Annual Environmental Report

2024

Killenaule

D0443-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2024 AER

This Annual Environmental Report has been prepared for D0443-01, Killenaule, in Tipperary 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 major capital or operational changes undertaken.

1.2 TREATMENT SUMMARY

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

- Killenaule WWTP with a Plant Capacity PE of 1200, 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
TPEFF2900D0443SW001	Killenaule WWTP	Treated	Compliant	N/A

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
Small Stream Risk Score Assessment

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 KILLENAULE WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - KILLENAULE 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
Total Phosphorus (as P) mg/l	12	12	2.35
Ammonia-Total (as N) mg/l	12	84	14
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	258	49
Total Nitrogen mg/l	12	100	21
Suspended Solids mg/l	12	380	61
COD-Cr mg/l	12	575	117
pH pH units	12	7.80	7.05
Hydraulic Capacity	N/A	1154	362

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 - TPEFF2900D0443SW001

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	50	100	N/A	12	N/A	N/A	7.88	Pass
Temperature °C	25	25	N/A	12	N/A	N/A	12	Pass
pH pH units	9	9	N/A	12	N/A	N/A	7.28	Pass
Suspended Solids mg/l	5	12.5	N/A	12	1	N/A	4.24	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	4	8	N/A	12	N/A	N/A	1.54	Pass
Ammonia-Total (as N) mg/l	1	2	N/A	12	N/A	N/A	0.037	Pass
ortho-Phosphate (as P) - unspecified mg/l	0.5	0.6	N/A	12	N/A	N/A	0.047	Pass
Nitrate (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	11	

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)
Nitrite (as N) mg/l	N/A	N/A	N/A	12	N/A	N/A	0.071	
Conductivity @20°C µS/cm	N/A	N/A	N/A	12	N/A	N/A	431	
Total Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	11	
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	12	N/A	N/A	0.040	

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 TPEFF2900D0443SW001

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	222485, 146124	RS16K050070	No	No	No	No	Moderate
Downstream	222586, 145961	RS16K050080	No	No	No	No	Moderate

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	RS16K050070	1.28	RS16K050080	1.85	1.50	38.2
Ammonia-Total (as N) mg/l	RS16K050070	0.022	RS16K050080	0.033	0.065	15.7
ortho-Phosphate (as P) - unspecified mg/l	RS16K050070	0.025	RS16K050080	0.010	0.035	-42.9
Dissolved Oxygen mg/l	RS16K050070	10	RS16K050080	10	N/A	
Dissolved Oxygen % O2	RS16K050070	93	RS16K050080	90	N/A	
Temperature °C	RS16K050070	12	RS16K050080	12	N/A	
Total Nitrogen mg/l	RS16K050070	3.02	RS16K050080	4.15	N/A	
pH pH units	RS16K050070	7.80	RS16K050080	7.60	N/A	

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, BOD, Total Nitrogen, 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 - KILLENAULE WWTP

2.1.4.1 Treatment Efficiency Report - Killenaule 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	8224	208	97
SS	10307	570	94
TP	397	5	99
TN	3561	1512	58
COD	19782	1061	95

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

2.1.4.2 Treatment Capacity Report Summary - Killenaule 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.

Killenaule WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	804
DWF to the Treatment Plant (m^3/day)	268
Current Hydraulic Loading - annual max (m^3/day)	1154
Average Hydraulic loading to the Treatment Plant (m^3/day)	362.02
Organic Capacity (PE) - As Constructed	1200
Organic Capacity (PE) - Collected Load (peak week)[Note1]	1006
Organic Capacity (PE) - Remaining	194
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 - KILLENAULE 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)
There were no reportable incidents in 2024.			

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2024	0
Number of Incidents reported to the EPA via EDEN in 2024	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 2024 (No. of events)	Total volume discharged in 2024 (m3)	Monitoring Status
SW2	222536, 146042	Yes	Low Significance	Not Meeting Criteria	Unknown	Unknown	Not Monitored
SW3	222516, 146075	Yes	Low Significance	Meeting Criteria	Unknown	Unknown	Not Monitored
SW4	222403, 146350	Yes	Low Significance	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

SWO Summary	
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
D0443-SIP:01	Infiltration assessment, a plan for implementation of works and completion of works as agreed under Condition 5 of this licence.	C	15/12/2015	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
D0443-01-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: 30/06/2025

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 ,

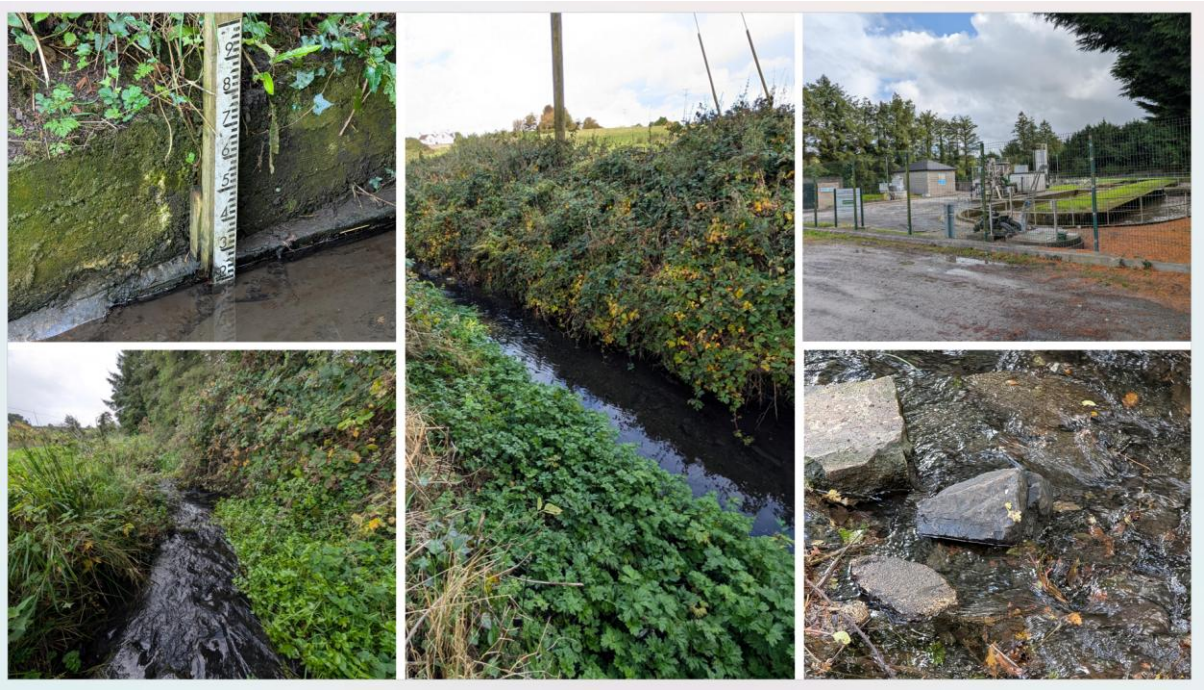
Eleanor Roche

Head of Environmental Regulation.

7 APPENDIX

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

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



Report to Uisce Éireann

Limnos Consultancy, January 2025

Contents

Killenaule WWTP

Introduction

Small Streams Risk Score (SSRS) assessments on the Killenaule Stream upstream and downstream of the Killenaule waste water treatment plant (WWTP) are outlined in this report. The assessments were made on 7 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 use.

Location of Sites Sampled

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

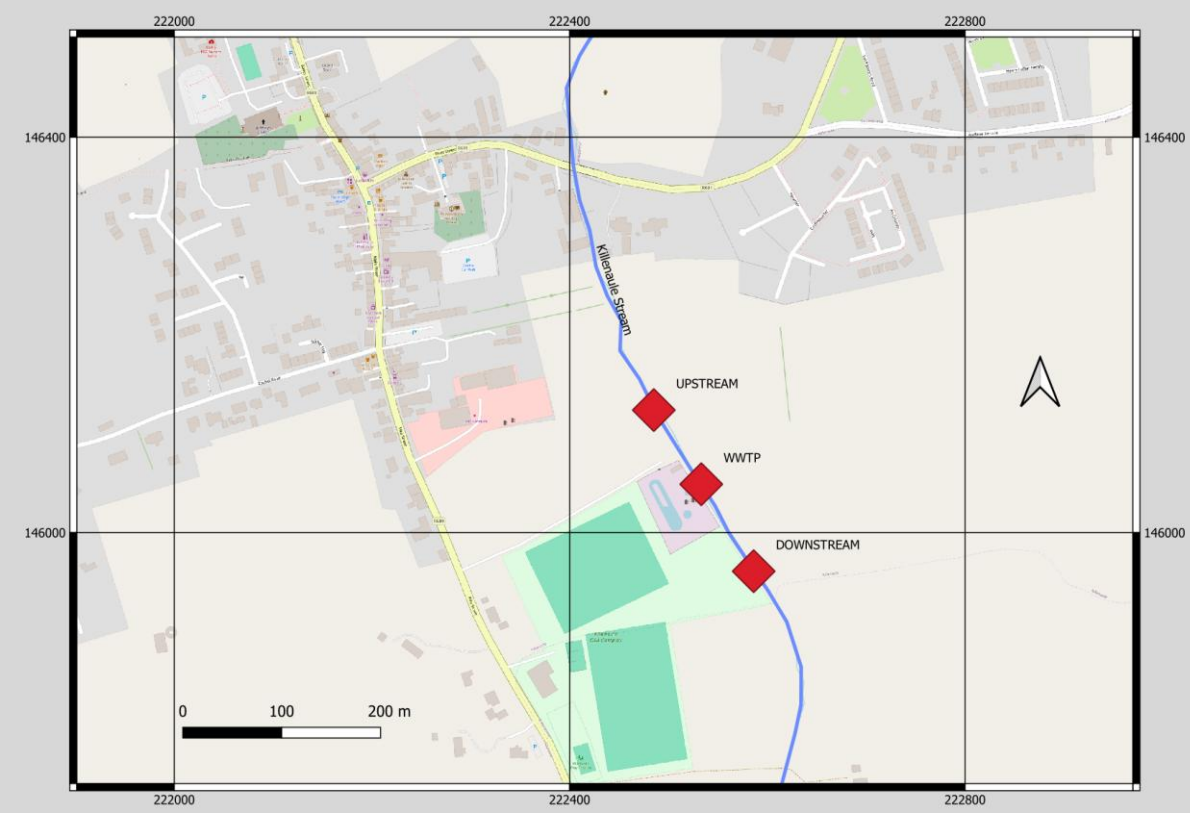


Figure 1. Location of upstream and downstream monitoring sites for Killenaule WWTP. The river flows South.

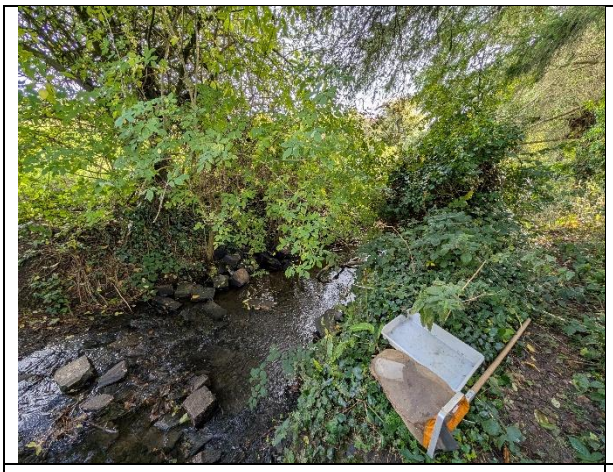
Table 2. Location of sites sampled upstream and downstream of Killenaule WWTP.

Location	Killenaule WWTP Upstream	Killenaule WWTP Downstream
EPA Code	RS16K050070	RS16K050080
Station	Upstream Killenaule WWTP	Downstream Killenaule WWTP
River	Killenaule Stream	Killenaule Stream
Easting	222485	222586
Northing	146124	145961

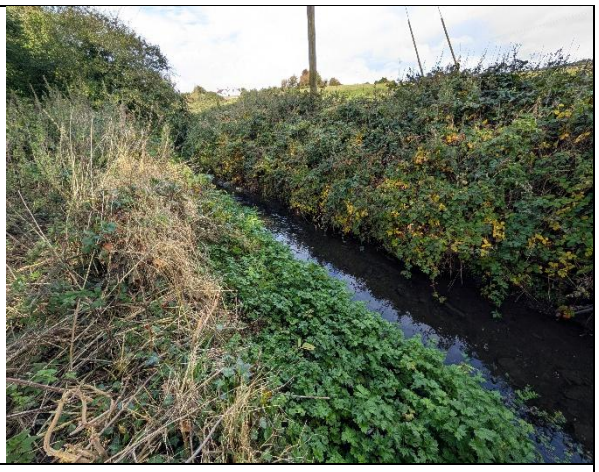
Results

Site Photographs

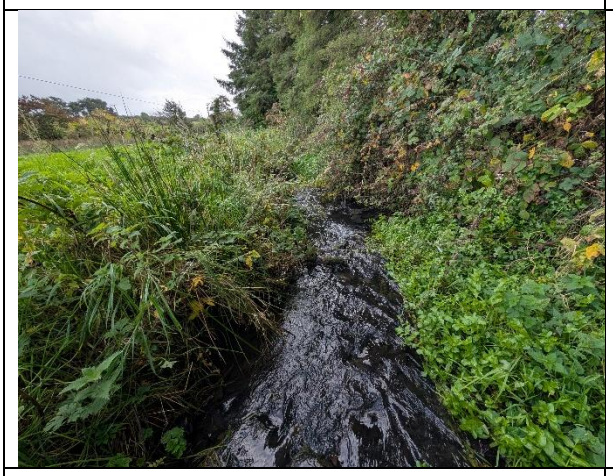
Figure 2 shows photographs taken when sampling upstream and downstream of the Killenaule WWTP on 7 October 2024.



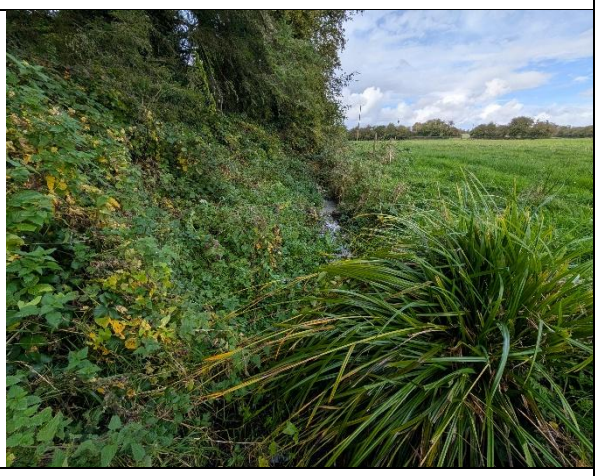
U/S Killenaule WWTP looking downstream



U/S Killenaule WWTP looking upstream



D/S Killenaule WWTP looking downstream



D/S Killenaule WWTP looking upstream

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

Macroinvertebrates - SSRS

Table 3 gives the recorded macroinvertebrate taxa for the standard kick samples taken at these sites. The taxa are ordered from top to bottom by their SSRS group, from the more sensitive (Groups 1, 2 and 3) to the more tolerant (Groups 4 and 5), noting that not all taxa recorded belong to an SSRS group.

Table 3. Relative abundances of macroinvertebrates recorded upstream and downstream of Killenaule WWTP discharge point.

			Upstream Killenaule WWTP	**Downstream Killenaule WWTP**
		River	**Killenaule Stream**	**Killenaule Stream**
		Code	**16K050070**	**16K050080**
		Location	**Upstream Killenaule WWTP**	**Downstream Killenaule WWTP**
		Date of Sample	**07/10/2024**	**07/10/2024**
SSRS Group		**Taxon**		
3	Trich	Limnephilidae	Few	Few
3	Trich	Odontoceridae	Few	-
3	Trich	*Sericostoma personatum*	Few	-
4	GOlD	Ancylidae	Few	-
4	GOlD	Chironomidae	Numerous	Few
4	GOlD	*Eiseniella*	-	Few
4	GOlD	*Potamopyrgus antipodarum*	Few	-
4	GOlD	Tubificidae	Common	Numerous
5	Asellus	*Asellus aquaticus*	-	Few
	n/a	*Baetis rhodani*	-	Common
	n/a	*Elmis aenea*	Few	Few
	n/a	*Erpobdella octoculata*	-	Few
	n/a	*Gammarus*	Dominant	Dominant
	n/a	*Glossiphonia complanata*	Few	Few
	n/a	Planaria	Few	-
	n/a	Sphaeriidae	-	Few
		Number Taxa	**11**	**11**
		SSRS	**2.4**	**3.2**
		Q-Value	**Q3**	**Q3**

The upstream site declined in part due to the loss of *Ecdyonurus* and *Rhithrogena* which was present in December 2023. No stoneflies were noted but three Trichoptera taxa were present. As in 2023 five different GOlD taxa were recorded. The SSRS score dropped from 3.2 to 2.4 and the number of taxa dropped from 12 to 11. The major difference between the 2023 sample and the 2024 was the disappearance of the blackfly larvae, Simuliidae, in 2024 which were present in excessive numbers in 2023. A Q-Value of Q3 was assigned.

The downstream site had 11 taxa, up from eight in 2023. The SSRS improved from 0.8 to 3.2 but obviously still a very low score putting the site at risk of not achieving good ecological status. No Ephemeroptera or Plecoptera were recorded and there was just one Trichoptera – the cased caddis of the Limnephilidae family. There were three GOlD taxa present, with the Tubificidae numerous. The lack of the first two main SSRS groups and the low number of Trichoptera in Group 3 plus the presence of *Asellus* resulted in the SSRS of 3.2. A Q-Value of Q3 was assigned.

Physico-Chemical Results

Table 4 gives the physico-chemical measurements made on 7 October 2024. The dissolved oxygen was again slightly low at 93/94% saturation The conductivity was very similar to the 2023 result in the mid-400s µS/cm

Table 4. Physico-chemical results for Killenaule River, 7 October 2024.

Station	Dissolved Oxygen (DO) % Saturation	DO mg/l	Temp. °C	Conductivity µS/cm	pH
Upstream Killenaule WWTP	93.8	9.14	14.70	456	7.85
Downstream Killenaule WWTP	93.3	9.08	14.70	459	7.70

Summary

The Killenaule Stream was once again in poor condition, albeit with little difference between the upstream and downstream sites. Both were assigned Q3 and the SSRS results put both sites in the ‘At Risk’ category.

Reference

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