# Annual Environmental Report

# 2024

Coill Dubh

D0242-01

## CONTENTS

# 1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2024 AER

This Annual Environmental Report has been prepared for D0242-01, Coill Dubh, in Kildare 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.

Process optimisation continued at the WwTP during 2024 (*e.g.,* adjustments were made to sludge wasting to optimise the MLSS, SBR cycle times and processing volumes were adjusted, anoxic process times were adjusted, and ferric dosing adjustments were made).

## 1.2 TREATMENT SUMMARY

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

- Coill Dubh WWTP with a Plant Capacity PE of 2000, 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 |
|---|---|---|---|---|
| **TPEFF1400D0242SW001** | Coill Dubh WWTP | Treated | Non-Compliant | Ammonia-Total (as N) mg/l<br>ortho-Phosphate (as P) - unspecified mg/l<br>Suspended Solids mg/l<br>Total Phosphorus (as P) mg/l |

## 1.4 LICENCE SPECIFIC REPORTING

| Assessment / Report |
|---|
| **Small Stream Risk Score Assessment** |

# 2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

## 2.1 COILL DUBH WWTP - TREATED DISCHARGE

### 2.1.1 INFLUENT MONITORING SUMMARY - COILL DUBH 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) mg/l** | 12 | 408 | 167 |
| **COD-Cr mg/l** | 12 | 1240 | 478 |
| **Total Nitrogen mg/l** | 12 | 76 | 46 |
| **Suspended Solids mg/l** | 12 | 378 | 180 |
| **Total Phosphorus (as P) mg/l** | 12 | 11 | 5.5 |
| **ortho-Phosphate (as P) - unspecified mg/l** | 1 | 1.55 | 1.55 |
| **pH pH units** | 1 | 8.03 | 8.03 |
| **Ammonia-Total (as N) mg/l** | 1 | 23 | 23 |
| **Hydraulic Capacity** | N/A | 748 | 367 |

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

## Significance of Results:

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

## 2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF1400D0242SW001

| 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 | 10 | N/A | N/A | 36 | Pass |
| **Suspended Solids mg/l** | 10 | 25 | N/A | 10 | 1 | 1 | 8.21 | Fail |
| **BOD, 5 days with Inhibition (Carbonaceous) mg/l** | 8 | 16 | N/A | 10 | 2 | N/A | 4.12 | Pass |
| **pH pH units** | 6 | 9 | N/A | 10 | 0 | 0 | 7.41 | Pass |
| **Total Phosphorus (as P) mg/l** | 0.5 | 0.6 | N/A | 10 | 7 | 7 | 0.98 | Fail |
| **Ammonia-Total (as N) mg/l** | 0.5 | 1 | N/A | 10 | 6 | 4 | 1.50 | Fail |
| **ortho-Phosphate (as P) - unspecified mg/l** | 0.25 | 0.5 | N/A | 10 | 4 | 3 | 0.430 | Fail |

| Parameter | WWDL ELV (Schedule A) | ELV with Condition 2 Interpretation included Note 1 | Interim % reduction from influent concentration | Number of sample results | Number of exceedances | Number of exceedances with Condition 2 Interpretation included | Annual Mean | Overall Compliance (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|
| **Total Nitrogen mg/l** | N/A | N/A | N/A | 10 | N/A | N/A | 30 | |
| **Alkalinity-total (as CaCO3) mg/l** | N/A | N/A | N/A | 2 | N/A | N/A | 66 | |
| **Conductivity @20°C µS/cm** | N/A | N/A | N/A | 8 | N/A | N/A | 885 | |
| **Nitrate (as N) mg/l** | N/A | N/A | N/A | 2 | N/A | N/A | 15 | |

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):

**Plant /Equipment Breakdown at WWTP.**

## Significance of Results:

The WWTP is non compliant with the ELV's 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 TPEFF1400D0242SW001

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** | 279596, 227220 | RS14W140860 | No | No | No | No | Poor |
| **Downstream** | 278857, 226765 | RS14S010020 | No | No | No | No | Poor |

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.

Based on ambient monitoring results a deterioration in Ammonia, Ortho-P and BOD 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.

As per the 3rd Cycle Barrow Catchment Report (HA 14), Agriculture and Urban Waste Water are significant pressures on the At Risk Slate_020 waterbody.

It is unknown if the wastewater treatment plant is having an observable negative impact on the Water Framework Directive status.

## 2.1.4 OPERATIONAL PERFORMANCE SUMMARY - COILL DUBH WWTP

### *2.1.4.1 Treatment Efficiency Report - Coill Dubh 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** | 22414 | 552 | 98 |
| **COD** | 64055 | 4846 | 92 |
| **SS** | 24166 | 1099 | 95 |
| **TN** | 6151 | 3961 | 36 |
| **TP** | 743 | 131 | 82 |

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

### 2.1.4.2 Treatment Capacity Report Summary - Coill Dubh 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.

| Coill Dubh WWTP | |
|---|---|
| **Peak Hydraulic Capacity ($m^3$/day) - As Constructed** | 1229 |
| **DWF to the Treatment Plant ($m^3$/day)** | 460 |
| **Current Hydraulic Loading - annual max ($m^3$/day)** | 748 |
| **Average Hydraulic loading to the Treatment Plant ($m^3$/day)** | 367 |
| **Organic Capacity (PE) - As Constructed** | 2000 |
| **Organic Capacity (PE) - Collected Load (peak week)[Note1]** | 1680 |
| **Organic Capacity (PE) - Remaining** | 320 |
| **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 - COILL DUBH 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) |
|---|---|---|---|
| **Monitoring Equipment offline** | Plant or equipment breakdown at WWTP | No | Yes |
| **Uncontrolled release** | SWO exceptional rainfall and overflow expected | No | Yes |
| **Abatement equipment off-line** | Plant or equipment breakdown at WWTP | No | Yes |

| Incident Type | Cause | Recurring (Y/N) | Closed (Y/N) |
|---|---|---|---|
| **Uncontrolled release** | SWO exceptional rainfall and overflow expected | No | Yes |
| **Uncontrolled release** | SWO exceptional rainfall and overflow expected | No | Yes |
| **Uncontrolled release** | SWO exceptional rainfall and overflow expected | No | Yes |
| **Abatement equipment off-line** | Plant or equipment breakdown at WWTP | No | No |
| **Breach of ELV** | Plant or equipment breakdown at WWTP | Yes | No |

### 3.2.2 SUMMARY OF OVERALL INCIDENTS

| Question | Answer |
|---|---|
| **Number of Incidents in 2024** | 8 |
| **Number of Incidents reported to the EPA via EDEN in 2024** | 8 |
| **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 ($m^3$) | Monitoring Status |
|---|---|---|---|---|---|---|---|
| **SW002** | 279437, 227002 | Yes | Low Significance | Meeting Criteria | Unknown | 2035 | 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 ($m^3$)?** | 2035 |
| **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?** | 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 |
|---|---|---|---|---|---|---|---|
| **There are no Specified Improvement Programmes for this Agglomeration.** | | | | | | | |

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 |
|---|---|---|
| **D0242-01-Priority Substances Assessment** | Yes | No |
| **D0242-01-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?** | No |
| **List reason e.g. additional SWO identified** | N/A |
| **Is there a need to request/advise the EPA of any modification to the existing WWDL with respect to condition 4 changes to monitoring location, frequency etc** | No |
| **List reason e.g. changes to monitoring requirements** | N/A |
| **Have these processes commenced?** | N/A |
| **Are all outstanding reports and assessments from previous AERs included as an appendix to this AER** | Yes |

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

Date: 16/04/2025

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 - Ambient Monitoring Summary** |
| **Appendix 7.2 - Small Stream Risk Score Assessment** |

# Coill Dubh Ambient Monitoring Summary 2024

| | | | Receiving Waters Designation (Yes/No) | | | | | Mean (mg/l) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Ambient Monitoring Point from WWDL (or as agreed with EPA)** | **Irish National Grid Reference (Easting, Northing)** | **EPA Feature Coding Tool code** | **Bathing Water** | **Drinking Water** | **FWPM** | **Shellfish** | **Current WFD Status** | **cBOD** | **o-Phosphate (as P)** | **Ammonia (as N)** |
| Upstream Monitoring Point | 279596, 227220 | RS14W140860 | No | No | No | No | Poor | 10.456 | 0.019 | 0.103 |
| Downstream Monitoring Point | 278857, 226765 | RS14S010020 | No | No | No | No | Poor | 3.102 | 0.040 | 0.204 |
| *Difference* | | | | | | | | *-7.355* | *0.021* | *0.101* |
| EQS | | | | | | | | 1.500 | 0.035 | 0.065 |
| % of EQS | | | | | | | | 490.303% | 59.425% | 155.185% |

# Coill Dubh Ambient Monitoring Summary 2024

| Upstream | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Station Name | Sample Date | pH | BOD mg/ l | Total Nitrogen | Ammonia | Ortho-Phosphate | DO mg/l | DO % Sat |
| | | pH units | mg/l | mg/l | mg/l | mg/l | mg/l | % Sat |
| Upstream | 24/01/2024 | 7.61 | 1.9 | 2.74 | 0.75 | 0.06 | 9.400 | 74.340 |
| Upstream | 09/04/2024 | 7.5 | 2 | 3.4 | <0.015 | <0.010 | 9.9 | 93.8 |
| Upstream | 14/05/2024 | 7.9 | < 1 | 3.2 | 0.047 | 0.05 | 7.8 | 73.1 |
| Upstream | 11/06/2024 | 8.1 | < 1 | 3 | 0.04 | < 0.01 | 8.6 | 81.3 |
| Upstream | 02/07/2024 | 7.4 | 3 | 2.1 | < 0.015 | < 0.01 | 7.9 | 77.7 |
| Upstream | 20/08/2024 | 8.1 | < 1 | 1.9 | 0.048 | < 0.01 | 7.7 | 79 |
| Upstream | 26/09/2024 | 8.1 | 2 | 1.8 | <0.015 | 0.03 | | |
| Upstream | 24/10/2024 | 7.9 | 31 | 1.5 | 0.022 | <0.01 | 8.1 | 82.9 |
| Upstream | 13/11/2024 | 7.9 | 64 | 2 | 0.17 | 0.02 | 9.5 | 79.1 |
| Upstream | 26/11/2024 | 7.4 | 6 | 3.1 | <0.015 | <0.01 | 11.3 | 89.5 |
| Upstream | 04/12/2024 | 7.6 | 3 | 4.2 | <0.015 | <0.01 | 10.5 | 87.3 |
| | **Mean** | **7.774** | **10.456** | **2.631** | **0.103** | **0.019** | **9.070** | **81.804** |
| | **95%ile** | **8.100** | **47.500** | **3.800** | **0.460** | **0.055** | **10.940** | **91.865** |

| Downstream | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Station Name** | **Sample Date** | **pH** | **BOD mg/ l** | **Total Nitrogen mg/l** | **Ammonia mg/l** | **Ortho-Phosphate mg/l** | **DO mg/l** | **DO % Sat** |
| | | **pH units** | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **mg/l** | **% Sat** |
| Downstream | 24/01/2024 | 7.86 | 2 | 2.82 | 0.72 | 0.06 | 9.47 | 74.89 |
| Downstream | 09/04/2024 | 7.6 | 1 | 3 | 0.017 | < 0.01 | 9.2 | 87.6 |
| Downstream | 14/05/2024 | 8 | < 1 | 5.1 | 0.018 | 0.05 | 7.5 | 75.2 |
| Downstream | 11/06/2024 | 8 | < 1 | 3.5 | 0.062 | 0.02 | 8.5 | 82.2 |
| Downstream | 02/07/2024 | 7.1 | 2 | 4.6 | 0.06 | 0.12 | 7.6 | 74.3 |
| Downstream | 20/08/2024 | 8 | < 1 | 1.6 | 0.065 | 0.02 | 7.4 | 75 |
| Downstream | 26/09/2024 | 7.9 | 4 | 8 | 0.59 | 0.08 | | |
| Downstream | 24/10/2024 | 7.8 | 19 | 1.5 | 0.15 | < 0.01 | 8.1 | 77.8 |
| Downstream | 13/11/2024 | 8 | 2 | 5.5 | 0.5 | 0.06 | 10.9 | 90.2 |
| Downstream | 26/11/2024 | 7.5 | 1 | 3.4 | 0.047 | < 0.01 | 11.2 | 89.6 |
| Downstream | 04/12/2024 | 7.7 | 1 | 3.4 | < 0.015 | < 0.01 | 10.1 | 84.6 |
| | **Mean** | **7.769** | **3.102** | **3.856** | **0.204** | **0.040** | **8.997** | **81.139** |
| | **95%ile** | **8.000** | **11.500** | **6.750** | **0.655** | **0.100** | **11.065** | **89.930** |

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

Kildare County Council

# Coill Dubh Small Stream Risk Score 2024

Mícheál McHugh Jewell, Daniel Dunleavy

AQUAFACT Ref: P14738

December 2024

COMMERCIAL IN CONFIDENCE

**Client: Kildare County Council**

**Address: Devoy Park, Naas Co Kildare W91 X77F**

**Reference no: P14738**

**Date of issue: 02/12/2024**

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## Report Approval Sheet

| | |
|---|---|
| **Client** | Kildare County Council |
| **Report Title** | Coill Dubh Small Stream Risk Score 2024 |
| **Job Number** | P14738 |
| **Report Status** | Final |
| **Issue Date** | 02/12/2024 |

| Rev | Status | Issue Date | Document File Name | Author (s) | Approved by: |
|---|---|---|---|---|---|
| 1 | Draft | 08/11/2024 | P14738 Coill Dubh SSRS Nov 2024_Draftv1 | Mícheál McHugh Jewell, Daniel Dunleavy | E. McCormack |
| 2 | Final | 02/12/2024 | P14738 Coill Dubh SSRS Nov 2024_FInal | Mícheál McHugh Jewell, Daniel Dunleavy | E. McCormack |
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AQUAFACT APEM Group

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# List of Acronyms/Glossary

| | |
|---|---|
| **D/S** | Downstream |
| **EPA** | Environmental Protection Agency |
| **G.OL.D** | Gastropods, Oligochaetes, Dipterans |
| **IFI** | Inland Fisheries Ireland |
| **SSRS** | Small Stream Risk Score |
| **U/S** | Upstream |
| **WFD** | Water Framework Directive |
| **WRBD** | Western River Basin District |
| **WWTP** | Wastewater Treatment Plant |

# 1. Introduction

AQUAFACT was contracted by Kildare County Council to carry out an SSRS assessment of the discharge belonging to Coill Dubh Wastewater Treatment plant. A sample was taken upstream and downstream of the discharge point. The sampling was carried out on the 15th of October 2024.

# 2. Methodology

## 2.1 Sampling

Two kick samples were taken (See Figure 2.1 and Table 2.1). The two-minute kick and one minute stone wash sampling method was employed to collect samples of macroinvertebrates for analysis. This involved placing a standard hand net of pore size 500µm in the river, facing upstream and disturbing the riverbed in front of the net mouth. The surveyor then moved in a diagonal direction upstream to ensure that different micro-habitats were included in the sample. The kick sample method dislodges macroinvertebrates from the substrates and submerged plant material. This was continued for approximately two minutes and followed by one minute of stone washing (Lucey *et al*., 1999).

The macroinvertebrate assemblages of each sample were identified and counted on the riverbank. The details of the macroinvertebrate assemblages were recorded on data sheets. The resulting species list was then used to assign the SSRS score to the sampled streams.

The IFI's 2010 Biosecurity Protocol for Field Survey Work document was followed during sampling.


**Figure 2-1:Upstream and Downstream positions on the River Slate & West Cooleragh at Coill Dubh**

**Table 2.1: Coill Dubh SSRS station coordinates.**

| Station | Latitude | Longitude |
|---|---|---|
| Coill Dubh Upstream | 53.2892355 | -6.8078691 |
| Coill Dubh Downstream | 53.2854253 | -6.8185926 |

## 2.2 Small Stream Risk Score

The Small Streams Risk Score (SSRS) is a biological risk assessment system for identifying rivers that are 'at risk' of failing to achieve the 'good' water quality status goals of the Water Framework Directive (WFD). It was developed by the Environmental Protection Agency (EPA) in association with the Western River Basin District (WRBD) in 2006 and revised in 2009.

The SSRS method is a rapid field methodology for risk assessment that is based solely on macroinvertebrate indicators of water quality and their well-understood response to pollution. Importantly, the SSRS score indicates whether or not the stream is at risk from pollution and not the ecological health of the stream. The SSRS score ranges from 0-11.2.

**Table 2.2: SSRS Categories**

| SSRS Range | Category |
|---|---|
| <6.5 | Stream at Risk (AR) |
| >6.5-7.25 | Indeterminate/Stream may be at risk |
| >7.25 | Probably not at risk (PNAR) |

# 3. Results

The upstream station recorded a slightly higher SSRS score. However, both the upstream and downstream stations were categorised as 'Stream at risk' of not meeting Good status (Table 3.2). The substrate of the upstream station was mud/silt over stones with an average mud depth of 1-5cm. Leaf litter was abundant in the stream and the flow was slow. The downstream station had a greater degree of riffle/glide habitat and had portions of stony substrate with <1cm depth of mud. Both upstream and downstream stations were accessible by cattle. Macrofaunal assemblages were similar at both stations with G.Ol.D group fauna outnumbering a variety of trichoptera families (Table 3.1). *Asellus* was absent at both stations.

**Table 3.1: Taxa list and relative abundance scores**

| Taxa | Upstream | Downstream |
|---|---|---|
| **Trichoptera** | | |
| Hydropsychidae | | 1 |
| Rhyacophilidae | | 1 |
| Glossosomatidae | | 2 |
| Limnephilidae | 2 | 1 |
| Sericostomatidae | 1 | 2 |
| **G.OL.D** | | |
| *Planorbis* | | 1 |
| *Limbriculus* | | 1 |
| Chironomidae | 3 | 3 |
| Simuliidae | | 5 |
| *Bithynia* | 1 | 1 |
| **Asellus** | Absent | Absent |

**Table 3.2: Biological sampling results 2024**

| Station | SSRS Score | SSRS Category |
|---|---|---|
| Coill Dubh Upstream | 4 | Stream at risk (AR) |
| Coill Dubh Downstream | 3.2 | Stream at risk (AR) |

# 4. Coill Dubh WWTP Comparison 2016 to 2024

Table 4.1 compares the SSRS results from 2016 to 2024. Figure 4.1 displays the trend over time (scores <6.5 are deemed At Risk). Both upstream and downstream sites have been 'at risk' since 2016. The highest SSRS score in that period was 4 for upstream in 2024 and 4.8 for downstream in 2021. Both the upstream and downstream station have steadily decreased in score since 2021, which suggests that water quality in the stream may be degrading, though 2024 showed an improvement from 1.6 U/S and D/S to 4 and 3.2 respectively.

**Table 4.1: Coill Dubh SSRS Comparison 2015-2024**

| Year | U/S SSRS | U/S RC | D/S SSRS | D/S RA |
|---|---|---|---|---|
| 2024 | 4 | AR | 3.2 | AR |
| 2023 | 1.6 | AR | 1.6 | AR |
| 2022 | 2.4 | AR | 2.4 | AR |
| 2021 | 3.2 | AR | 4.8 | AR |
| 2020 | 1.6 | AR | 4.0 | AR |
| 2019 | 1.6 | AR | 2.4 | AR |
| 2018 | 3.2 | AR | 2.4 | AR |
| 2017 | 3.2 | AR | 2.4 | AR |
| 2016 | 3.2 | AR | 0.0 | AR |

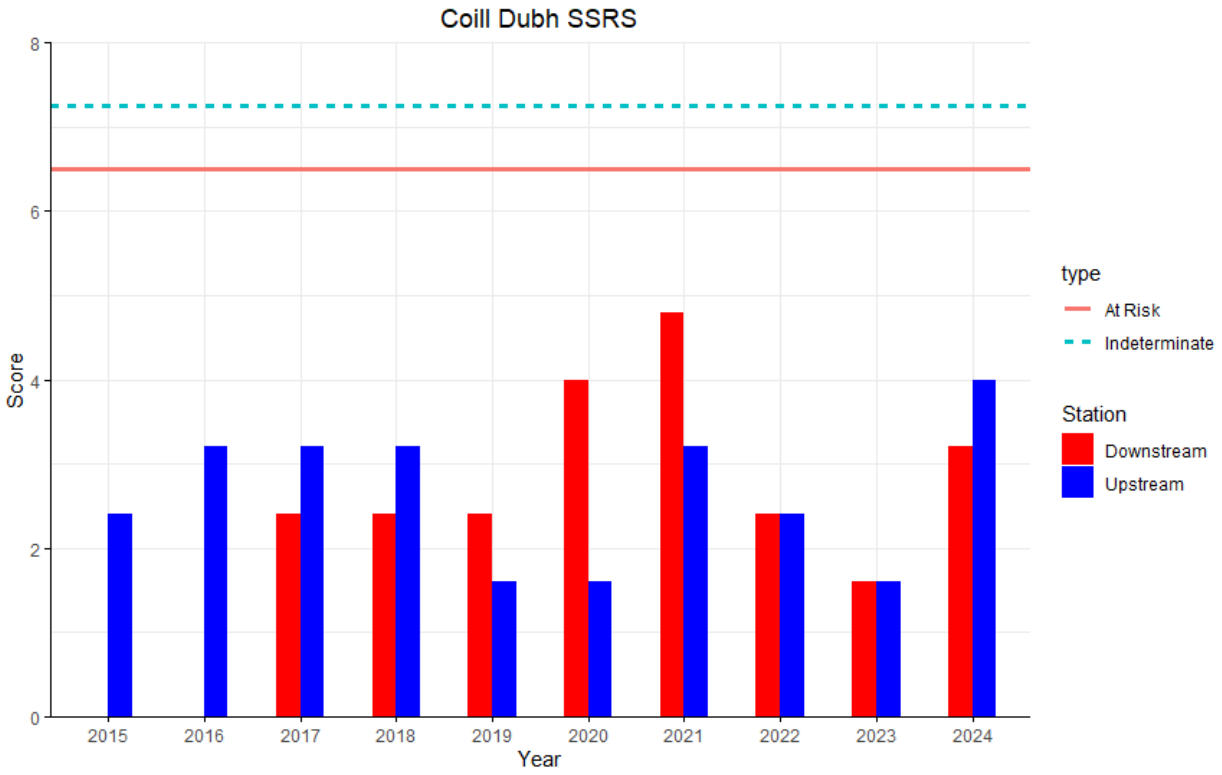



**Figure 4-1: SSRS comparison between Upstream and Downstream since 2015**

# 5. References

EPA. 2015. Guidance on Application and Use of the SSRS in Enforcement of Urban Waste Water Discharge Authorisations in Ireland. https://www.epa.ie/publications/compliance--enforcement/waste-water/SSRS-in-Enforcement-of-UWWDAs.pdf Accessed September 2021.

Lucey, J., Bowman, J.J., Klabby, K.J., Cunningham, P., Lehane, M., MacCarthaigh, M., McGarrigle, M.L. and Toner, P.F. 1999. Water Quality in Ireland, 1995 – 1997. EPA.

## Appendix 1 – Site photos

**Coill Dubh Downstream looking Downstream**

**Coill Dubh Downstream looking upstream**

**Coill Dubh Upstream looking downstream**

**Coill Dubh Upstream looking upstream**

# Appendix 2 – SSRS Data Sheets

**River:** SLATE | **Code:** RS14501002 | **Date:** 15/10/24 | **Time:**

**Station no.:** DOWNSTREAM | **Location:** COILL DUBH ASW1-PD | **Grid (6 figure):** 278401, 226750

**Field Chemistry**

| | |
|---|---|
| DO% | 81.77 |
| DO mg/l | 9.51 |
| Temp (°C) | 8.67 |
| Conductivity | |
| pH | 7.92 |
| Bank width (cm) | 250 |
| Wet width (cm) | 250 |
| Avg Depth (cm) | 20 |
| Staff gauge | |

**Velocity:** Torrential | Fast | Moderate | (Slow) | Very slow

**Colour:** (None) | Slight | Moderate | High

**Clarity:** Very clear | (Clear) | Slightly turbid | Highly turbid

**Discharge:** Flood | Normal | Low | Very Low | Dry | Recent Flood

**Stream Order:**

**Modifications:** Y/N Canalised-widened-bank erosion-arterial drainage

**Dominant Types:**
Bedrock
Boulder (>128mm)
(Cobble) (32-128mm)
(Gravel) (8-32mm)
Fine Gravel (2-8mm)
Sand (0.25-2mm)
Silt (<0.25mm)

**Slope:** (Low) – Medium – High – Very High

**Geology:** Calcareous-Siliceous-Mixed

**Substratum Condition:** Calcareous-Compacted-Loose - Normal

**Substratum:** (Stoney bottom) Muddy bottom (Mud over stones)

**Degree of siltation:** (Clear) Slight-Moderate-Heavy

**Depth of mud:** None (<1cm) 1-5cm: 5-10cm: >10cm

**Litter:** None (Present) – Moderate - Abundant

**Filamentous Algae:** (None) – Present – Moderate - Abundant

**Main land use u/s:** (Pasture) Urban | Bog | Tillage | Forestry | Other

**Sample retained:** (Y) N

**Stream flow:** Riffle | (Riffle/Glide) | Slow flow

**Shading:** High – (Moderate) – Low - None

**Cattle access:** (Y) upstream – downstream or N

**Photo:** Y / N

**Sewage Fungus:** (None) – Present – Moderate - Abundant

**Sampled in Minutes:** Pond net x 2 | Stone wash x 1 | Weed sweep x

**General Comments:**

## Macroinvertebrate Composition

The macroinvertebrates are divided into the following 5 specific groups:
- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.OL.D (Gastropoda, Oligochaeta and Diptera)
- Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)

**Relative Abundance**

| | |
|---|---|
| 1-5 | 1 |
| 6-20 | 2 |
| 21-50 | 3 |
| 51-100 | 4 |
| 101+ | 5 |

**Ephemeroptera:**

| | |
|---|---|
| *Ecdyonurus* Ab | |
| *Rhithrogena* Ab | |
| *Heptagenia* Ab | |
| *Ephemerella* Ab | |
| *Caenis* Ab | |
| *Paraleptophlebia* Ab | |
| *Ephemera danica* Ab | |
| Other Ephem Ab | |

Total no. of taxa: 0 | Total Relative Abundance: 0

**Plecoptera:**

| | |
|---|---|
| *Leuctra* Ab | |
| *Isoperla* Ab | |
| *Protonemura* Ab | |
| *Amphinemura* Ab | |
| *Perla* Ab | |
| *Dinocras* Ab | |
| Other Plecop Ab | |
| Other Plecop Ab | |

Total no. of Taxa: 0 | Total Relative Abundance: 0

**Trichoptera:**

| | |
|---|---|
| Hydropsychidae Ab | 1 |
| Polycentropodidae Ab | |
| *Rhyacophila* Ab | 1 |
| Philopotamidae Ab | |
| Limnephilidae Ab | 1 |
| Sericostomatidae Ab | 2 |
| Glossosomatidae Ab | 2 |
| Lepidostomatidae Ab | |
| Other Trichoptera Ab | |

Total no. of Taxa: 5 | Total Relative Abundance: 7

**G.OL.D:**

| | |
|---|---|
| *Lymnaea* (G) Ab | |
| *Potamopyrgus* (G) Ab | |
| *Planorbis* (G) Ab | 1 |
| *Ancylus* (G) Ab | |
| *Physa* (G) Ab | |
| *Lumbriculus* (Ol) Ab | 1 |
| *Eiseniella* (Ol) Ab | |
| Tubificidae (Ol) Ab | |

Total no. of Taxa: 5 | Total Relative Abundance: 11

| | |
|---|---|
| Chironomidae (D) Ab | 3 |
| *Chironomus* (D) Ab | |
| Simulidae (D) Ab | 5 |
| *Dicranota* (D) Ab | |
| Tipulidae (D) Ab | |
| Ceratopogonidae (D) Ab | |
| Other GOLD Ab | 1 |

Bithynia

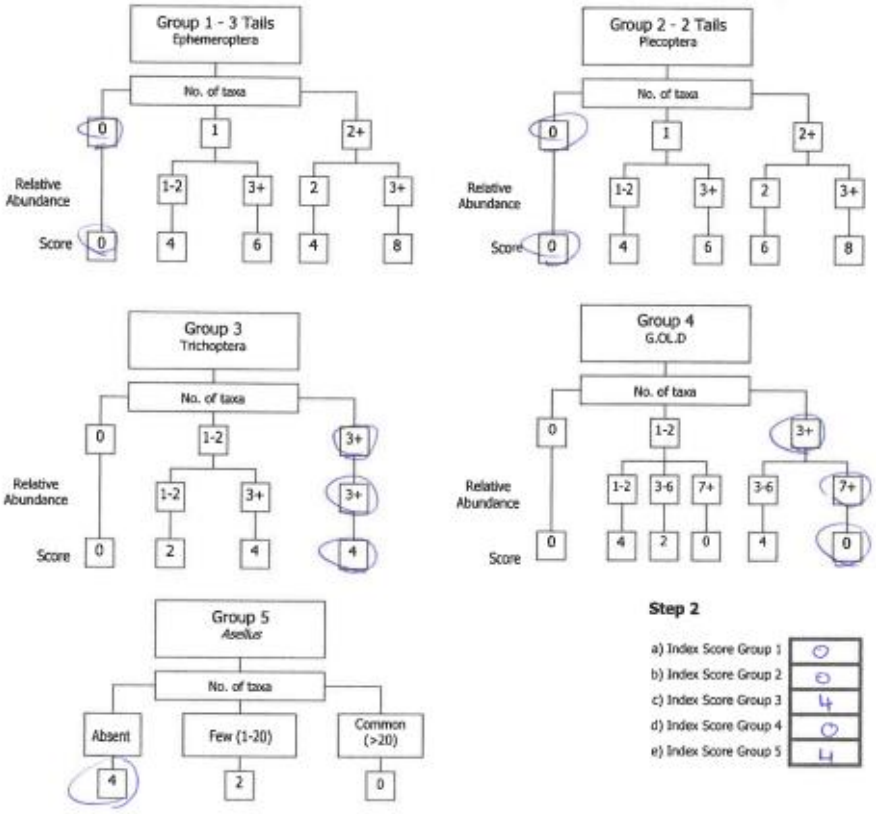
***Asellus***: Absent ✓ | Few/Low | Common/Numerous

**NOTE:** *Asellus* must be recorded as absent if none are found

**NOTE** *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

**Downstream**

**Step 1.** Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.




**Step 2**

| | |
|---|---|
| a) Index Score Group 1 | 0 |
| b) Index Score Group 2 | 0 |
| c) Index Score Group 3 | 4 |
| d) Index Score Group 4 | 0 |
| e) Index Score Group 5 | 4 |

**Step 3.** Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

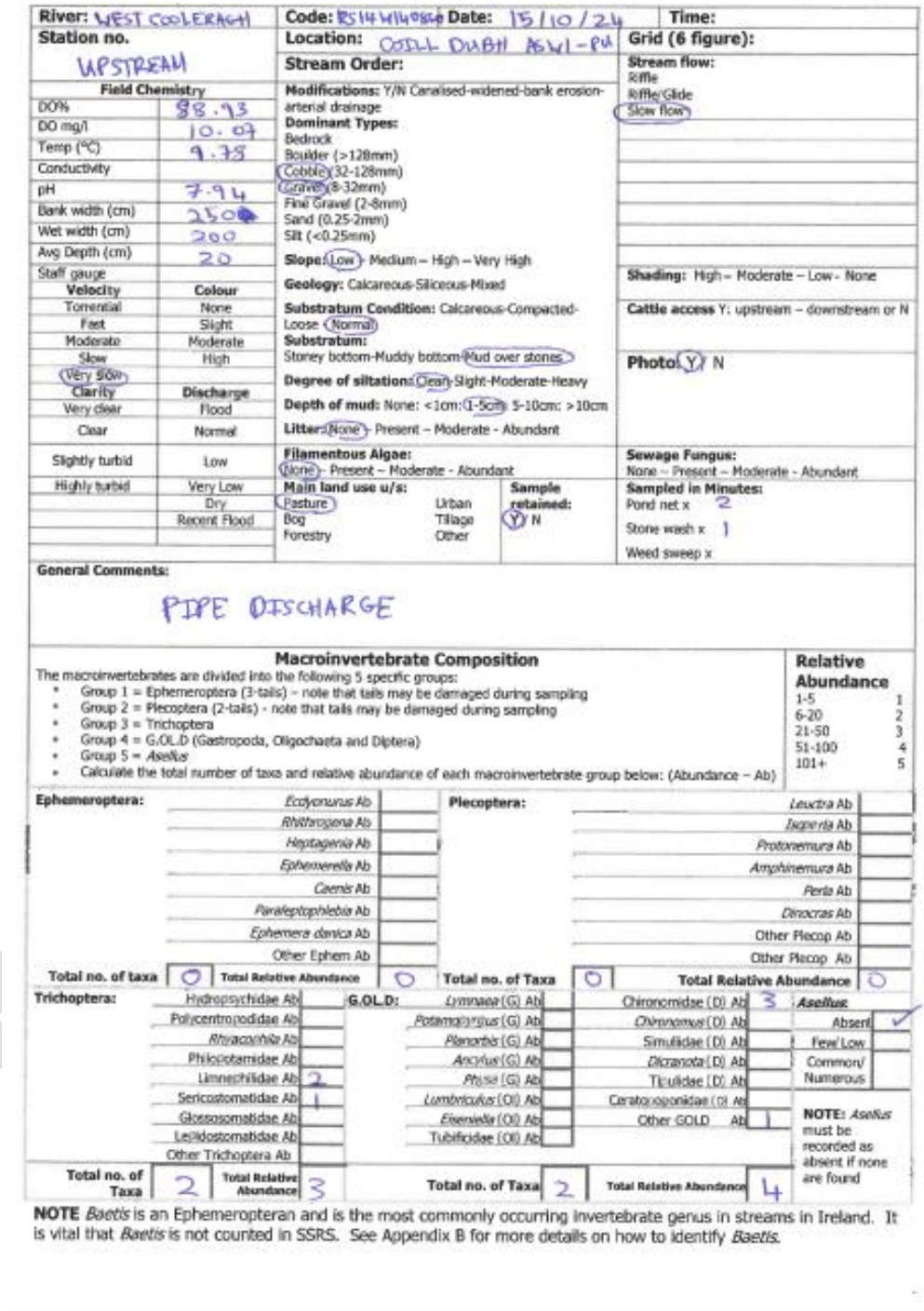
| Total Index Score (TIS) sum (a+b+c+d+e) | Average Index Score (AIS) TIS/5 (5 for 5 groups) | **SSR Score** (AIS x 2) |
|---|---|---|
| 8 | 1.6 | 3.2 |

**Step 4.** Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

| > 7.25 Probably not at risk | > 6.5 – 7.25 Indeterminate Stream may be at risk | <6.5 Stream at risk |
|---|---|---|
| | | ✓ |

Surveyor (signed): [signature] Name (print): MMJ Date: 30 / 10 / 24

**Downstream II**



River: WEST COOLERAGH | Code: RS14W140860 Date: 15/10/24 | Time:
Station no.: UPSTREAM | Location: COILL DUBH AGW1-PU | Grid (6 figure):

| Field Chemistry | |
|---|---|
| DO% | 88.93 |
| DO mg/l | 10.07 |
| Temp (°C) | 9.75 |
| Conductivity | |
| pH | 7.94 |
| Bank width (cm) | 250 |
| Wet width (cm) | 200 |
| Avg Depth (cm) | 20 |
| Staff gauge | |

| Velocity | Colour |
|---|---|
| Torrential | None |
| Fast | Slight |
| Moderate | Moderate |
| Slow | High |
| (Very Slow) | |

| Clarity | Discharge |
|---|---|
| Very clear | Flood |
| Clear | Normal |
| Slightly turbid | Low |
| Highly turbid | Very Low |
| | Dry |
| | Recent Flood |

**Stream Order:**

**Modifications:** Y/N Canalised-widened-bank erosion-arterial drainage

**Dominant Types:**
Bedrock
Boulder (>128mm)
(Cobble) (32-128mm)
(Gravel) (8-32mm)
Fine Gravel (2-8mm)
Sand (0.25-2mm)
Silt (<0.25mm)

**Slope:** (Low) - Medium – High – Very High

**Geology:** Calcareous-Siliceous-Mixed

**Substratum Condition:** Calcareous-Compacted-Loose (Normal)

**Substratum:**
Stoney bottom-Muddy bottom-(Mud over stones)

**Degree of siltation:** (Clear)-Slight-Moderate-Heavy

**Depth of mud:** None: <1cm: (1-5cm) 5-10cm: >10cm

**Litter:** (None) - Present – Moderate - Abundant

**Filamentous Algae:**
(None) - Present – Moderate - Abundant

**Main land use u/s:**
(Pasture) Urban
Bog Tillage
Forestry Other

**Sample retained:** (Y) N

**Stream flow:**
Riffle
Riffle/Glide
(Slow flow)

**Shading:** High – Moderate – Low - None

**Cattle access** Y: upstream – downstream or N

**Photo:** (Y) N

**Sewage Fungus:**
None – Present – Moderate - Abundant

**Sampled in Minutes:**
Pond net x 2
Stone wash x 1
Weed sweep x

**General Comments:**
PIPE DISCHARGE

**Macroinvertebrate Composition**

The macroinvertebrates are divided into the following 5 specific groups:
- Group 1 = Ephemeroptera (3-tails) – note that tails may be damaged during sampling
- Group 2 = Plecoptera (2-tails) - note that tails may be damaged during sampling
- Group 3 = Trichoptera
- Group 4 = G.OL.D (Gastropoda, Oligochaeta and Diptera)
- Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance – Ab)

**Relative Abundance**

| | |
|---|---|
| 1-5 | 1 |
| 6-20 | 2 |
| 21-50 | 3 |
| 51-100 | 4 |
| 101+ | 5 |

| Ephemeroptera: | | Plecoptera: | |
|---|---|---|---|
| *Ecdyonurus* Ab | | *Leuctra* Ab | |
| *Rhithrogena* Ab | | *Isoperla* Ab | |
| *Heptagenia* Ab | | *Protonemura* Ab | |
| *Ephemerella* Ab | | *Amphinemura* Ab | |
| *Caenis* Ab | | *Perla* Ab | |
| *Paraleptophlebia* Ab | | *Dinocras* Ab | |
| *Ephemera danica* Ab | | Other Plecop Ab | |
| Other Ephem Ab | | Other Plecop Ab | |
| Total no. of taxa: 0 | Total Relative Abundance: 0 | Total no. of Taxa: 0 | Total Relative Abundance: 0 |

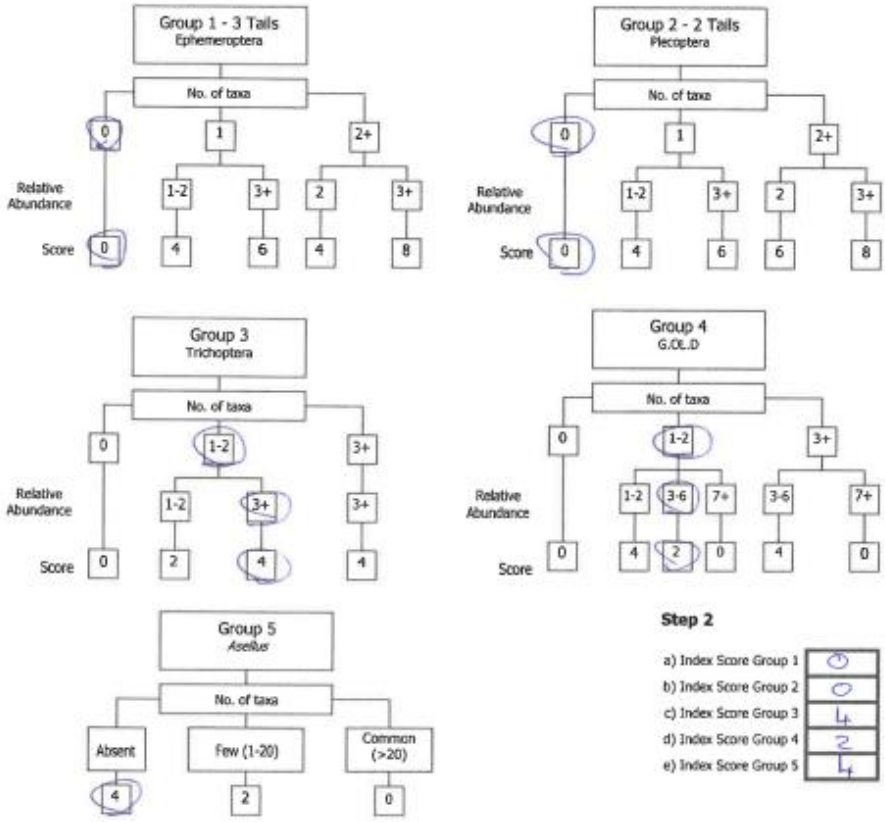
| Trichoptera: | | G.OL.D: | | | | *Asellus* | |
|---|---|---|---|---|---|---|---|
| Hydropsychidae Ab | | *Lymnaea* (G) Ab | | Chironomidae (D) Ab | 3 | Absent | ✓ |
| Polycentropodidae Ab | | *Potamopyrgus* (G) Ab | | *Chironomus* (D) Ab | | Few/Low | |
| *Rhyacophila* Ab | | *Planorbis* (G) Ab | | Simuliidae (D) Ab | | Common/ Numerous | |
| Philopotamidae Ab | | *Ancylus* (G) Ab | | *Dicranota* (D) Ab | | | |
| Limnephilidae Ab | 2 | *Physa* (G) Ab | | Tipulidae (D) Ab | | | |
| Sericostomatidae Ab | 1 | *Lumbriculus* (Ol) Ab | | Ceratopogonidae (Ol) Ab | | | |
| Glossosomatidae Ab | | *Eiseniella* (Ol) Ab | | Other GOLD Ab | 1 | | |
| Lepidostomatidae Ab | | Tubificidae (Ol) Ab | | | | | |
| Other Trichoptera Ab | | | | | | | |
| Total no. of Taxa: 2 | Total Relative Abundance: 3 | Total no. of Taxa: 2 | | Total Relative Abundance: 4 | | | |

**NOTE:** *Asellus* must be recorded as absent if none are found

**NOTE** *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

**Upstream**

**Step 1.** Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.




**Step 2**

| | |
|---|---|
| a) Index Score Group 1 | 0 |
| b) Index Score Group 2 | 0 |
| c) Index Score Group 3 | 4 |
| d) Index Score Group 4 | 2 |
| e) Index Score Group 5 | 4 |

**Step 3.** Calculate the Total Index Score, the Average Index Score and the SSR Score using the boxes below

| Total Index Score (TIS) sum (a+b+c+d+e) | Average Index Score (AIS) TIS/5 (5 for 5 groups) | SSR Score (AIS x 2) |
|---|---|---|
| 10 | 2 | 4 |

**Step 4.** Assess the stream by comparing the final SSR score with the categories below and tick the appropriate box

| > 7.25 Probably not at risk | > 6.5 – 7.25 Indeterminate Stream may be at risk | <6.5 Stream at risk |
|---|---|---|
| | | ✓ |

Surveyor (signed): _____ Name (print): MICHEÁL MCHUGH Date: 30 / 10 / 24

**Upstream II**