

Annual Environmental Report

2023



Kingscourt

D0083-01

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1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2023 AER

This Annual Environmental Report has been prepared for D0083-01, Kingscourt, in Cavan 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.

1.2 TREATMENT SUMMARY

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

- Kingscourt WWTP with a Plant Capacity PE of 2335, 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
TPEFF0200D0083SW001	Kingscourt WWTP	Treated	Non-Compliant	Ammonia-Total (as N) mg/l ortho-Phosphate (as P) - unspecified 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 KINGSCOURT WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - KINGSCOURT 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
Suspended Solids mg/l	13	2960	206
COD-Cr mg/l	13	5350	505
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	13	828	73
Hydraulic Capacity	N/A	5369	923

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 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 - TPEFF0200D0083SW001

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	30	Pass
Suspended Solids mg/l	35	87.5	N/A	13	1	N/A	14	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	10	20	N/A	13	1	N/A	4.34	Pass
pH pH units	9	9	N/A	13	N/A	N/A	7.52	Pass
Ammonia-Total (as N) mg/l	0.5	1	N/A	13	13	12	14	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.1	0.2	N/A	13	13	12	1.23	Fail

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):

Ammonia - Total (as N), ortho - Phosphate (as P)

Significance of Results:

The WWTP is non compliant with the ELVs set out in the Wastewater Discharge Licence.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF0200D0083SW001

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	279752, 295581	RS06M230700	No	No	No	No	Good
Downstream	279711, 296264	RS06M230710	No	No	No	No	Good

The table below provides a summary of monitoring results for designated ambient monitoring points. The upstream and downstream annual mean values are shown (mg/l), and the difference between both monitoring stations is given as a percentage of the Environmental Quality Standard (EQS) where relevant.

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
BOD - 5 days (Total) mg/l	RS06M230700	1.18	RS06M230710	3.25	1.50	138.1
Ammonia-Total (as N) mg/l	RS06M230700	0.023	RS06M230710	0.233	0.065	322

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
ortho-Phosphate (as P) - unspecified mg/l	RS06M230700	0.055	RS06M230710	0.043	0.035	-35.2
pH pH units	RS06M230700	7.82	RS06M230710	7.55	N/A	
Dissolved Oxygen % O2	RS06M230700	11	RS06M230710	N/A	N/A	
Suspended Solids mg/l	RS06M230700	8.84	RS06M230710	4.77	N/A	
Temperature °C	RS06M230700	9.20	RS06M230710	N/A	N/A	
Dissolved Oxygen mg/l	RS06M230700	96	RS06M230710	N/A	N/A	

Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence for the following: Ammonia-Total (as N) mg/l, ortho-Phosphate (as P) - unspecified mg/l.

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.

Based on ambient monitoring results a deterioration in Ammonia - Total (as N), BOD - 5 Days (Total) , 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 - KINGSCOURT WWTP

2.1.4.1 Treatment Efficiency Report - Kingscourt 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	89113	2480	97
COD	218533	5265	98
cBOD	31747	772	98
TP	N/A	N/A	N/A
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 - Kingscourt 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.

Kingscourt WWTP	
Peak Hydraulic Capacity (m ³ /day) - As Constructed	1500
DWF to the Treatment Plant (m ³ /day)	420
Current Hydraulic Loading - annual max (m ³ /day)	5369

Kingscourt WWTP	
Average Hydraulic loading to the Treatment Plant (m ³ /day)	923.29
Organic Capacity (PE) - As Constructed	2335
Organic Capacity (PE) - Collected Load (peak week) ^{Note1}	3125
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 - KINGSCOURT 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
1	Water Pollution	0	1
1	Water Quality	0	1

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 Uisce Éireann 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	Recurring (Y/N)	Closed (Y/N)
Breach of ELV	WWTP upgrade required to meet ELV	Yes	No
Abatement equipment off-line	Emergency overflow caused by pump failure	No	Yes

Incident Type	Cause	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	Inadequate Operational Procedures/Training	No	Yes
Plant or equipment breakdown at WWTP	Plant or equipment breakdown at WWTP	No	No
Uncontrolled release	Inadequate Operational Procedures/Training	No	Yes
Abatement equipment off-line	Plant or equipment breakdown at WWTP	No	No

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2023	6
Number of Incidents reported to the EPA via EDEN in 2023	6
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 2023 (No. of events)	Total volume discharged in 2023 (m3)	Monitoring Status
SW002	279339,295755	Yes	Low Significance	Meeting Criteria	Unknown	Unknown	Monitored
TBC	278812,296065	Yes	Low Significance	Meeting Criteria	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 wastewater discharge by metered SWOs during the year (m3)?	Unknown
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	N/A
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
D0083-SIP:01	Any improvements necessary to ensure that the discharge complies with the emission limit values set in Schedule A: Discharges and Discharge Monitoring	C	31/12/2021	No	At Planning Stage	2030	
D0083-SIP:02	SW003 to be discontinued	C	31/01/2014	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	Included in this AER
D0083-01-Small Stream Risk Score Assessment	Yes	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?	Yes
List reason e.g. additional SWO identified	To include additional SWO identified
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	N/A
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	Yes

7 APPENDIX

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

SSRS Compliance Monitoring: *Kingscourt* Waste Water Treatment Plant 2023



**Report to Uisce Éireann
Limnos Consultancy, January 2024**

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Kingscourt WWTP

Introduction

Small Streams Risk Score (SSRS) assessments on the Mullantra River upstream and downstream of the Kingscourt waste water treatment plant (WWTP) are outlined in this report. The assessments were made on 26 October 2023. Limnos Consultancy was contracted by Irish Water to undertake the surveys.

Methodology

Small Streams Risk Score (SSRS)

Samples were taken using an ISO compliant kick-sampling sampling method compatible with the Environmental Protection Agency (EPA) Standard Operating Procedure for sampling aquatic macroinvertebrates. Samples were taken upstream and downstream of the discharge from the WWTP. SSRS results were assigned based on the macroinvertebrate fauna.

The author was the main initiator of the SSRS system developed by the Western River Basin District and the EPA under his supervision in 2005–2006 (McGarrigle 2014). He has undertaken SSRS training of local authority and other professional staff at the Local Government Water Services Training Centres around the country for over 100 personnel.

The SSRS was calculated based on selected sub-groups of the macroinvertebrates recorded. The score is calculated based on the number of taxa and their relative abundance in four main invertebrate groups as follows:

Group 1: Ephemeroptera (excluding *Baetis rhodani*)

Group 2: Plecoptera

Group 3: Trichoptera

Group 4: GOLD (Gastropoda, Oligochaeta, Diptera)

Group 5: *Asellus*

The first three groups above, mayflies, stoneflies, and caddis flies, are regarded as pollution-sensitive whereas gastropods, oligochaetes, dipterans and *Asellus* are relatively pollution-tolerant. The maximum score that can be achieved is 11.2 and threshold scores deciding the degree of risk of not being at good ecological status are as follows:

- > 7.25 Probably not at risk
- > 6.5 to 7.25 Indeterminate
- < 6.5 Stream may be at risk.

Samples were taken with a standard 1 mm mesh pond net. A 3-minute kick sample was combined with a 1-minute stonewash. Samples were placed on a white tray and, once cleaned of debris such as leaves and twigs and excessive sand or gravel by decanting and hand picking, the sample was examined carefully to identify the macroinvertebrates. At least 25 minutes were spent identifying and assigning each taxon found to a relative abundance category. Table 1 gives the definition of the relative abundance terms Few, Common, Numerous, Dominant and Excessive. The numeric code is used in the results tables below.

Table 1. SSRS Relative abundance table.

Abundance	Number of Individual Specimens	Relative abundance numeric code
Few:	1 to 5 individuals	1
Common:	6 to 20	2
Numerous:	21-50	3
Dominant:	51 to 100	4
Excessive:	>100	5

Physico-Chemical Measurements

Physico-chemical measurements were also made for dissolved oxygen, temperature and conductivity using a HACH HQ40d meter with appropriate compatible probes.

Location of Sites Sampled

Figure 1 maps the sampling sites and Table 2 gives the details of the locations sampled.

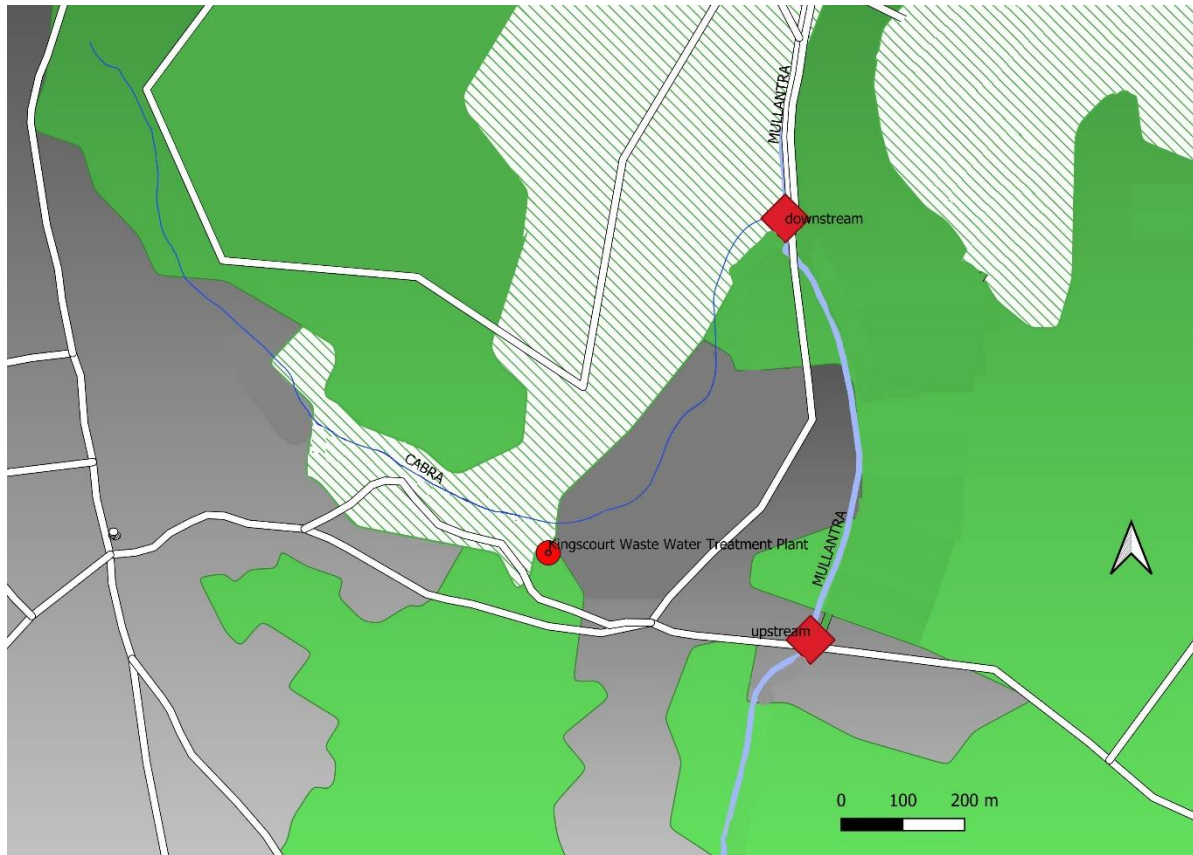


Figure 1. Location of upstream and downstream monitoring sites for Kingscourt WWTP. The river flows North.

Table 2. Location of sites sampled on the Mullantra River upstream and downstream of Kingscourt WWTP.

Location	Kingscourt WWTP Upstream	Kingscourt WWTP Downstream
EPA Code	RS06M230700	RS06M230710
Station	Br on R165 in Kingscourt	Br 600m d/s RS06M230700 (on side road)
River	Mullantra	Mullantra
Easting	279753	279711
Northing	295581	296264

Results

Site Photographs

Figure 2 shows photographs taken when sampling at Site 1 and Site 2 upstream and downstream of the Kingscourt WWTP On 26 October 2023.

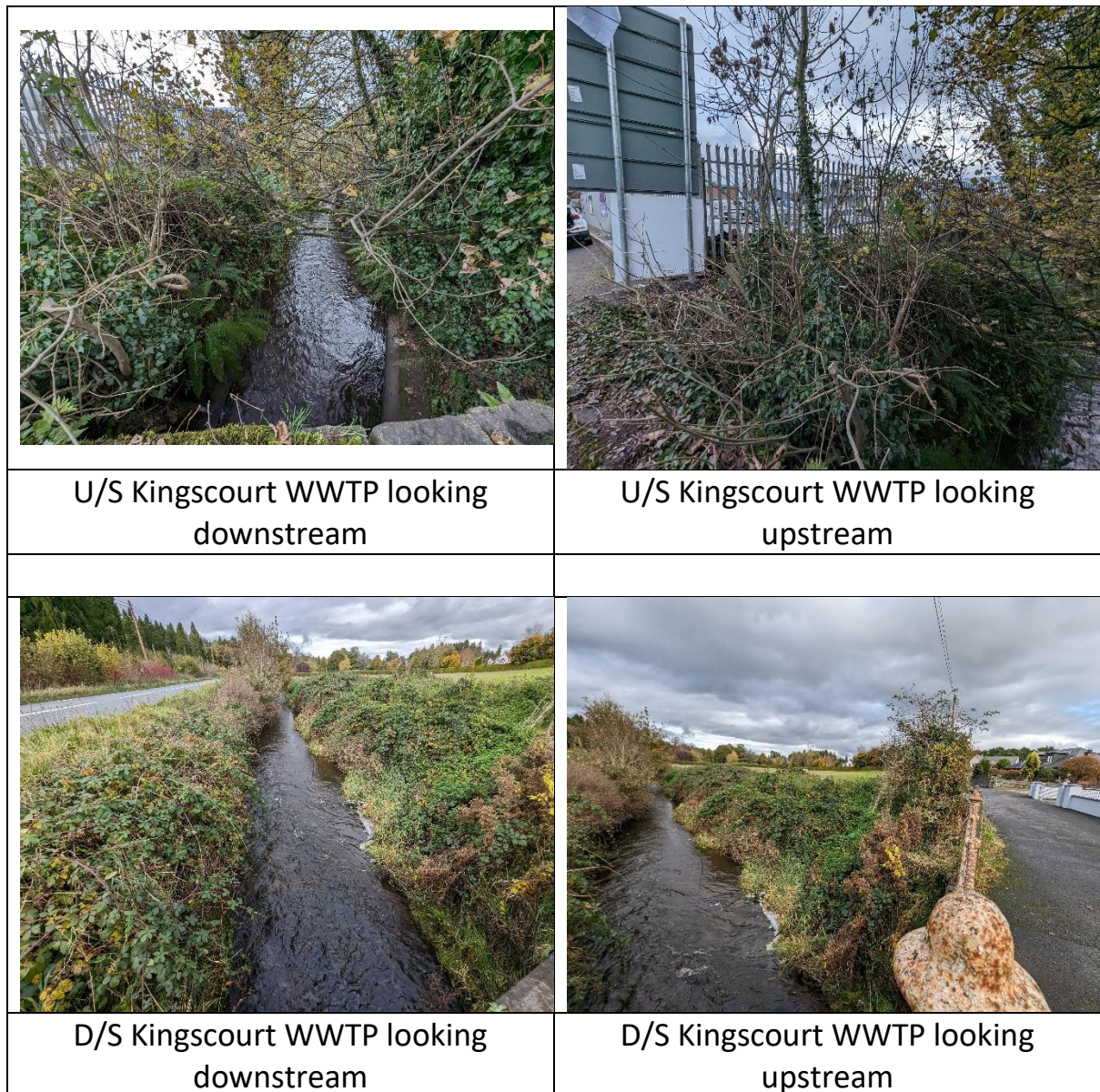


Figure 2. Upstream (U/S) and downstream (D/S) of Kingscourt WWTP.

Macroinvertebrates – SSRS

Table 3. Macroinvertebrates recorded upstream and downstream of Kingscourt WWTP discharge point.

	Location:	Kingscourt u/s	Kingscourt d/s
		Date of Sample	
SSRS Group	Taxon	26/10/2023	26/10/2023
1, Ephem	<i>Ecdyonurus</i>	Few	-
1, Ephem	<i>Rhithrogena</i>	Numerous	Common
1, Ephem	<i>Serratella ignita</i>	-	Few
3, Trich	Goeridae	Few	-
3, Trich	Hydropsyche	Few	-
3, Trich	Limnephilidae	Few	-
3, Trich	<i>Rhyacophila</i>	-	Few
3, Trich	<i>Sericostoma personatum</i>	Common	Few
4, GOLD	Chironomidae	-	Few
4, GOLD	<i>Dicranota</i>	-	Few
4, GOLD	<i>Potamopyrgus antipodarum</i>	Few	Few
4, GOLD	Simuliidae	Few	Common
4, GOLD	Tipulidae	Few	-
4, GOLD	Tubificidae	Common	Few
5, Asellus	<i>Asellus</i>	Few	Few
n/a	<i>Baetis rhodani</i>	Numerous	Numerous
n/a	<i>Erpobdella octoculata</i>	-	Few
n/a	<i>Gammarus</i>	Dominant	Dominant
n/a	<i>Glossiphonia complanata</i>	Few	-
n/a	Hydraenidae	Few	-
n/a	Planaria	Common	-
	Number Taxa	16	13
	SSRS	7.2	6.4
	Q-Value	Q3-4	Q3

Error! Reference source not found. gives the recorded macroinvertebrate taxa for the standard kick samples taken at these sites. The taxa are ordered from top to bottom in terms of their SSRS Grouping and general sensitivity to

pollution with *Ecdyonurus* and *Rhithrogena* at the top being the most sensitive and *Asellus* and Tubificidae at the bottom being the most tolerant. Note that not all taxa are included in the SSRS groups. The samples contained 16 and 13 taxa, upstream and downstream, respectively. They scored 7.2 and 6.4, upstream and downstream, respectively, on the SSRS. This suggests that both sites improved compared with 2022 when they scored 6.4 and 0.8, respectively, upstream and downstream. The downstream site showed a significant improvement in terms of its SSRS score compared with 2022. This is due in part to the presence of two Ephemeroptera Group 1 taxa, *Rhithrogena* and *Seratella* – no Ephemeroptera were found there in October 2022. The GOLD ,Group 4, taxa were less abundant than in 2022 and this improved the score. Similarly, there were much fewer *Asellus* noted in 2023 than in 2022 and this also increased the SSRS final value. No stoneflies were recorded. The Mullantra River is not currently included in the main EPA WFD operational or surveillance monitoring programmes and no historical Q-Values or biological assessments appear to be available. It was included as an Investigative site for water chemistry with EDENIreland.ie data available from 2016 to 2022.

Physico-Chemical Results

Table 4. Physico-chemical results for Kingscourt River, 26 October 2023.

Station	Dissolved Oxygen (DO) % Saturation	DO mg/l	Temp. °C	Conductivity µS/cm	pH
Upstream Kingscourt WWTP	95.27	10.00	13.00	374	7.33
Downstream Kingscourt WWTP	95.45	9.93	13.40	384	7.34

Summary

The Mullantra River is in Moderate condition before it reaches the Kingscourt WWTP discharge possibly due to upstream urban and agricultural pressures. The upstream site did, however, score more highly in October 2023 than it did in October 2022. The Mullantra is in relatively poor condition downstream of the WWTP discharge point, albeit scoring significantly higher in 2023 than in 2022. It is likely that the discharge remains as the main cause of the deterioration in quality.

Reference

McGarrigle, M. 2014. "Assessment of Small Water Bodies in Ireland." *Biology and Environment* 114B(3). doi: 10.3318/BIOE.2014.15.