

# Annual Environmental Report

2018



Castlebellingham

D0269-01

## **TABLE OF CONTENTS**

### **1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2018 AER**

- 1.1 LICENCE SPECIFIC REPORTING INCLUDED IN AER
- 1.2 TREATMENT TYPE
  - 1.2.1 CASTLEBELLINGHAM WWTP
- 1.3 ELV OVERVIEW
  - 1.3.1 CASTLEBELLINGHAM WWTP
- 1.4 SLUDGE REMOVAL

### **2 MONITORING REPORTS SUMMARY**

- 2.1 SUMMARY REPORT ON MONTHLY INFLUENT MONITORING
  - 2.1.1 INFLUENT MONITORING SUMMARY - CASTLEBELLINGHAM WWTP
- 2.2 DISCHARGES FROM THE AGGLOMERATION
  - 2.2.1 EFFLUENT MONITORING SUMMARY - CASTLEBELLINGHAM WWTP
- 2.3 AMBIENT MONITORING SUMMARY
  - 2.3.1 AMBIENT MONITORING REPORT SUMMARY - CASTLEBELLINGHAM WWTP
  - 2.3.2 AMBIENT MONITORING PARAMETER MEAN (MG/L) - CASTLEBELLINGHAM WWTP

### **3 OPERATIONAL REPORTS SUMMARY**

- 3.1 TREATMENT EFFICIENCY REPORT
  - 3.1.1 TREATMENT EFFICIENCY REPORT SUMMARY - CASTLEBELLINGHAM WWTP
- 3.2 TREATMENT CAPACITY REPORT SUMMARY
- 3.3 COMPLAINTS SUMMARY
- 3.4 REPORTED INCIDENTS SUMMARY
  - 3.4.1 SUMMARY OF INCIDENTS
  - 3.4.2 SUMMARY OF OVERALL INCIDENTS
- 3.5 SLUDGE / OTHER INPUTS TO THE WWTP

### **4 INFRASTRUCTURAL ASSESSMENTS AND PROGRAMME OF IMPROVEMENTS**

- 4.1 STORM WATER OVERFLOW IDENTIFICATION AND INSPECTION REPORT
  - 4.1.1 SWO IDENTIFICATION
  - 4.1.2 INSPECTION SUMMARY REPORT
- 4.2 REPORT ON PROGRESS MADE AND PROPOSALS BEING DEVELOPED TO MEET THE IMPROVEMENT PROGRAMME REQUIREMENTS

- 4.2.1 SPECIFIED IMPROVEMENT PROGRAMME SUMMARY
- 4.2.2 IMPROVEMENT PROGRAMME SUMMARY
- 4.2.3 SEWER INTEGRITY RISK ASSESSMENT SUMMARY

**5 LICENCE SPECIFIC REPORTS**

**6 CERTIFICATION AND SIGN OFF**

- 6.1 SUMMARY OF AER CONTENTS
- 6.2 DECLARATION BY IRISH WATER

**7 APPENDIX**

- 7.1 AMBIENT MONITORING SUMMARY

# 1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2018 AER

This Annual Environmental Report has been prepared for D0269-01, Castlebellingham, in Louth in accordance with the requirements of the wastewater discharge licence for the agglomeration. Specified reports are included as an appendix to the AER as follows:

## 1.1 Licence specific reporting included in AER

Assessment / Report	Included in AER
<b>There is no Licence Specific Reports included in the AER.</b>	

## 1.2 Treatment Type

The agglomeration is served by a wastewater treatment plant Castlebellingham WWTP with a Plant Capacity PE of 1700. The treatment process includes the following:

### 1.2.1 Castlebellingham WWTP

Treatment type	Yes / No	Details
<b>Preliminary Treatment</b>	Yes	Screening
<b>Primary Treatment</b>	No	
<b>Secondary Treatment</b>	Yes	Activated sludge
<b>Nutrient Removal</b>	No	
<b>Tertiary Treatment</b>	No	

The overall compliance of the final effluent with the Emission Limit Values (ELVs) is shown below. More detailed information on the below ELV's can be found in Section 2.2 Discharges from the agglomeration.

### 1.3 ELV Overview

#### 1.3.1 Castlebellingham WWTP

Compliance Status	
Were all parameters compliant for Castlebellingham WWTP treatment plant	No
Where non compliant see Table 2.2.1 for details of parameters	

### 1.4 Sludge Removal

The amount of sludge removed from the wastewater treatment plant is shown below along with the transported destination of the sludge from the treatment plant.

Treatment Plant	Sludge type	Quantity	Unit	% Dry Solids	Destination
Castlebellingham WWTP	Liquid Sludge	3027.4	Weight (Tonnes)	0.97	Dundalk WWTP

#### Annual Statement of Measures

New storm tank and inlet works are planned. Automatic wasting of sludge works are planned under the IWSS programme to provide greater process control and treatment robustness. IW will be going to tender by end Q2 2019, with delivery across all IWSS sites projected for end 2021.

## 2 MONITORING REPORTS SUMMARY

### 2.1 Summary report on monthly influent monitoring

A summary of influent monitoring for the treatment plant is presented in below. This monitoring is primarily undertaken in order to determine the overall efficiency of the plant in removing pollutants from the raw wastewater.

#### 2.1.1 Influent Monitoring Summary - Castlebellingham WWTP

Parameters	Number of Samples	Annual Max	Annual Mean
<b>Total Phosphorus (as P) mg/l</b>	7	13	4.9
<b>BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l</b>	10	1700	277.87
<b>COD-Cr mg/l</b>	11	3875	571.5
<b>Suspended Solids mg/l</b>	12	550	173.98
<b>Total Nitrogen mg/l</b>	6	324	68.02
<b>Hydraulic Capacity</b>		1277.4	328.48

If other inputs in the form of sludge / leachate are added to the WWTP then these are included in Section 3.5 if applicable.

#### Significance of Results:

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

## 2.2 Discharges from the agglomeration

### 2.2.1 Effluent Monitoring Summary - Castlebellingham WWTP

Parameter	WWDL ELV (Schedule A)	ELV with Condition 2 Interpretation included <sup>Note 1</sup>	Interim % reduction from influent concentration	Number of sample results	Number of exceedances	Number of with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
ortho-Phosphate (as P) - unspecified mg/l	0	0	0	8	0	0	1.52	N/A
Faecal coliforms cfu/100ml	0	0	0	8	0	0	560858.51	n/A
E. Coli cfu/100ml	0	0	0	8	0	0	301054.02	N/A
Ammonia-Total (as N) mg/l	2	2.4	0	8	2	1	1.17	Fail
pH pH units	6 to 9	0	0	8	0	0	7.2	Pass
Suspended Solids mg/l	25	62.5	0	13	3	1	25.51	Fail
Enterococci (Intestinal) cfu/100ml	0	0	0	8	0	0	1229.64	N/A
COD-Cr mg/l	125	250	0	8	2	0	75.69	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	25	50	0	8	1	0	11.86	Pass

Notes:

1– This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied

#### Cause of Exceedance(s):

Plant or equipment maintenance at WWTP and Plant or equipment breakdown at WWTP.

#### Significance of Results:

The WWTP is non compliant with the ELV's set in the Wastewater Discharge Licence. Three samples were non compliant with the ELV in relation to TSS, one of which was above the ELV with the Condition 2 interpretation included. Two samples were non compliant with the ELV in relation to Ammonia N, one of which was above the ELV with the Condition 2 interpretation included. The impact on receiving waters is assessed further in Section 2.3.

### 2.3 Ambient monitoring summary

A summary of monitoring from ambient monitoring points associated with the wastewater discharge is provided in the sections below. For discharges to rivers upstream (U/S) and downstream (D/S) location data is provided. For other ambient points in lakes, coastal or transitional waters, monitoring data from the most appropriate monitoring station is selected.

#### 2.3.1 Ambient Monitoring Report Summary - Castlebellingham WWTP

The table below provides details of ambient monitoring locations and details of any designations as sensitive areas.

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference	Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Status
<b>Upstream</b>	306180, 295322	TPEFF2100D0269SW001	No	No	No	Yes	Moderate
<b>Downstream</b>	306964, 294540	TPEFF2100D0269SW001	No	No	No	Yes	Moderate

#### 2.3.2 Ambient Monitoring Parameter Summary - Castlebellingham WWTP

The results for ambient results and / or additional monitoring data sets are included in the **Appendix 7.1 - Ambient Monitoring Summary**.



### Significance of Results:

The ambient monitoring results meet the required EQS.

Where the ambient monitoring results meet the EQS this relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

The discharge from the wastewater treatment plant does not have an observable negative impact on the water quality.

The discharge from the WWTP has no observable negative impact on the Water Framework Directive status.

As shown in evidence presented as part of the 2016 AER, there are no Drinking Water Abstraction points downstream of the treatment plant. Therefore, it is considered that there are no potential impacts on drinking water abstractions arising from the Castlebellingham WWTP. As such there is no need for further assessment at present (see AER 2016 Appendix 7.6).

The Dundalk Bay Shellfish Area is located approx. 4 km from the primary discharge point. Stage 2 Scoping Assessment Reports concluded that discharges from Castlebellingham are likely to have a negative microbiological effect on the quality of the shellfish in the Dundalk Bay designated shellfish waters.

### 3 OPERATIONAL REPORTS SUMMARY

#### 3.1 Treatment Efficiency Report

Treatment efficiency is based on the removal of key pollutants from the influent wastewater by the treatment plant. In essence the calculation is based on the balance of load coming into the plant versus the load leaving the plant. The efficiency is presented as a percentage removal rate.

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

##### 3.1.1 Treatment Efficiency Report Summary - Castlebellingham WWTP

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
<b>COD</b>	71626.17	9665.66	86.51
<b>cBOD</b>	37589.75	1514.18	95.97
<b>SS</b>	20788.71	3021.64	85.46

Note: The above data is based on sample results for the number of dates reported

### 3.2 Treatment Capacity Report Summary

Treatment capacity is an assessment of the hydraulic (flow) and organic (the amount of pollutants) load a treatment plant is designed to treat versus the current loading of that plant.

Castlebellingham WWTP	
Peak Hydraulic Capacity (m <sup>3</sup> /day) - As Constructed	2160
DWF to the Treatment Plant (m <sup>3</sup> /day)	720
Current Hydraulic Loading - annual max (m <sup>3</sup> /day)	1277.4
Average Hydraulic loading to the Treatment Plant (m <sup>3</sup> /day)	328.48
Organic Capacity (PE) - As Constructed	1700
Organic Capacity (PE) - Collected Load (peak week)	1478
Organic Capacity (PE) - Remaining	222
Will the capacity be exceeded in the next three years? (Yes/No)	No

### 3.3 Complaints Summary

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

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There is no Complaint data included in the AER.			

### 3.4 Reported Incidents Summary

Environmental incidents that arise in an agglomeration are reported on an on-going basis in accordance with our waste water discharge licences. Where an incident occurs and it is reportable under the licence, it is reported to the Environmental Protection Agency through their Environmental Data Exchange Network, or in some instances by telephone. Some incidents which arise in the agglomeration are recorded by Irish Water but may not be reportable under our licence for example where the incident does not have an impact on environmental performance.

A summary of reported incidents is included below.

#### 3.4.1 Summary of Incidents

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
<b>Non-compliance</b>	Plant or equipment maintenance at WWTP	1	No	Yes
<b>Other</b>	Plant or equipment breakdown at WWTP	3	No	No

#### 3.4.2 Summary of Overall Incidents

Question	Answer
<b>Number of Incidents in 2018</b>	4
<b>Number of Incidents reported to the EPA via EDEN in 2018</b>	4
<b>Explanation of any discrepancies between the two numbers above</b>	N/A

### 3.5 Sludge / Other inputs to the WWTP

'Other inputs' to the waste water treatment plant are summarised in table below

Input type	Quantity	Unit	P.E.	% of load to WWTP	Included in Influent Monitoring (Y/N)?	Is there a leachate/sludge acceptance procedure for the WWTP?	Is there a dedicated leachate/sludge acceptance facility for the WWTP?(Y/N)
<b>There is no Sludge and Other Input data for the Treatment Plant included in the AER.</b>							

## 4 INFRASTRUCTURAL ASSESSMENTS AND PROGRAMME OF IMPROVEMENTS

### 4.1 Storm Water Overflow Identification and Inspection Report

A summary of the operation of the storm water overflows and their significance where known is included below:

**No Appendix Included.**

#### 4.1.1 SWO Identification

WWDL Name / Code for Storm Water Overflow	Irish Grid Ref.	Included in Schedule A4 of the WWDL	Significance of the overflow (High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2018 (No. of events)	Total volume discharged in 2018 (m <sup>3</sup> )	Monitoring Status
SW002	305844, 294591	Yes	Low	Meeting			Not Monitored
SW003	306341, 295141	Yes	Low	Meeting			Monitored*
SW004	305977, 295162	Yes	Low	Meeting			Not Monitored

\*SW003 is monitored, however further to a review of the 2018 data, the data was not regarded as reliable.

#### 4.1.2 Inspection Summary Report

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m <sup>3</sup> )?	Unknown
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	No

SWO Summary	
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes
Have the EPA been advised of any additional SWOs / changes to Schedule C3 and A4 under Condition 1.7?	No

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

### 4.2.1 Specified Improvement Programme Summary

A wastewater discharge licence may require a number of reports on specific subject areas to be prepared for the agglomeration in question. These reports are submitted to the EPA as part of the Annual Environmental Report. This section provides list of the various reports required for this agglomeration and a brief summary of their recommendations.

Specified Improvement Programmes (under Schedule A and C of WWDL)	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
Appropriate treatment to ensure all emission limit values are achieved.	C	31/12/2019	No	Not Started		The improvement programme will be reviewed by IW to assess the works required to comply with the licence condition on a prioritised basis.

A summary of the status of any improvements identified by under Condition 5.2 is included below.

### 4.2.2 Improvement Programme Summary

Improvement Identifier	Improvement Description	Improvement Source	Expected Completion Date	Comments
<b>D0269-IP:44</b>	Upgrade of sludge wasting control system	Improved Operational Control	31/12/2021	Sludge control system to be upgraded to provide greater process control and treatment robustness.

#### 4.2.3 Sewer Integrity Risk Assessment

The utilisation of multiple capital maintenance programmes and the outputs of the workshops with the Local Authority Operations Staff held under the programme can be used to satisfy the requirements of Condition 5 regarding network integrity. Improvement works identified by way of these programmes and workshops will be included in the Improvements Summary Table.



## 5 LICENCE SPECIFIC REPORTS

A wastewater discharge licence may require a number of reports on specific subject areas to be prepared for the agglomeration in question. These reports are submitted to the EPA as part of the Annual Environmental Report. This section provides list of the various reports required for this agglomeration and a brief summary of their recommendations.

5.a Licence Specific Reports Summary Table

Licence Specific Report	Required by licence	Year included in AER	Included in this AER	Reference to relevant section of AER
Drinking Water Abstraction Point Risk Assessment	Yes	2016	No	
Priority Substances Assessment	Yes	2016	No	

## 6 CERTIFICATION AND SIGN OFF

### 6.1 Summary of AER Contents

Parameter	Answer
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?	No
List reason e.g. additional SWO identified	N/A
Is there a need to request/advise the EPA of any modifications to the existing WWDL?	No
List reason e.g. changes to monitoring requirements	N/A
Have these processes commenced?	N/A
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER	N/A

I certify that the information given in this Annual Environmental Report is truthful, accurate and complete:

Date: 19/03/2019

This AER has been produced by Irish Water's Environmental Information System (EIMS) and has been electronically signed off in that system for and on behalf of,

Eleanor Roche

Acting Head of Environmental Regulation.

## 7 APPENDIX

### Appendix

#### Appendix 7.1 - Ambient Monitoring Summary

## Castlebellingham Ambient Monitoring Data

### Ambient Monitoring Report Summary Table

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish National Grid Reference (Easting, Northing)	EPA Feature Coding Tool code	Receiving Waters Designation (Yes/No)			
			Bathing Water	Drinking Water	FWPM	Shellfish
Upstream Monitoring Point	306180, 295322	RS06G021230				
Downstream Monitoring Point	306964, 294540	RS06G021240	No	No	No	Yes

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Current WFD Status	Mean (mg/l)		
		cBOD	o-Phosphate (as P)	Ammonia (as N)
Upstream Monitoring Point	Moderate	1.333	0.033	0.033
Downstream Monitoring Point	Moderate	1.033	0.050	0.063
<i>Difference</i>		<i>-0.300</i>	<i>0.018</i>	<i>0.030</i>
EQS		2.600	0.075	0.140
% of EQS		-11.538%	23.333%	21.429%

## 2018 Ambient Monitoring Summary

Upstream Results						
Date		Ammonia (mg/l) *	Ortho P (mg/l) *	BOD (mg/l) *	TSS (mg/l)	pH (mg/l)
6-Feb-2018	U/S	< 0.06	0.020	< 1	2.0	8.30
15-May-2018	U/S	< 0.06	< 0.02	2.0	2.0	8.40
29-Aug-2018	U/S	0.030	0.060	< 2	54.0	8.09
26-Sep-2018	U/S	0.040	0.055	0.6	< 2	8.04
25-Oct-2018	U/S	0.030	0.028	3.4	12.0	7.96
5-Dec-2018	U/S	0.040	0.022	0.5	< 2	7.71
<b>Mean</b>		<b>0.033</b>	<b>0.033</b>	<b>1.333</b>	12.0	8.16
<b>95%ile</b>		<b>0.040</b>	<b>0.059</b>	<b>3.050</b>	43.5	8.38

Downstream Results						
Date		Ammonia (mg/l) *	Ortho P (mg/l) *	BOD (mg/l) *	TSS (mg/l)	pH (mg/l)
6-Feb-2018	D/S	< 0.06	0.030	< 1	4.0	8.30
15-May-2018	D/S	< 0.06	< 0.02	< 1	3.0	8.20
29-Aug-2018	D/S	0.060	0.070	< 2	203.0	8.11
26-Sep-2018	D/S	0.050	0.056	1.0	7.0	8.09
25-Oct-2018	D/S	0.180	0.110	3.3	9.0	7.94
5-Dec-2018	D/S	0.030	0.024	0.4	< 2	7.65
<b>Mean</b>		<b>0.063</b>	<b>0.050</b>	<b>1.033</b>	37.8	8.13
<b>95%ile</b>		<b>0.150</b>	<b>0.100</b>	<b>2.725</b>	154.5	8.28

**Note:** Where the concentration in the result is less than the limit of detection (LOD), a value of 50% of the LOD was used in calculating the mean and 95%ile concentrations.

Outer Dundalk Bay - Biota Results 2016

Year	Date	Sample	Station	SWD Area	WFD Area	Latitude	Longitude	Species (latin)	Species (common)	# of individuals	Length Range (mm)	Length Mean (mm)	Length Stdev (mm)	Tissue analysed	Moisture (%)	Lipid (%)	alpha-HCH (ug kg-1 WW)	beta-HCH (ug kg-1 WW)	cis-chlordane (ug kg-1 WW)	cis-heptachlorepoixide (ug kg-1 WW)	DDD (o p') (ug kg-1 WW)	DDD (p p') (ug kg-1 WW)	DDE (o p') (ug kg-1 WW)	DDE (p p') (ug kg-1 WW)	DDT (o p') (ug kg-1 WW)	DDT (p p') (ug kg-1 WW)	delta-HCH (ug kg-1 WW)	gamma-HCH (ug kg-1 WW)	heptachlor (ug kg-1 WW)	CB52 (ug kg-1 WW)
2016	29/11/16	1248	IA36E44	Dundalk Bay	Outer Dundalk Bay	53.88494	-6.33017	Cerastoderma edule	cockle	25	26.8 - 32.3	28.56	1.372	SB	85.9	0.59	<0.03	nd (<0.001)	nd (<0.001)	nd (<0.001)	<0.03	<0.031	<0.03	<0.034	<0.03	<0.032	nd (<0.001)	<0.03	nd (<0.001)	0.0086
2016	29/11/16	1248	IA36E44	Dundalk Bay	Outer Dundalk Bay	53.88494	-6.33017	Cerastoderma edule	cockle	25	26.8 - 32.3	28.56	1.372	SB	85.9	0.59	0.037	0.184	nd (<0.001)	nd (<0.001)	nd (<0.001)	0.123	0.09	0.107	0.595	0.427	0.962	0.728	0.473	0.0069
2016	29/11/16	1248	IA36E44	Dundalk Bay	Outer Dundalk Bay	53.88494	-6.33017	Cerastoderma edule	cockle	25	26.8 - 32.3	28.56	1.372	SB	85.9	0.59	0.979	0.142	3.408	0.354	0.686	2.341	2.655	nd (<0.003)	nd (<0.003)	<0.037	nd (<0.006)	nd (<0.003)	<0.038	0.013
2016	29/11/16	1248	IA36E44	Dundalk Bay	Outer Dundalk Bay	53.88494	-6.33017	Cerastoderma edule	cockle	25	26.8 - 32.3	28.56	1.372	SB	85.9	0.59	<0.036	0.013	<0.01	0.022	0.05	0.015	0.05	nd (<0.006)	0.03	0.0099	0.014	nd (<0.004)	<0.007	0.031

Shellfish Water Ambient Data for Outer Dundalk Bay

Year	Station	WFD Water Body	Date	Month	Latitude	Longitude	Water Depth (m)	Sample Depth (m)	acenaphthene (ug/l)	acenaphthylene (ug/l)	anthracene (ug/l)	arsenic (ug/l)	benzo[a]anthracene (ug/l)	benzo[a]pyrene (ug/l)	benzo[b]fluoranthene (ug/l)	benzo[b+k]fluoranthene (ug/l)	benzo[ghi]perylene (ug/l)	benzo[k]fluoranthene (ug/l)	cadmium (ug/l)	chromium (ug/l)	chrysene (pg/l)	cobalt (ug/l) *	copper (ug/l)	dibenz[a,h]anthracene (ug/l)	fluoranthene (ug/l)
2016	Dundalk Bay	Outer Dundalk Bay	14/04/16	April	53.946	-6.305	3.50	0.50	nd(<0.002)	nd(<0.002)	nd(<0.002)	1.64	nd(<0.002)	nd(<0.002)	nd(<0.002)	nd(<0.001)	nd(<0.002)	<0.05	0.33	nd(<0.002)	0.02	0.54	nd(<0.002)	nd(<0.002)	
2016	Dundalk Bay	Outer Dundalk Bay	21/06/16	June	53.9457	-6.3051	5.00	0.50	nd(<0.002)	nd(<0.002)	nd(<0.002)	1.76	nd(<0.002)	nd(<0.002)	nd(<0.002)	nd(<0.001)	nd(<0.002)	<0.05	0.19	nd(<0.002)	0.02	0.38	nd(<0.002)	nd(<0.002)	

Year	Station	WFD Water Body	Date	Month	Latitude	Longitude	Water Depth (m)	Sample Depth (m)	dibenz[a,h]anthracene (ug/l)	fluoranthene (ug/l)	fluorene (ug/l)	indeno[1,2,3-cd]pyrene (ug/l)	lead (ug/l)	manganese (ug/l) *	mercury (ng/l)	naphthalene (ug/l)	nickel (ug/l)	phenanthrene (ug/l)	pyrene (ug/l)	seccid depth (m)	silver (ug/l)	sum BGHIP and INDP (ug/l)	uranium (ug/l) *	vanadium (ug/l) *	zinc (ug/l)
2016	Dundalk Bay	Outer Dundalk Bay	14/04/16	April	53.946	-6.305	3.50	0.50	nd(<0.002)	nd(<0.002)	nd(<0.002)	nd(<0.001)	<0.1	3.23	1.04	nd(<0.002)	0.28	nd(<0.002)	nd(<0.002)	0.89	<0.05	nd(<0.001)	3.44	1.31	<1
2016	Dundalk Bay	Outer Dundalk Bay	21/06/16	June	53.9457	-6.3051	5.00	0.50	nd(<0.002)	nd(<0.002)	nd(<0.002)	nd(<0.001)	nd(<0.004)	1.23	1.23	nd(<0.002)	0.23	nd(<0.002)	nd(<0.002)	<0.05	nd(<0.001)	3.41	1.37	<1	

Year	Station	WFD Water Body	Date	Month	Latitude	Longitude	Water Depth (m)	Sample Depth (m)	fluorene (ug/l)	indeno[1,2,3-cd]pyrene (ug/l)	lead (ug/l)	manganese (ug/l) *	mercury (ng/l)	naphthalene (ug/l)	nickel (ug/l)	phenanthrene (ug/l)	pyrene (ug/l)	seccid depth (m)	silver (ug/l)	sum BGHIP and INDP (ug/l)	uranium (ug/l) *	vanadium (ug/l) *	zinc (ug/l)
2016	Dundalk Bay	Outer Dundalk Bay	14/04/16	April	53.946	-6.305	3.50	0.50	nd(<0.002)	nd(<0.001)	<0.1	3.38	0.95	nd(<0.002)	0.24	nd(<0.002)	nd(<0.002)	1.80	nd(<0.002)	nd(<0.001)	3.07	1.06	<1
2016	Dundalk Bay	Outer Dundalk Bay	21/06/16	June	53.9457	-6.3051	5.00	0.50	nd(<0.002)	nd(<0.001)	<0.1	4.13	0.72	nd(<0.002)	0.17	nd(<0.002)	nd(<0.002)	5.00	nd(<0.002)	nd(<0.001)	3.22	1.07	<1