

# Annual Environmental Report

2021



Killmallock

D0106-01

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## 7.1 SMALL STREAM RISK SCORE ASSESSMENT

# 1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2021 AER

This Annual Environmental Report has been prepared for D0106-01, Killmallock, in Limerick 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.

Ortho P and ammonia monitoring taking place at this plant.

## 1.2 TREATMENT SUMMARY

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

- Killmallock WWTP with a Plant Capacity PE of 4000, 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
TPEFF1900D0106SW002	Killmallock WWTP	Treated	Non-Compliant	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 KILMALLOCK WWTP - TREATED DISCHARGE

#### 2.1.1 INFLUENT MONITORING SUMMARY - KILMALLOCK 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	4.95	3.70
Total Nitrogen mg/l	12	44	28
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	188	114
Suspended Solids mg/l	12	228	120
COD-Cr mg/l	12	506	286
Hydraulic Capacity	N/A	1821	586

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'. The design of the wastewater treatment plant allows for peak values and therefore the peak loads have not impacted on compliance with Emission Limit Values.

## 2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF1900D0106SW001

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)
<b>COD-Cr mg/l</b>	50	100	N/A	12	N/A	N/A	7.84	Pass
<b>Suspended Solids mg/l</b>	15	38	N/A	12	N/A	N/A	5.25	Pass
<b>BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l</b>	15	30	N/A	12	N/A	N/A	1.41	Pass
<b>pH units</b>	9.00	9.00	N/A	12	N/A	N/A	7.58	Pass
<b>Ammonia-Total (as N) mg/l</b>	1.00	1.20	N/A	12	N/A	N/A	0.056	Pass
<b>Total Phosphorus (as P) mg/l</b>	1.00	1.20	N/A	12	N/A	N/A	0.223	Pass
<b>ortho-Phosphate (as P) - unspecified mg/l</b>	0.300	0.360	N/A	12	1	1	0.114	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):

Under dosing of Ferric Sulphate

### Significance of Results:

One Ortho P failure.

## 2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF1900D0106SW001

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	160645, 128426	RS24L010410	No	No	No	No	Moderate
Downstream	159232, 127480	RS24L010460	No	Yes	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
Ammonia-Total (as N) mg/l	RS24L010410	0.030	RS24L010460	0.030	0.065	0

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	RS24L010410	0.036	RS24L010460	0.039	0.035	9.4
Dissolved Oxygen % O2	RS24L010410	102	RS24L010460	101	N/A	
pH units	RS24L010410	8.21	RS24L010460	8.23	N/A	
Temperature °C	RS24L010410	11	RS24L010460	11	N/A	
BOD - 5 days (Total) mg/l	RS24L010410	1.52	RS24L010460	1.41	N/A	

### Significance of Results:

The WWTP discharge was not compliant with the ELV's set in the wastewater discharge licence for the following: 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.

The discharge from the wastewater treatment plant does not have an observable impact on the water quality.

The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.

## 2.1.4 OPERATIONAL PERFORMANCE SUMMARY - KILMALLOCK WWTP

### 2.1.4.1 Treatment Efficiency Report - Kilmallock 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	27632	302	99
TP	894	48	95
SS	28941	1123	96
TN	6694	N/A	N/A
COD	69297	1675	98

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

#### **2.1.4.2 Treatment Capacity Report Summary - Kilmallock 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.

<b>Kilmallock WWTP</b>	
<b>Peak Hydraulic Capacity (m<sup>3</sup>/day) - As Constructed</b>	2220
<b>DWF to the Treatment Plant (m<sup>3</sup>/day)</b>	780
<b>Current Hydraulic Loading - annual max (m<sup>3</sup>/day)</b>	1821
<b>Average Hydraulic loading to the Treatment Plant (m<sup>3</sup>/day)</b>	586
<b>Organic Capacity (PE) - As Constructed</b>	4000
<b>Organic Capacity (PE) - Collected Load (peak week)<sup>Note1</sup></b>	2077
<b>Organic Capacity (PE) - Remaining</b>	1923
<b>Will the capacity be exceeded in the next three years? (Yes/No)</b>	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 - KILMALLOCK 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)
<b>Domestic /Septic Tank Sludge</b>	4233.44	Weight (Tonnes)	200	1	No	Yes	Yes

## 3 COMPLAINTS AND INCIDENTS

### 3.1 COMPLAINTS SUMMARY

A summary of complaints of an environmental nature related to the discharge(s) to water from the WWTP and network is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
There were no relevant environmental complaints in 2021.			

### 3.2 REPORTED INCIDENTS SUMMARY

Environmental incidents that arise in an agglomeration are reported on an on-going basis in accordance with our waste water discharge licences. Where an incident occurs and it is reportable under the licence, it is reported to the Environmental Protection Agency through their Environmental Data Exchange Network, or in some instances by telephone. Some incidents which arise in the agglomeration are recorded by Irish Water but may not be reportable under our licence for example where the incident does not have an impact on environmental performance.

A summary of reported incidents is included below.

#### 3.2.1 SUMMARY OF INCIDENTS

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Breach of ELV	Dosing pump failure or maintenance at WWTP	1	No	Yes

### 3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2021	1
Number of Incidents reported to the EPA via EDEN in 2021	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 2021 (No. of events)	Total volume discharged in 2021 (m3)	Monitoring Status
TBC	161127, 127735	No	Low	Meeting	Unknown	Unknown	Monitored
TBC	161308, 127718	No	Low	Meeting	Unknown	2419	Monitored
TBC	159989, 128256	No	Low	Meeting	Unknown	Unknown	Not Monitored
SW3	160255, 128273	Yes	Low	Meeting	Unknown	Unknown	Not Monitored

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

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

SWO Summary	
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?	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
D0106-SIP:01	Discharges from SW1 must cease by 01/01/11 at the latest.	A	01/01/2011	Yes	Works Completed		
D0106-SIP:02	New WWTP and ancillary works	C	01/01/2011	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
<b>No additional improvements planned at this time.</b>				

## 4.2.3 SEWER INTEGRITY RISK ASSESSMENT

The utilisation of multiple capital maintenance programmes and the outputs of the workshops with the Local Authority Operations Staff held under the programme can be used to satisfy the requirements of Condition 5 regarding network integrity. Improvement works identified by way of these programmes and workshops will be included in the Improvements Summary Tables 4.2.1 and 4.2.2.

## 5 LICENCE SPECIFIC REPORTS

A wastewater discharge licence may require a number of reports on specific subject areas to be prepared for the agglomeration in question. These reports are submitted to the EPA as part of the Annual Environmental Report. This section provides a list of the various reports required for this agglomeration and a brief summary of their recommendations.

Licence Specific Report	Required by licence	Year included in AER	Included in this AER
<b>Small Stream Risk Score Assessment</b>	Yes	2016	No

## 6 CERTIFICATION AND SIGN OFF

### 6.1 SUMMARY OF AER CONTENTS

Parameter	Answer
Does the AER include an Executive Summary?	Yes
Does the AER include an assessment of the performance of the Waste Water Works (i.e. have the results of assessments been interpreted against WWDL requirements and or Environmental Quality Standards)?	Yes
Has a Technical amendment/licence review application been submitted to the Agency by IW?	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	Yes
List reason e.g. changes to monitoring requirements	Ambient monitoring location changes
Have these processes commenced?	N/A
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER	N/A

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

Signed:    Date: 21/04/2022

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

Katherine Walshe

Acting Head of Environmental Regulation.

# 7 APPENDIX

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

River: <u>Loobagh River</u>		Code:	Date: <u>21-06-21</u>	Time: <u>09:00</u>
Station no.		Location: <u>Upstream Kilmallack</u>		Grid (6 figure):
Field Chemistry		Stream Order: <u>4th</u>		Stream flow: Riffle <input checked="" type="checkbox"/> Riffle/Glide Slow flow
DO%	<u>98</u>	Modifications: Y/N Canalised-widened-bank erosion-arterial drainage <input checked="" type="checkbox"/>		
DO mg/l	<u>7.12</u>	Dominant Types: Bedrock Boulder (>128mm) Cobble (32-128mm) <input checked="" type="checkbox"/> Gravel (8-32mm) Fine Gravel (2-8mm) Sand (0.25-2mm) Silt (<0.25mm)		
Temp (°C)	<u>14.0</u>	Slope: <u>Low</u> - Medium - High - Very High		
Conductivity	<u>251</u>	Geology: <u>Calcareous-Siliceous-Mixed</u>		Shading: High - <u>Moderate</u> - Low - None
pH	<u>7.2</u>	Substratum Condition: <u>Calcareous-Compacted-Loose - Normal</u>		Cattle access Y: upstream - downstream of <u>N</u>
Bank width (cm)	<u>8m</u>	Substratum: Stoney bottom-Muddy bottom-Mud over stones		Photo: Y / <u>N</u>
Wet width (cm)	<u>5m</u>	Degree of siltation: Clean-Slight <input checked="" type="checkbox"/> Moderate-Heavy		
Avg Depth (cm)	<u>35cm</u>	Depth of mud: None: <1cm: <u>1-5cm</u> : 5-10cm: >10cm		
Staff gauge	<u>N O</u>	Litter: <u>None</u> - Present - Moderate - Abundant		
Velocity	<u>Colour</u>	Filamentous Algae: None - Present - Moderate - Abundant		Sewage Fungus: None - Present - Moderate - Abundant
Torrential	<u>None</u>	Main land use u/s:		Sample retained: Y / <u>N</u>
Fast <input checked="" type="checkbox"/>	<u>Slight</u> <input checked="" type="checkbox"/>	Pasture: <input checked="" type="checkbox"/>	Urban <input checked="" type="checkbox"/>	Sampled in Minutes: Pond net x <u>2</u>
Moderate	<u>Moderate</u>	Bog	Tillage	Stone wash x <u>1</u>
Slow	<u>High</u>	Forestry	Other	Weed sweep x <u>1</u>
Very slow				
Clarity	<u>Discharge</u>			
Very clear	<u>Flood</u>			
Clear <input checked="" type="checkbox"/>	<u>Normal</u>			
Slightly turbid	<u>Low</u> <input checked="" type="checkbox"/>			
Highly turbid	<u>Very Low</u>			
	<u>Dry</u>			
	<u>Recent Flood</u>			

General Comments:

OK.

**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.O.L.D (Gastropoda, Oligochaeta and Diptera)
  - Group 5 = *Asellus*
- Calculate the total number of taxa and relative abundance of each macroinvertebrate group below: (Abundance - Ab)

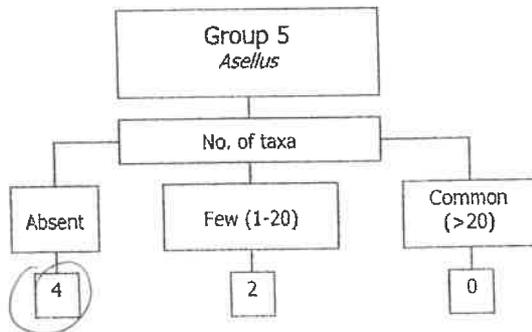
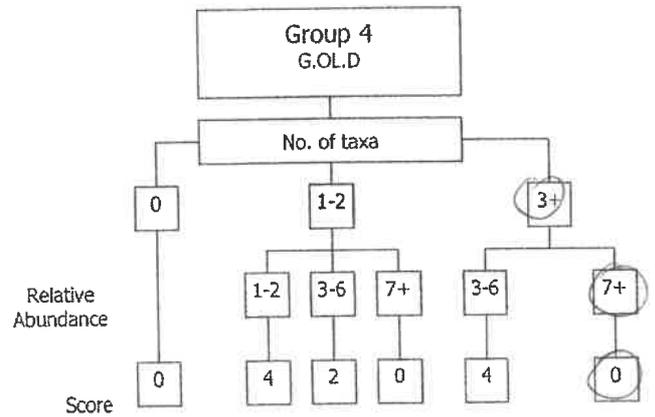
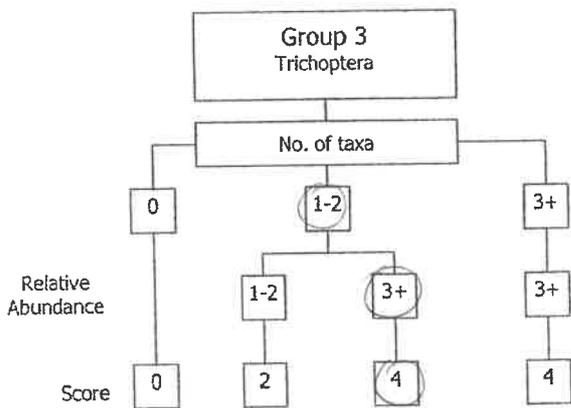
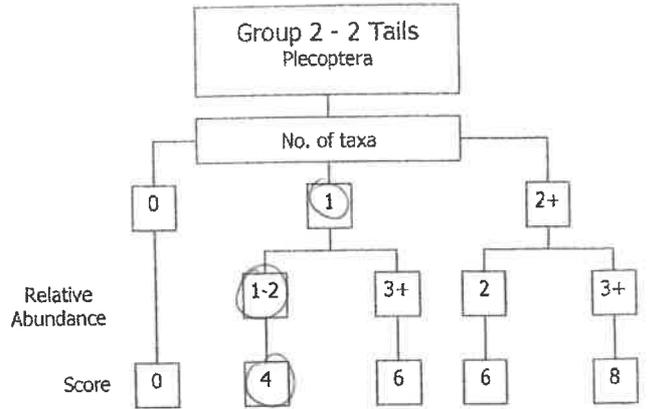
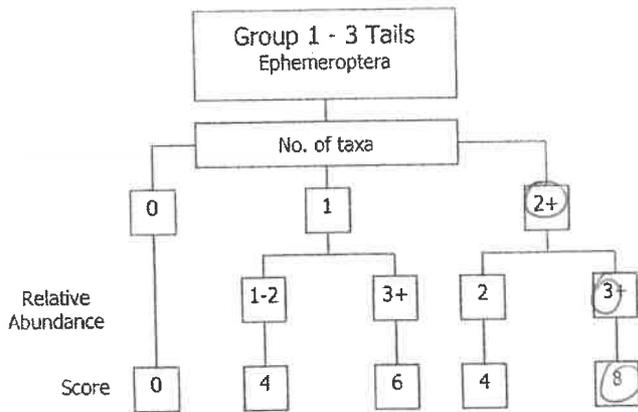
Relative Abundance	
1-5	1
6-20	2
21-50	3
51-100	4
101+	5

Ephemeroptera:		Plecoptera:	
<i>Ecdyonurus</i> Ab		<i>Leuctra</i> Ab	<u>2</u>
<i>Rhithrogena</i> Ab	<u>1</u>	<i>Isoperla</i> Ab	
<i>Heptagenia</i> Ab	<u>2</u>	<i>Protonemura</i> Ab	
<i>Ephemerella</i> Ab		<i>Amphinemura</i> Ab	
<i>Caenis</i> Ab	<u>1</u>	<i>Perla</i> Ab	
<i>Paraleptophlebia</i> Ab		<i>Dinocras</i> Ab	
<i>Ephemera danica</i> Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
<b>Total no. of taxa</b>	<b>3</b>	<b>Total no. of Taxa</b>	<b>1</b>
<b>Total Relative Abundance</b>	<b>4</b>	<b>Total Relative Abundance</b>	<b>2</b>
Trichoptera:		G.O.L.D:	
Hydropsychidae Ab		<i>Lymnaea</i> (G) Ab	
Polycentropodidae Ab		<i>Potamopyrgus</i> (G) Ab	<u>1</u>
<i>Rhyacophila</i> Ab	<u>1</u>	<i>Planorbis</i> (G) Ab	
Philopotamidae Ab		<i>Ancylus</i> (G) Ab	<u>2</u>
Limnephilidae Ab		<i>Physa</i> (G) Ab	
Sericostomatidae Ab		<i>Lumbriculus</i> (OI) Ab	
Glossosomatidae Ab	<u>2</u>	<i>Eiseniella</i> (OI) Ab	
Lepidostomatidae Ab		Tubificidae (OI) Ab	<u>1</u>
Other Trichoptera Ab			
<b>Total no. of Taxa</b>	<b>2</b>	<b>Total no. of Taxa</b>	<b>6</b>
<b>Total Relative Abundance</b>	<b>3</b>	<b>Total Relative Abundance</b>	<b>10</b>
		Chironomidae (D) Ab	<u>1</u>
		<i>Chironomus</i> (D) Ab	
		Simuliidae (D) Ab	<u>4</u>
		<i>Dicranota</i> (D) Ab	<u>1</u>
		Tipulidae (D) Ab	
		Ceratopogonidae (D) Ab	
		Other GOLD Ab	
		<b>Asellus:</b>	
		Absent	<input checked="" type="checkbox"/>
		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*.

**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 8
- b) Index Score Group 2 4
- 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) 20  
sum (a+b+c+d+e)

Average Index Score (AIS) 4  
TIS/5 (5 for 5 groups)

SSR Score 8  
(AIS x 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): A. Insley Name (print): ADRIAN INSLEY Date: 21 / 06 / '21

River: <u>Loobagh River</u>		Code:	Date: <u>21-06-21</u>	Time: <u>09:45</u>
Station no.		Location: <u>Downstream Kilmallock</u>		Grid (6 figure):
Field Chemistry		Stream Order: <u>4<sup>th</sup></u>		Stream flow: Riffle Riffle/Glide ✓ Slow flow
DO%	<u>100</u>	Modifications: Y/N Canalised-widened-bank erosion-arterial drainage ✓		
DO mg/l	<u>7.92</u>	Dominant Types: Bedrock		
Temp (°C)	<u>14.1</u>	Boulder (>128mm)		
Conductivity	<u>251</u>	Cobble (32-128mm) ✓		
pH	<u>7.1</u>	Gravel (8-32mm)		
Bank width (cm)	<u>8 m</u>	Fine Gravel (2-8mm)		
Wet width (cm)	<u>5 m</u>	Sand (0.25-2mm)		
Avg Depth (cm)	<u>15 cm</u>	Silt (<0.25mm)		
Staff gauge	<u>NO</u>	Slope: <u>low</u> - Medium - High - Very High		
Velocity	<u>Colour</u>	Geology: <u>Calcareous-Siliceous-Mixed</u>		Shading: High - <u>Moderate</u> - Low - None
Torrential	<u>None</u>	Substratum Condition: <u>Calcareous-Compacted-Loose - Normal</u>		Cattle access Y: <u>upstream</u> - downstream or N
Fast	<u>Slight</u> ✓	Substratum: Stoney <u>bottom</u> -Muddy bottom-Mud over stones		Photo: <u>Y</u> <u>N</u>
Moderate ✓	<u>Moderate</u>	Degree of siltation: <u>Clean-Slight-Moderate-Heavy</u>		
Slow	<u>High</u>	Depth of mud: <u>None</u> - <1cm - <u>1-5cm</u> - 5-10cm - >10cm		
Very slow		Litter: <u>None</u> - Present - Moderate - Abundant		
Clarity	<u>Discharge</u>	Filamentous Algae: <u>None</u> - Present - Moderate - Abundant		Sewage Fungus: <u>None</u> - Present - Moderate - Abundant
Very clear	<u>Flood</u>	Main land use u/s: <u>Pasture</u> Urban Bog Tillage Forestry Other		Sample retained: <u>Y</u> <u>RD</u>
Clear ✓	<u>Normal</u>			Sampled in Minutes: Pond net x <u>2</u> Stone wash x <u>30 sec</u> Weed sweep x <u>30 sec</u>
Slightly turbid ✓	<u>Low</u> ✓			
Highly turbid ✓	<u>Very Low</u>			
	<u>Dry</u>			
	<u>Recent Flood</u>			

General Comments:

OR

### 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.O.L.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:

<i>Ecdyonurus</i> Ab	
<i>Rhythrogena</i> Ab	1
<i>Heptagenia</i> Ab	2
<i>Ephemerella</i> Ab	
<i>Caenis</i> Ab	1
<i>Paraleptophlebia</i> Ab	
<i>Ephemera danica</i> Ab	
Other Ephem Ab	

#### Plecoptera:

<i>Leuctra</i> Ab	1
<i>Isoperla</i> Ab	
<i>Protonemura</i> Ab	
<i>Amphinemura</i> Ab	
<i>Perla</i> Ab	
<i>Dinocras</i> Ab	
Other Plecop Ab	
Other Plecop Ab	

Total no. of taxa

3

Total Relative Abundance

4

Total no. of Taxa

1

Total Relative Abundance

1

#### Trichoptera:

Hydropsychidae Ab	2
Polycentropodidae Ab	
<i>Rhyacophila</i> Ab	2
Philopotamidae Ab	
Limnephilidae Ab	
Sericostomatidae Ab	
Glossosomatidae Ab	1
Lepidostomatidae Ab	
Other Trichoptera Ab	

#### G.O.L.D:

<i>Lymnaea</i> (G) Ab	
<i>Potamopyrgus</i> (G) Ab	
<i>Planorbis</i> (G) Ab	
<i>Ancylus</i> (G) Ab	
<i>Physa</i> (G) Ab	
<i>Lumbriculus</i> (O) Ab	
<i>Eiseniella</i> (O) Ab	
Tubificidae (O) Ab	

Chironomidae (D) Ab	1
<i>Chironomus</i> (D) Ab	
Simuliidae (D) Ab	1
<i>Dicranota</i> (D) Ab	
Tipulidae (D) Ab	
Ceratopogonidae (D) Ab	
Other GOLD Ab	

#### Asellus:

Absent	✓
Few/Low	
Common/Numerous	

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

Total no. of Taxa

3

Total Relative Abundance

5

Total no. of Taxa

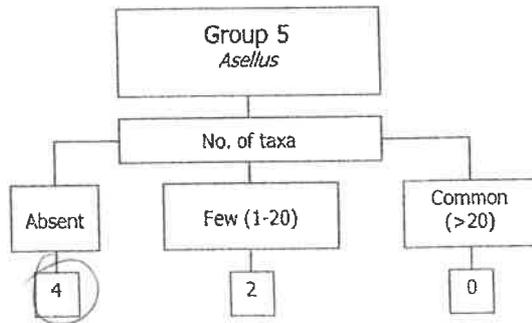
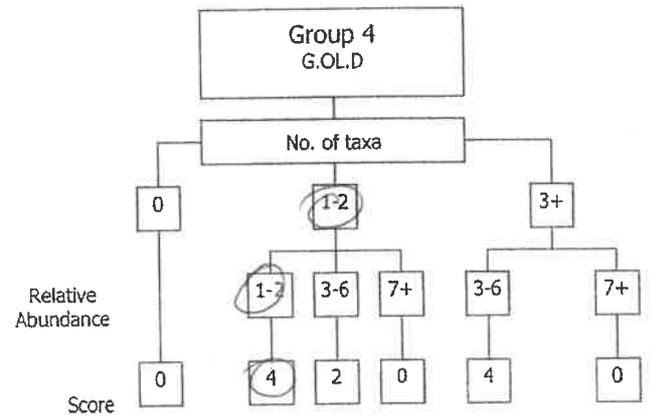
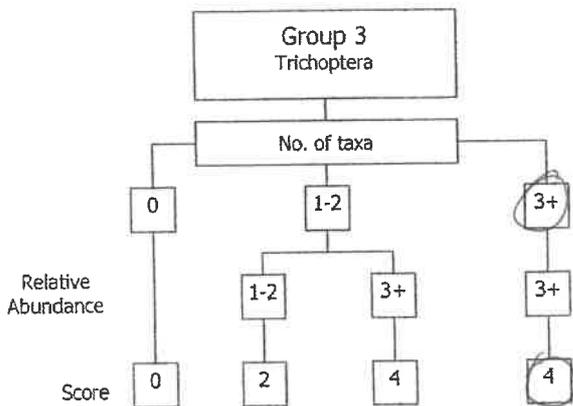
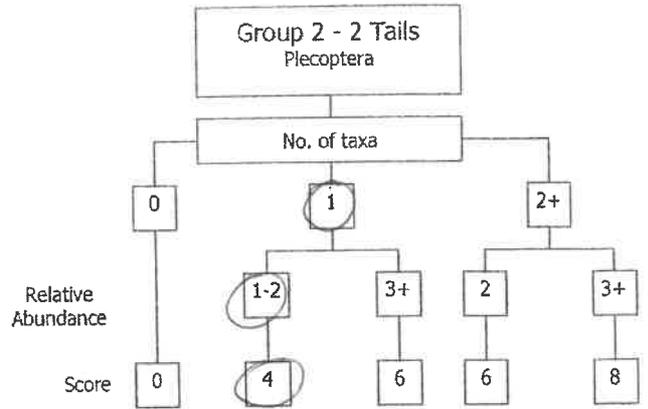
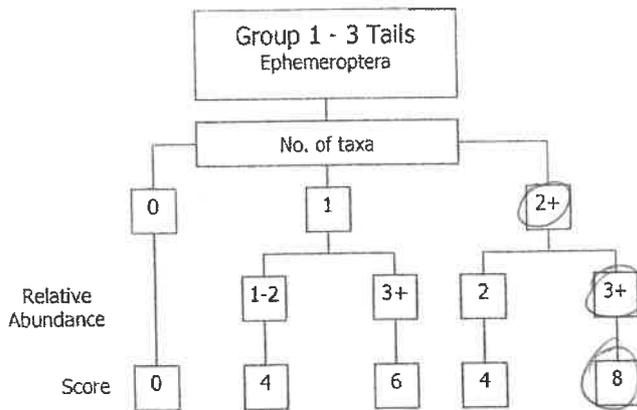
2

Total Relative Abundance

2

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*.

**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 

8
---
- b) Index Score Group 2 

4
---
- c) Index Score Group 3 

4
---
- d) Index Score Group 4 

4
---
- 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) 

24
----

Average Index Score (AIS) TIS/5 (5 for 5 groups) 

4.8
-----

SSR Score (AIS x 2) 

9.6
-----

**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): A. Insley Name (print): AORIAN INSLEY Date: 21 / 06 / 21