples	16	24	24	24	24

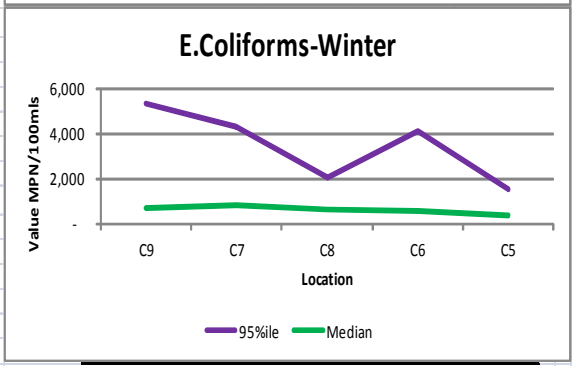




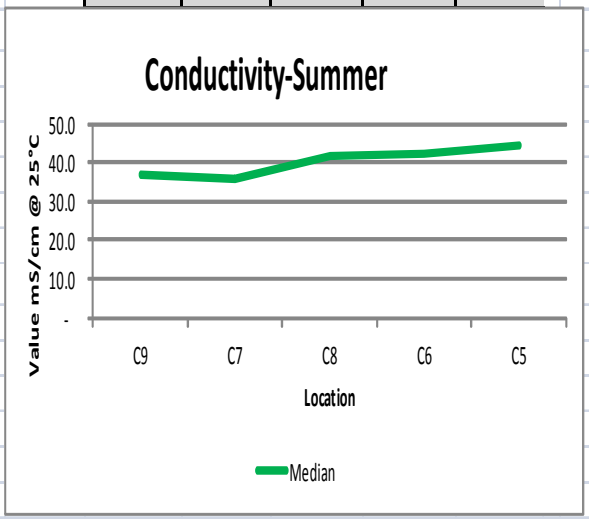


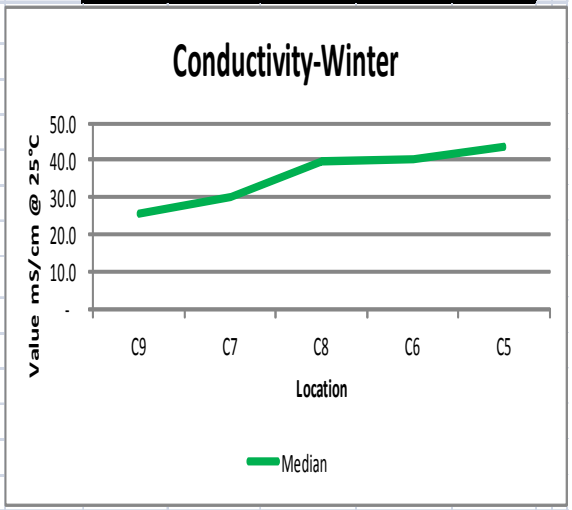






	Tivoli	Blackrock Castle	Mid L. Mahon	End L. Mahon	Haulbowline
Conductivity-Summer	C9	C7	C8	C6	C5
5%ile	3.8	5.8	29.5	35.5	39.5
95%ile	43.4	42.0	44.7	45.8	46.9
Max	43.8	42.9	44.8	46.2	47.1
Median	36.7	35.7	41.8	42.1	44.3
Min	2.4	3.1	7.0	13.1	37.4
No.Samples	24	36	36	36	36
Conductivity-Winter	C9	C7	C8	C6	C5
5%ile	4.7	9.5	24.5	24.4	37.6
95%ile	42.6	42.1	42.9	45.3	46.8
Max	43.0	42.1	43.4	52.2	47.0
Median	25.9	30.3	39.6	40.1	43.4
Min	3.9	8.5	19.5	22.3	30.9
No.Samples	16	24	24	24	24





Summary 2015 Trophic Status

Table 9, S.I. 272 of 2009

And

Comparison

Years 2015 to 2010

Note:							
Ref SI 272 of 2009	G/M Threshold	G/M Threshold					
Chloro-Median*	5	10	**PASS +**	indicates satisfies this standard also			
Chloro-90 Percentile*	10	20	**PASS +**	indicates satisfies this standard also			

				Lower Estuary C9 Tivoli 2015					Lower Estuary C7 Blackrock Castle 2015					Lough Mahon C8 Mid Mahon 2015					Lough Mahon C6 End Lough Mahon 2015					Cork Harbour C5 Haulbowline 2015				
		Salinity		17.85		26.00			20.95		26.00			28.15		30.10			28.45		30.20			31.05		31.90		
		0 PSU	35 PSU	PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU	
Category	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	1.345	2.04			FAIL	1.147	1.16			FAIL	0.687	0.615			PASS	0.668	0.585			PASS	0.503	0.285			PASS
	Winter MRP - Median	60	40	59.2	43.5			PASS	56.05	42.5			PASS	47.85	36.5			PASS	47.55	34.5			PASS	43.95	29.0			PASS
	Summer DIN - Median	2.6	0			0.825	**0.380**	PASS			0.825	**0.540**	PASS			0.563	**0.235**	PASS			0.556	**0.215**	PASS			0.448	**0.180**	PASS
	Summer MRP - Median	60	40			50.00	**26.0**	PASS			50.00	**22.5**	PASS			45.80	**21.0**	PASS			45.60	**16.5**	PASS			43.10	**13.0**	PASS
B	Chloro-Median*	15	10			12.50	**1.85**	PASS +			12.50	**5.20**	PASS +			11.37	**4.50**	PASS +			11.34	**2.90**	PASS +			10.83	**3.20**	PASS +
	Chloro-90 Percentile*	30	20			25.00	**11.64**	PASS +			25.00	**17.25**	PASS			22.74	**12.40**	PASS +			22.68	**12.15**	PASS +			21.75	**9.75**	PASS +
	Opportunistic Algae																											
C	DO %Sat - 5 Percentile	70	80			75.00	65.03	FAIL			75.00	63.93	FAIL			77.10	67.39	FAIL			77.20	68.61	FAIL			78.00	69.59	FAIL
	DO %Sat - 95 Percentile	130	120			125.00	**87.51**	PASS			125.00	**102.28**	PASS			122.90	**100.53**	PASS			122.80	**101.17**	PASS			122.00	**109.03**	PASS
	BOD 95%ile	4			0.6		2.0	PASS		1.5		2.1	PASS		1.2		2.1	PASS		0.5		1.8	PASS		1.0		1.5	PASS
						Intermediate					Intermediate					Intermediate					Intermediate					Intermediate		

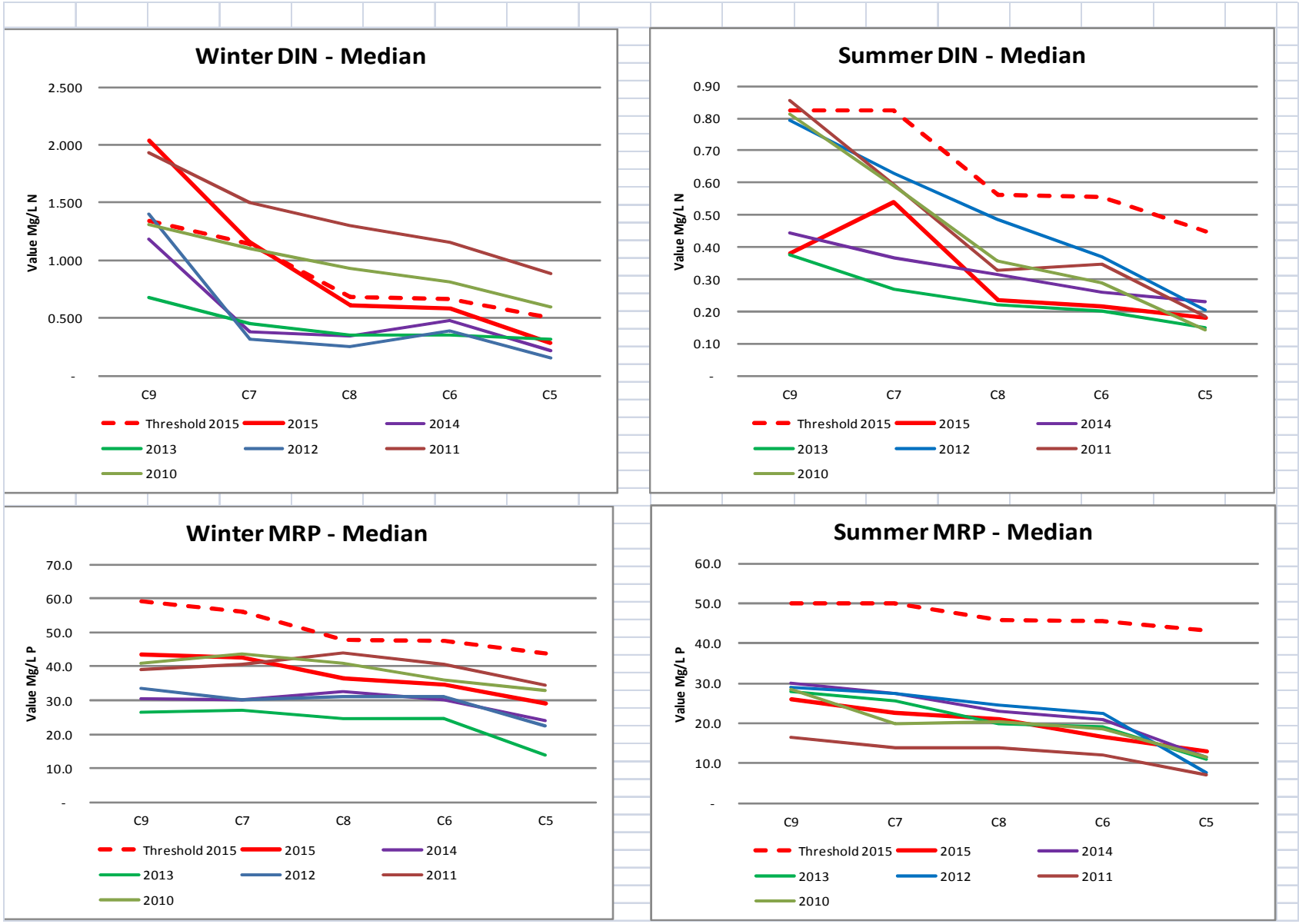
				Lower Estuary C9 Tivoli 2014					Lower Estuary C7 Blackrock Castle 2014					Lough Mahon C8 Mid Mahon 2014					Lough Mahon C6 End Lough Mahon 2014					Cork Harbour C5 Haulbowline 2014				
		Salinity		15.30		29.00			24.25		29.85			27.30		31.25			26.15		32.05			31.25		33.80		
		0 PSU	35 PSU	PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU	
Category	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	1.52	**1.265**			PASS	0.937	**0.500**			PASS	0.742	**0.350**			PASS	0.815	**0.615**			PASS	0.49	**0.230**			PASS
	Winter MRP - Median	60	40	60.00	**30.0**			PASS	51.75	**30.0**			PASS	48.70	**32.0**			PASS	49.85	**30.0**			PASS	43.75	**23.5**			PASS
	Summer DIN - Median	2.6	0			0.633	**0.45**	PASS			0.579	**0.37**	PASS			0.426	**0.32**	PASS			0.439	**0.26**	PASS			0.327	**0.23**	PASS
	Summer MRP - Median	60	40			47.00	**30.0**	PASS			46.15	**27.5**	PASS			42.75	**23.0**	PASS			42.95	**21.0**	PASS			41.20	**11.5**	PASS
B	Chloro-Median*	15	10			11.70	**1.00**	PASS +			11.45	**1.00**	PASS +			10.75	**1.00**	PASS +			10.79	**1.00**	PASS +			10.36	**1.00**	PASS +
	Chloro-90 Percentile*	30	20			23.30	**3.05**	PASS +			22.88	**3.40**	PASS +			21.55	**3.20**	PASS +			21.67	**3.35**	PASS +			20.70	**3.20**	PASS +
	Opportunistic Algae																											
C	DO %Sat - 5 Percentile	70	80			77.00	59.25	FAIL			77.00	65.65	FAIL			78.25	69.77	FAIL			78.05	70.67	FAIL			79.00	73.39	FAIL
	DO %Sat - 95 Percentile	130	120			123.00	**116.89**	PASS			123.00	**118.83**	PASS			121.75	123.16	FAIL			121.95	127.58	FAIL			121.00	135.88	FAIL
	BOD 95%ile	4			1.2		2.4	PASS		0.5		2.2	PASS		0.5		2.5	PASS		0.5		1.8	PASS		0.5		1.8	PASS
						Intermediate					Intermediate					Intermediate					Intermediate					Intermediate		

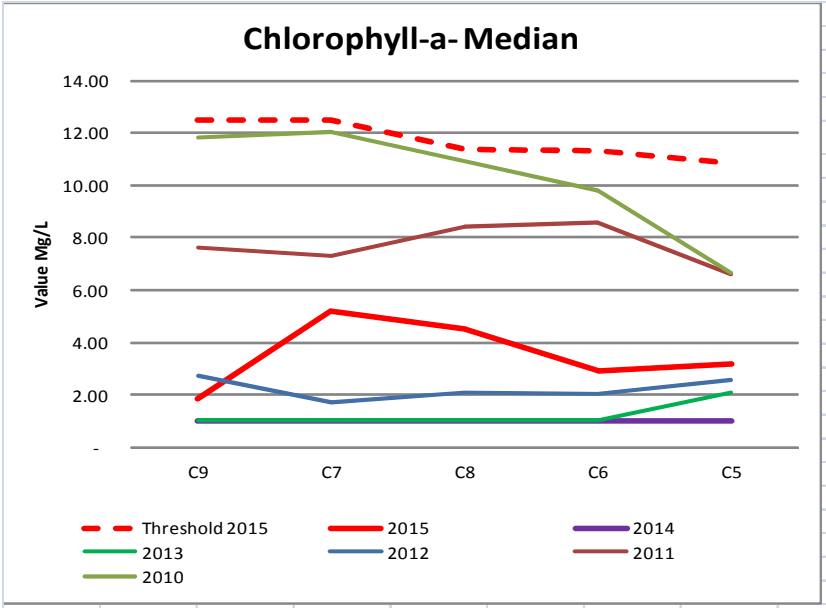
				Lower Estuary C9 Tivoli 2013					Lower Estuary C7 Blackrock Castle 2013					Lough Mahon C8 Mid Mahon 2013					Lough Mahon C6 End Lough Mahon 2013					Cork Harbour C5 Haulbowline 2013				
		Salinity		25.10		27.30			30.40		31.10			30.70		31.20			29.60		32.00			32.30		33.80		
		0 PSU	35 PSU	PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU	
Category	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	0.883	**0.680**			PASS	0.543	**0.455**			PASS	0.524	**0.350**			PASS	0.595	**0.355**			PASS	0.423	**0.315**			PASS
	Winter MRP - Median	60	40	50.90	**26.5**			PASS	45.20	**27.0**			PASS	44.60	**24.5**			PASS	46.40	**24.5**			PASS	42.70	**14.0**			PASS
	Summer DIN - Median	2.6	0			0.742	**0.38**	PASS			0.500	**0.270**	PASS			0.493	**0.22**	PASS			0.442	**0.20**	PASS			0.327	**0.150**	PASS
	Summer MRP - Median	60	40			48.70	28.0	PASS			43.90	**25.5**	PASS			43.80	**20.0**	PASS			43.00	**19.0**	PASS			41.20	**11.0**	PASS
B	Chloro-Median*	15	10			12.11	1.00	PASS +			11.07	**1.00**	PASS +			11.04	**1.00**	PASS +			10.80	**1.00**	PASS +			10.36	**2.10**	PASS +
	Chloro-90 Percentile*	30	20			24.25	2.70	PASS +			22.15	**4.40**	PASS +			22.10	**3.20**	PASS +			21.70	**9.75**	PASS +			20.70	**4.95**	PASS +
	Opportunistic Algae																											
C	DO %Sat - 5 Percentile	70	80			76.00	**77.10**	PASS			78.00	**84.10**	PASS			78.00	89.80	PASS			78.00	**94.90**	PASS			79.00	**90.60**	PASS
	DO %Sat - 95 Percentile	130	120			124.00	124.10	FAIL			122.00	127.60	FAIL			122.00	134.80	FAIL			122.00	129.70	FAIL			121.00	153.70	FAIL
	BOD 95%ile	4			0.5		1.9	PASS		1.0		2.0	PASS		0.5		2.3	PASS		0.5		2.5	PASS		0.9		2.2	PASS
						Intermediate					Intermediate					Intermediate					Intermediate					Intermediate		
						Marginal Fail only																						

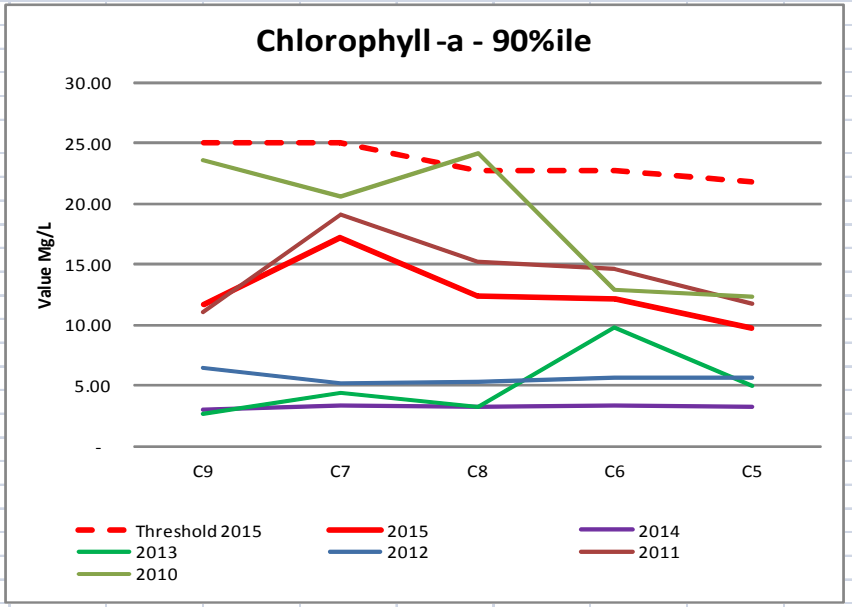
				Lower Estuary C9 Tivoli 2012					Lower Estuary C7 Blackrock Castle 2012					Lough Mahon C8 Mid Mahon 2012					Lough Mahon C6 End Lough Mahon 2012					Cork Harbour C5 Haulbowline 2012				
		Salinity		17.70		24.20			29.50		28.75			29.75		28.95			28.35		29.90			31.00		31.90		
		0 PSU	35 PSU	PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU	
Category	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	1.355	1.41			FAIL	0.601	0.32			PASS	0.585	0.26			PASS	0.675	0.39			PASS	0.506	0.16			PASS
	Winter MRP - Median	60	40	59.30	33.5			PASS	46.50	30.0			PASS	46.25	31.0			PASS	47.65	31.0			PASS	44.00	22.5			PASS
	Summer DIN - Median	2.6	0			0.940	0.79	PASS			0.649	0.629	PASS			0.633	0.49	PASS			0.575	0.37	PASS			0.448	0.205	PASS
	Summer MRP - Median	60	40			51.80	29.0	PASS			47.25	27.5	PASS			47.05	24.5	PASS			46.10	22.5	PASS			43.10	7.5	PASS
B	Chloro-Median*	15	10			13.04	2.75	PASS +			11.85	1.70	PASS +			11.71	2.10	PASS +			11.44	2.06	PASS +			10.83	2.55	PASS +
	Chloro-90 Percentile*	30	20			26.00	6.45	PASS +			23.45	5.20	PASS +			23.33	5.32	PASS +			22.85	5.65	PASS +			22.26	5.63	PASS +
	Opportunistic Algae																											
C	DO %Sat - 5 Percentile	70	80			74.00	91.60	PASS			76.75	94.80	PASS			76.95	97.60	PASS			77.00	99.40	PASS			78.00	105.30	PASS
	DO %Sat - 95 Percentile	130	120			126.00	115.70	PASS			123.25	116.00	PASS			123.05	115.50	PASS			123.00	119.40	PASS			122.00	119.60	PASS
	BOD 95%ile	4			2.3		1.0	PASS		2.3		1.2	PASS		1.5		1.1	PASS		0.6		1.4	PASS		1.1		1.1	PASS
						Intermediate					Unpolluted /Good					Unpolluted /Good					Unpolluted /Good					Unpolluted /Good		

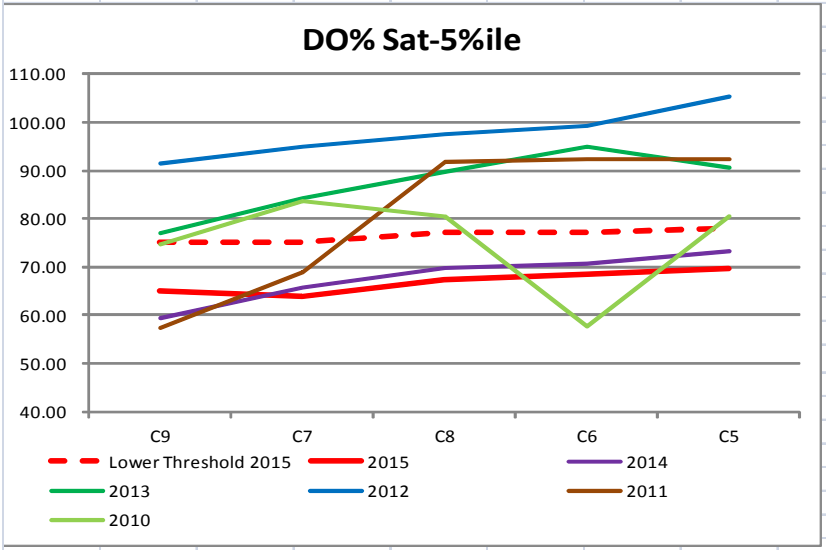
				Lower Estuary C9 Tivoli 2011					Lower Estuary C7 Blackrock Castle 2011					Lough Mahon C8 Mid Mahon 2011					Lough Mahon C6 End Lough Mahon 2011					Cork Harbour C5 Haulbowline 2011				
		Salinity		24.75		31.05			27.50		33.30			30.55		33.95			30.95		34.30			31.45		36.25		
		0 PSU	35 PSU	PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU	
Category	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	0.909	1.93			FAIL	0.729	1.50			FAIL	0.534	1.30			FAIL	0.509	1.15			FAIL	0.477	0.88			FAIL
	Winter MRP - Median	60	40	51.25	39.0			PASS	48.50	40.5			PASS	44.90	44.0			PASS	44.00	40.5			PASS	43.55	34.5			PASS
	Summer DIN - Median	2.6	0			0.503	0.86	FAIL			0.359	0.594	FAIL			0.317	0.33	FAIL?			0.276	0.35	FAIL			0.250	0.185	PASS
	Summer MRP - Median	60	40			43.95	17	PASS			41.70	14	PASS			41.00	14	PASS			40.70	12	PASS			40.00	7	PASS
B	Chloro-Median	15	10			11.10	7.60	PASS			10.50	7.30	PASS			10.30	8.40	PASS			10.20	8.60	PASS			10.00	6.60	PASS
	Chloro-90 Percentile	30	20			22.20	11.06	PASS			20.94	19.12	PASS			20.60	15.20	PASS			20.40	14.60	PASS			20.00	11.74	PASS
	Opportunistic Algae																											
C	DO %Sat - 5 Percentile	70	80			78.00	57.41	FAIL			79.00	68.90	FAIL			79.00	91.72	PASS			79.30	92.39	PASS			80.00	92.19	PASS
	DO %Sat - 95 Percentile	130	120			122.00	105.03	PASS			121.00	114.18	PASS			121.00	119.44	PASS			120.70	121.47	FAIL			120.00	123.24	FAIL
	BOD 95%ile	4			2.0		3.0	PASS		2.0		9.0	FAIL		2.0		3.0	PASS		2.0		2.0	PASS		2.0		2.0	PASS
						Intermediate					Intermediate					Intermediate					Intermediate					Intermediate		

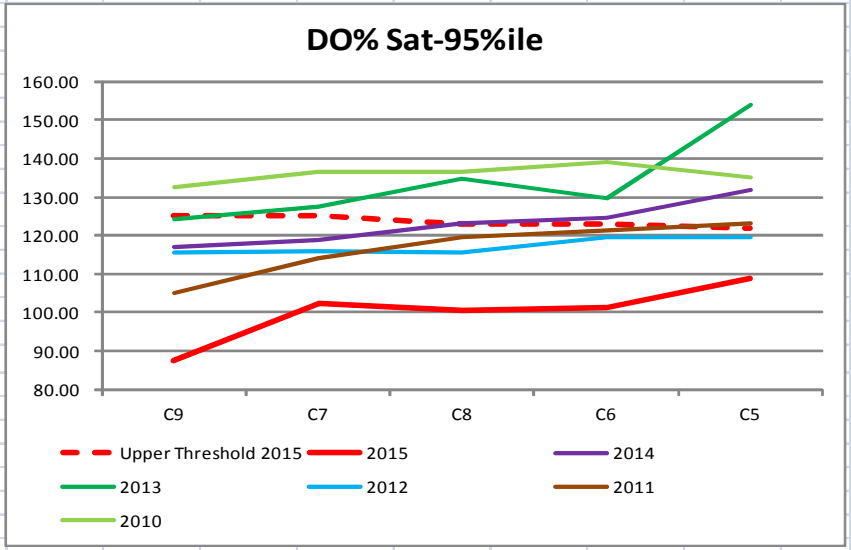
				Lower Estuary C9 Tivoli 2010					Lower Estuary C7 Blackrock Castle 2010					Lough Mahon C8 Mid Mahon 2010					Lough Mahon C6 End Lough Mahon 2010					Cork Harbour C5 Haulbowline 2010				
		Salinity		28.75		29.20			31.00		31.05			32.20		33.10			32.35		33.65			33.85		34.90		
		0 PSU	35 PSU	PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU		PSU	PSU	PSU	PSU	
Category	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value		Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	0.649	1.31			FAIL	0.506	1.11			FAIL	0.429	0.93			FAIL	0.42	0.82			FAIL	0.324	0.60			FAIL
	Winter MRP - Median	60	40	47.25	41.0			PASS	44.00	43.5			PASS	42.80	41.0			PASS	42.65	36.0			PASS	41.15	33.0			PASS
	Summer DIN - Median	2.6	0			0.62	0.81	FAIL			0.503	0.591	FAIL			0.372	0.36	PASS			0.336	0.29	PASS			0.250	0.143	PASS
	Summer MRP - Median	60	40			46.80	29	PASS			44.00	20	PASS			41.90	21	PASS			41.35	19	PASS			40.10	12	PASS
B	Chloro-Median	15	10			11.64	11.80	FAIL ?			11.05	12.05	FAIL			10.57	10.90	FAIL?			10.40	9.80	PASS			10.10	6.65	PASS
	Chloro-90 Percentile	30	20			23.20	23.56	FAIL ?			22.10	20.60	PASS			21.05	24.20	FAIL			20.76	12.90	PASS			20.10	12.34	PASS
	Opportunistic Algae																											
C	DO %Sat - 5 Percentile	70	80			77.00	74.67	FAIL			78.00	83.75	PASS			79.00	80.39	PASS			79.00	57.76	FAIL			79.90	80.56	PASS
	DO %Sat - 95 Percentile	130	120			123.00	132.68	FAIL			122.00	136.63	FAIL			121.00	136.36	FAIL			121.00	138.91	FAIL			120.10	134.96	FAIL
	BOD 95%ile	4			2.0		3.9	PASS		2.0		8.0	FAIL		2.0		2.5	PASS		2.0		2.0	PASS		2.0		2.0	PASS
						Potentially Eutrophic					Potentially Eutrophic					Potentially Eutrophic					Intermediate					Intermediate		

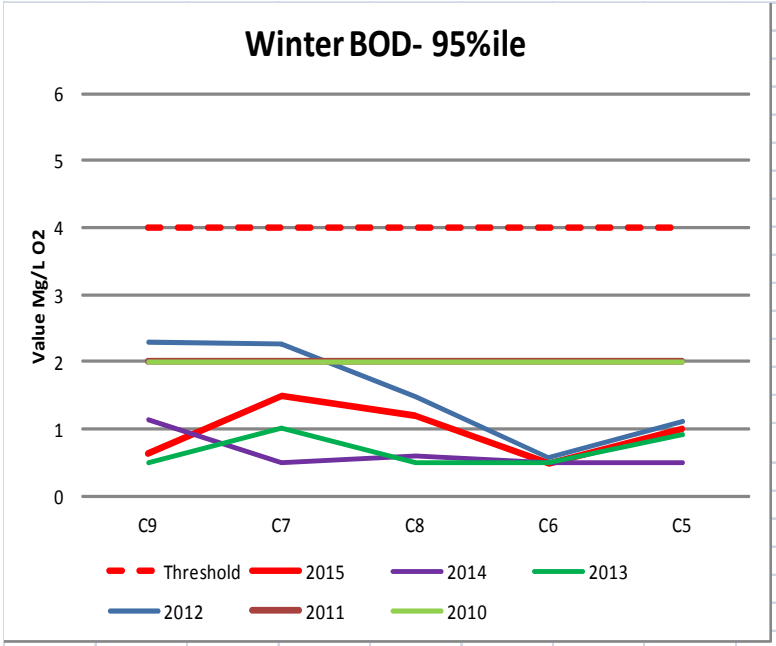

Winter DIN - Median
Value Mg/L N
2.500
2.000
1.500
1.000
0.500
-
C9
C7
C8
C6
C5
Threshold 2015
2015
2014
2013
2012
2011
2010
Summer DIN - Median
Value Mg/L N
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
-
C9
C7
C8
C6
C5
Threshold 2015
2015
2014
2013
2012
2011
2010
Winter MRP - Median
Value Mg/L P
70.0
60.0
50.0
40.0
30.0
20.0
10.0
-
C9
C7
C8
C6
C5
Threshold 2015
2015
2014
2013
2012
2011
2010
Summer MRP - Median
Value Mg/L P
60.0
50.0
40.0
30.0
20.0
10.0
-
C9
C7
C8
C6
C5
Threshold 2015
2015
2014
2013
2012
2011
2010

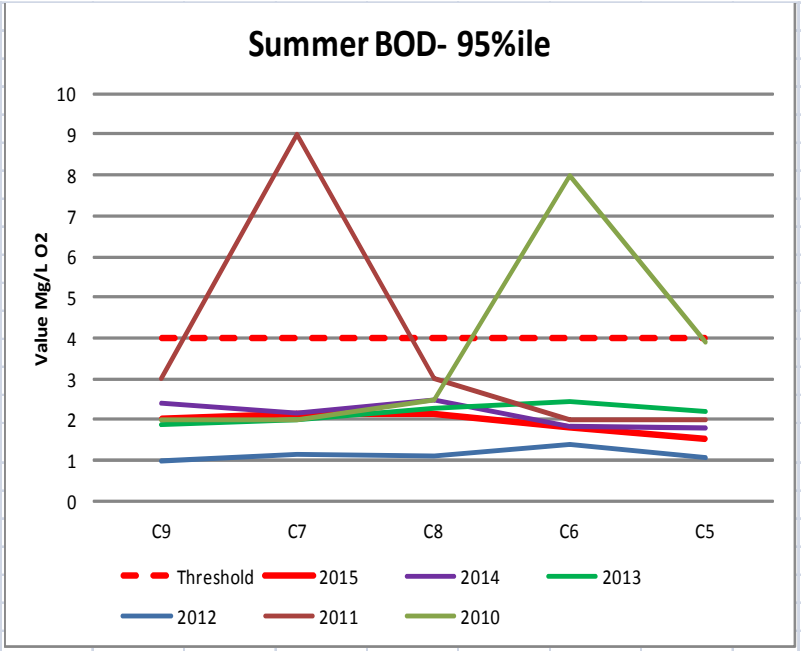

Chlorophyll-a- Median
Value Mg/L
14.00
12.00
10.00
8.00
6.00
4.00
2.00
-
C9
C7
C8
C6
C5
Threshold 2015
2015
2014
2013
2012
2011
2010


Chlorophyll -a - 90%ile
Value Mg/L
30.00
25.00
20.00
15.00
10.00
5.00
-
C9
C7
C8
C6
C5
Threshold 2015
2015
2014
2013
2012
2011
2010


DO% Sat-5%ile
110.00
100.00
90.00
80.00
70.00
60.00
50.00
40.00
C9
C7
C8
C6
C5
Lower Threshold 2015
2015
2014
2013
2012
2011
2010


DO% Sat-95%ile
160.00
150.00
140.00
130.00
120.00
110.00
100.00
90.00
80.00
C9
C7
C8
C6
C5
Upper Threshold 2015
2015
2014
2013
2012
2011
2010


Winter BOD- 95%ile
Value Mg/L O2
0
1
2
3
4
5
6
C9
C7
C8
C6
C5
Threshold
2015
2014
2013
2012
2011
2010


Summer BOD- 95%ile
Value Mg/L O2
0
1
2
3
4
5
6
7
8
9
10
C9
C7
C8
C6
C5
Threshold
2015
2014
2013
2012
2011
2010

EPA MONITORING 2014

Incl.

Summary Trophic Status

&

Lee Estuary Lower –Analysis Breakdown

Note:							
Ref SI 272 of 2009	G/M Threshold	G/M Threshold					
Chloro-Median*	5	10	**PASS +**	indicates satisfies this standard also			
Chloro-90 Percentile*	10	20	**PASS +**	indicates satisfies this standard also			

Location Name		Description	Season	Salinity	Temp	pH	DO_Sat %	BOD	TON	NH3	PO4	chl_a	DIN
Lee Estuary Lower				PSU	°C		% saturation	mg/l O2	mg/l N	mg/l N	µg/l P	mg/m3	NH3 +TON
EPA	**IW**	No.Samples	S	36	36	36	36	26	36	36	36	35	36.000
LE150	**C9**	Max	S	32.35	18.65	8.40	151.50	8.00	2.14	0.63	68.00	62.40	2.328
LE160		Median	S	28.80	16.17	7.90	86.90	1.40	0.29	0.13	30.00	5.40	0.727
LE170		Min	S	4.79	14.36	7.50	36.40	0.50	0.06	0.05	13.00	1.40	0.122
LE180		5%ile	S	5.18	14.49	7.58	43.80	0.50	0.07	0.06	18.75	1.91	0.130
		95%ile (90%ile Chlor)	S	31.98	18.14	8.20	116.73	3.95	2.10	0.53	60.50	30.50	2.213
		No.Samples	W	11	11	12	11	1	12	12	12	12	12.000
		Max	W	27.27	8.45	8.00	96.20	0.50	3.99	0.22	50.00	2.50	4.044
		Median	W	24.88	8.33	7.60	94.20	0.50	1.69	0.08	44.00	1.40	1.824
		Min	W	1.57	7.04	7.00	79.00	0.50	0.71	0.03	25.00	1.30	0.814
		5%ile	W	1.78	7.09	7.06	82.10	0.50	0.77	0.03	25.55	1.30	0.832
		95%ile (90%ile Chlor)	W	26.30	8.45	7.95	95.65	0.50	3.72	0.22	48.35	2.49	3.792

2014	EPA DATA						
Lee Estuary Lower	**Salinity**		**24.88**		**28.80**		
Eutrophic	0 PSU	35 PSU	PSU	PSU	PSU	PSU	
TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	**Value**	Summer Threshold	**Value**	
Winter DIN - Median	2.6	0	0.896	**1.824**			**Fail**
Winter MRP - Median	60	40	51.12	**44.0**			**PASS**
Summer DIN - Median	2.6	0			0.645	**0.73**	**Fail**
Summer MRP - Median	60	40			47.20	**30.0**	**PASS**
Chloro-Median*	15	10			11.74	**5.40**	**PASS +**
Chloro-90 Percentile*	30	20			23.40	**30.50**	**Fail**
Opportunistic Algae							
DO %Sat - 5 Percentile	70	80			76.80	**43.80**	**Fail**
DO %Sat - 95 Percentile	130	120			123.20	**116.73**	**PASS**
BOD 95%ile	4			0.5		**3.95**	**PASS**
					Eutrophic		

Location Name		Description	Season	Salinity	Temp	pH	DO_Saturation	BOD	TON	NH3	PO4	chl_a	DIN
Lough Mahon				PSU	°C		% saturation	mg/l O2	mg/l N	mg/l N	µg/l P	mg/m3	NH3 +TON
EPA	**IW**	No.Samples	S	24	24	24	24	9	24	24	24	24	24.000
LE310	**C7**	Max	S	33.46	17.33	8.20	126.80	3.20	1.79	0.42	51.00	25.60	1.939
LE330	**C8**	Median	S	30.31	15.87	8.10	101.65	1.40	0.16	0.11	20.50	6.20	0.273
LE340	**C6**	Min	S	11.85	14.37	7.70	74.20	0.50	0.03	0.06	9.00	3.50	0.093
		5%ile	S	18.27	14.71	7.92	88.02	0.50	0.03	0.06	10.30	3.73	0.103
		95%ile (90%ile Chlor)	S	32.80	17.22	8.20	125.18	2.56	0.78	0.28	48.90	9.80	0.932
		No.Samples	W	8	8	8	8	1	8	8	8	7	8.000
		Max	W	28.05	8.48	8.00	98.30	0.50	2.65	0.14	41.00	4.40	2.720
		Median	W	22.93	8.24	7.95	95.30	0.50	1.04	0.10	35.50	2.00	1.163
		Min	W	11.61	7.64	7.80	89.60	0.50	0.57	0.07	28.00	1.30	0.649
		5%ile	W	12.93	7.69	7.80	91.32	0.50	0.60	0.07	29.40	1.39	0.683
		95%ile (90%ile Chlor)	W	28.05	8.48	8.00	97.64	0.50	2.42	0.13	39.95	3.32	2.503

2014	EPA DATA						
Lough Mahon	**Salinity**		**22.93**		**30.31**		
Intermediate	0 PSU	35 PSU	PSU	PSU	PSU	PSU	
TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	**Value**	Summer Threshold	**Value**	
Winter DIN - Median	2.6	0	1.023	**1.163**			**Fail**
Winter MRP - Median	60	40	53.07	**35.5**			**PASS**
Summer DIN - Median	2.6	0			0.550	**0.27**	**PASS**
Summer MRP - Median	60	40			45.40	**20.5**	**PASS**
Chloro-Median*	15	10			11.30	**6.20**	**PASS +**
Chloro-90 Percentile*	30	20			22.62	**9.80**	**PASS +**
Opportunistic Algae							
DO %Sat - 5 Percentile	70	80			77.30	**88.02**	**PASS**
DO %Sat - 95 Percentile	130	120			122.70	**125.18**	**PASS**
BOD 95%ile	4			0.5		**2.6**	**PASS**
					Intermediate		

Location Name		Description	Season	Salinity	Temp	pH	DO_Saturation	BOD	TON	NH3	PO4	chl_a	DIN
Cork Harbour				PSU	°C		% saturation	mg/l O2	mg/l N	mg/l N	µg/l P	mg/m3	NH3 +TON
EPA	ity C	No.Samples	S	16	16	16	16	10	16	16	16	16	16.000
LE380	C5	Max	S	34.89	16.39	8.20	115.30	1.50	0.63	0.15	29.00	8.10	0.779
LE620		Median	S	33.46	15.17	8.10	103.45	0.50	0.04	0.04	9.50	4.85	0.078
		Min	S	13.52	13.52	8.10	95.60	0.50	0.01	0.02	5.00	2.50	0.028
		5%ile	S	25.56	13.53	8.10	96.88	0.50	0.01	0.02	5.75	2.65	0.030
		95%ile (90%ile Chlor)	S	34.52	16.02	8.20	113.65	1.46	0.32	0.10	18.50	6.85	0.414
		No.Samples	W	6	6	6	6	1	6	6	6	5	6.000
		Max	W	33.98	8.83	8.00	97.90	0.50	0.98	0.11	37.00	3.30	1.092
		Median	W	28.07	8.64	8.00	97.10	0.50	0.44	0.06	27.00	1.80	0.493
		Min	W	20.89	8.16	8.00	96.80	0.50	0.35	0.04	24.00	1.40	0.385
		5%ile	W	21.22	8.18	8.00	96.83	0.50	0.37	0.04	24.50	1.46	0.407
		95%ile (90%ile Chlor)	W	33.55	8.80	8.00	97.83	0.50	0.96	0.10	36.25	3.02	1.060

2014	EPA DATA						
Cork Harbour	Salinity		28.07		33.46		
Unpolluted/Good	0 PSU	35 PSU	PSU	PSU	PSU	PSU	
TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value	
Winter DIN - Median	2.6	0	0.693	**0.493**			PASS
Winter MRP - Median	60	40	47.93	**27.0**			PASS
Summer DIN - Median	2.6	0			0.349	**0.078**	PASS
Summer MRP - Median	60	40			41.54	**9.5**	PASS
Chloro-Median*	15	10			10.46	**4.85**	PASS +
Chloro-90 Percentile*	30	20			20.87	**6.85**	PASS +
Opportunistic Algae							
DO %Sat - 5 Percentile	70	80			79.00	**96.88**	PASS
DO %Sat - 95 Percentile	130	120			121.00	**113.65**	PASS
BOD 95%ile	4			0.5		1.4	PASS
					Unpolluted/Good		

Location Name		Description	Season	Salinity	Temp	pH	DO_Saturation	BOD	TON	NH3	PO4	chl_a	DIN
Cork Harbour Outer				PSU	°C		% saturation	mg/l O2	mg/l N	mg/l N	µg/l P	mg/m3	NH3 +TON
EPA	ity C	No.Samples	S	18	18	18	18	9	18	18	18	18	18.000
LE630		Max	S	34.94	15.55	8.20	107.80	0.50	0.14	0.05	11.00	5.60	0.184
LE810		Median	S	34.43	14.25	8.10	102.95	0.50	0.02	0.02	7.00	3.10	0.032
		Min	S	31.27	11.55	8.00	90.50	0.50	0.01	0.01	2.50	1.90	0.015
		5%ile	S	32.30	11.59	8.00	92.20	0.50	0.01	0.01	2.50	2.33	0.015
		95%ile (90%ile Chlor)	S	34.91	15.34	8.20	106.87	0.50	0.09	0.05	8.45	4.62	0.130
		No.Samples	W	2	2	2	2	0	2	2	2	2	2.000
		Max	W	32.23	8.70	8.00	98.90		0.58	0.04	26.00	2.00	0.620
		Median	W	31.07	8.64	8.00	98.00		0.47	0.04	25.50	1.90	0.503
		Min	W	29.91	8.58	8.00	97.10		0.35	0.04	25.00	1.80	0.386
		5%ile	W	30.03	8.59	8.00	97.19		0.36	0.04	25.05	1.81	0.398
		95%ile (90%ile Chlor)	W	32.11	8.69	8.00	98.81		0.57	0.04	25.95	1.98	0.608

2014	EPA DATA						
Cork Harbour Outer	Salinity		31.07		34.43		
Unpolluted/Good	0 PSU	35 PSU	PSU	PSU	PSU	PSU	
TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value	
Winter DIN - Median	2.6	0	**0.501**	**0.503**			Fail/PAS
Winter MRP - Median	60	40	43.93	**25.5**			PASS
Summer DIN - Median	2.6	0			0.286	**0.03**	PASS
Summer MRP - Median	60	40			40.57	**7.0**	PASS
Chloro-Median*	15	10			10.18	**3.10**	PASS +
Chloro-90 Percentile*	30	20			20.36	**4.62**	PASS +
Opportunistic Algae							
DO %Sat - 5 Percentile	70	80			79.40	**92.20**	PASS
DO %Sat - 95 Percentile	130	120			120.60	**106.87**	PASS
BOD 95%ile	4			-		0.5	PASS
					Unpolluted/Good		

Lee Estuary Lower -Analysis Break Down by Monitoring Location

	2014	EPA DATA						
	LE150	Salinity		13.86		17.74		
	Intermediate	0 PSU	35 PSU	PSU	PSU	PSU	PSU	
Category	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	1.62	1.870			Fail
	Winter MRP - Median	60	40	60.00	36.5			PASS
	Summer DIN - Median	2.6	0			1.352	0.97	PASS
	Summer MRP - Median	60	40			59.26	31.5	PASS
B	Chloro-Median*	15	10			14.78	4.85	PASS +
	Chloro-90 Percentile*	30	20			29.56	12.16	PASS
	Opportunistic Algae							
C	DO %Sat - 5 Percentile	70	80			70.74	39.81	Fail
	DO %Sat - 95 Percentile	130	120			129.26	99.65	PASS
	BOD 95%ile	4			-		2.69	PASS
						Intermediate		

	2014	EPA DATA						
	LE160	Salinity		13.94		19.80		
	Eutrophic	0 PSU	35 PSU	PSU	PSU	PSU	PSU	
	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	1.616	2.258			Fail
	Winter MRP - Median	60	40	60.00	47.0			PASS
	Summer DIN - Median	2.6	0			1.220	0.71	PASS
	Summer MRP - Median	60	40			57.20	32.0	PASS
B	Chloro-Median*	15	10			14.24	5.95	PASS +
	Chloro-90 Percentile*	30	20			28.36	37.70	Fail
	Opportunistic Algae							
C	DO %Sat - 5 Percentile	70	80			71.80	49.45	Fail
	DO %Sat - 95 Percentile	130	120			128.20	92.48	PASS
	BOD 95%ile	4					3.8	PASS
						Eutrophic		

	2014	EPA DATA						
	LE170	Salinity		15.39		25.43		
	Intermediate	0 PSU	35 PSU	PSU	PSU	PSU	PSU	
Category	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	1.514	2.154			Fail
	Winter MRP - Median	60	40	60.00	45.0			PASS
	Summer DIN - Median	2.6	0			0.861	0.675	PASS
	Summer MRP - Median	60	40			50.57	30.0	PASS
B	Chloro-Median*	15	10			12.68	5.60	PASS +
	Chloro-90 Percentile*	30	20			25.34	22.86	PASS
	Opportunistic Algae							
C	DO %Sat - 5 Percentile	70	80			74.44	59.37	Fail
	DO %Sat - 95 Percentile	130	120			125.56	129.39	Fail
	BOD 95%ile	4			0.5		6.08	Fail
						Intermediate		

	2014	EPA DATA						
	LE180	Salinity		27.27		29.50		
	Intermediate	0 PSU	35 PSU	PSU	PSU	PSU	PSU	
	TSAS Criteria	G/M Threshold	G/M Threshold	Winter Threshold	Value	Summer Threshold	Value	
A	Winter DIN - Median	2.6	0	1.637	1.697			Fail/PASS
	Winter MRP - Median	60	40	60.00	31.5			PASS
	Summer DIN - Median	2.6	0			0.601	0.606	Fail/PASS
	Summer MRP - Median	60	40			46.50	27.5	PASS
B	Chloro-Median*	15	10			11.55	4.90	PASS +
	Chloro-90 Percentile*	30	20			23.05	8.90	PASS +
	Opportunistic Algae							
C	DO %Sat - 5 Percentile	70	80			77.00	76.60	Fail /<10%
	DO %Sat - 95 Percentile	130	120			123.00	124.30	Fail /<10%
	BOD 95%ile	4			-		1.8	PASS
						Intermediate		

Appendix 7.3 – Pollutant Release and Transfer Register (PRTR) Summary Sheets

Guidance to completing the PRTR workbook

PRTR Returns Workbook

Version 1.1.19

REFERENCE YEAR	2015

1. FACILITY IDENTIFICATION

Parent Company Name	Irish Water
Facility Name	Cork City Waste Water Treatment Plant
PRTR Identification Number	D0033
Licence Number	D0033-01

Classes of Activity

No.	**class_name**
-	Refer to PRTR class activities below

Address 1	
Address 2	
Address 3	
Address 4	
	Cork
Country	Ireland
Coordinates of Location	-8.33527 51.8878
River Basin District	IESW
NACE Code	3700
Main Economic Activity	Sewerage
AER Returns Contact Name	Niall Horgan
AER Returns Contact Email Address	nhorgan@water.ie
AER Returns Contact Position	Environment Compliance Specialist, Irish Water
AER Returns Contact Telephone Number	+353 1 8925396
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	21
User Feedback/Comments	50% Reduction in Storm overflows (fugitive) in 2015 over 2014 leading to +/-50% excess warnings. Wet Cake and Dried Pellet quantities shown seperately on Waste return. Normal Process for 2015. Not all Priority Substances which were tested in 2014 were tested again in 2015. Query regarding some results from Laboratory whether Effluent interchanged with Influent results, which may give over-high results for PAHs.Accuracy of LOD for NonylPhenol results precluded their use.
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	**Activity Name**
5(f)	Urban waste-water treatment plants

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	
Have you been granted an exemption ?	
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	
Is the reduction scheme compliance route being used ?	

4. WASTE IMPORTED/ACCEPTED ONTO SITE

Guidance on waste imported/accepted onto site

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	

This question is only applicable if you are an IPPC or Quarry site

4.1 RELEASES TO AIR Link to previous years emissions data | PRTR# : D0033 | Facility Name : Cork City Waste Water Treatment Plant | Filename : D0033_2015_PRTR.xls | Return Year : 2015 | 12/02/2016 17:36

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
02	Carbon monoxide (CO)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	1794.0	1865.0	0.0	71.0
03	Carbon dioxide (CO2)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	528779.0	6059639.0	0.0	5530860.0
05	Nitrous oxide (N2O)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	27.0	0.0	27.0
07	Non-methane volatile organic compounds (NMVOC)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	22.0	0.0	22.0
08	Nitrogen oxides (NOx/NO2)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	5487.0	5703.0	0.0	216.0
11	Sulphur oxides (SOx/SO2)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	21.0	0.0	21.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: Cork City Waste Water Treatment Plant

Please enter summary data on the quantities of methane flared and / or utilised			**Method Used**			
	T (Total) kg/Year	**M/C/E**	**Method Code**	**Designation or Description**	**Facility Total Capacity m3 per hour**	
Total estimated methane generation (as per site model)	0.0				N/A	
Methane flared	0.0				0.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	0.0				N/A	

4.2 RELEASES TO WATERS Link to previous years emissions data | PRTR# : D0033 | Facility Name : Cork City Waste Water Treatment Plant | Filename : D0033_2015_PRTR.xls | Return Year : 2015 | 12/02/2016 17:40

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
34	1,2-dichloroethane (EDC)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
25	Alachlor	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
26	Aldrin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
61	Anthracene	M	ALT	GC-MS	1.915	1.986	0.0	0.071
17	Arsenic and compounds (as As)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	90.325	92.355	0.0	2.03
27	Atrazine	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.426	0.443	0.0	0.017
62	Benzene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.685	0.935	0.0	0.25
91	Benzo(g,h,i)perylene	M	ALT	GC-MS	2.445	2.535	0.0	0.09
63	Brominated diphenylethers (PBDE)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
18	Cadmium and compounds (as Cd)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	2.105	2.519	0.0	0.414
28	Chlordane	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
29	Chlordecone	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
30	Chlorfenvinphos	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
79	Chlorides (as Cl)	M	ALT	Colorimetric	43416519.422	43814972.428	0.0	398453.006
31	Chloro-alkanes, C10-C13	E	ESTIMATE	EPA UWWTP Tool Version 5.0	8.558	8.874	0.0	0.316
32	Chlorpyrifos	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.003	0.003	0.0	0.0
19	Chromium and compounds (as Cr)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	12.564	12.714	0.0	0.15
20	Copper and compounds (as Cu)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	497.806	506.303	0.0	8.497
82	Cyanides (as total CN)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	119.466	123.677	0.0	4.211
33	DDT	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
70	Di-(2-ethyl hexyl) phthalate (DEHP)	M	ALT	GC-MS	89.646	92.955	0.0	3.309
35	Dichloromethane (DCM)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	1.852	2.032	0.0	0.18
36	Dieldrin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
37	Diuron	E	ESTIMATE	EPA UWWTP Tool Version 5.0	1.074	1.074	0.0	0.0
38	Endosulphan	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
39	Endrin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
65	Ethyl benzene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.676	0.848	0.0	0.172
88	Fluoranthene	M	ALT	GC-MS	2.893	3.0	0.0	0.107
83	Fluorides (as total F)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	22411.45	22907.73	0.0	496.28
40	Halogenated organic compounds (as AOX)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	97.26	100.85	0.0	3.59

POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
41	Heptachlor	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
90	Hexabromobiphenyl	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
42	Hexachlorobenzene (HCB)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
43	Hexachlorobutadiene (HCBD)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
89	Isodrin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
67	Isoproturon	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.306	0.329	0.0	0.023
23	Lead and compounds (as Pb)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	123.849	140.091	0.0	16.242
45	Lindane	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.019	0.021	0.0	0.002
21	Mercury and compounds (as Hg)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.15	0.0	0.15
46	Mirex	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
68	Naphthalene	M	ALT	GC-MS	0.693	0.719	0.0	0.026
22	Nickel and compounds (as Ni)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	173.488	178.902	0.0	5.414
64	Nonylphenol and Nonylphenol ethoxylates (NP/NPEs)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	3.38	5.018	0.0	1.638
87	Octylphenols and Octylphenol ethoxylates	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
69	Organotin compounds (as total Sn)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
48	Pentachlorobenzene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
49	Pentachlorophenol (PCP)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
71	Phenols (as total C)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	37.072	158.685	0.0	121.613
50	Polychlorinated biphenyls (PCBs)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
72	Polycyclic aromatic hydrocarbons (PAHs)	M	ALT	GC-MS	29.746	30.844	0.0	1.098
51	Simazine	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.574	0.595	0.0	0.021
52	Tetrachloroethylene (PER)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	2.408	2.408	0.0	0.0
53	Tetrachloromethane (TCM)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
73	Toluene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	20.099	41.038	0.0	20.939
12	Total nitrogen	M	ALT	Digestion & Colorimetric	791653.893	816783.728	0.0	25129.835
76	Total organic carbon (TOC) (as total C or COD/3)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	375688.129	395391.965	0.0	19703.836
13	Total phosphorus	M	ALT	Digestion & Colorimetric	85611.737	88514.225	0.0	2902.488
59	Toxaphene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
74	Tributyltin and compounds	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
54	Trichlorobenzenes (TCBs)(all isomers)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
57	Trichloroethylene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0

POLLUTANT			Method Used		QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
77	Trifluralin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
75	Triphenyltin and compounds	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
60	Vinyl chloride	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
78	Xylenes	E	ESTIMATE	EPA UWWTP Tool Version 5.0	4.723	7.111	0.0	2.388
24	Zinc and compounds (as Zn)	M	ALT	ICP-MS	1466.931	1521.071	0.0	54.14

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT			Method Used		QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT			Method Used		QUANTITY			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
370	Selenium	E	ESTIMATE	EPA UWWTP Tool Version 5.0	193.553	194.556	0.0	1.003
205	Antimony (as Sb)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	6.297	7.019	0.0	0.722
368	Molybdenum	E	ESTIMATE	EPA UWWTP Tool Version 5.0	61.801	63.906	0.0	2.105
358	Tin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	123.263	123.263	0.0	0.0
373	Barium	E	ESTIMATE	EPA UWWTP Tool Version 5.0	936.187	989.775	0.0	53.588
374	Boron	E	ESTIMATE	EPA UWWTP Tool Version 5.0	11959.564	12448.826	0.0	489.262
356	Cobalt	E	ESTIMATE	EPA UWWTP Tool Version 5.0	7.162	7.643	0.0	0.481
386	Vanadium	E	ESTIMATE	EPA UWWTP Tool Version 5.0	111.131	118.951	0.0	7.82
388	Dichlobenil	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.175	0.179	0.0	0.004
383	Linuron	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
385	Mecoprop Total	E	ESTIMATE	EPA UWWTP Tool Version 5.0	4.362	4.541	0.0	0.179
380	2,4 Dichlorophenol (2,4 D)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	2.079	2.132	0.0	0.053
384	MCPA	E	ESTIMATE	EPA UWWTP Tool Version 5.0	3.612	3.627	0.0	0.015
382	Glyphosate	M	ALT	LC-MS	0.069	0.072	0.0	0.003
389	Benzo[a]pyrene	M	ALT	GC-MS	0.652	0.676	0.0	0.024
390	Benzo[b]fluoranthene	M	ALT	GC-MS	0.856	0.888	0.0	0.032
391	Benzo[k]fluoranthene	M	ALT	GC-MS	0.448	0.465	0.0	0.017
392	Indeno[1,2,3-c,d]pyrene	M	ALT	GC-MS	1.956	2.028	0.0	0.072
393	Carbon tetrachloride	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
394	2,6-Dichlorobenzamide	E	ESTIMATE	EPA UWWTP Tool Version 5.0	3.278	3.368	0.0	0.09

POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
395	Dicofol	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
396	Hexabromocyclodecane (HBCD)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
397	PFOS	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.02	0.02	0.0	0.0
238	Ammonia (as N)	M	ALT	Colorimetric	505113.324	523755.42	0.0	18642.096
303	BOD	M	ALT	Electrochemical	458375.264	496874.592	0.0	38499.328
306	COD	M	ALT	Digestion & Colorimetric	2924775.656	3038709.605	0.0	113933.949
362	Kjeldahl Nitrogen	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
327	Nitrate (as N)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
372	Nitrite (as N)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.0	0.0	0.0	0.0
332	Ortho-phosphate (as PO4)	M	ALT	Colorimetric	216148.243	224125.574	0.0	7977.331
240	Suspended Solids	M	ALT	Gravimetric	691576.583	733895.766	0.0	42319.183
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0

POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.3 RELEASES TO WASTEWATER OR SEWER

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

4.4 RELEASES TO LAND

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			QUANTITY		
			Method Used				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

RELEASES TO LAND					Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			QUANTITY		
			Method Used				
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	13 01 11	Yes	0.8729	synthetic hydraulic oils	R9	M	Volume Calculation	Offsite in Ireland	Enva Ireland Ltd,W0145-02	Unit 9 Raffeen Industrial Estate,Raffeen,Monkstown,County Cork,Ireland	Enva Ireland Ltd,W0145-02,Unit 9 Raffeen Industrial estate,Raffeen,Monkstown,County Cork,Ireland	Unit 9 Raffeen Industrial estate,Raffeen,Monkstown,County Cork,ireland
Within the Country	19 08 02	No	2.18	waste from desanding	D5	M	Weighed	Offsite in Ireland	Greenstar Munster,W013602	Sarsfield Court Industrial Estate,Glanmire,.,County Cork,Ireland		
Within the Country	19 08 05	No	2712.0	sludges from treatment of urban waste water	R10	M	Weighed	Offsite in Ireland	Enva Ireland Ltd,W0145-02	Unit 9 Raffeen Industrial Estate,Raffeen,Monkstown,County Cork,Ireland		
Within the Country	20 01 01	No	6.1	paper and cardboard	R3	M	Weighed	Offsite in Ireland	Greenstar Munster,W013602	Sarsfield Court Industrial Estate,Glanmire,.,County Cork,Ireland		
Within the Country	20 03 01	No	17.12	mixed municipal waste	D5	M	Weighed	Offsite in Ireland	Greenstar Munster,W013602	Sarsfield Court Industrial Estate,Glanmire,.,County Cork,Ireland		
Within the Country	19 08 01	No	3.48	screenings	D5	M	Weighed	Offsite in Ireland	Greenstar Munster,W013602	Sarsfield Court Industrial Estate,Glanmire,.,County Cork,Ireland		
Within the Country	19 08 05	No	867.7	sludges from treatment of urban waste water	R10	M	Weighed	Offsite in Ireland	Enva Ireland Ltd,W0145-02	Unit 9 Raffeen Industrial Estate,Raffeen,Monkstown,County Cork,Ireland		

* Select a row by double-clicking the Description of Waste then click the delete button

Air Emission - Inputs

CELL COLOUR KEY	
	INPUT - type in your facility value in cell
	OUTPUT - automatically generated cell value

RELEASES TO AIR

Air: Emissions from WWTP Works

Data Entry Table: Characteristics of the WWTP

For use where no data from on-site monitoring of air emissions from the plant are available.
Nitrous Oxide (N2O) calculated directly for actual p.e. data

1 Loadings and Works		
A Facility Loadings Data for Reporting Year	**Value**	
Total p.e. served	250,011	*Enter Actual Population Equivalent of catchment*
Design p.e.	413,200	*Enter Design Population Equivalent of facility*
Total influent BOD kg/annum (measured)	5,475,238	*Enter total annual quantity;* ***NB note units: kg/annum***
Total Sludge removed offsite kg Dry Matter / annum		*Enter total annual quantity;* ***NB note units: kg/annum***
Total Sludge digested on-site kg Dry Matter / annum	2,670,600	*Enter total annual quantity;* ***NB note units: kg/annum***

For information only:
Calculated Values (see Calculations Worksheet)

TOW kg BOD / annum	
TOW = "Total Organically biodegradable material in domestic (=municipal) Wastewater"	
5,478,991	Total p.e. served TOW equivalent
9,055,278	Design p.e. TOW equivalent
249,840	**Quality check: p.e. of influent BOD kg/annum**
0	*BOD content of sludge removed kg/annum*
1,068,240	*BOD content of sludge digested kg/annum*
4,406,998	Residual BOD net of sludge removed/digested kg/annum

B Characteristics of the Works		Status	
B1 Aerobic plant			
Does the aerobic section of the plant contain dissolved oxygen?			*Y / N (default is "Y")* **Methane Conversion factor for the aerobic plant will be determined by this answer**
All tanks covered and extracted to on-site flare?			*Y / N (default is "N")* **Releases will be reported as "Fugitive"**
% of Headspace biogas utilised on site (0 - 100)			*Only required if Headspace extraction on site; Calculate by % operation of engine. Default assumption is Zero utilisation*
% of Headspace biogas flared (0 - 100)			*Only required if Headspace extraction on site; Calculate by % operation of flare. Default assumption is Zero flaring*
Total % biogas utilised or flared onsite			

B2 Onsite Anaerobic Digestion for sludge treatment	Status	
Anaerobic digestion on site?	Y	*Y / N (default is "N")* **Releases will be reported as "Emission Point 1"**
% of Digester biogas utilised on site (0 - 100)	95	*Only required if Anaerobic digestion on site; Calculate by % operation of engine. Default assumption is Zero utilisation*
% of Digester biogas flared (0 - 100)	5	*Only required if Anaerobic digestion on site; Calculate by % operation of flare. Default assumption is Zero flaring*
Total % biogas utilised or flared onsite		

2 Estimated Fuel use at the UWWTP	Diesel Usage Tonnes/annum	
Total Diesel Use on site in the year	6.6	***Tonne / annum*** **Releases will be reported as "Fugitive"**

The output data is presented on this worksheet in the precise format for transfer directly into the "**Releases to Air**" Worksheet of your AER/PRTR Emissions Reporting Workbook

		ESTIMATED QUANTITIES			
PRTR No. Annex II	Name	**Emission Point 1**	**T (Total) KG/Year**	**A (Accidental) KG/Year**	**F (Fugitive) KG/Year**
1	Methane (CH4)	0	0	0	0
2	Carbon Monoxide (CO)	1,794	1,865	0	71
3	Carbon Dioxide (CO2)	528,779	6,059,639	0	5,530,860
5	Nitrous oxide (N2O)		27	0	27
7	Non-methane volatile organic compounds (NMVOC)		22	0	22
8	Nitrogen oxides (NOx/NO2)	5,487	5,704	0	216
11	Sulphur oxides (SOx/SO2)		21	0	21

Wastewater Treatment Data Input

NEXT

CELL COLOUR KEY:

- **INPUT** - Select value from drop down list
- **INPUT** - type in your facility value in cell
- **OUTPUT** - automaticaly generated cell value

Facility Name	Cork City Waste Water Treatment Plant
Address	Carrigrennan, Little Island, Co. Cork
Reporting Year	
Licence Reg. No.	D0033-01

Enter Facility Details

P.E. (Actual Treated)	>50000 p.e.
Saline Intrusion	Yes saline intrusion
Type of Treatment	Secondary Treatment - Activated Sludge
Nutrient Removal	No Nutrient Removal

These parameters are required to generate estimated PRTR mass emission values.
Click on the cell and select from the drop down menu.
Refer to the Definitions below for further information.

Please enter Total Annual Flow (m³/annum):

Treated (Predominant/Main Emission):	40748090 m3/annum
Fugitive Emissions:	1503880 m3/annum
TOTAL:	42251970 m3/annum

Final effluent volume released via the main emission point
Additional estimated volume released in storm bypasses

Definition of Input Requirements

P.E. (Actual Treated): P.E. (population equivalent) is a measurement of the average organic biodegradable load received daily at the treatment plant. A population equivalent of 1 (1 p.e.) means the organic biodegradable load having a five-day biochemical oxygen demand (BOD5) of 60g of oxygen per day. Select a P.E. band (**<10,000 p.e., 10,000 - 50,000 p.e., >50,000 p.e.**) into which the actual operating P.E. of the treatment plant falls. (Please note: the operating P.E. is based on the existing population served and not the design population size of the UWWTP).

Saline Intrusion: Identify whether saline intrusion is known to occur within the sewage network serving the treatment plant. This will be the case for some coastally located UWWTPs.

Type of Treatment: Identify the type of treatment provided at the plant. Treatment options are "No Treatment", "Primary Treatment Only", "Secondary Treatment - Activated Sludge", "Secondary Treatment - Attached Growth", "Tertiary Treatment - Filtration", and "Tertiary Treatment - Disinfection".

Nutrient Removal: Identify whether nutrient removal is employed at the treatment plant. Nutrient removal options are "Phosphorus Removal Only - Biological/Chemical/Wetland", "Nitrogen Removal Only", "Phosphorous and Nitrogen Removal", and "No Nutrient Removal".

Measured Values

CELL COLOUR
INPUT - type in your facility value in cell
OUTPUT - automaticaly generated cell value

Enter all measured values in this sheet

Note: If you do not have measured values then LEAVE THE CELL BLANK

Measured values reported in this worksheet should be the average concentration of the pollutant measured over the previous reporting year. Measured values should be used when they are available rather than estimated values from the Toolset. Measured values relate to parameters that are analysed in a laboratory. Please enter the measured values to the orange cells in mg/l for the year.

Note: the unit of measurement must be in mg/l for all parameters entered on this sheet.

Where measured values are reported, the Method Code must be indicated in the "Method of Measurement" column. The method code used shall be in accordance with the internationally approved measurement methods - please refer to the UWW PRTR Electronic Toolset Guidance Document on the EPA website. The method description should also be provided as indicated below.

Note: Wastewater licensed pollutants such as BOD and COD, Ortho- P are included at the bottom of this sheet - please enter annual measured data in mg/l for these.

Method Codes

ISO/CEN Standard - If the laboratory is working to an ISO/CEN standard that is on the approved list of standards, you should use this as the method code. Example for Total Nitrogen is EN ISO 11905-1:1998. Leave the Description Field Blank in the PRTR Workbook.	**Example for Total Nitrogen**	**EN ISO 11905-1:1998**	**Method Description: Blank**
OTH - If the method you are using is not an ISO/CEN standard or does not fall under any of the other method codes then use OTH. This method code would apply when using methods from the Standard Methods for the Analysis of Water and Wastewater series or when using a Hach Spectrophotometric Method for Total Nitrogen, for example. Use the method code OTH and please put a description of the method in the method description field in the PRTR Emissions Reporting Workbook.	**Example for Total Phosphorus**	**OTH**	**Method Description: Standard Methods for the Analysis of Water and Wastewater - Total P Analysis**

UWWT Facility Details:	>50000 p.e., Yes saline intrusion, Secondary Treatment - Activated Sludge, No Nutrient Removal

Enter your measured values in these two columns

Double-click the cells below to select the method code

Enter your method description in this column

PRTR Substances:

PRTR Nr.	CAS No.	Parameter	Treated Effluent Concentration (mg/l)	Fugitive Emission Concentration (mg/l)	Treated Effluent Mass emission (kg/annum)	Fugitive Emission Mass emission (kg/annum)	Method of Measurement (Method Code)	Method Description (Analytical Method)
12		Total nitrogen (as N)	19.428	16.710	791653.893	25129.835	ALT	Digestion & Colorimetric
13		Total phosphorus (as P)	2.101	1.930	85611.737	2902.488	ALT	Digestion & Colorimetric
76		Total organic carbon			0.000	0.000		
79		Chlorides (as total Cl)	1065.486	264.950	43416519.422	398453.006	ALT	Colorimetric
82		Cyanides (as total CN)			0.000	0.000		
83		Fluorides (as total F)			0.000	0.000		
17		Arsenic and compounds (as As)			0.000	0.000		
18		Cadmium and compounds (as Cd)			0.000	0.000		
19		Chromium and compounds (as Cr)			0.000	0.000		
20		Copper and compounds (as Cu)			0.000	0.000		
21		Mercury and compounds (as Hg)			0.000	0.000		
22		Nickel and compounds (as Ni)			0.000	0.000		
23		Lead and compounds (as Pb)			0.000	0.000		
24		Zinc and compounds (as Zn)	0.036	0.036	1466.931	54.140	ALT	ICP-MS
31	85535-84-8	Chloroalkanes (C10-C13)			0.000	0.000		
25	15972-60-8	Alachlor			0.000	0.000		
26	309-00-2	Aldrin			0.000	0.000		
36	60-57-1	Dieldrin			0.000	0.000		
39	72-20-8	Endrin			0.000	0.000		
41	76-44-8	Heptachlor			0.000	0.000		
28	57-74-9	Chlordane			0.000	0.000		
29	143-50-0	Chlordecone			0.000	0.000		
46	2385-85-5	Mirex			0.000	0.000		
38	115-29-7	Endosulphan			0.000	0.000		
45	58-89-9	Lindane (1,2,3,4,5, 6 -hexachlorocyclohexane)			0.000	0.000		
89	465-73-6	Isodrin			0.000	0.000		
33	50-29-3	DDT - sum of all isomers			0.000	0.000		
77	1582-09-8	Trifluralin			0.000	0.000		
42	118-74-1	Hexachlorobenzene (HCB)			0.000	0.000		
43	87-68-3	Hexachlorobutadiene (HCBD)			0.000	0.000		
30	470-90-6	Chlorfenvinphos			0.000	0.000		
32	2921-88-2	Chlorpyrifos			0.000	0.000		
27	1912-24-9	Atrazine			0.000	0.000		
51	122-34-9	Simazine			0.000	0.000		
37	330-54-1	Diuron			0.000	0.000		
67	34123-59-6	Isoproturon			0.000	0.000		
75		Triphenyltin			0.000	0.000		
69		Organotin			0.000	0.000		
74		Tributyltin			0.000	0.000		
72		PAH, Total	0.001	0.001	29.746	1.098	ALT	GC-MS
91	191-24-2	Benzo[ghi]perylene	0.000	0.000	2.445	0.090	ALT	GC-MS

PRTR Nr.	CAS No.	Parameter	Treated Effluent Concentration (mg/l)	Fugitive Emission Concentration (mg/l)	Treated Effluent Mass emission (kg/annum)	Fugitive Emission Mass emission (kg/annum)	Method of Measurement (Method Code)	Method Description (Analytical Method)
61	120-12-7	Anthracene	0.000	0.000	1.915	0.071	ALT	GC-MS
68	91-20-3	Naphthalene	0.000	0.000	0.693	0.026	ALT	GC-MS
88	206-44-0	Flouranthene	0.000	0.000	2.893	0.107	ALT	GC-MS
50	1336-36-3	Polychlorinated biphenyls (PCBs) - sum of 11 congenors			0.000	0.000		
40		Halogenated organic compounds (as AOX)			0.000	0.000		
52	127-18-4	Tetrachloroethylene (PER)			0.000	0.000		
53	56-23-5	Tetrachloromethane (TCM)			0.000	0.000		
57	79-01-6	Trichloroethylene			0.000	0.000		
60	75-01-4	Vinyl chloride			0.000	0.000		
34	107-06-2	1,2-dichloroethane (EDC)			0.000	0.000		
35	75-09-2	Dichloromethane (DCM)			0.000	0.000		
71	108-95-2	Phenols (as total C)			0.000	0.000		
87	1806-26-4	Octylphenols and Octylphenol Ethoxylates			0.000	0.000		
64		Nonylphenol and Nonylphenol ethoxylates (NP/NPEs)			0.000	0.000	ALT	
54	12002-48-1	Trichlorobenzenes (TCBs) (all isomers)			0.000	0.000		
49	87-86-5	Pentachlorophenol (PCP)			0.000	0.000		
48	608-93-5	Pentachlorobenzene			0.000	0.000		
62	71-43-2	Benzene as BTEX			0.000	0.000		
73	108-88-3	Toluene as BTEX			0.000	0.000		
78	1330-20-7	Xylenes (total mass of ortho, para and meta-xylene)BTEX			0.000	0.000		
65	100-41-4	Ethyl benzene (BTEX)			0.000	0.000		
70	117-81-7	Di(2-ethylhexyl)phthalate	0.002	0.002	89.646	3.309	ALT	GC-MS
59	8001-35-2	Toxaphene			0.000	0.000		
90	36355-1-8	Hexabromobiphenyl			0.000	0.000		
63		Brominated diphenylethers (PBDE)			0.000	0.000		

Non-PRTR Substances:

PRTR Nr.	CAS No.	Parameter	Treated Effluent Concentration (mg/l)	Fugitive Emission Concentration (mg/l)	Treated Effluent Mass emission (kg/annum)	Fugitive Emission Mass emission (kg/annum)	Method of Measurement (Method Code)	Method Description (Analytical Method)
370		Selenium			0.000	0.000		
205		Antimony (as Sb)			0.000	0.000		
368		Molybdenum			0.000	0.000		
358		Tin			0.000	0.000		
373		Barium			0.000	0.000		
374		Boron			0.000	0.000		
356		Cobalt			0.000	0.000		
386		Vanadium			0.000	0.000		
388		Dichlobenil			0.000	0.000		
383		Linuron			0.000	0.000		
385		Mecoprop Total			0.000	0.000		
380		2,4 Dichlorophenol (2,4 D)			0.000	0.000		
384		MCPA			0.000	0.000		
382		Glyphosate	0.000	0.000	0.069	0.003	ALT	LC-MS
389		Benzo[a]pyrene	0.000	0.000	0.652	0.024	ALT	GC-MS
390		Benzo[b]fluoranthene	0.000	0.000	0.856	0.032	ALT	GC-MS
391		Benzo[k]fluoranthene	0.000	0.000	0.448	0.017	ALT	GC-MS
392		Indeno[1,2,3-c,d]pyrene	0.000	0.000	1.956	0.072	ALT	GC-MS
393		Carbon tetrachloride			0.000	0.000		
394		2,6-Dichlorobenzamide			0.000	0.000		
395		Dicofol			0.000	0.000		
396		Hexabromocyclododecane (HBCD)			0.000	0.000		
397		PFOS			0.000	0.000		
238		**Ammonia (as N)**	12.396	12.396	505113.324	18642.096	ALT	Colorimetric
303		**BOD**	11.249	25.600	458375.264	38499.328	ALT	Electrochemical
306		**COD**	71.777	75.760	2924775.656	113933.949	ALT	Digestion & Colorimetric
362		**Kjeldahl Nitrogen**			0.000	0.000		
327		**Nitrate (as N)**			0.000	0.000		
372		**Nitrite (as N)**			0.000	0.000		
332		**Ortho-phosphate (as PO4)**	5.305	5.305	216148.243	7977.331	ALT	Colorimetric
240		**Suspended Solids**	16.972	28.140	691576.583	42319.183	ALT	Gravimetric
		Licensed Pollutants listed above						

Note: There are no user input requirements in this worksheet

These values are generated in the Toolset based on the data filled in on the Waste Water Treatment Data Input Sheet (i.e. Generated by the Estimation Toolset)

UWWT Facility Details:	>50000 p.e., Yes saline intrusion, Secondary Treatment - Activated Sludge, No Nutrient Removal

PRTR substances estimated by tool:

PRTR Nr.	CAS No.	Parameter	Treated Effluent Concentration (mg/l)	Fugitive Emission Concentration (mg/l)	Treated Effluent Mass emission (kg/annum)	Fugitive Emission Mass emission (kg/annum)	Total Mass Emission (kg/annum)
12		Total nitrogen (as N)	14.694	23.480	598767.715	35311.102	634078.817
13		Total phosphorus (as P)	2.258	4.295	91993.907	6459.165	98453.071
76		Total organic carbon	9.220	13.102	375688.129	19703.836	395391.965
79		Chlorides (as total Cl)	878.000	1014.667	35776823.020	1525936.907	37302759.927
82		Cyanides (as total CN)	0.003	0.003	119.466	4.211	123.677
83		Fluorides (as total F)	0.550	0.330	22411.450	496.280	22907.730
17		Arsenic and compounds (as As)	0.002	0.001	90.325	2.030	92.355
18		Cadmium and compounds (as Cd)	0.000	0.000	2.105	0.414	2.519
19		Chromium and compounds (as Cr)	0.000	0.000	12.564	0.150	12.714
20		Copper and compounds (as Cu)	0.012	0.006	497.806	8.497	506.303
21		Mercury and compounds (as Hg)	0.000	0.000	0.000	0.150	0.150
22		Nickel and compounds (as Ni)	0.004	0.004	173.488	5.414	178.902
23		Lead and compounds (as Pb)	0.003	0.011	123.849	16.242	140.091
24		Zinc and compounds (as Zn)	0.049	0.122	2011.474	183.323	2194.797
31	85535-84-8	Chloroalkanes (C10-C13)	0.000	0.000	8.558	0.316	8.874
25	15972-60-8	Alachlor	0.000	0.000	0.000	0.000	0.000
26	309-00-2	Aldrin	0.000	0.000	0.000	0.000	0.000
36	60-57-1	Dieldrin	0.000	0.000	0.000	0.000	0.000
39	72-20-8	Endrin	0.000	0.000	0.000	0.000	0.000
41	76-44-8	Heptachlor	0.000	0.000	0.000	0.000	0.000
28	57-74-9	Chlordane	0.000	0.000	0.000	0.000	0.000
29	143-50-0	Chlordecone	0.000	0.000	0.000	0.000	0.000
46	2385-85-5	Mirex	0.000	0.000	0.000	0.000	0.000
38	115-29-7	Endosulphan	0.000	0.000	0.000	0.000	0.000
45	58-89-9	Lindane (1,2,3,4,5, 6 -hexachlorocyclohexane)	0.000	0.000	0.019	0.002	0.020
89	465-73-6	Isodrin	0.000	0.000	0.000	0.000	0.000
33	50-29-3	DDT - sum of all isomers	0.000	0.000	0.000	0.000	0.000
77	1582-09-8	Trifluralin	0.000	0.000	0.000	0.000	0.000
42	118-74-1	Hexachlorobenzene (HCB)	0.000	0.000	0.000	0.000	0.000
43	87-68-3	Hexachlorobutadiene (HCBD)	0.000	0.000	0.000	0.000	0.000
30	470-90-6	Chlorfenvinphos	0.000	0.000	0.000	0.000	0.000
32	2921-88-2	Chlorpyrifos	0.000	0.000	0.003	0.000	0.003
27	1912-24-9	Atrazine	0.000	0.000	0.426	0.017	0.443
51	122-34-9	Simazine	0.000	0.000	0.574	0.021	0.595
37	330-54-1	Diuron	0.000	0.000	1.074	0.000	1.074
67	34123-59-6	Isoproturon	0.000	0.000	0.306	0.023	0.328
75		Triphenyltin	0.000	0.000	0.000	0.000	0.000
69		Organotin	0.000	0.000	0.000	0.000	0.000
74		Tributyltin	0.000	0.000	0.000	0.000	0.000
72		PAH, Total	0.000	0.000	0.505	0.323	0.829
91	191-24-2	Benzo[ghi]perylene	0.000	0.000	0.081	0.003	0.085
61	120-12-7	Anthracene	0.000	0.000	0.113	0.003	0.116
68	91-20-3	Naphthalene	0.000	0.000	0.163	0.217	0.380
88	206-44-0	Flouranthene	0.000	0.000	0.095	0.019	0.114
50	1336-36-3	Polychlorinated biphenyls (PCBs) - sum of 11 cong	0.000	0.000	0.000	0.000	0.000
40		Halogenated organic compounds (as AOX)	0.002	0.002	97.260	3.590	100.849
52	127-18-4	Tetrachloroethylene (PER)	0.000	0.000	2.408	0.000	2.408
53	56-23-5	Tetrachloromethane (TCM)	0.000	0.000	0.000	0.000	0.000
57	79-01-6	Trichloroethylene	0.000	0.000	0.000	0.000	0.000
60	75-01-4	Vinyl chloride	0.000	0.000	0.000	0.000	0.000
34	107-06-2	1,2-dichloroethane (EDC)	0.000	0.000	0.000	0.000	0.000
35	75-09-2	Dichloromethane (DCM)	0.000	0.000	1.852	0.180	2.033
71	108-95-2	Phenols (as total C)	0.001	0.081	37.072	121.613	158.685
87	1806-26-4	Octylphenols and Octylphenol Ethoxylates	0.000	0.000	0.000	0.000	0.000
64		Nonylphenol and Nonylphenol ethoxylates (NP/NPE	0.000	0.001	3.380	1.638	5.018
54	12002-48-1	Trichlorobenzenes (TCBs) (all isomers)	0.000	0.000	0.000	0.000	0.000
49	87-86-5	Pentachlorophenol (PCP)	0.000	0.000	0.000	0.000	0.000

48	608-93-5	Pentachlorobenzene	0.000	0.000	0.000	0.000	0.000
62	71-43-2	Benzene as BTEX	0.000	0.000	0.685	0.250	0.935
73	108-88-3	Toluene as BTEX	0.000	0.014	20.099	20.939	41.038
78	1330-20-7	Xylenes (total mass of ortho, para and meta-xylene	0.000	0.002	4.723	2.388	7.111
65	100-41-4	Ethyl benzene (BTEX)	0.000	0.000	0.676	0.172	0.848
70	117-81-7	Di(2-ethylhexyl)phthalate	0.001	0.003	37.377	4.451	41.829
59	8001-35-2	Toxaphene	0.000	0.000	0.000	0.000	0.000
90	36355-1-8	Hexabromobiphenyl	0.000	0.000	0.000	0.000	0.000
63		Brominated diphenylethers (PBDE)	0.000	0.000	0.000	0.000	0.000
non PRTR substances estimated by tool:							
PRTR Nr.	**CAS No.**	**Parameter**	**Treated Effluent Concentration (mg/l)**	**Fugitive Emission Concentration (mg/l)**	**Treated Effluent Mass emission (kg/annum)**	**Fugitive Emission Mass emission (kg/annum)**	**Total Mass Emission (kg/annum)**
N/A		Total Hardness (mg/l CaCO3)	428.813	483.667	17473290.343	727376.627	18200666.970
N/A		Selenium	0.005	0.001	193.553	1.003	194.556
N/A		Antimony	0.000	0.000	6.297	0.722	7.019
N/A		Molybdenum	0.002	0.001	61.801	2.105	63.907
N/A		Tin	0.003	0.000	123.263	0.000	123.263
N/A		Barium	0.023	0.036	936.187	53.588	989.776
N/A		Boron	0.294	0.325	11959.564	489.262	12448.827
N/A		Cobalt	0.000	0.000	7.162	0.481	7.643
N/A		Vanadium	0.003	0.005	111.131	7.820	118.951
N/A		Dichlobenil	0.000	0.000	0.175	0.004	0.179
N/A		Linuron	0.000	0.000	0.000	0.000	0.000
N/A		Mecoprop	0.000	0.000	4.362	0.179	4.541
N/A		2,4-D	0.000	0.000	2.079	0.053	2.132
N/A		MCPA	0.000	0.000	3.612	0.015	3.627
N/A		Glyphosate	0.002	0.000	62.456	0.593	63.048
N/A		Benzo[a]pyrene	0.000	0.000	0.081	0.003	0.085
N/A		Benzo[b]fluoranthene	0.000	0.000	0.081	0.003	0.085
N/A		Benzo[k]fluoranthene	0.000	0.000	0.081	0.003	0.085
N/A		Indeno[1,2,3-c,d]pyrene	0.000	0.000	0.090	0.003	0.093
N/A		Carbon tetrachloride	0.000	0.000	0.000	0.000	0.000
N/A		2,6-Dichlorobenzamide	0.000	0.000	3.278	0.090	3.369
N/A		Dicofol	-	-	#VALUE!	#VALUE!	#VALUE!
N/A		Hexabromocyclododecane (HBCD)	0.000	0.000	0.000	0.000	0.000
N/A		PFOS	0.000	0.000	0.020	0.000	0.020

Releases to Water Output Table

CELL COLOUR KEY:
INPUT - Type in your facility value in cell
OUTPUT - automatically generated cell value

Export Data to PRTR Workbook

Click the Red Arrow to transfer all the measured and estimated data to the PRTR Emissions Reporting Workbook for this specfic UWWTP. Please ensure the PRTR Workbook is closed prior to the transfer and select the correct PRTR Workbook from your dedicated folder for this UWWTP.

Please ensure that all the Inputs for Air and Water are completed prior to transfer. Please update the PRTR Workbook with method descriptions and waste transfers prior to upload.

Facility Name:	Cork City Waste Water Treatment Plant
Address:	Carrigrennan, Little Island, Co. Cork
Reporting year:	0

Treated: Final effluent volume released via main emission point	40,748,090
Fugitive: Estimated additional volume released in storm bypasses	1,503,880
Total Annual Flow (m³/annum):	*42251970*

SECTION A : WWTP SPECIFIC PRTR POLLUTANTS

Note '#VALUE!' error messages will disappear when flow data are entered above

POLLUTANT			Method Used		QUANTITY				E-PRTR reporting threshold kg/annum
No. Annex II	Name	M/E	Method of Measurement	Designation or Description	Emission Point 1	F (Fugitive) kg/year	A (Accidental) kg/year *(Enter site specific data)*	T (Total) kg/year	
12	Total nitrogen	M	ALT	Digestion & Colorimetric	791,653.893	25,129.835		816,783.727	50,000
13	Total phosphorus	M	ALT	Digestion & Colorimetric	85,611.737	2,902.488		88,514.225	5,000
76	Total organic carbon (TOC) (as total C or COD/3)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	375,688.129	19,703.836		395,391.965	50,000
79	Chlorides (as total Cl)	M	ALT	Colorimetric	43,416,519.422	398,453.006		43,814,972.428	2,000,000
82	Cyanides (as total CN)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	119.466	4.211		123.677	50
83	Fluorides (as total F)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	22,411.450	496.280		22,907.730	2,000
17	Arsenic and compounds (as As)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	90.325	2.030		92.355	5
18	Cadmium and compounds (as Cd)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	2.105	0.414		2.519	5
19	Chromium and compounds (as Cr)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	12.564	0.150		12.714	50
20	Copper and compounds (as Cu)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	497.806	8.497		506.303	50
21	Mercury and compounds (as Hg)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.150		0.150	1
22	Nickel and compounds (as Ni)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	173.488	5.414		178.902	20
23	Lead and compounds (as Pb)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	123.849	16.242		140.091	20
24	Zinc and compounds (as Zn)	M	ALT	ICP-MS	1,466.931	54.140		1,521.071	100
31	Chloroalkanes (C10-C13)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	8.558	0.316		8.874	1
25	Alachlor	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
26	Aldrin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
36	Dieldrin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1

POLLUTANT					QUANTITY				E-PRTR reporting threshold kg/annum
			Method Used						
No. Annex II	Name	M/E	Method of Measurement	Designation or Description	Emission Point 1	F (Fugitive) kg/year	A (Accidental) kg/year *(Enter site specific data)*	T (Total) kg/year	
39	Endrin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
41	Heptachlor	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
28	Chlordane	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
29	Chlordecone	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
46	Mirex	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
38	Endosulphan	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
45	Lindane	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.019	0.002		0.020	1
89	Isodrin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
33	DDT	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
77	Trifluralin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
42	Hexachlorobenzene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
43	Hexachlorobutadiene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
30	Chlorfenvinphos	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
32	Chlorpyrifos	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.003	0.000		0.003	1
27	Atrazine	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.426	0.017		0.443	1
51	Simazine	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.574	0.021		0.595	1
37	Diuron	E	ESTIMATE	EPA UWWTP Tool Version 5.0	1.074	0.000		1.074	1
67	Isoproturon	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.306	0.023		0.328	1
75	Triphenyltin and compounds	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
69	Organotin compounds(as total Sn)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	50
74	Tributyltin and compounds	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
72	Polycyclic aromatic hydrocarbons (PAHs)	M	ALT	GC-MS	29.746	1.098		30.844	5
91	Benzo(g,h,i)perylene	M	ALT	GC-MS	2.445	0.090		2.535	1
61	Anthracene	M	ALT	GC-MS	1.915	0.071		1.986	1
68	Naphthalene	M	ALT	GC-MS	0.693	0.026		0.718	10
88	Fluoranthene	M	ALT	GC-MS	2.893	0.107		3.000	1
50	Polychlorinated biphenyls (PCBs)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	0,1
40	Halogenated organic compounds (as AOX)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	97.260	3.590		100.849	1,000
52	Tetrachloroethylene (PER)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	2.408	0.000		2.408	10
53	Tetrachloromethane (TCM)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
57	Trichloroethylene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	10
60	Vinyl chloride	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	10
34	1,2-dichloroethane (EDC)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	10
35	Dichloromethane (DCM)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	1.852	0.180		2.033	10
71	Phenols (as total C)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	37.072	121.613		158.685	20
87	Octylphenols and Octylphenol ethoxylates	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
64	Nonylphenol and Nonylphenol ethoxylates (NP/NPEs)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	3.380	1.638		5.018	1
54	Trichlorobenzenes (TCBs) (all isomers)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
49	Pentachlorophenol (PCP)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
48	Pentachlorobenzene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
62	Benzene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.685	0.250		0.935	200
73	Toluene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	20.099	20.939		41.038	200
78	Xylenes	E	ESTIMATE	EPA UWWTP Tool Version 5.0	4.723	2.388		7.111	200
65	Ethyl benzene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.676	0.172		0.848	200
70	Di-(2-ethyl hexyl) phthalate (DEHP)	M	ALT	GC-MS	89.646	3.309		92.954	1
59	Toxaphene	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1
90	Hexabromobiphenyl	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	0,1
63	Brominated diphenylethers (PBDE)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000	1

POLLUTANT					QUANTITY				
			Method Used						E-PRTR reporting threshold kg/annum
No. Annex II	Name	M/E	Method of Measurement	Designation or Description	Emission Point 1	F (Fugitive) kg/year	A (Accidental) kg/year *(Enter site specific data)*	T (Total) kg/year	

SECTION C : REMAINING NON-PRTR SUBSTANCES AND POLLUTANT EMISSIONS AS REQUIRED IN YOUR LICENCE

POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/E	Method Code	Designation or Description *(Note: replace with site-specific data if applicable)*	Emission Point 1	F (Fugitive) kg/year	A (Accidental) kg/year *(Enter site specific data)*	T (Total) kg/year
370	Selenium	E	ESTIMATE	EPA UWWTP Tool Version 5.0	193.553	1.003		194.556
205	Antimony (as Sb)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	6.297	0.722		7.019
368	Molybdenum	E	ESTIMATE	EPA UWWTP Tool Version 5.0	61.801	2.105		63.907
358	Tin	E	ESTIMATE	EPA UWWTP Tool Version 5.0	123.263	0.000		123.263
373	Barium	E	ESTIMATE	EPA UWWTP Tool Version 5.0	936.187	53.588		989.776
374	Boron	E	ESTIMATE	EPA UWWTP Tool Version 5.0	11,959.564	489.262		12,448.827
356	Cobalt	E	ESTIMATE	EPA UWWTP Tool Version 5.0	7.162	0.481		7.643
386	Vanadium	E	ESTIMATE	EPA UWWTP Tool Version 5.0	111.131	7.820		118.951
388	Dichlobenil	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.175	0.004		0.179
383	Linuron	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000
385	Mecoprop Total	E	ESTIMATE	EPA UWWTP Tool Version 5.0	4.362	0.179		4.541
380	2,4 Dichlorophenol (2,4 D)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	2.079	0.053		2.132
384	MCPA	E	ESTIMATE	EPA UWWTP Tool Version 5.0	3.612	0.015		3.627
382	Glyphosate	M	ALT	LC-MS	0.069	0.003		0.072
389	Benzo[a]pyrene	M	ALT	GC-MS	0.652	0.024		0.676
390	Benzo[b]fluoranthene	M	ALT	GC-MS	0.856	0.032		0.887
391	Benzo[k]fluoranthene	M	ALT	GC-MS	0.448	0.017		0.465
392	Indeno[1,2,3-c,d]pyrene	M	ALT	GC-MS	1.956	0.072		2.028
393	Carbon tetrachloride	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000
394	2,6-Dichlorobenzamide	E	ESTIMATE	EPA UWWTP Tool Version 5.0	3.278	0.090		3.369
395	Dicofol	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000
396	Hexabromocyclodecane (HBCD)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000
397	PFOS	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.020	0.000		0.020
238	Ammonia (as N)	M	ALT	Colorimetric	505,113.324	18,642.096		523,755.420
303	BOD	M	ALT	Electrochemical	458,375.264	38,499.328		496,874.592
306	COD	M	ALT	Digestion & Colorimetric	2,924,775.656	113,933.949		3,038,709.605
362	Kjeldahl Nitrogen	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000
327	Nitrate (as N)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000
372	Nitrite (as N)	E	ESTIMATE	EPA UWWTP Tool Version 5.0	0.000	0.000		0.000
332	Ortho-phosphate (as PO4)	M	ALT	Colorimetric	216,148.243	7,977.331		224,125.575
240	Suspended Solids	M	ALT	Gravimetric	691,576.583	42,319.183		733,895.767

Appendix 7.4 – Sewer Integrity Tool Output

	Section 1.1 Agglomeration Details					
	Name	**Insert Agglomeration Name**				
	Licence Number	**Insert Licence Number and Revisions Number (eg D0045-02)**				
	Insert Name of Catchment if the Risk Assessment is for part of an agglomeration (only divide agglomeration where p.e. >5,000p.e. and where such division is warranted)	**Insert Catchment Name (e.g., Downtown Pumping Station network). Refer to Guidance Notes for rules on division of large agglomerations.**				
	Date Licence Issued	**Insert Date**				
	Current Date	**Insert Current Date**				
			Year	Year	Year	Year
	Waste Water Works - Wastewater Treatment Plant Details	**Unit**	2015	2016	2017	2018
1.1	Is there an existing WWTP in operation?		**Yes**	**Yes**	**Yes**	**Yes**
	Section 1.2 BOD Loading & Population Equivalent					
1.2	Average Daily Influent Flow or Average Total Flow in system (If no measured data exists, insert estimated figure)	l/day, measured	109053000			
1.3	Average Daily Influent BOD or Average BOD Load from area served (If no measured data exists, insert estimated figure)	mg/l, measured	137.6			
1.4	Total BOD Load	kg/day	15005.6928	0	0	0
1.5	Average Population Equivalent (@0.06kg/person/day)	p.e.	250095	0	0	0
1.6	Estimated (existing) Non-Domestic Load	p.e.	132175			
1.7	Estimated Domestic Load	p.e.	117920	0	0	0
1.8	Occupancy Rate for the Agglomeration	pop/house	2.61			
1.9	Estimated Number of Connected Properties	houses	45180	0	0	0
1.10	Number of properties within the agglomeration when compared with CSO Data or An Post Geodirectory	houses	75263			
	Section 1.3 Hydraulic Details					
1.11	Average Dry Weather Flow arriving at WWTP OR Total Average DWF in system (If no measured data exists insert estimated figure)	l/s, measured	895			
1.12	Estimated 3DWF	l/sec	2685.00	0.00	0.00	0.00
1.13	Annual Average Peak Flow to WWTP or discharging from whole system if there is no existing WWTP	l/s, measured	2766			
1.14	This Annual Average Peak as Multiples of Dry Weather Flow (Peaking Factor)	Nr	3.09	0.00	0.00	0.00
1.15	Highest Peak Flow Recorded (Insert UNKNOWN if no records exist)	l/s	2911			
1.16	Does this Peak Flow (multiple of DWF) cause hydraulic capacity problems within the network ?	---	No	Yes	Yes	Yes
1.17	Total Rainfall for Previous Year	mm	1447			
1.18	Comparison - Mean Annual Rainfall for the agglomeration	mm	1228			
1.18.1	Define the Weather Station Used		Cork Airport			
1.19	If Storm Water Storage is available at the Wastewater Treatment plant, what is the volume of the storm tank ?	m^3	15400			
1.20	Is the capacity of the storm tank sufficient to capture and retain all overflows to the tank ?	---	No	No	No	No
1.21	Total monthly average volume of Storm Water Stored or Returned for Treatment within the Waste Water Treatment Plant	m^3 per month	63814			
1.22	If the answer to 1.20 above is No, What is the estimated frequency of Overflows from the Storm Tank ? (N/A if no overflow)		> 5 times per month	< 1 per month	1 to 2 times per month	< 1 per month
	Waste Water Works - Sewer Network Details	**Unit**	2015	2016	2017	2018
	Section 1.4 Waste Water Works - Gravity Sewer Details					
1.23	What database is used to maintain records of the sewer network		Other Record	SUS 2001	SUS 2002	SUS 2003
1.23.1	If other or combination of the above please describe	Describe	ArcGis			
1.24	Total length of sewers (use drop down menus to define whether these figures are estimated or measured)	km Estimated	403.38	0.00	0.00	0.00
1.24.1	Total length of sewers > 450mm Diameter	km Estimated	60.28			
1.24.2	Total length of sewers > 300mm but ≤ 450mm in Diameter	km Estimated	35.27			
1.24.3	Total length of sewers > 225mm but ≤ 300mm in Diameter	km Measured	59.99			
1.24.4	Total length of sewers ≤ 225mm in Diameter	km Estimated	247.84			
1.24.5	Other	km Estimated	Unknown			
1.25	Pipeline Material					
1.25.1	What portion of the sewer network consists of Concrete Pipes	% Estimated	33%			
1.25.2	What portion of the sewer network consists of Plastic Pipes	% Estimated	33%			
1.25.3	What portion of the sewer network consists of Clay materials	% Estimated	24%			
1.25.4	What portion of the sewer network consists of Brick Type Sewers	% Estimated	5%			
1.25.5	What portion of the sewer network consists of Other Materials	% Estimated	5%			
1.26	Total number of Storm Water Overflows	Nr	71			

1.27	What Screening or other mechanical devices are employed at the storm water overflows					
	SWO No. _ located at _____	Describe				
1.28	Water Quality at the receiving waters					
1.28.1	Where the receiving water is a river - indicate the EPA Biological Rating of the Receiving Water for each SWO below (Particularly if there is more than one receiving water within the agglomeration)					
	SWO No. __ located at ___	Describe	Q5			
1.28.2	Where the receiving water is a coastal water indicate the Status of the Receiving Water for each SWO below (Particularly if there is more than one receiving water within the agglomeration)					
	SWO No. _ located at _____	Describe	Moderate			
1.28.3	With reference to the SWO's detailed above define if the receiving waters are sensitive in accordance with the Urban Wastewater Treatment Regulations as amended.					
	SWO No. _ located at _____	Describe	Sensitive			
1.28.4	With reference to the SWO's detailed above define are the receiving waters Protected Areas (designated or awaiting designation)					
	SWO No. _ located at _____	Designation				
1.28.5	With reference to the SWO's detailed above define do the receiving waters have any other designations.					
	SWO No. _ located at _____	Designation				
	Section 1.5 Waste Water Works - Pumping Stations					
1.29	Number of Pumping Stations (operated by the Local Authority)	Nr	38			
1.30	Total Length of Rising Mains (operated by the Local Authority)	km	18.7			
1.31	Rising Main Material					
1.31.1	What portion of the rising mains consists of ductile iron pipes	% Measured	33%			
1.31.2	What portion of the rising mains consists of plastic pipes	% Measured	66%			
1.31.3	What portion of the rising mains consists of other materials	% Estimated	N/A			
1.32	Discharge Capacity of the Pump Set (s) at normal duty point					
	At Pump Station __ at _____					
1.33	What percentage of the pumping stations have recorded flow data (i.e. if all pumping stations have flow meters on the rising mains then this would read 100%)	%	10.00%			
1.34	Available Storage Capacity at Pump Stations (include pump sump and any storm water/emergency overflow tanks)					
	At Pump Station __ at _____	m^3	10			
1.35	Total Number of ***"Licenced Secondary Discharge Points and Stormwater Overflows"*** at pumping stations	Nr	4			
1.36	Total Number of ***"Emergency Overflow Points"*** at pumping stations	Nr	34			
1.37	What Screening or other mechanical devices are employed at the secondary discharge points or emergency overflows ?					

	At Pump Station __ at _____	Describe	6mm Screen			
1.38	Water Quality at the receiving waters at each pumping station location					
1.38.1	Where the receiving water is a river - indicate the EPA Biological Rating of the Receiving Water for each secondary discharge point or emergency overflow at each pumping station (Particularly if there is more than one receiving water within the agglomeration)					
	At Pump Station __ at _____	Describe	Q5			
1.38.2	Where the receiving water is a coastal water indicate the Status of the Receiving Water for each secondary discharge point or emergency overflow at each pumping station (Particularly if there is more than one receiving water within the agglomeration)					
	At Pump Station __ at _____	Describe	Moderate			
1.38.3	With reference to the pumping stations, for each secondary discharge point or emergency overflow detailed above, define if the receiving waters are sensitive in accordance with the Urban Wastewater Treatment Regulations as amended.					
	At Pump Station __ at _____		Sensitive			
1.38.4	With reference to the pumping stations, for each secondary discharge point or emergency overflow detailed above, are the receiving waters Protected Areas (designated or awaiting designation) .					
	At Pump Station __ at _____	Designation				
1.38.5	With reference to the pumping stations, for each secondary discharge point or emergency overflow detailed above, do the receiving waters have any other designations.					
	At Pump Station __ at _____	Designation				
1.39	Estimated Number of Private Pumping Stations within the agglomeration (not operated by the Local Authority)	Nr	5			
	Section 1.6 Reporting					
	Section 1.6.1 Reported Number of Sewer Related Complaints ('Complaint' as defined in the Discharge Licence)					
1.40	Number of Reported Complaints	Nr	2			
1.41	Number of Reported Complaints which have been rectified	Nr	2			
	Section 1.6.2 Reported/Recorded/Estimated Number of Secondary Discharges					
1.42	Number of Reported Secondary Discharges	Nr	1			
1.43	Number of Recorded Secondary Discharges	Nr	1			
1.44	Estimated Total Number of Secondary Discharges	Nr	2	0	0	0
	Section 1.6.3 Reported/Recorded/Estimated Number of Emergency Overflow Discharges from Pumping Stations					
1.45	Number of Reported Emergency Overflow Discharges	Nr	1			
1.46	Number of Recorded Emergency Overflow Discharges	Nr	1			
1.47	Estimated Total Number of Emergency Overflow Discharges	Nr	2	0	0	0
	Section 1.7 Operational Staff					
1.48	In the four boxes below, describe the extent of operation staff employed by the Local Authority to maintain and operate the sewer network and pumping stations *(The individual personnel shall not be named , only grade and level of training needs to be provided)*					

1.48.1	For example, 1 Nr. Fulltime Caretaker employed at General Operative Level (with basis H&S training) to operate & maintain the sewer network. 1 Nr. Part-time Caretaker employed as a Mechanical Fitter (FETAC Level 5) to operate & maintain the pumping stations.	reman with 14 GO to operate Network within City Borough Boundary,				
1.48.2		1 Fitter,1 Electrician & GO for Pump Stations in City				
1.48.3		Technichian & Contractors for Pump Stations, City				
1.48.4		Contractor, 24 hour, on Chief PS & Header Chamber				
	Waste Water Works - Investment Details	**Unit**	2015	2016	2017	2018
	Section 1.8 Capital Investment works carried out since most recent report (including works not included on WSIP Programme or not WSIP funded)					
1.49	Sewers Upgraded or Replaced	m	200			
1.50	Sewers Rehabilitated	m	0			
1.51	Manholes Rehabilitated	Nr	5			
1.52	Local Repairs	Nr	50			
1.53	Total Length of sewers Upgraded, Replaced or Rehabilitated	m	200	0	0	0
1.54	Pumping Stations Operated by Local Authority Upgraded or Repaired	Nr	38			
1.55	WWTW operated by Local Authority Upgraded or Replaced	Nr	0			
1.56	In the following two cells describe the actual Capital Investment undertaken in the reporting period.					
1.56.1	For example : Sewer Rehabilitation Contract Works being undertaken under the WSIP					
1.56.2						
	Section 1.9 Licence Specified Improvements Works					
1.57	*The Local Authority is required to report on the extent of Improvement Works which have been specifed under the Licence as issued by the EPA. Reference which AER contains this information*		2012 AER			
	Section 1.10 Other Updates Since Last Report					
1.58	*For example : 50% of the sewer network is currently being upgraded under the WSIP with an investment of €1.5m in 2010.*					
1.59	*For example : 2% of the sewer network is currently being replaced under the Local Authorities Annual Maintenance Fund*					
1.60						
1.61						
1.62						

Section 2.1 Hydraulic Risk Assessment

Query	Description	Prompt	Risk Score	Short Commentary by the Local Authority	Comment or Action to be Taken
2.1	**Has a Hydraulic Performance Assessment been undertaken for the Sewer Network (e.g., Computer Model or other Engineering Design or Design Review) ?**	No	40		If the answer is **No** assess the need and cost benefit of developing a computer model or engineering design assessment of the Sewer Network and complete Query 2.12. If the answer is **Yes** proceed to Queries 2.1.1 to 2.1.4 inclusive
2.1.1	If Answer to Query 2.1 is Yes, what % of the Network is covered by the hydraulic assessment ?	N/A	0		The % coverage of the Network by the Hydraulic Assessment can be estimated by the area assessed against the area served by the Network. ENTER "N/A" IF COMPUTER MODEL or DESIGN DOES NOT EXIST. DO NOT LEAVE BLANK OR ENTER "0".
2.1.2	How many years has it been since the **completion** of the hydraulic assessment ?	more than 10	0		Select N/A response if no design assessment or design exists.
2.1.3	Are the outcomes of the Hydraulic Assessment being implemented ?	No	0		Select N/A response if no design assessment or design exists.
2.1.4	How many years has it been since the **outcomes** of the hydraulic assessment have been implemented ?	more than 10	0		Select N/A response if no hydraulic performance assessment or design exists. For onging works select "less than 5".
2.2	**Has a Dynamic Computer Model been used to Assess the Hydraulic Performance of the Sewer Network ?**	No	10		Computer Model means a Hydroworks/Infoworks Model, Micro-Drainage Model or equivalent.
2.3	**Has a Manhole Survey been undertaken in accordance with WRc Documentation "Model Contract Document for Manhole Location Surveys and the Production of Record Maps" ?**	No	10		If the answer is **No** assess the need and cost benefit of undertaking a Manhole Survey and complete Query 2.12. If the answer is **Yes** proceed to Query 2.2.1
2.3.1	If yes, how many years has it been since the survey was undertaken or updated?	N/A	0		Select N/A if no Manhole Survey has been undertaken. Enter N/A value for Confidence Grade if Prompt Box is "N/A"
2.4	**Has a Flow Survey been undertaken in accordance with WRc Documentation "A Guide to Short Term Flow Surveys of Sewer Systems" and "Contract Documents for Short Term Sewer Flows" ?**	No	20		If the answer is **No** assess the need and cost benefit of undertaking a Flow Monitoring Survey and complete Query 2.12. . If answer is **Yes** Proceed to Query 2.5
2.5	**What was this Flow Survey Information Used for ?**				
2.5.1	To Determine the extent of Problematic Sewer Catchments	No	0		Select N/A if no Flow Survey has been undertaken.
2.5.2	To Verify a Computer or Mathematical Model of the Network	No	0		Select N/A if no Flow Survey has been undertaken.
2.6	**Have Performance Criteria been developed to determine the short, medium or long term capacity of the sewer network ?**	No	10		If the answer is **No** assess the Future Needs of the Sewer Network and complete Query 2.12. If the answer is **Yes** proceed to Query 2.8
2.7	**How many flood events resulting from surcharge in the network have occurred in the past 3 years?**	more than 6	10		Flood events in this context means water/sewage backing up from the Network causing flooding of properties or causing disruption of traffic
2.8	**Are there deficiencies in performance criteria within the sewer network ?**	Yes	20		If the answer is **No**, Proceed to Query 2.10 and complete Query 2.12. If the answer is **Yes** proceed to Query 2.9
2.9	**Have the causes of these deficiencies in the Performance Criteria been identified and rectified ?**	N/A	0		If the answer is **No**, consider further examination of the hydraulic model (if available) and complete Query 2.12. If the answer is **Yes** proceed to Query 2.10
2.10	**Can the Hydraulic Assessment (defined in Query 2.1 above) be used to determine the benefit of reducing the contributory Impermeable Areas or extent of surface water contributions**	No	10		If the answer is **No**, consider further development of the Hydraulic Assessment (or model if available) and complete Query 2.12. If the answer is **Yes** proceed to Query 2.11
2.11	**Has an Impermeable Area Survey been carried out for the agglomeration or parts of the agglomeration ?**	No	10		If the answer is **No**, consider the need and cost benefit of undertaking an Impermeable Survey for parts of the agglomeration which are under hydraulic pressure and complete Query 2.12. .
	Total Risk Assessment Score (RAS)		**140**		
2.12	**Prepare Assessment of Needs & Sewer Upgrade Implementation Plan**	In the AER Attach Assessment of Needs and Rehabilitation Implementation Plan as separate documents			
2.13	In the AER provide Summary of Proposed Works or Direction to be taken to improve hydraulic efficiency				

Section 3.1 Environmental Risk Assessment					
Query	**Description**	**Prompt**	**Risk Score**	**Short Commentary by the Local Authority**	**Comment or Action to be Taken**
3.1	What Environmental or Discharge Quality Data is available with regard to the sewer network ?	up-to-date electronic or paper database exists	0		Select N/A if no discharges, secondary discharges or overflows from network; if discharges do exist complete Query 3.12
3.1.1	Do trade effluents discharge to the sewer network?	Yes	20		If the answer is **No**, proceed to Query 3.1.2. If the answer is **Yes**, Proceed to Query 3.2
3.1.2	Are there Storm Water Overflows within the network ?	Yes	20		If the answer is **No**, proceed to Query 3.1.3. If the answer is **Yes,** Proceed to Query 3.3
3.1.3	Are there Secondary Discharges within the network (excluding Emergency Overflows at Pump Stations)?	Yes	20		If the answer is **No**, proceed to Query 3.1.4.
3.1.4	Is there any evidence that exfiltration is occurring from the network ?	Unknown	20		If the answer is **No**, does all wastewater enter a wastewater treatment plant (insert summary details in the AER)? If **Yes**, Proceed to Query 3.6
3.2	If Answer to Query 3.1.1 is "Yes", what % of trade effluents have a licence to Discharge to the Public Sewer ?	21 - 30%	28		Select N/A if answer to Query 3.1.1 is **No**. If not all trade effleunts are licenced, Local Authority should consider issuing and controlling such discharges under the appropriate Legislation.
3.2.1	Are all licenced trade Discharges compliant with their relevant licence and associated conditions	No	10		Answer N/A if none of the trade effluents are licenced. Answer No if this information is unknown. If the answer is **Unknown** or **No**, consider issuing a direction to the relevant Licencee. If the answer is **Yes,** no further action is needed.
3.2.2	If Answer to Query 3.2.1 is "No", state what % of Trade Discharges are NOT compliant with their relevant licence and associated conditions (where that non-compliance led to enforcement action)	11 - 25%	10		Select **N/A** if answer to Query 3.2.1 is Yes. If N/A is selected as answer to Query 3.2.2
3.3	In accordance with the DoEHLG paper "Procedures & Criteria in relation to Storm Water Overflows", what % of storm water overflows in the system have been classified for their significance?	100%	0		If the answer is **No,** consider a review of each discharge within the sewer network complete and Query 3.11. If the answer is **Yes**, proceed to Query 3. 6
3.4	Have samples from any Secondary Discharges within the system been analysed ?	No	30		Select N/A if no secondary discharges in system. If the answer to Query 3.4 is **No**, consider examining the quality of each secondary discharge within the sewer network complete Query 3.11. If the answer is **Yes**, proceed to Query
3.5	What percentage of discharges from the system are known to cause environmental pollution of the receiving waters ?	21 - 30%	30		If the answer is greater than 50% then detail, in the AER, the Improvement Programme necessary to reduce this percentage.
3.6	In relation to possible exfiltration has a risk analysis of ground water contamination or pollution been undertaken ?	No	20		Select N/A if answer to Query 3.1.4 is NO. If the answer is **No**, consider undertaking ground water risk analysis and complete Query 3.12
3.6.1	If Answer to Query 3.6 is "Yes", have any groundwater aquifers been identified in the area of the Network and/or Discharge Points?	No	0		Select **N/A** if no risk analysis of groundwater contamination has been undertaken.
3.6.2	If Answer to Query 3.6.1 is "Yes", state the classification of groundwater aquifer identified in the area?	N/A	0		Select **N/A** if no risk analysis of groundwater contamination has been undertaken.
3.6.3	In relation to Query 3.6.1, is the aquifer used as a source for Public, Private or Group Water Supply Schemes?	No	0		Select **N/A** if no risk analysis of groundwater contamination has been undertaken.
3.7	Has an Impact Assessment of each Storm Water Overflow been undertaken in accordance with the DoEHLG paper "Procedures & Criteria in relation to Storm Water Overflows" including setting performance criteria?	Yes	0		If the answer is **No**, consider assessing the risk category of the receiving waters. If the answer is **Yes**, proceed to Query 3.8 and provide summary details of the assessment in the AER.
3.8	What percentage of storm water overflows comply with the performance criteria referred to in Query 3.7?	11 - 50%	40		Select N/A if answer to Query 3.7 is **No** or if there are no SWOs in system. **(Risk Score is locked at 0 if no SWOs in system is stated in Agglomeration Details)**
3.9	Have the causes of these Capacity Deficiencies (storm water overflows & Secondary Discharges) been identified ?	Yes	0		Select N/A if answer to Query 3.7 is NO or if there are no SWOs in system. If the answer to Query 3.9 is **No**, consider further examination of the environmental model
		Total Risk Assessment Score (RAS)	**248**		
3.10	Prepare Assessment of Needs & Sewer Upgrade Implementation Plan	In the AER Attach Assessment of Needs and Rehabilitation Implementation Plan as separate documents			
3.11	Provide Summary Details (in the AER) of records upstream and downstream of licenced discharges with regard to Environmental Performance of the network. These details can be included as part of the AER submitted for the agglomeration.				

Section 4.1 Structural Risk Assessment

Query	Description	Prompt	Risk Score	Short Commentary by the Local Authority	Comment or Action to be Taken
4.1	**Has a CCTV Survey been undertaken in accordance with WRc Documentation "Model Contract Document for Sewer Condition Inspections" and "Manual of Sewer Condition Classification" ?**	Yes	0		If the answer is **No** assess the need and benefit of undertaking CCTV Survey. If **Yes** Proceed to Query 4.2
4.1.1	How many years has it been since the **completion** of the CCTV Survey?	less than 5	0		If no CCTV has been undertaken, select "N/A" response
4.2	**What was this CCTV Survey Information Used for?**	Minimal Survey to Determine extent of Problem Sewers	5		Select N/A if answer to Query 4.1 is NO.
4.3	**Has the CCTV Survey been used to Assess the Structural Condition of the Sewer Network or targeted sections of the Sewer Network?**	Yes	0		If no CCTV has been undertaken, select "No" response. If the answer is **No** assess the need and benefit of undertaking an assessment of the Structural Condition of the Sewer Network. If the answer is **Yes** proceed to Q
4.4	**Have Performance Criteria been developed to determine the short, medium or long term structural condition of the sewer network ?**	Yes	0		If the answer is **No**, enter "unknown" in response to Queries 4.4.1 to 4.4.5; consider assessing the Future Needs of the Sewer Network. If the answer is **Yes** proceed to Queries 4
4.4.1	What % of the Total Sewer Length contains Collapsed or Imminent Collapse of Sewers (Grade 5)	5%	17		Insert Percentage of Overall Network Length; If a sewer length contains a Grade 5 collapse, include the total length of that sewer in calcuating the %. If information is not available type "Unknown" into Prompt Box
4.4.2	What % of Total Sewer Length contains Sewers Likely to Collapse (Grade 4)	10%	12		Insert Percentage of Overall Network Length; If a sewer length contains a Grade 4 condition, include the total length of that sewer in calcuating the %. If information is not available type "Unknown" into Prompt Box
4.4.3	What % of Total Sewer Length contains sewers with Further Possible Deterioration (Grade 3)	20%	7		Insert Percentage of Overall Network Length; If a sewer length contains a Grade 3 deterioration, include the total length of that sewer in calcuating the %. If information is not available type "Unknown" into Prompt Box
4.4.4	What % of Total Sewer Length contains sewers with Minimal Collapse (Grade 2)	40%	5		Insert Percentage of Overall Network Length; If a sewer length contains a Grade 2 feature, include the total length of that sewer in calcuating the %. If information is not available type "Unknown" into Prompt Box
4.4.5	What % of Total Sewer Length contains sewers of Acceptable Structural Condition (Grade 1)	unknown	5		Insert Percentage of Overall Network Length. If information is not available type "Unknown" into Prompt Box
If all % lengths are known, Check Total Length = 100%			**45**		If answers to Queries 4.4.1, 4.4.2 or 4.4.3 are above a set level, the RAS for Query 4 is automitically set at the maximum of 140.
4.5	**What % of the deficiencies, as detailed in Items 4.4.1, 4.4.2 and 4.4.3, have been rectified ?**	0 - 10%	35		Select N/A if answer to Query 4.4 is **No**. If the answer is **No**, Proceed to Query 4.6 If the answer is **Yes**, what monitoring is in place to ensure continued acceptance of structural condition? Proceed to Query 4.7
4.6	**Have the causes of the Structural Deficiencies (Grades 3, 4 and 5) been identified or is there a Preventative Maintenance Programme in place?**	No	10		If the answer is **No**, consider further examination of the sewer network, the structural loading conditions, gradients and possible H_2S Formation. If Yes completed Query 4.7
		Total Risk Assessment Score (RAS)	**95**		

4.7	**Prepare Assessment of Needs & Sewer Rehabilitation Implementation Plan**	In the AER Attach Assessment of Needs and Rehabilitation Implementation Plan as separate documents

Section 5.1 O&M Risk Assessment					
Query	**Description**	**Prompt**	**Risk Score**	**Short Commentary by the Local Authority**	**Comment or Action to be Taken**
5.1	Are complaints of an environmental nature recorded and held in a central database?	Yes	0		Consider setting up Central Database for Complaints
5.2	Is there an emergency response procedure in place?	Yes	0		Consider setting up target response times for dealing with Complaints
5.3	What has been the highest frequency of flooding in the network due to hydraulic inadequacy, over the past 5 years?	More than 5 times/yr	20		Refers to flooding from the Network only, not natural flooding from rivers/streams/high tides. Select the highest number of events in any 12 month period.
5.4	What has been the highest frequency of flooding in the network due to operational causes over the past 5 years?	More than 5 times/yr	20		Refers to flooding from the Network only, not natural flooding from rivers/streams/high tides. Select the highest number of events in any 12 month period.
5.5	What has been the highest frequency of surcharging of critical sewers in the network, over the past 5 years?	More than 5 times/yr	20		Select the highest number of events in any 12 month period.
5.6	What has been the highest frequency of reportable incidents in the network, over the past 5 years?	4 times/yr	15		Select the highest number of events in any 12 month period.
5.7	What has been the highest frequency of reportable incidents due to discharges, for whatever reason, from Pumping Station Emergency Overflows in the network, over the past 5 years?	3 times/yr	6		Select the highest number of events at any given Pumping Station in any 12 month period.
5.8	What has been the highest frequency of blockages in sewers in the network over the past 5 years?	>0.25/km/yr	20		Select the highest number of events per km of sewer network in any 12 month period.
5.9	What has been the highest frequency of collapses in sewers in the network over the past 5 years?	More than 5 times/yr	20		Select the highest number of events in any 12 month period.
5.10	What has been the highest frequency of bursts in rising mains in the network over the past 5 years?	Once/yr	4		Select the highest number of events in any 12 month period.
		Total Risk Assessment Score (RAS)	**125**		

5.11	Prepare Up Dated Operational and Maintenance Plan	

Section 6.1 Summary of Risk Assessment Scores

Element	Risk Assessment Score	Risk Category	% Risk Score	Maximum Risk Score
Section 2.1 Hydraulic Risk Assessment	140	High Risk	93%	150
Section 3.1 Environmental Risk Assessment	248	Low Risk	50%	500
Section 4.1 Structural Risk Assessment	95.31666667	Medium Risk	64%	150
Section 5.1 O&M Risk Assessment	125	Medium Risk	63%	200
Total RAS for Network	**608.3166667**	**High Risk**	**61%**	**1000**

If the total RAS is greater than 750, or if any of the individual RASs are greater than 75% of the Maximum Available Score, the Risk category for the Network is graded "High Risk"

Appendix 7.5 – Specified Improvement Programme

WasteWater Treatment Plant Upgrade.

The Cork City scheme is currently being reviewed and part of the review will include an assessment of nutrient removal requirements and impacts on shellfish waters. . It is proposed to undertake a review of the dispersion modelling of the discharge from Carrigrennan to assess potential impacts of the discharge from the wastewater treatment plant. The 2017-2021 investment plan also includes a proposal to provide nutrient removal at Carrigrennan. The 2017-2021 investment plan includes a proposal to provide UV treatment at Carrigrennan if the updated discharge modelling shows that it is necessary to protect the shellfish water quality.

A.3 & C.2: SD02 St Patrick's Bridge Culvert:

The project to identify the crossed and missed connections into St Patricks Culvert is underway. A consultant was appointed, and subsequently contractors also appointed, in 2015, to carry out surveys and identify sources of cross contamination into storm Culvert with a view to remediation. The surveys have commenced and are scheduled to be completed in Q3 2016. Once the findings are available a scheme for remediation will be drawn up to rectify the issues at fault.

C1: Infiltration programme:

Irish Water is progressing with a Network and Infiltration Review Project, with a view to constructing a verified hydraulic model of the entire wastewater network associated with the Cork City Agglomeration. The tender process to appoint a consultant to prepare the Drainage Area Plan (DAP) for the agglomeration is near conclusion. It is expected to appoint the Consultant in Q2 2016.

This model will be utilised to identify areas of tidal infiltration, existing and future capacity issues and potential misconnections between foul and storm networks.

The project will incorporate previous projects, i.e.

Tramore River Valley Study

Glanmire/Riverstown /Little Island Stormwater Seperation Study

The project will also give outputs for

C.1 *Improvement in operation of and reduction in frequency of Discharge via CSO71 (Carrigrennan WWTP),* as reductions in infiltration achieved through identification and resolution of issues in the Network will reduce frequency of overflows at WWTP

C3: Meet *Requirements of DoEHLG "Procedures and Criteria in relation to Storm Water Overflows" 1995* as it will quantify the overflows from each Storm Water Overflow and hence verify if they are problematic or not.

This Network Model Project and the Water Quality /Designation of Sensitive Waters review are the key items required to inform prioritisation of projects /address issues identified in the licence for the agglomeration.

Review of operation of Atlantic Pond and Ballinure Header Chamber

A review is underway by Irish Water of the operation of Ballinure Header Chamber and Atlantic Pond Pump Station, the largest pump station in the agglomeration. These are key items of infrastructure. It is expected that by optimisation of equipment together with upgrade of controls and Scada/ Telemetry, that improvements will be achieved in flow regimes to the WWTP. This should assist in reducing peak flows and also reduce some overflows from the WWTP.

The tender process is being finalised and a contractor is at the point of being appointed. The contractor will be appointed in Q1 2016 to undertake the upgrade works.

Ref C1. I*mprovement in operation of and reduction in frequency of Discharge via CSO71 (Carrigrennan WWTP).*

Suppressed Capital Maintenance Programme

Replacement of Failed and Failing assets, e.g. Pumps, Flow meters, Non return valves, Sensors, Electrical equipment, Telemetry etc. Are continuing steadily under IW . These programmes assist greatly in delivery of sustainable operational and maintenance service.

Appendix 7.6 – Priority Substances Monitoring Review

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Introduction

Priority Substances Monitoring has been carried out for D0033-01, Cork City, in County Cork in accordance with the requirements of 4.12 of the wastewater discharge licence for the agglomeration.

The Environmental Protection Agency undertook an Effluent Characterisation with consultants Mott MacDonald Ireland Ltd, and 88 pollutants, (including all the priority substances) were monitored on a quarterly basis at 11 WWTPs around Ireland, including Cork City WWTP. This study's objective was to determine which pollutants are likely to be found in Irish WWTPs and also to refine the UWW Calculation Tool for PRTR reporting purposes.

It was agreed with the EPA that Cork City did not have to carry out further sample testing for the Priority Substances, i.e. Organic Compounds and Metals, as this testing was included in the Effluent Characterisation monitoring for Cork City WWTP. The final report for this WWTP Characterisation was produced in July 2012.

A summary of the findings of the report with relevance to Carrigrennan WWTP was attached in **2012 AER Report as Appendix 1: Priority Substances.** The **2013 AER** reported on the requirement for a monitoring programme under paragraph 4.12 and schedule B1 note 3 of the licence.

1.1 2013 Assessment Conclusion

The results of the WWTP Characterisation were reviewed against the Annual Average Environmental Quality Standard (AA-EQS) for Other Surface Waters as set out in Tables 10 to 12 in S.I No.272 of 2009 and as amended in S.I. No. 327 of 2012.

No impact on the Receiving Waters was identified from the substances tested.

The majority of parameters were below the Annual Average Environmental Quality Standard (AA-EQS) for Other Surface Waters as set out in Tables 10 to 12 in S.I No.272 of 2009 and as amended in S.I. No. 327 of 2012.

Overall it was considered that given the location of the outfall from the WWTP in the Lower Estuary there is adequate dilution for the concentration of substances where detected above the Annual Average Environmental Quality Standard.

From the review however, four substances are recommended to be tested on an annual basis to verify that there is no deterioration in effluent quality.

1) **Cyanide** presented as exceeding the AA-EQS (Other) in two samples of effluent of four tested at levels of 22 and 16, Vs standard of 10 ug/l.

2)**Zinc** had one exceedance at 45.4 ug/l Vs AA-EQS (Other) standard of 40 ug/l.

3) **Nonylphenol and Nonylphenol Ethoxylates** (NP/NPEs) had one test value of the four above the AA-EQS (Other) standard of 0.3 ug/l. This test result was however at a level of 3.65 ug/l which warrants further test, in particular given the type of industries adjacent to the WWTP.

4)**Di(2-ethylexyl)phthalate** had all four test values below the AA-EQS (Other) standard of 1.3 ug/l, the highest test value coming in at 1.11 ug/l. It is close enough to the standard to warrant retest on an annual basis in conjunction with the other three substances above.

1.2 Monitoring 2014

Samples were collected and tested in November 2014 from the influent and Effluent at the WWTP, together with a sample at both High and Low tide from each of the 5 ambient monitoring locations in the harbour, a total of 12 samples in all. These samples were tested for a total of 13 Priority Substances. Given the number of industries feeding into the WWTP it was considered that it would be expedient, since sampling and analysis was being carried out in any event, to extend the range of parameters to encompass those likely to be a source of concern for the WWTP and the receiving waters.

Some parameters in 2014 testing had inlet values higher than those of the Characterisation study, notably PAH Total and 4- Nonylphenol branched, and DCM and Phenols exceeded those of the Characterisation study by a factor of 10.

Given that, as in the 2013 assessment, No impact on the Receiving Waters was identified in 2014 from the substances tested, no testing of the receiving waters was carried out in 2015.

1.3 Monitoring 2015

Samples were collected and tested in November 2015 from the influent and Effluent at the WWTP. These samples were tested for **Zinc, Glyphosate, PAHs, Nonylphenols** and **DEHP**. The Results are tabulated in Table 7.7.1 over

1)**Cyanide** was not tested in 2015

2)**Zinc** results in 2015 were directly comparable to the results of 2014 testing. Effluent in 2015 at 36 ug/l microgramme/litre was within the S.I. 272 /2009 AA-EQS (Other) standard of 40 ug/l.

3)**Glyphosate** results were similar to 2014, and all less than the limit of detection.

4)**PAHs:** Anthracene, Benzo(a)pyrene, Flouranthene, and Napthalene were all below the AA-EQS (Other)limits of S.I. 327/2012. However the sum of benzo(b)flouranthene and benzo(k)flouranthene at 0.032 ug/l marginally exceeded the AA-EQS (Other) limit of 0.03 ug/l. Similarly the sum of benzo(g,h,i)flouranthene and indeno(1,2,-cd)pyrene at 0.108 ug/l exceeded the value of 0.002 ug/l for the AA-EQS (Other) limit of S.I. 327 /2012 .

5) **Nonylphenol and Nonylphenol Ethoxylates** (NP/NPEs) monitoring results were all inconclusive, being less than limits of detection.

6)**Di(2-ethylhexyl)phthalate** result for Effluent at 2.2 ug/l exceeded the AA-EQS (Other) limit of S.I. 327 /2012 of 1.3 ug/l. The Influent value was directly comparable to that detected in 2014, but in 2015 no major improvement was detected over the treatment process.

1.4 Comparison and Conclusions

Zinc: Measured value of Influent in 2015 at 73 ug/l is typical of an influent under the influence of Tidal infiltration. This compares directly with value of 77 ug/l detected for Influent in 2014. In both 2014 and 2015 Effluent levels for Zinc improved through the treatment process, to 28 ug/l and 36 ug/l respectively, within the allowed AA-EQS Value .

Glyphosate: No issues and no change between 2014 and 2015.

PAH: There are questions about the results of the PAH testing. All results for Effluent were higher than the Influent, apart from Naphthalene. The overall PAH total (EPA 16) for Effluent at 0.730 ug/l was four times that of the Influent at 0.176 ug/l. This could be explained by the variation in inflows to the WWTP from local industries carrying out batch processes. Sampling was carried out on a Tuesday to attempt to overcome this issue but there is still a chance that effluent discharges did not reflect the equivalent inflows to the plant on the date in question. Further testing, possible mid week, is recommended as a cross-check on results and to verify exceedences where they may occur.

Nonylphenol and Nonylphenol Ethoxylates: Further testing is recommended to a lower limit of detection to verify the effect of inflows to the WWTP. Given the high <LOD result of monitoring it was decided not to include the results in the PRTR as the value of half the LOD to be used could scew the PRTR report without proper substantiation.

Di(2-ethylhexyl)phthalate: Influent values for 2014 and 2015 are directly comparable. Further testing is recommended to verify the values in the Effluent given the exceedence for effluent detected.

1.5 Table 7.6.1– Inlet and Discharge Priority Substance Data

		Priority Substances Assessment 2013 AER		Priority Substances Review				AA : Annual Average MAC: Maximum Allowable Concentration			
				November 2014		November 2015		S.I.327 of 2012		S.I. 272 of 2009	
Name of Substance	Unit	Outlet Impact (Yes/No)	Rec. Action	INLET / CRUDE SEWAGE	OUTLET / FINAL EFFLUENT	INLET / CRUDE SEWAGE	OUTLET / FINAL EFFLUENT	AA -EQS Other Surface Waters	MAC - EQS Other Surface Waters	AA -EQS Other Surface Waters	MAC - EQS Other Surface Waters
cyanide (total)	ug/l	No[2]	Annual Test	<20	<20	NT	NT			10	
zinc	ug/l	No[2]	Annual Test	77	28	73	36			40	
MCPP (mecoprop)	ug/l	No[1]	NFA	<0.04	<0.40	NT	NT				
2,4-D	ug/l	No[1]	NFA	<0.05	<0.50	NT	NT				
glyphosate	ug/l	No[3]	NFA	<0.0034	<0.0034	<0.0034	<0.0034			60 *	
acenaphthene	ug/l			0.01	<0.010	0.017	0.041				
acenaphthylene	ug/l			<0.010	<0.010	<0.010	0.027				
anthracene	ug/l			<0.010	<0.010	<0.010	0.047	0.1	0.4	<------	
benz(a)anthracene	ug/l			0.012	<0.010	<0.010	0.071				
benzo(a)pyrene	ug/l			<0.010	<0.010	<0.010	0.016	0.05	0.1	<------	
benzo(b)fluoranthene	ug/l			<0.010	<0.010	<0.010	0.021	0.03	n/a	<------	
benzo(k)fluoranthene	ug/l			<0.010	<0.010	<0.010	0.011				
benzo(g,h,i)perylene	ug/l			<0.010	<0.010	<0.010	0.06	0.002	n/a	<------	
indeno(1,2,3-cd)pyrene	ug/l			<0.010	<0.010	<0.010	0.048				
chrysene	ug/l			0.014	<0.010	<0.010	0.073				
dibenz(a,h)anthracene	ug/l			<0.010	<0.010	<0.010	0.044				
fluoranthene	ug/l			<0.010	<0.010	0.016	0.071	0.1	1	<------	
fluorene	ug/l			<0.010	<0.010	0.014	0.042				
naphthalene	ug/l			<0.010	<0.010	0.076	0.017	1.2	n/a	<------	
phenanthrene	ug/l			0.013	<0.010	0.021	0.063				
pyrene	ug/l			<0.010	<0.010	0.016	0.078				
PAH total (EPA 16)	ug/l	No[1]	NFA	0.049	<0.010	0.176	0.730				
carbon tetrachloride	ug/l	No[1]	NFA	<1.0	<1.0	NT	NT				
dichloromethane	ug/l	No[1]	NFA	<10	<10	NT	NT				
phenolics (as phenol)	ug/l	No[1]	NFA	37	<20	NT	NT				
4-nonylphenol branched	ug/l	No[2]	Annual Test	35	2.2	<2.0	<2.0	0.3	2	<------	
4-nonylphenol diethoxylate -isomers	ug/l			<2.0	<0.10	<2.0	<2.0				
4-nonylphenol monoethoxylate -	ug/l			<2.0	0.12	<1.0	<1.0				
4-nonylphenol tetraethoxylate -	ug/l			<6.0	<0.30	<3.0	<3.0				
4-nonylphenol triethoxylate -isomers	ug/l			<4.0	<0.20	<2.0	<2.0				
nonylphenol ethoxylates (1-4 EO)	ug/l			<2.0	<0.60	<6.0	<6.0				
2,6-dichlorobenzamide	ug/l	No[1]	NFA	<0.10	<0.10	NT	NT				
toluene	ug/l	No[1]	NFA	1.3	<1.0	NT	NT				
di(2-ethylhexyl)phthalate	ug/l	No[2]	Annual Test	2.7	<0.30	2.8	2.2	1.3	n/a	<------	
		No[1]	Below Limits of AA-EQS (Other) Tables 10,11, or 12							*(inland Surface Waters)	
		No[2]	Exceeds Limit or close to Limit of AA-EQS (Other) Tables 10,11 or 12								
		No[3]	NFA	No Further Action							