Annual Environmental Report

2024

Mullagh

D0252-01

CONTENTS

7 APPENDIX

7.1 SMALL STREAM RISK SCORE ASSESSMENT

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2024 AER

This Annual Environmental Report has been prepared for D0252-01, Mullagh, 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)

- Mullagh WWTP with a Plant Capacity PE of 3000, 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
TPEFF0200D0252SW001	Mullagh WWTP	Treated	Non-Compliant	Ammonia-Total (as N) mg/l BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l ortho-Phosphate (as P) - unspecified mg/l Suspended Solids mg/l

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
Small Stream Risk Score Assessment

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 MULLAGH WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - MULLAGH 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
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	360	146
COD-Cr mg/l	12	955	319
Suspended Solids mg/l	12	870	164
Hydraulic Capacity	N/A	1735	557

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 - TPEFF0200D0252SW001

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	12	N/A	N/A	38.05	Pass
Suspended Solids mg/l	25	62.5	N/A	12	6	N/A	55.23	Fail
pH pH units	9	9	N/A	12	N/A	N/A	7.24	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	5	10	N/A	12	9	3	7.97	Fail
Ammonia-Total (as N) mg/l	0.3	0.6	N/A	12	10	9	3.18	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.1	0.2	N/A	12	11	11	0.41	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):

Refer to Incident Section of the Report.

Significance of Results:

The WWTP is non compliant with the ELV's as set in the Wastewater Discharge Licence. The impact on receiving waters is assessed further in Section 2.

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF0200D0252SW001

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	268914, 285136	RS07M060340	No	No	No	No	Moderate
Downstream	270986, 284095	RS07M030500	No	No	No	No	Poor

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	RS07M060340	2.10	RS07M030500	0.854	1.50	-83.3
Ammonia-Total (as N) mg/l	RS07M060340	0.042	RS07M030500	0.051	0.065	13.8

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	RS07M060340	0.029	RS07M030500	0.047	0.035	49.2
pH pH units	RS07M060340	7.75	RS07M030500	7.75	N/A	
Dissolved Oxygen mg/l	RS07M060340	9.54	RS07M030500	12	N/A	
Suspended Solids mg/l	RS07M060340	45	RS07M030500	N/A	N/A	
Dissolved Oxygen % O2	RS07M060340	96	RS07M030500	N/A	N/A	
Temperature °C	RS07M060340	12	RS07M030500	8.65	N/A	

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.

Based on ambient monitoring results a deterioration in Ammonia - Total (as N) & ortho- Phosphate (as 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 have an observable negative impact on the Water Framework Directive status.

2.1.4 OPERATIONAL PERFORMANCE SUMMARY - MULLAGH WWTP

2.1.4.1 Treatment Efficiency Report - Mullagh 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)
cBOD	29616	1621	95
TP	N/A	N/A	N/A
SS	33418	11228	66
TN	N/A	N/A	N/A
COD	64813	7735	88

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

2.1.4.2 Treatment Capacity Report Summary - Mullagh 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.

Mullagh WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	675
DWF to the Treatment Plant (m^3/day)	225
Current Hydraulic Loading - annual max (m^3/day)	1735

Mullagh WWTP	
Average Hydraulic loading to the Treatment Plant (m^3/day)	557
Organic Capacity (PE) - As Constructed	3000
Organic Capacity (PE) - Collected Load (peak week)[Note1]	1980
Organic Capacity (PE) - Remaining	1020
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 - MULLAGH 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 2024.			

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

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2024	1
Number of Incidents reported to the EPA via EDEN in 2024	1
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 2024 (No. of events)	Total volume discharged in 2024 (m3)	Monitoring Status
SW002	270086, 284632	Yes	Low Significance	Not Meeting Criteria	Unknown	Unknown	Not Monitored

The contents presented in this table include the most up to date information available at the time of writing. 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?	No
The SWO Assessment included the requirements of relevant of WWDL schedules?	No
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 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
D0252-SIP:01	Complete improvements to comply with ELVs specified in Schedule A. Implement, in accordance with Condition 5.6.1, either (a) improvements to the existing waste water works to achieve compliance with the emission limit values specified in Schedule A.1: Primary Waste Water discharge & Monitoring of this licence, or (b) an alternative primary discharge point, or (c) connection to another agglomeration.	C	31/12/2019	Yes	At Planning Stage	2027	

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
D0252-01-Priority Substances Assessment	Yes	No
D0252-01-Small Stream Risk Score Assessment	Yes	Yes

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?	N/A
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	N/A
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	No

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

Signed: Date: 23/05/2025

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

Eleanor Roche

Head of Environmental Regulation.

7 APPENDIX

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

SSRS Compliance Monitoring: *Mullagh* Waste Water Treatment Plant 2024

Report to Uisce Éireann

Limnos Consultancy, January 2025

Contents

Mullagh WWTP

Introduction

Small Streams Risk Score (SSRS) assessments on the Mullagh River upstream and downstream of the Mullagh waste water treatment plant (WWTP) are outlined in this report. The assessments were made on 14 October 2024. 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 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. 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. Probes were calibrated before sampling.

Location of Sites Sampled

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

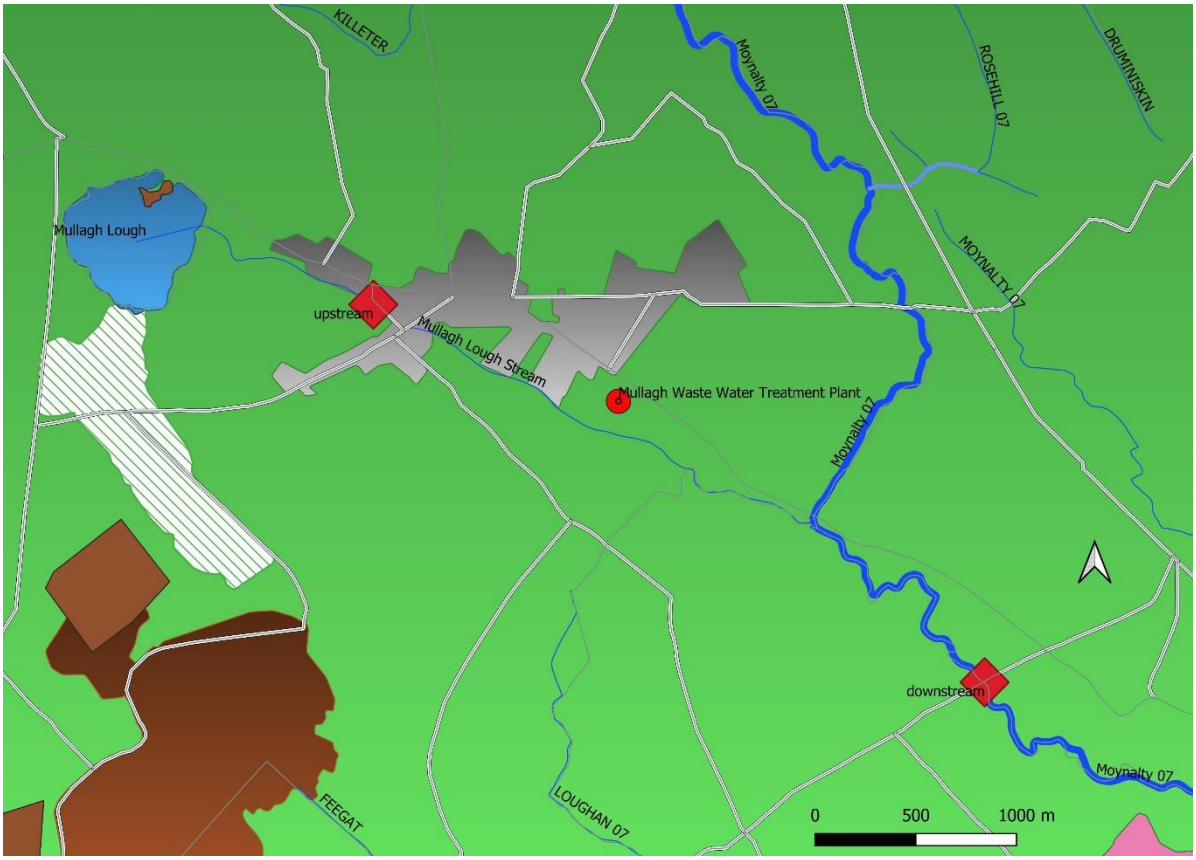

Figure 1. Location of upstream and downstream monitoring sites for Mullagh WWTP. River flows North.

Table 2. Location of sites sampled upstream and downstream of Mullagh WWTP.

Location	Mullagh WWTP Upstream	Mullagh WWTP Downstream
EPA Code	RS07M060340	RS07M030500
Station	Bridge at Brookfield	Ballintlieve Bridge
River	Mullagh Lough Stream	Moynalty
Easting	268914	271950
Northing	285136	283260

Results

Site Photographs

Figure 2 shows photographs taken when sampling upstream and downstream of the Mullagh WWTP on 14 October 2024.

U/S Mullagh WWTP looking downstream

U/S Mullagh WWTP looking upstream

D/S Mullagh WWTP looking downstream

D/S Mullagh WWTP looking upstream

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

Macroinvertebrates – SSRS

Table 3 shows the macroinvertebrate taxa recorded at both sites on 14 October 2024.

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

			Upstream Mullagh WWTP	Downstream Mullagh WWTP
		0	Mullagh L. Stream	Moynalty
			07M060340	07M030500
			West Br in Mullagh	Ballintlieve Br
			14/10/2024	14/10/2024
SSRS Group		**Taxon**		
1	Ephem	*Ecdyonurus*	-	Few
1	Ephem	*Rhithrogena semicolorata*	-	Few
3	Trich	*Hydropsyche*	-	Common
3	Trich	*Sericostoma personatum*	Few	-
4	GOlD	Ancylidae	-	Few
4	GOlD	Chironomidae	Common	Few
4	GOlD	*Lymnaea peregra*	-	Few
4	GOlD	*Potamopyrgus antipodarum*	Few	Dominant
4	GOlD	Simuliidae	-	Common
4	GOlD	Tipulidae	Few	Few
4	GOlD	Tubificidae	Common	Few
5	Asellus	*Asellus aquaticus*	-	Common
	n/a	*Baetis rhodani*	Few	Numerous
	n/a	*Crangonyx*	-	Few
	n/a	*Elmis aenea*	Few	Few
	n/a	*Gammarus*	Dominant	Few
	n/a	Hydrachnidae	Common	-
	n/a	*Limnius volckmari*	-	Few
	n/a	Planaria	Common	-
		Number Taxa	**10**	**16**
		SSRS	**4**	**3.2**
		Q-Value	**Q3**	**Q3-4**

The SSRS grouping to which they belong is shown where relevant – not all families or orders are included in the SSRS method. The taxa are ordered from top to bottom broadly in terms of their sensitivity to pollution with *Ecdyonurus* at the top being the most sensitive and Tubificidae and *Asellus* at the bottom being the most tolerant.

The upstream site on the smaller Mullagh Lough Stream had 10 types and there were 16 recorded at the downstream site on the main Moynalty River. The upstream site is in poor condition with an SSRS of 4 and a Q-Value of Q3. The stream flows from Mullagh Lough and may be impacted by the lake's condition. Agricultural influences are apparent in the upper catchment. The site lacked both Group 1 Ephemeroptera and Group 2 Plecoptera but had a single Trichoptera, the cased caddis *Sericostoma*. *Gammarus* was the dominant type and Tubificidae were common together with chironomids and flatworms. The main difference between this sample and the 2023 sample is the lack of Simuliidae in 2024 – they were numerous in October 2023 at the upstream site. This may be a sign of instability as typically the faunal composition does not vary in rivers and streams from year to year – the more common types usually re-occur in successive samples.

The upstream site is dominated by fools watercress with a coverage of ~80%.

The downstream site on the River Moynalty had 16 taxa but scored a low SSRS of 3.2 despite having both *Ecdyonurus* and *Rhithrogena* from Group 1 in low numbers. The main change is the dominance of *Potamopyrgus* in 2024 – its abundance was low in 2023. *Gammarus* dropped from dominant in 2023 to just 'Few' in 2024. Similarly, *Baetis rhodani* numbers increased from 'Few' in 2023 to 'Numerous' in 2024. The tolerant taxon *Asellus aquaticus* was common in 2024 but absent in 2023. As indicated above, it is unusual to see such major changes in the dominant types from year to year.

Other pressures may be impacting the Moynalty. At the time of writing, the EPA had not published any newer data than the 2020 biological monitoring results but it is likely that it was surveyed in 2023.

As discussed in the 2023 report, ideally, to give a more accurate assessment of the impact of the WWTP, the downstream site should be on the Mullagh Lough Stream but access to this is difficult especially in high flows in winter. It can be accessed in low flow by wading downstream from Mullagh Bridge and sampling just upstream of the confluence of the two water bodies.

Physico-Chemical Results

Table 4 presents the physico-chemical results for the two sites. The dissolved oxygen of 87.2% at the upstream site is relatively poor and it is likely to drop significantly during the hours of darkness. The faunal composition discussed above reflects the poor oxygenation conditions.

Table 4. Physico-chemical results for Mullagh River, 14 October 2024.

Station	Dissolved Oxygen (DO) % Saturation	DO mg/l	Temp. °C	Conductivity µS/cm	pH
Upstream Mullagh WWTP	87.2	9.54	10.90	383	7.85
Downstream Mullagh WWTP	101.0	11.13	10.70	235	7.56

Summary

The Mullagh River is in poor condition before it reaches the Mullagh WWTP possibly due to the influence of Mullagh Lough – while the SSRS value of 4 was unchanged, the Q-Value dropped to Q3 – poor condition, due to the lack of any of the Group A Q-Value taxa.

The Moynalty site downstream of the confluence with the Mullagh Lough Stream and the WWTP discharge showed an improvement compared with 2023 due to the occurrence of two of the more sensitive mayflies, *Ecdyonurus* and *Rhithrogena*. There were, however, some changes in the main taxa that is a bit concerning suggesting changing pressures on the system at this point.

To rule out whether these changes are related to the WWTP, a sample site on the Lough Mullagh Stream upstream of the confluence with the Moynalty would be required. Access via the WWTP to the stream is required.

Reference

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