Annual Environmental Report

2021

Coachford

D0427-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2021 AER

This Annual Environmental Report has been prepared for D0427-01, Coachford, in Cork 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.

New WWTP has been constructed and started taking flows in October 2021

1.2 TREATMENT SUMMARY

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

- Coachford WWTP with a Plant Capacity PE of 402, the treatment type is 1 - Primary treatment

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
TPEFF0500D0427SW001	Coachford WWTP	Treated	Non-Compliant	Ammonia-Total (as N) mg/l BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l Suspended Solids mg/l Total Phosphorus (as P) mg/l

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 COACHFORD WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - COACHFORD 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
Ammonia-Total (as N) mg/l	18	38	9.72
COD-Cr mg/l	18	1036	172
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	15	305	67
Total Phosphorus (as P) mg/l	18	4.87	1.22
Suspended Solids mg/l	18	752	97
Hydraulic Capacity	N/A	2090	607

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 greater than the peak Treatment Plant Capacity. The annual maximum hydraulic loading is greater than the peak Treatment Plant Capacity. Further details on the plant capacity and efficiency can be found under the sectional ‘Operational Performance Summary’.

2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF0500D0427SW001

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	18	1	N/A	17	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	25	50	N/A	15	2	2	4.15	Fail
Suspended Solids mg/l	25	62.5	N/A	18	3	1	11	Fail
pH pH units	9.00	9.00	N/A	18	N/A	N/A	7.26	Pass
Ammonia-Total (as N) mg/l	6.50	7.80	N/A	18	4	4	1.90	Fail
Total Phosphorus (as P) mg/l	1.20	1.44	N/A	18	2	1	0.104	Fail
E. Coli no./100mls	N/A	N/A	N/A	5	N/A	N/A	3076	
Faecal coliforms no./100mls	N/A	N/A	N/A	5	N/A	N/A	2755	
Enterococci (Intestinal) no./100mls	N/A	N/A	N/A	5	N/A	N/A	110	

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):

See Incident Section 3.2

Significance of Results:

Plant was non-compliant prior to upgrade

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF0500D0427SW001

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
Downstream	146156, 71656	LS190022800800020	No	Yes	No	No	Moderate

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 not compliant with the ELV's set in the wastewater discharge licence.

The ambient monitoring results do not meet the required EQS at the upstream and the downstream monitoring locations. The EQS 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 impact on the water quality.

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 - COACHFORD WWTP

2.1.4.1 Treatment Efficiency Report - Coachford 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)
SS	16411	1483	91
COD	29129	2322	92
TP	206	14	93
cBOD	12422	614	95
TN	N/A	N/A	N/A

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

2.1.4.2 Treatment Capacity Report Summary - Coachford 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.

Coachford WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	72
DWF to the Treatment Plant (m^3/day)	72
Current Hydraulic Loading - annual max (m^3/day)	2090
Average Hydraulic loading to the Treatment Plant (m^3/day)	607
Organic Capacity (PE) - As Constructed	402
Organic Capacity (PE) - Collected Load (peak week)[Note1]	654
Organic Capacity (PE) - Remaining	0
Will the capacity be exceeded in the next three years? (Yes/No)	Yes

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 - COACHFORD 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)
Domestic /Septic Tank Sludge	30	Volume (m3)		100	No	No	No

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)
Breach of ELV	WWTP upgrade required to meet ELV	1	Yes	No
Uncontrolled release	Adverse Weather	1	No	Yes

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2021	2
Number of Incidents reported to the EPA via EDEN in 2021	2
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 (m3)	Monitoring Status
TBC	145991, 73145	No	Low	Meeting	Unknown	Unknown	Not Monitored
TBC	145991, 73145	No	Unknown	Not Meeting	Unknown	Unknown	Not Monitored
SW002	145955, 73162	Yes	Low	Not yet Assessed	Unknown	359	Monitored
SW003	145991, 73145	Yes	Low	Not yet Assessed	Unknown	Unknown	Not Monitored

Any TBC SWO(s) were identified as part of the on-going National SWO programme and will be updated in subsequent AER(s) once the information is confirmed.

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m3)?	359

SWO Summary	
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?	Yes

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
D0427-SIP:01	Improvement works to ensure compliance with Condition 1.7 of this licence	C	31/12/2018	Yes	Works Completed		

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
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
Has a Technical amendment/licence review application been submitted to the Agency by IW?	Yes
List reason e.g. additional SWO identified	To include the relocation of the primary discharge point location & addition of SWO
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?	Yes
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:

Signed: Date: 17/05/2022

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

Data Type	Sample Date	Parameter Name	Unit	Result
Lake Water	11/10/2021 9:10:00 AM	Ammonia-Total (as N)	mg/l	0.038
Lake Water	11/10/2021 9:10:00 AM	BOD - 5 days (Total)	mg/l	1.4
Lake Water	11/10/2021 9:10:00 AM	Dissolved Oxygen	% Saturation	98.1
Lake Water	11/10/2021 9:10:00 AM	E. Coli	no./100mls	54
Lake Water	11/10/2021 9:10:00 AM	Enterococci (Intestinal)	no./100mls	6
Lake Water	11/10/2021 9:10:00 AM	Faecal coliforms	no./100mls	57
Lake Water	11/10/2021 9:10:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	0.027
Lake Water	11/10/2021 9:10:00 AM	pH	pH units	7.5
Lake Water	11/10/2021 9:10:00 AM	Suspended Solids	mg/l	4
Lake Water	11/10/2021 9:10:00 AM	Temperature	°C	14.8
Lake Water	11/10/2021 9:10:00 AM	Total Phosphorus (as P)	mg/l	0.05
Lake Water	4/8/2021 10:22:00 AM	Alkalinity-total (as CaCO3)	mg/l	39
Lake Water	4/8/2021 10:22:00 AM	Ammonia-Total (as N)	mg/l	
Lake Water	4/8/2021 10:22:00 AM	Chlorophyll	µg/l	16
Lake Water	4/8/2021 10:22:00 AM	Conductivity @25°C	µS/cm	129
Lake Water	4/8/2021 10:22:00 AM	Depth	m	0.3
Lake Water	4/8/2021 10:22:00 AM	Dissolved Oxygen	mg/l	11.8
Lake Water	4/8/2021 10:22:00 AM	Dissolved Oxygen	% Saturation	108
Lake Water	4/8/2021 10:22:00 AM	Nitrate (as N)	mg/l	1
Lake Water	4/8/2021 10:22:00 AM	Nitrite (as N)	µg/l	
Lake Water	4/8/2021 10:22:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	
Lake Water	4/8/2021 10:22:00 AM	pH	pH units	7.7
Lake Water	4/8/2021 10:22:00 AM	Silica (as SiO2)	mg/l	2
Lake Water	4/8/2021 10:22:00 AM	StationDepth	m	13.1
Lake Water	4/8/2021 10:22:00 AM	Temperature	°C	10.4
Lake Water	4/8/2021 10:22:00 AM	Total Oxidised Nitrogen (as N)	mg/l	1
Lake Water	4/8/2021 10:22:00 AM	Total Phosphorus (as P)	mg/l	0.018
Lake Water	4/8/2021 10:22:00 AM	Transparency	m	1.7
Lake Water	4/8/2021 10:22:00 AM	True Colour	mg/litre Pt Co	29
Lake Water	5/6/2021 10:38:00 AM	Alkalinity-total (as CaCO3)	mg/l	35
Lake Water	5/6/2021 10:38:00 AM	Ammonia-Total (as N)	mg/l	
Lake Water	5/6/2021 10:38:00 AM	Chlorophyll	µg/l	5.3
Lake Water	5/6/2021 10:38:00 AM	Conductivity @25°C	µS/cm	144
Lake Water	5/6/2021 10:38:00 AM	Depth	m	0.3
Lake Water	5/6/2021 10:38:00 AM	Dissolved Oxygen	% Saturation	94
Lake Water	5/6/2021 10:38:00 AM	Dissolved Oxygen	mg/l	11.1
Lake Water	5/6/2021 10:38:00 AM	Nitrate (as N)	mg/l	1.1
Lake Water	5/6/2021 10:38:00 AM	Nitrite (as N)	µg/l	5.56
Lake Water	5/6/2021 10:38:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	
Lake Water	5/6/2021 10:38:00 AM	pH	pH units	7.7
Lake Water	5/6/2021 10:38:00 AM	Silica (as SiO2)	mg/l	1.4
Lake Water	5/6/2021 10:38:00 AM	StationDepth	m	13.4
Lake Water	5/6/2021 10:38:00 AM	Temperature	°C	11.9
Lake Water	5/6/2021 10:38:00 AM	Total Oxidised Nitrogen (as N)	mg/l	1.1
Lake Water	5/6/2021 10:38:00 AM	Total Phosphorus (as P)	mg/l	0.016
Lake Water	5/6/2021 10:38:00 AM	Transparency	m	2.3
Lake Water	5/6/2021 10:38:00 AM	True Colour	mg/litre Pt Co	14
Lake Water	6/3/2021 10:15:00 AM	Alkalinity-total (as CaCO3)	mg/l	32
Lake Water	6/3/2021 10:15:00 AM	Ammonia-Total (as N)	mg/l	0.035
Lake Water	6/3/2021 10:15:00 AM	Chlorophyll	µg/l	20
Lake Water	6/3/2021 10:15:00 AM	Conductivity @25°C	µS/cm	116
Lake Water	6/3/2021 10:15:00 AM	Depth	m	0.3
Lake Water	6/3/2021 10:15:00 AM	Dissolved Oxygen	mg/l	11.3
Lake Water	6/3/2021 10:15:00 AM	Dissolved Oxygen	% Saturation	95
Lake Water	6/3/2021 10:15:00 AM	Nitrate (as N)	mg/l	0.64
Lake Water	6/3/2021 10:15:00 AM	Nitrite (as N)	µg/l	10.8
Lake Water	6/3/2021 10:15:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	
Lake Water	6/3/2021 10:15:00 AM	pH	pH units	7.8
Lake Water	6/3/2021 10:15:00 AM	Silica (as SiO2)	mg/l	1.2
Lake Water	6/3/2021 10:15:00 AM	StationDepth	m	12.4
Lake Water	6/3/2021 10:15:00 AM	Temperature	°C	13.5
Lake Water	6/3/2021 10:15:00 AM	Total Oxidised Nitrogen (as N)	mg/l	0.65
Lake Water	6/3/2021 10:15:00 AM	Total Phosphorus (as P)	mg/l	0.027
Lake Water	6/3/2021 10:15:00 AM	Transparency	m	2.3
Lake Water	6/3/2021 10:15:00 AM	True Colour	mg/litre Pt Co	33
Lake Water	7/8/2021 9:05:00 AM	Alkalinity-total (as CaCO3)	mg/l	36
Lake Water	7/8/2021 9:05:00 AM	Ammonia-Total (as N)	mg/l	0.027
Lake Water	7/8/2021 9:05:00 AM	Chlorophyll	µg/l	3.8
Lake Water	7/8/2021 9:05:00 AM	Conductivity @25°C	µS/cm	135
Lake Water	7/8/2021 9:05:00 AM	Depth	m	0.3
Lake Water	7/8/2021 9:05:00 AM	Dissolved Oxygen	mg/l	9.8
Lake Water	7/8/2021 9:05:00 AM	Dissolved Oxygen	% Saturation	103
Lake Water	7/8/2021 9:05:00 AM	Nitrate (as N)	mg/l	0.91
Lake Water	7/8/2021 9:05:00 AM	Nitrite (as N)	µg/l	14
Lake Water	7/8/2021 9:05:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	
Lake Water	7/8/2021 9:05:00 AM	pH	pH units	7.6
Lake Water	7/8/2021 9:05:00 AM	Silica (as SiO2)	mg/l	1.3
Lake Water	7/8/2021 9:05:00 AM	StationDepth	m	12
Lake Water	7/8/2021 9:05:00 AM	Temperature	°C	17.9

Lake Water	7/8/2021 9:05:00 AM	Total Oxidised Nitrogen (as N)	mg/l	0.93
Lake Water	7/8/2021 9:05:00 AM	Total Phosphorus (as P)	mg/l	0.017
Lake Water	7/8/2021 9:05:00 AM	Transparency	m	2.3
Lake Water	7/8/2021 9:05:00 AM	True Colour	mg/litre Pt Co	26
Lake Water	8/5/2021 9:07:00 AM	Alkalinity-total (as CaCO3)	mg/l	42
Lake Water	8/5/2021 9:07:00 AM	Ammonia-Total (as N)	mg/l	0.043
Lake Water	8/5/2021 9:07:00 AM	Chlorophyll	µg/l	4.3
Lake Water	8/5/2021 9:07:00 AM	Conductivity @25°C	µS/cm	146
Lake Water	8/5/2021 9:07:00 AM	Depth	m	0.3
Lake Water	8/5/2021 9:07:00 AM	Dissolved Oxygen	mg/l	8.6
Lake Water	8/5/2021 9:07:00 AM	Dissolved Oxygen	% Saturation	94
Lake Water	8/5/2021 9:07:00 AM	Nitrate (as N)	mg/l	0.99
Lake Water	8/5/2021 9:07:00 AM	Nitrite (as N)	µg/l	15.8
Lake Water	8/5/2021 9:07:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	
Lake Water	8/5/2021 9:07:00 AM	pH	pH units	7.6
Lake Water	8/5/2021 9:07:00 AM	Silica (as SiO2)	mg/l	1.5
Lake Water	8/5/2021 9:07:00 AM	StationDepth	m	13.8
Lake Water	8/5/2021 9:07:00 AM	Temperature	°C	19.7
Lake Water	8/5/2021 9:07:00 AM	Total Oxidised Nitrogen (as N)	mg/l	1
Lake Water	8/5/2021 9:07:00 AM	Total Phosphorus (as P)	mg/l	0.015
Lake Water	8/5/2021 9:07:00 AM	Transparency	m	3.2
Lake Water	8/5/2021 9:07:00 AM	True Colour	mg/litre Pt Co	18
Lake Water	9/2/2021 9:45:00 AM	Alkalinity-total (as CaCO3)	mg/l	47
Lake Water	9/2/2021 9:45:00 AM	Ammonia-Total (as N)	mg/l	0.055
Lake Water	9/2/2021 9:45:00 AM	Chlorophyll	µg/l	7.4
Lake Water	9/2/2021 9:45:00 AM	Conductivity @25°C	µS/cm	142
Lake Water	9/2/2021 9:45:00 AM	Depth	m	0.3
Lake Water	9/2/2021 9:45:00 AM	Dissolved Oxygen	mg/l	8.7
Lake Water	9/2/2021 9:45:00 AM	Dissolved Oxygen	% Saturation	93
Lake Water	9/2/2021 9:45:00 AM	Nitrate (as N)	mg/l	0.57
Lake Water	9/2/2021 9:45:00 AM	Nitrite (as N)	µg/l	17.6
Lake Water	9/2/2021 9:45:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	
Lake Water	9/2/2021 9:45:00 AM	pH	pH units	7.6
Lake Water	9/2/2021 9:45:00 AM	Silica (as SiO2)	mg/l	1.1
Lake Water	9/2/2021 9:45:00 AM	StationDepth	m	13.7
Lake Water	9/2/2021 9:45:00 AM	Temperature	°C	18.7
Lake Water	9/2/2021 9:45:00 AM	Total Oxidised Nitrogen (as N)	mg/l	0.58
Lake Water	9/2/2021 9:45:00 AM	Total Phosphorus (as P)	mg/l	0.015
Lake Water	9/2/2021 9:45:00 AM	Transparency	m	2.5
Lake Water	9/2/2021 9:45:00 AM	True Colour	mg/litre Pt Co	23
Lake Water	10/6/2021 10:03:00 AM	Alkalinity-total (as CaCO3)	mg/l	42
Lake Water	10/6/2021 10:03:00 AM	Ammonia-Total (as N)	mg/l	0.038
Lake Water	10/6/2021 10:03:00 AM	Chlorophyll	µg/l	5.3
Lake Water	10/6/2021 10:03:00 AM	Conductivity @25°C	µS/cm	138
Lake Water	10/6/2021 10:03:00 AM	Depth	m	0.3
Lake Water	10/6/2021 10:03:00 AM	Dissolved Oxygen	mg/l	8.4
Lake Water	10/6/2021 10:03:00 AM	Dissolved Oxygen	% Saturation	84
Lake Water	10/6/2021 10:03:00 AM	Nitrate (as N)	mg/l	0.57
Lake Water	10/6/2021 10:03:00 AM	Nitrite (as N)	µg/l	33.1
Lake Water	10/6/2021 10:03:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	
Lake Water	10/6/2021 10:03:00 AM	pH	pH units	7.8
Lake Water	10/6/2021 10:03:00 AM	Silica (as SiO2)	mg/l	1.1
Lake Water	10/6/2021 10:03:00 AM	StationDepth	m	13.8
Lake Water	10/6/2021 10:03:00 AM	Temperature	°C	15.7
Lake Water	10/6/2021 10:03:00 AM	Total Oxidised Nitrogen (as N)	mg/l	0.6
Lake Water	10/6/2021 10:03:00 AM	Total Phosphorus (as P)	mg/l	0.012
Lake Water	10/6/2021 10:03:00 AM	Transparency	m	2.5
Lake Water	10/6/2021 10:03:00 AM	True Colour	mg/litre Pt Co	19
Lake Water	11/4/2021 11:15:00 AM	Alkalinity-total (as CaCO3)	mg/l	25
Lake Water	11/4/2021 11:15:00 AM	Ammonia-Total (as N)	mg/l	0.054
Lake Water	11/4/2021 11:15:00 AM	Chlorophyll	µg/l	1.8
Lake Water	11/4/2021 11:15:00 AM	Conductivity @25°C	µS/cm	108
Lake Water	11/4/2021 11:15:00 AM	Depth	m	0.3
Lake Water	11/4/2021 11:15:00 AM	Dissolved Oxygen	mg/l	9.5
Lake Water	11/4/2021 11:15:00 AM	Dissolved Oxygen	% Saturation	85
Lake Water	11/4/2021 11:15:00 AM	Nitrate (as N)	mg/l	1.3
Lake Water	11/4/2021 11:15:00 AM	Nitrite (as N)	µg/l	
Lake Water	11/4/2021 11:15:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	0.021
Lake Water	11/4/2021 11:15:00 AM	pH	pH units	6.6
Lake Water	11/4/2021 11:15:00 AM	Silica (as SiO2)	mg/l	3.2
Lake Water	11/4/2021 11:15:00 AM	StationDepth	m	12.7
Lake Water	11/4/2021 11:15:00 AM	Temperature	°C	11
Lake Water	11/4/2021 11:15:00 AM	Total Oxidised Nitrogen (as N)	mg/l	1.3
Lake Water	11/4/2021 11:15:00 AM	Total Phosphorus (as P)	mg/l	0.041
Lake Water	11/4/2021 11:15:00 AM	Transparency	m	2.3
Lake Water	11/4/2021 11:15:00 AM	True Colour	mg/litre Pt Co	67
Lake Water	12/2/2021 10:35:00 AM	Alkalinity-total (as CaCO3)	mg/l	36
Lake Water	12/2/2021 10:35:00 AM	Ammonia-Total (as N)	mg/l	0.064
Lake Water	12/2/2021 10:35:00 AM	Chlorophyll	µg/l	1.5
Lake Water	12/2/2021 10:35:00 AM	Conductivity @25°C	µS/cm	136
Lake Water	12/2/2021 10:35:00 AM	Depth	m	0.3

Lake Water	12/2/2021 10:35:00 AM	Dissolved Oxygen	% Saturation	86
Lake Water	12/2/2021 10:35:00 AM	Dissolved Oxygen	mg/l	9.5
Lake Water	12/2/2021 10:35:00 AM	Nitrate (as N)	mg/l	1.5
Lake Water	12/2/2021 10:35:00 AM	Nitrite (as N)	µg/l	8.49
Lake Water	12/2/2021 10:35:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	0.013
Lake Water	12/2/2021 10:35:00 AM	pH	pH units	7.3
Lake Water	12/2/2021 10:35:00 AM	Silica (as SiO2)	mg/l	3.8
Lake Water	12/2/2021 10:35:00 AM	StationDepth	m	12.3
Lake Water	12/2/2021 10:35:00 AM	Temperature	°C	8.7
Lake Water	12/2/2021 10:35:00 AM	Total Oxidised Nitrogen (as N)	mg/l	1.5
Lake Water	12/2/2021 10:35:00 AM	Total Phosphorus (as P)	mg/l	0.023
Lake Water	12/2/2021 10:35:00 AM	Transparency	m	2
Lake Water	12/2/2021 10:35:00 AM	True Colour	mg/litre Pt Co	42
Lake Water	5/19/2021 1:25:00 PM	Ammonia-Total (as N)	mg/l	0.14
Lake Water	5/19/2021 1:25:00 PM	BOD - 5 days (Total)	mg/l	7.4
Lake Water	5/19/2021 1:25:00 PM	Dissolved Oxygen	% Saturation	104.7
Lake Water	5/19/2021 1:25:00 PM	E. Coli	no./100mls	15
Lake Water	5/19/2021 1:25:00 PM	Enterococci (Intestinal)	no./100mls	36
Lake Water	5/19/2021 1:25:00 PM	Faecal coliforms	no./100mls	42
Lake Water	5/19/2021 1:25:00 PM	ortho-Phosphate (as P) - unspecified	mg/l	0.99
Lake Water	5/19/2021 1:25:00 PM	pH	pH units	7.6
Lake Water	5/19/2021 1:25:00 PM	Suspended Solids	mg/l	15
Lake Water	5/19/2021 1:25:00 PM	Temperature	°C	15.3
Lake Water	5/19/2021 1:25:00 PM	Total Phosphorus (as P)	mg/l	0.17
Lake Water	7/21/2021 9:30:00 AM	Ammonia-Total (as N)	mg/l	0.03
Lake Water	7/21/2021 9:30:00 AM	BOD - 5 days (Total)	mg/l	1.2
Lake Water	7/21/2021 9:30:00 AM	Dissolved Oxygen	% Saturation	104
Lake Water	7/21/2021 9:30:00 AM	E. Coli	no./100mls	140
Lake Water	7/21/2021 9:30:00 AM	Enterococci (Intestinal)	no./100mls	
Lake Water	7/21/2021 9:30:00 AM	Faecal coliforms	no./100mls	225
Lake Water	7/21/2021 9:30:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	0.003
Lake Water	7/21/2021 9:30:00 AM	pH	pH units	8
Lake Water	7/21/2021 9:30:00 AM	Suspended Solids	mg/l	4
Lake Water	7/21/2021 9:30:00 AM	Temperature	°C	23
Lake Water	7/21/2021 9:30:00 AM	Total Phosphorus (as P)	mg/l	
Lake Water	1/13/2021 11:10:00 AM	Alkalinity-total (as CaCO3)	mg/l	38
Lake Water	1/13/2021 11:10:00 AM	Ammonia-Total (as N)	mg/l	0.042
Lake Water	1/13/2021 11:10:00 AM	Chlorophyll	µg/l	
Lake Water	1/13/2021 11:10:00 AM	Conductivity @25°C	µS/cm	149
Lake Water	1/13/2021 11:10:00 AM	Depth	m	0.3
Lake Water	1/13/2021 11:10:00 AM	Dissolved Oxygen	mg/l	12.2
Lake Water	1/13/2021 11:10:00 AM	Dissolved Oxygen	% Saturation	103
Lake Water	1/13/2021 11:10:00 AM	Nitrate (as N)	mg/l	2.1
Lake Water	1/13/2021 11:10:00 AM	Nitrite (as N)	µg/l	
Lake Water	1/13/2021 11:10:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	0.014
Lake Water	1/13/2021 11:10:00 AM	pH	pH units	7.2
Lake Water	1/13/2021 11:10:00 AM	Silica (as SiO2)	mg/l	3.4
Lake Water	1/13/2021 11:10:00 AM	StationDepth	m	14.1
Lake Water	1/13/2021 11:10:00 AM	Temperature	°C	7.1
Lake Water	1/13/2021 11:10:00 AM	Total Oxidised Nitrogen (as N)	mg/l	2.1
Lake Water	1/13/2021 11:10:00 AM	Total Phosphorus (as P)	mg/l	0.02
Lake Water	1/13/2021 11:10:00 AM	Transparency	m	2.3
Lake Water	1/13/2021 11:10:00 AM	True Colour	mg/litre Pt Co	24
Lake Water	2/18/2021 10:25:00 AM	Alkalinity-total (as CaCO3)	mg/l	26
Lake Water	2/18/2021 10:25:00 AM	Ammonia-Total (as N)	mg/l	0.032
Lake Water	2/18/2021 10:25:00 AM	Chlorophyll	µg/l	
Lake Water	2/18/2021 10:25:00 AM	Conductivity @25°C	µS/cm	103
Lake Water	2/18/2021 10:25:00 AM	Depth	m	0.3
Lake Water	2/18/2021 10:25:00 AM	Dissolved Oxygen	% Saturation	100
Lake Water	2/18/2021 10:25:00 AM	Dissolved Oxygen	mg/l	11.9
Lake Water	2/18/2021 10:25:00 AM	Nitrate (as N)	mg/l	1
Lake Water	2/18/2021 10:25:00 AM	Nitrite (as N)	µg/l	
Lake Water	2/18/2021 10:25:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	0.014
Lake Water	2/18/2021 10:25:00 AM	pH	pH units	7.2
Lake Water	2/18/2021 10:25:00 AM	Silica (as SiO2)	mg/l	2.2
Lake Water	2/18/2021 10:25:00 AM	StationDepth	m	14.2
Lake Water	2/18/2021 10:25:00 AM	Temperature	°C	8.6
Lake Water	2/18/2021 10:25:00 AM	Total Oxidised Nitrogen (as N)	mg/l	1
Lake Water	2/18/2021 10:25:00 AM	Total Phosphorus (as P)	mg/l	0.028
Lake Water	2/18/2021 10:25:00 AM	Transparency	m	3
Lake Water	2/18/2021 10:25:00 AM	True Colour	mg/litre Pt Co	43
Lake Water	3/3/2021 9:45:00 AM	Alkalinity-total (as CaCO3)	mg/l	26
Lake Water	3/3/2021 9:45:00 AM	Ammonia-Total (as N)	mg/l	0.03
Lake Water	3/3/2021 9:45:00 AM	Chlorophyll	µg/l	
Lake Water	3/3/2021 9:45:00 AM	Conductivity @25°C	µS/cm	100
Lake Water	3/3/2021 9:45:00 AM	Depth	m	0.3
Lake Water	3/3/2021 9:45:00 AM	Dissolved Oxygen	mg/l	11.1
Lake Water	3/3/2021 9:45:00 AM	Dissolved Oxygen	% Saturation	94

Lake Water	3/3/2021 9:45:00 AM	Nitrate (as N)	mg/l	1
Lake Water	3/3/2021 9:45:00 AM	Nitrite (as N)	µg/l	
Lake Water	3/3/2021 9:45:00 AM	ortho-Phosphate (as P) - unspecified	mg/l	0.016
Lake Water	3/3/2021 9:45:00 AM	pH	pH units	7.5
Lake Water	3/3/2021 9:45:00 AM	Silica (as SiO2)	mg/l	2.1
Lake Water	3/3/2021 9:45:00 AM	StationDepth	m	14.7
Lake Water	3/3/2021 9:45:00 AM	Temperature	°C	8.5
Lake Water	3/3/2021 9:45:00 AM	Total Oxidised Nitrogen (as N)	mg/l	1
Lake Water	3/3/2021 9:45:00 AM	Total Phosphorus (as P)	mg/l	0.026
Lake Water	3/3/2021 9:45:00 AM	Transparency	m	2.5
Lake Water	3/3/2021 9:45:00 AM	True Colour	mg/litre Pt Co	43
Lake Water	3/18/2021 1:00:00 PM	Ammonia-Total (as N)	mg/l	0.005
Lake Water	3/18/2021 1:00:00 PM	BOD - 5 days (Total)	mg/l	1.6
Lake Water	3/18/2021 1:00:00 PM	Dissolved Oxygen	% Saturation	102.3
Lake Water	3/18/2021 1:00:00 PM	E. Coli	no./100mls	
Lake Water	3/18/2021 1:00:00 PM	Enterococci (Intestinal)	no./100mls	173
Lake Water	3/18/2021 1:00:00 PM	Faecal coliforms	no./100mls	248
Lake Water	3/18/2021 1:00:00 PM	ortho-Phosphate (as P) - unspecified	mg/l	0.006
Lake Water	3/18/2021 1:00:00 PM	pH	pH units	7.8
Lake Water	3/18/2021 1:00:00 PM	Suspended Solids	mg/l	
Lake Water	3/18/2021 1:00:00 PM	Temperature	°C	9.9
Lake Water	3/18/2021 1:00:00 PM	Total Phosphorus (as P)	mg/l	

Parameter Name	D/S Location	D/S Annual Mean	Difference	EQS	% of EQS
Ammonia	LS190022800800020	0.045		0.065	69.2
BOD	LS190022800800020	2.900			
Dissolved Oxygen (%)	LS190022800800020	96.750		80.000	120.9
Dissolved Oxygen (mg/l)	LS190022800800020	10.325			
Ortho-Phosphate (mg/l)	LS190022800800020	0.122			
Ph	LS190022800800020	7.530		6.000	125.5
Suspended Solids (mg/l)	LS190022800800020	7.660			
Temperature (oC)	LS190022800800020	13.418			
Total Oxidised Nitrogen (mg/l)	LS190022800800020	1.060			
Total Phosphorous (mg/l)	LS190022800800020	0.034		0.025	136.0