Annual Environmental Report

2021

Birr

D0109-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2021 AER

This Annual Environmental Report has been prepared for D0109-01, Birr, in Offaly in accordance with the requirements of the wastewater discharge licence for the agglomeration. Specified reports where relevant are included as an appendix to the AER.

1.1 ANNUAL STATEMENT OF MEASURES

A summary of any improvements undertaken is provided where applicable.

There were no capital works, significant changes or operational improvements undertaken in 2021.

1.2 TREATMENT SUMMARY

The agglomeration is served by a wastewater treatment plant(s)

- Birr WWTP with a Plant Capacity PE of 12000, the treatment type is 3P - Tertiary P removal.

1.3 ELV OVERVIEW

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.

Discharge Point Reference	Treatment Plant	Discharge Type	Compliance Status	Parameters failing if relevant
TPEFF2500D0109SW001	Birr WWTP	Treated	Compliant	N/A

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
There are no Licence Specific Reports included in this AER.

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 BIRR WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - BIRR WWTP

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

Parameters	Number of Samples	Annual Max	Annual Mean
pH pH units	8	7.68	7.39
BOD, 5 days with Inhibition (Carbonaceous) mg/l	13	598	150
Ammonia-Total (as N) mg/l	8	33	18
ortho-Phosphate (as P) - unspecified mg/l	8	2.63	1.22
COD-Cr mg/l	13	1242	309.25
Suspended Solids mg/l	13	741	184.77
Total Nitrogen mg/l	13	47	24
Total Phosphorus (as P) mg/l	13	5.65	2.70
Hydraulic Capacity	N/A	3644	2449

If other inputs in the form of sludge / leachate are added to the WWTP then these are included in Section 2.1.5 if applicable.

Significance of Results:

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity. The annual maximum hydraulic loading is less than the peak Treatment Plant Capacity. Further details on the plant capacity and efficiency can be found under the sectional 'Operational Performance Summary'. The design of the wastewater treatment plant allows for peak values and therefore the peak loads have not impacted on compliance with Emission Limit Values.

2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF2500D0109SW001

Parameter	WWDL ELV (Schedule A)	ELV with Condition 2 Interpretation included [Note 1]	Interim % reduction from influent concentration	Number of sample results	Number of exceedances	Number of exceedances with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
COD-Cr mg/l	125	250	N/A	13	N/A	N/A	15	Pass
Suspended Solids mg/l	35	87.5	N/A	13	N/A	N/A	4.08	Pass
BOD, 5 days with Inhibition (Carbonaceous) mg/l	25	50	N/A	13	N/A	N/A	1.48	Pass
pH pH units	6.00	9.00	N/A	13	N/A	N/A	7.87	Pass
Ammonia-Total (as N) mg/l	5.00	6.00	N/A	13	N/A	N/A	0.070	Pass
Total Phosphorus (as P) mg/l	2.00	2.40	N/A	13	N/A	N/A	0.130	Pass
Mercury - unfiltered µg/l	N/A	N/A	N/A	1	N/A	N/A	0.035	

Parameter	WWDL ELV (Schedule A)	ELV with Condition 2 Interpretation included [Note 1]	Interim % reduction from influent concentration	Number of sample results	Number of exceedances	Number of exceedances with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
Total Nitrogen mg/l	N/A	N/A	N/A	13	N/A	N/A	19	
Nitrate (as N) mg/l	N/A	N/A	N/A	13	N/A	N/A	15	
ortho-Phosphate (as P) - unspecified mg/l	N/A	N/A	N/A	13	N/A	N/A	0.047	
Tributyltin µg/l	N/A	N/A	N/A	1	N/A	N/A	0.212	
Nitrite (as N) mg/l	N/A	N/A	N/A	13	N/A	N/A	0.032	
Conductivity @20°C µS/cm	N/A	N/A	N/A	13	N/A	N/A	639	

Notes:
1 – This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied
2 – For pH the WWDA specifies a range of pH 6 - 9

Cause of Exceedance(s):

Not applicable

Significance of Results:

The WWTP is compliant with the ELV's set in the Wastewater Discharge Licence.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF2500D0109SW001

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.

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	River Station Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Ecological Status
Upstream	205362, 205624	RS25L020800	No	No	No	No	Good
Downstream	203285, 207919	RS25L020900	No	No	No	No	Good

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 WWTP discharge was compliant with the ELV's set in the wastewater discharge licence.

The ambient monitoring results do not meet the required EQS at the downstream monitoring location. The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

Based on ambient monitoring results a deterioration in Ammonia & Ortho-P concentrations downstream of the effluent discharge is noted.

A deterioration in water quality has been identified, however it is not known if it or is not caused by the WWTP.

Other causes of deterioration in water quality in the area are unknown.

The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.

2.1.4 OPERATIONAL PERFORMANCE SUMMARY - BIRR WWTP

2.1.4.1 Treatment Efficiency Report - Birr WWTP

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:

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
TP	2412	106	96
cBOD	133867	1208	99
SS	165175	3335	98
TN	21544	15794	27
COD	276448	12438	96

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

2.1.4.2 Treatment Capacity Report Summary - Birr WWTP

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.

Birr WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	8100
DWF to the Treatment Plant (m^3/day)	2700
Current Hydraulic Loading - annual max (m^3/day)	3644

Birr WWTP	
Average Hydraulic loading to the Treatment Plant (m^3/day)	2449
Organic Capacity (PE) - As Constructed	12000
Organic Capacity (PE) - Collected Load (peak week)[Note1]	11011
Organic Capacity (PE) - Remaining	989
Will the capacity be exceeded in the next three years? (Yes/No)	No

Nominal design capacities can be based on conservative design principles. In some cases assessment of existing plants has shown organic capacities significantly higher than the nominal design capacity. Accordingly plants that appear to be overloaded when comparing a collected peak load with the nominal design capacity can be fully compliant due to the safety factors in the original design.

2.1.5 SLUDGE / OTHER INPUTS - BIRR 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)
There is no Sludge and Other Input data for the Treatment Plant included in the AER.							

3 COMPLAINTS AND INCIDENTS

3.1 COMPLAINTS SUMMARY

A summary of complaints of an environmental nature related to the discharge(s) to water from the WWTP and network is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There were no relevant environmental complaints in 2021.			

3.2 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.

3.2.1 SUMMARY OF INCIDENTS

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
There were no reportable incidents in 2021.				

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2021	0
Number of Incidents reported to the EPA via EDEN in 2021	0
Explanation of any discrepancies between the two numbers above	N/A

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:

4.1.1 SWO IDENTIFICATION

WWDL Name / Code for Storm Water Overflow (chamber) where applicable	Irish Grid Ref. (outfall)	Included in Schedule of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2021 (No. of events)	Total volume discharged in 2021 (m^3)	Monitoring Status
SW2	205371, 205854	Yes	Medium	Not Meeting	Unknown	Unknown	Not Monitored
SW3	205875, 204654	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW4	206171, 204637	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW5	206676, 203499	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW6	206934, 205172	Yes	Low	Meeting	Unknown	Unknown	Not Monitored

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

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 a 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)	Description	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
D0109-SIP:01	SW3 - Upgrading of Storm Water Overflows, to provide storm-water capacity of 150m^3, to comply with the DoE criteria for SWOs	C	01/01/2022	No	Not Started		
D0109-SIP:02	SW4 - Upgrading of Storm Water Overflows, to provide storm-water	C	01/01/2022	No	Not Started		

Specified Improvement Programmes (under Schedule A and C of WWDL)	Description	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
	capacity of 150m^3, to comply with the DoE criteria for SWOs						

A summary of the status of any other improvements identified by under Condition 5 assessments- is included below.

4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
No additional improvements planned at this time.				

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 Tables 4.2.1 and 4.2.2.

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 a list of the various reports required for this agglomeration and a brief summary of their recommendations.

Licence Specific Report	Required by licence	Year included in AER	Included in this AER
Priority Substances Assessment	Yes	2014	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
Has a Technical amendment/licence review application been submitted to the Agency by IW?	No
List reason e.g., additional SWO identified	N/A
Is there a need to request/advise the EPA of any modification to the existing WWDL with respect to condition 4 changes to monitoring location, frequency etc	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: 22/04/2022

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,

Katherine Walshe

Acting Head of Environmental Regulation.

7 APPENDIX

Appendix
Appendix 7.1 - Ambient monitoring summary

Birr Ambient Monitoring Summary 2021

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	205362, 205624	RS25L020800	No	No	No	No
Downstream Monitoring Point	203285, 207919	RS25L020900	No	No	No	No

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Current WFD Status	cBOD	o-Phosphate (as P)	Ammonia (as N)
Upstream Monitoring Point	Good	1.023	0.013	0.046
Downstream Monitoring Point	Good	0.954	0.015	0.068
Difference		*-0.068*	*0.003*	*0.022*
EQS		1.500	0.035	0.065
% of EQS		-4.554%	7.321%	34.071%

Birr Ambient Monitoring Data 2021

Station	Station Reference	Sample Date	Ammonia N mg/l	Biological Oxygen Demand mg/l	Conductivity @ 20°C µS/cm	COD Chemical Oxygen Demand mg/l	Dissolved Oxygen mg/l	Nitrite N mg/l	Total Nitrogen N mg/l	Dissolved Oxygen % Saturation % Sat.	Nitrate N mg/l	Temp Degrees C	Total Phosphorus P mg/l	Ortho-Phosphate P mg/l	pH pH units	Suspended Solids mg/l
0800 - Croghan Br	RS25L020800	27-Jan-2021	0.031	< 1			10.95		4	91.6		7.4	0.04	0.014	7.89	11
0800 - Croghan Br	RS25L020800	9-Feb-2021	0.023	1.2			11.8		3.6	89.3		3.7	0.2	0.011	7.9	2.5
0800 - Croghan Br	RS25L020800	10-Mar-2021	0.086	1			10.58		3.6	95.8		8.4	< 0.05	0.015	8	5.5
0800 - Croghan Br	RS25L020800	23-Mar-2021	0.036	2	614	< 20	11	< 0.015	4	88.5	3.5	3	< 0.2	< 0.02	8.04	< 2
0800 - Croghan Br	RS25L020800	11-Apr-2021	0.024	< 1	599	< 20	12.4	< 0.015	3.6	90.5	3.3	4	< 0.1	< 0.02	8.21	< 2
0800 - Croghan Br	RS25L020800	12-Apr-2021	0.047	1.7	596	< 20	11.5	< 0.015	3.6	94	3.5	4.2	< 0.1	< 0.02	8.25	< 2
0800 - Croghan Br	RS25L020800	13-Apr-2021	0.042	< 1	597	< 20	11.9	< 0.015	3.5	93	3.3	4.2	< 0.1	< 0.02	8.22	< 2
0800 - Croghan Br	RS25L020800	15-Apr-2021	0.088	< 1			11.2		3.5	99.3		10.7	< 0.05	< 0.006	8.1	< 2.5
0800 - Croghan Br	RS25L020800	9-June-2021	< 0.02	1.1			9.68		2.9	95.9		14.5	< 0.05	0.007	8	12
0800 - Croghan Br	RS25L020800	7-July-2021	0.02	1.7			8.95		2.2	88.1		13.6	0.12	0.006	7.7	34
0800 - Croghan Br	RS25L020800	26-Aug-2021	< 0.02	< 1			11.5		2.4	112.8		18.1	< 0.05	0.008	8.3	2.5
0800 - Croghan Br	RS25L020800	15-Sep-2021	< 0.02	< 1			9.2		2	87.3		15.3	0.05	0.011	8.07	< 2.5
0800 - Croghan Br	RS25L020800	5-Oct-2021	0.021	< 1			10.93		1.9	99.5		10.8	0.07	0.012	8	< 2.5
0800 - Croghan Br	RS25L020800	18-Oct-2021	0.078	< 1	386	< 20	9.34	0.008	2.7	91.2	2.545	12	0.05	0.017	7.96	< 2.5
0800 - Croghan Br	RS25L020800	19-Oct-2021	0.063	1.3			8.79		1.5	86.1		15.4	0.08	0.019	8.08	< 2.5
0800 - Croghan Br	RS25L020800	9-Nov-2021	0.04	< 1	466	< 20	12	0.016	2.7	106.7	2.612	4	0.07	0.026	7.95	3
		Mean	**0.0461**	**1.0228**	**543.0000**	**14.1423**	**10.7325**	**0.0111**	**2.9813**	**94.3500**	**3.1262**	**9.3313**	**0.0734**	**0.0129**	**8.0419**	**5.3122**
		95%ile	**0.0868**	**1.7750**	**610.2500**	**14.1423**	**12.1000**	**0.0147**	**4.0000**	**108.2250**	**3.5000**	**16.0750**	**0.1561**	**0.0208**	**8.2625**	**17.5000**

Station	Station Reference	Sample Date	Ammonia N mg/l	Biological Oxygen Demand mg/l	Conductivity @ 20°C µS/cm	COD Chemical Oxygen Demand mg/l	Dissolved Oxygen mg/l	Nitrite N mg/l	Total Nitrogen N mg/l	Dissolved Oxygen % Saturation % Sat.	Nitrate N mg/l	Temp Degrees C	Total Phosphorus P mg/l	Ortho-Phosphate P mg/l	pH pH units	Suspended Solids mg/l
0900 - Derrinsallow Br	RS25L020900	27-Jan-2021	0.025	< 1			10.3		4.5	91.6		7.3	0.04	0.013	7.93	23
0900 - Derrinsallow Br	RS25L020900	9-Feb-2021	0.025	1			11.5		3.6	87.5		3.9	0.16	0.011	7.9	2.5
0900 - Derrinsallow Br	RS25L020900	10-Mar-2021	0.078	< 1			10.56		3.9	92.5		8.6	< 0.05	0.014	8.1	5.5
0900 - Derrinsallow Br	RS25L020900	23-Mar-2021	0.029	1.7	619	< 20	11.2	0.072	4.6	89	3.4	3.2	< 0.2	< 0.02	8.1	12
0900 - Derrinsallow Br	RS25L020900	11-Apr-2021	0.027	< 1	614	< 20	12.2	< 0.015	3.7	90.1	3.4	4.1	0.95	< 0.02	8.26	< 2
0900 - Derrinsallow Br	RS25L020900	12-Apr-2021	0.039	< 1	612	< 20	12.2	< 0.015	3.6	92	3.6	4.6	< 0.1	< 0.02	8.27	< 2
0900 - Derrinsallow Br	RS25L020900	13-Apr-2021	0.03	1.1	616	< 20	12	< 0.015	3.8	92.1	3.7	4	< 0.1	< 0.02	8.27	< 2
0900 - Derrinsallow Br	RS25L020900	15-Apr-2021	0.072	< 1			104.2		3.8	10.6		10.6	< 0.05	< 0.006	8.1	3
0900 - Derrinsallow Br	RS25L020900	9-June-2021	< 0.02	1			9.82		3	97.4		14.8	< 0.05	0.007	8.1	< 2.5
0900 - Derrinsallow Br	RS25L020900	7-July-2021	0.044	2.3			8.71		2	87		13.9	0.13	0.006	7.8	41
0900 - Derrinsallow Br	RS25L020900	26-Aug-2021	< 0.02	< 1			9.77		2.1	94.7		18.2	< 0.05	0.009	8.2	4
0900 - Derrinsallow Br	RS25L020900	15-Sep-2021	< 0.02	1.1			8.8		2.3	82.5		15.5	0.05	0.01	8.1	< 2.5
0900 - Derrinsallow Br	RS25L020900	5-Oct-2021	< 0.02	< 1			11.07		2.1	101.3		10.7	0.07	0.02	8.1	< 2.5
0900 - Derrinsallow Br	RS25L020900	18-Oct-2021	0.072	< 1	373	< 20	9.54	0.006	2.2	90.3	2.142	12	0.05	0.023	8.05	< 2.5
0900 - Derrinsallow Br	RS25L020900	19-Oct-2021	0.054	< 1			8.89		1.9	87.2		15.3	0.1	0.018	8.09	9.5
0900 - Derrinsallow Br	RS25L020900	9-Nov-2021	0.54	< 1	476	< 20	12.7	0.046	3.1	104.7	2.799	4	0.07	0.056	8.15	5
		Mean	**0.068**	**0.954**	**551.667**	**14.142**	**16.466**	**0.026**	**3.138**	**86.906**	**3.174**	**9.419**	**0.136**	**0.015**	**8.095**	**7.301**
		95%ile	**0.194**	**1.850**	**618.250**	**14.142**	**35.575**	**0.066**	**4.525**	**102.150**	**3.675**	**16.175**	**0.437**	**0.031**	**8.270**	**27.500**

Note: Where the concentration in the result is less than the limit of detection (LOD), a value of LOD/sqrt(2) was used in calculating the mean and 95%ile concentrations.