Annual Environmental Report

2018

Killmallock

D0106-01

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2018 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 are included as an appendix to the AER as follows:

1.1 Licence specific reporting included in AER

Assessment / Report	Included in AER
No Licence specific reports are included	

1.2 Treatment Type

The agglomeration is served by a wastewater treatment plant KILMALLOCK WWTP with a Plant Capacity PE of 4000. The treatment process includes the following:

1.2.1 KILMALLOCK WWTP

Treatment type	Yes / No	Details
Preliminary Treatment	Yes	Screens
Primary Treatment	No	
Secondary Treatment	Yes	SBR
Nutrient Removal	Yes	Phosphorus Removal
Tertiary Treatment	No	

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 2.2 Discharges from the agglomeration.

1.3 ELV Overview

1.3.1 KILMALLOCK WWTP

Compliance Status	
Were all parameters compliant for KILMALLOCK WWTP treatment plant	No
Where noncompliant see table 2.2.1 for details of parameters	One Condition 2 breech for orthophosphate

1.4 Sludge Removal

The amount of sludge removed from the wastewater treatment plant is shown below along with the transported destination of the sludge from the treatment plant.

Treatment Plant	Sludge type	Quantity	Unit	% Dry Solids	Destination
KILMALLOCK WWTP	Cake Sludge	201810	Weight (Tonnes)	12	Bunlicky

Annual Statement of Measures

None

2 MONITORING REPORTS SUMMARY

2.1 Summary report on monthly influent monitoring

A summary of influent monitoring for the treatment plant is presented in below. This monitoring is primarily undertaken in order to determine the overall efficiency of the plant in removing pollutants from the raw wastewater.

2.1.1 Influent Monitoring Summary - KILMALLOCK WWTP

Parameters	Number of Samples	Annual Max	Annual Mean
BOD mg/l	12	844	184.5
COD mg/l	12	60.2	34.8
Suspended Solids mg/l	12	1425	198.8
Total Nitrogen mg/l	12	60.2	34.8
Total Phosphorus (as P) mg/l	12	12	4.69
Hydraulic Capacity	N/A	1582	689

If other inputs in the form of sludge / leachate are added to the WWTP then these are included in Section 3.5 if applicable

Significance of Results:

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity as detailed further in Section 3.2. The annual maximum hydraulic loading is less than the peak Treatment Plant Capacity as detailed further in Section 3.2.

2.2 Discharges from the agglomeration

2.2.1 Effluent Monitoring Summary - KILMALLOCK WWTP

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 with Condition 2 Interpretation included	Annual Mean	Overall Compliance (Pass/Fail)
Ammonia-Total (as N)	1	1.2	N/A	12	0	0	0.03	Pass
BOD	15	30	N/A	12	0	0	2.5	Pass
COD	50	100	N/A	12	0	0	14.5	Pass
Suspended Solids	15	37.5	N/A	12	0	0	8.7	Pass
Total Phosphorus (as P)	1	1.2	N/A	12	0	0	0.13	Pass
Orthophosphate (as P)	0.3	0.36	N/A	12	1	1	0.08	Fail
pH	6-9	6-9	N/A	12	0	0	7.6	Pass

Notes:
1– This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied
2 - For parameters where a mean ELV applies

Cause of Exceedance(s):

Unknown

Significance of Results:

The WWTP is non-compliant with the ELV's set in the Wastewater Discharge Licence.

2.3 Ambient monitoring summary

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.

2.3.1 Ambient Monitoring Report Summary - KILMALLOCK WWTP

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	Code	Bathing Water	Drinking Water	FWPM	Shellfish	WFD Status
Upstream – RS24L010410	161054, 127818	TPEFF1900D0106SW001	No	No	No	No	Good
Downstream - RS24L010460	160650, 128428	TPEFF1900D0106SW001	No	Yes	No	No	Good

2.3.2 Ambient Monitoring Parameter Summary - KILMALLOCK WWTP

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 for orthophosphate.

The ambient monitoring results meet the required EQS.

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.

3 OPERATIONAL REPORTS SUMMARY

3.1 Treatment Efficiency Report

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:

3.1.1 Treatment Efficiency Report Summary - KILMALLOCK WWTP

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)	Comment
BOD	22518	577	97	
COD	50019	3399	93	
SS	18534	1015	94	
Total P	766	18.7	97	

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

3.2 Treatment Capacity Report Summary

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.

KILMALLOCK WWTP	
Peak Hydraulic Capacity (m3/day) - As Constructed	2220
DWF to the Treatment Plant (m3/day)	780

KILMALLOCK WWTP	
Current Hydraulic Loading - annual max (m3/day)	1567
Average Hydraulic loading to the Treatment Plant (m3/day)	675
Organic Capacity (PE) - As Constructed	4000
Organic Capacity (PE) - Collected Load (peak week)	1809
Organic Capacity (PE) - Remaining	2191
Will the capacity be exceeded in the next three years? (Yes/No)	No

3.3 Complaints Summary

A summary of complaints of an environmental nature is included below.

Number of Complaints	Nature of Complaint	Number Open Complaints	Number Closed Complaints
2	Blocked Sewer	0	2

3.4 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.

3.4.1 Summary of Incidents

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
There is no Incident data included in the AER.				

3.4.2 Summary of Overall Incidents

Question	Answer
Number of Incidents in 2018	1
Number of Incidents reported to the EPA via EDEN in 2018	0
Explanation of any discrepancies between the two numbers above	

3.5 Sludge / Other inputs to the 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)?[3]	Is there a leachate/sludge acceptance procedure for the WWTP?	Is there a dedicated leachate/sludge acceptance facility for the WWTP?[2](Y/N)
Other	40072.49	Weight (Tonnes)	1100	2	No	No	No

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:

No Appendix Included

4.1.1 SWO Identification

WWDL Name / Code for Storm Water Overflow	Irish Grid Ref.	Included in Schedule A4 of the WWDL	Significance of the overflow(High / Medium / Low)	Assessed against DoEHLG Criteria	No. of times activated in 2018 (No. of events)	Total volume discharged in 2018 (m3)	Monitoring Status
SW3	160258, 128282	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW4	1611316, 127733	No	Low	Not Meeting	Unknown	Unknown	Not Monitored

4.1.2 Inspection Summary Report

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m3)?	Unknown
Is each SWO identified as non meeting DoEHLG Guidance included in the Programme of Improvements?	No
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes
Have the EPA been advised of any additional SWOs / charges 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 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)	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
Discharges from SW1 must cease by 01/01/11 at the latest.	A	01/01/2011	Yes	Works Completed		
New WWTP and ancillary works	C	01/01/2011	Yes	Works Completed		

A summary of the status of any improvements identified by under Condition 5.2 is included below.

4.2.2 Improvement Programme Summary

Improvement Identifier	Improvement Description	Improvement Source	Expected Completion Date	Comments
There are no Improvements Programme for this Agglomeration.				

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 Table".

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 list of the various reports required for this agglomeration and a brief summary of their recommendations.

5.a Licence Specific Reports Summary Table

Licence Specific Report	Required by licence	Year included in AER	Included in this AER	Reference to relevant section of AER (e.g. Appendix X).
Small Stream Risk Score Assessment	Yes	2016	Yes (for 2018)	Appendix 7.2

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	
Is there a need to request/advise the EPA of any modifications to the existing WWDL?	No
List reason e.g. changes to monitoring requirements	
Have these processes commenced?	
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: 28/03/2019

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 ,

Eleanor Roche

Acting Head of Environmental Regulation.

7 APPENDIX

In the appendix include all the detailed or site specific reports that are relevant to the AER. Reports omitted from previous AERs should also be appended here.

Appendix
Appendix 7.1 - Ambient monitoring summary
Appendix 7.2 - Small Stream Risk Score Assessment

Kilmallock Upstream.

Entity	Entity Referenc	Station	Station Reference	Station Easting	Station Northin	Sample Date
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	16-Jan-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	13-Feb-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	13-Mar-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	10-Apr-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	1-May-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	5-June-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	10-July-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	14-Aug-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	4-Sep-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	9-Oct-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	13-Nov-2018
Loobagh	24L01	Norlth Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	11-Dec-2018

	Parameter	Ammonia NH3-	Biological Oxyg	Dissolved Oxyg	Ortho-Phospha	pH	Temperature
	Max.	--	--	--	--	14	--
	Min.	--	--	--	--	--	--
	Test Method	TM-CHEM-17	TM-CHEM-3	TM-CHEM-8	--	TM-CHEM-21	--
Reason	Analyst Conclusion	mg/l	mg/l	% O2	mg/l	pH units	Degrees C
Compliance	-	0.05	1	92.4	0.062	7.8	5.7
Compliance	-	0.1	2.77	86.5	0.09	7.8	3.5
Compliance	-	0.03	1	102	0.039	8.1	5.1
Compliance	-	0.05	1	96	0.046	7.9	7.9
Compliance	-	0.03	1	103	0.027	8.3	8.9
Compliance	-	0.03	1	103	0.04	8.2	16.1
Compliance	-	0.03	1	93	0.042	8.1	17.4
Compliance	-	0.03	2.4	96.1	0.043	8.4	13.8
Compliance	-	0.03	1	95.8	0.035	8.2	12.7
Compliance	-	0.03	1	94.6	0.035	8.2	12.1
Compliance	-	0.03	1	107	0.047	8.1	9.3
Compliance	-	0.03	1	74	0.049	8.1	9

	good status mean	≤0.065	≤1.5		≤0.035
	good status mean 95%ile	≤0.14	≤2.6		≤0.075
	Mean	0.039166667	1.264166667		0.04625
	95%ile	0.0725	2.5665		0.0746
	Mean Compliance	Yes	Yes		NO
	95%ile Compliance	Yes	Yes		Yes

Visual Inspection
--
--
--
Descriptive
ok
A lot of rubbish
ok

Kilmallock Downstream.

Entity	Entity Referenc	Station	Station Referen	Station Easting	Station Northin	Sample Date	Reason
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	16-Jan-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	13-Feb-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	13-Mar-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	10-Apr-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	1-May-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	5-June-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	10-July-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	14-Aug-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	4-Sep-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	9-Oct-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	13-Nov-2018	Compliance
Loobagh	24L01	Glenfield Br d/s Kilmallock STP WDLE 2	RS24L010460	159232	127980	11-Dec-2018	Compliance

Parameter	Ammonia NH3-	Biological Oxyg	Dissolved Oxyg	Ortho-Phospha	pH	Temperature	Visual Inspection
Max.	--	--	--	--	14	--	--
Min.	--	--	--	--	--	--	--
Test Method	TM-CHEM-17	TM-CHEM-3	TM-CHEM-8	--	TM-CHEM-21	--	--
Analyst Conclusion	mg/l	mg/l	% O2	mg/l	pH units	Degrees C	Descriptive
-	0.04	1	92.8	0.055	7.8	5.9	clear
-	0.1	2.77	88	0.092	7.7	3.5	
-	0.03	1	103	0.039	8.1	5.3	
-	0.06	1	95.4	0.046	8	8	
-	0.03	1	116	0.041	8.3	10.2	clear
-	0.03	1	105	0.049	8.2	16.2	
-	0.03	1	91.9	0.055	8	16.8	
-	0.03	1	103	0.054	8.3	16.7	
-	0.03	1	95.3	0.047	8.2	12	
-	0.03	1	92	0.051	8.1	12.1	
-	0.03	8.2	102	0.056	8.2	8.5	
-	0.03	1	81	0.053	8.1	9	

good status mean	≤0.065	≤1.5		≤0.035
good status mean 95%ile	≤0.14	≤2.6		≤0.075
Mean	0.039166667	1.7475		0.053166667
95%ile	0.078	5.2135		0.0722
Mean Compliance	Yes	NO		NO
95%ile Compliance	Yes	NO		Yes

River: Loobagh | Code: | Date: 28-06-18 | Time: 10:00a.m.

Station no.
X 160 602
Y 128 364

Location: u/s Kilmallock outfall

Stream Order: 2nd Order Stream

Grid (6 figure):

Field Chemistry	
DO%	98%.
DO mg/l	6.95mg/l
Temp (°C)	15°C.
Conductivity	275
pH	7.3
Bank width (cm)	8 metres
Wet width (cm)	5 metres
Avg Depth (cm)	15cm
Staff gauge	No.

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

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: Clean-Slight-Moderate-Heavy

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

Litter: None – Present – Moderate - Abundant

Stream flow:
Riffle
Riffle/Glide ✓
Slow flow

Shading: High – Moderate – Low ✓ - None

Cattle access Y: upstream – downstream or (N)

Photo: Y / (N)

Filamentous Algae:
None – Present – Moderate - Abundant

Sewage Fungus:
None – Present – Moderate - Abundant

Main land use u/s:
Pasture ✓ | Urban ✓
Bog | Tillage
Forestry | Other

Sample retained:
Y (N)

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

General Comments:

Stream is low due to dry spell.

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	1
Heptagenia Ab	2
Ephemerella Ab	
Caenis Ab	1
Paraleptophlebia Ab	
Ephemera danica Ab	
Other Ephem Ab	

Total no. of taxa: 3 | Total Relative Abundance: 4

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:

Trichoptera:

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

Total no. of Taxa: 3 | Total Relative Abundance: 5

G.O.L.D:

Lymnaea (G) Ab	
Potamopyrgus (G) Ab	
Planorbis (G) Ab	
Ancylus (G) Ab	
Physa (G) Ab	
Lumbriculus (Ol) Ab	
Eiseniella (Ol) Ab	
Tubificidae (Ol) Ab	

Total no. of Taxa: 2 | Total Relative Abundance: 2

Chironomidae (D) Ab	1
Chironomus (D) Ab	
Simuliidae (D) Ab	1
Dicranota (D) Ab	
Tipulidae (D) Ab	
Ceratopogonidae (D) Ab	
Other GOLD Ab	

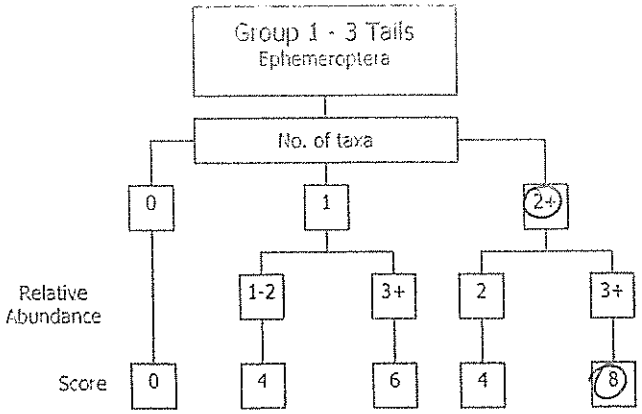
Asellus:

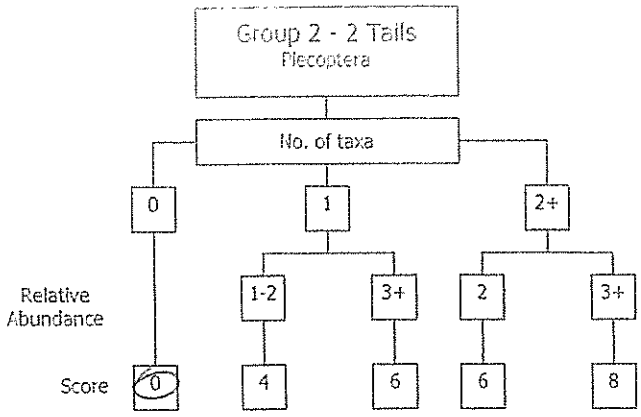
Absent	✓
Few/Low	
Common/ Numerous	

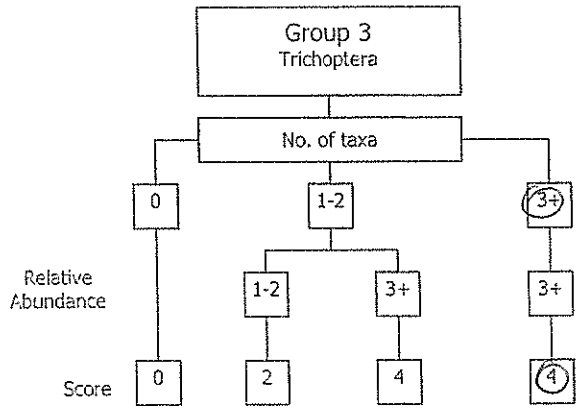
NOTE: *Asellus* must be recorded as absent if none are found

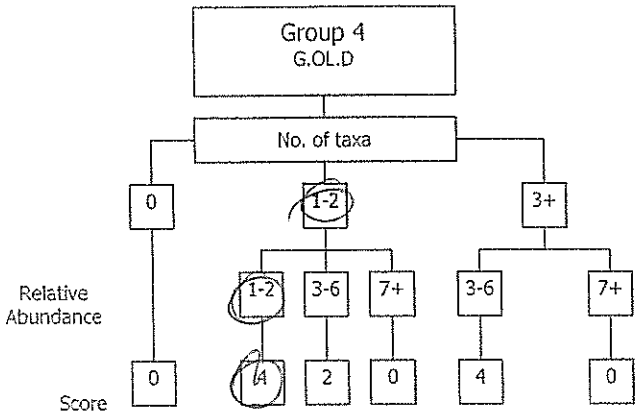
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

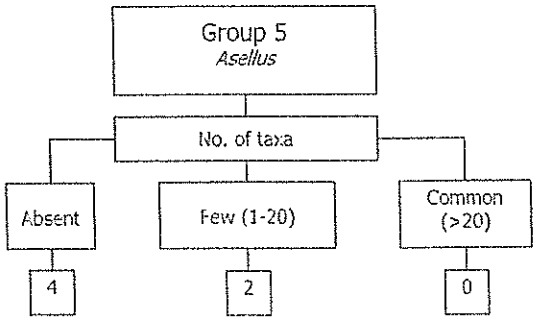
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from *each macroinvertebrate group* calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	8
b) Index Score Group 2	0
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)	20	Average Index Score (AIS) TIS/5 (5 for 5 groups)	4	SSR Score (AIS x 2)	8

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: 28 / 06 / 18

River: Laobagh | Code: | Date: 28-06-18 | Time: 11:30a.m.

Station no.
X 159,700
Y 123 286.

Location: D/s Kilwallock outflow

Grid (6 figure):

Stream Order:

Stream flow:
Riffle ✓
Riffle/Glide
Slow flow

Field Chemistry	
DO%	101%
DO mg/l	7.29mg/l
Temp (°C)	15°C.
Conductivity	273
pH	7.3
Bank width (cm)	8 metres
Wet width (cm)	5 metres
Avg Depth (cm)	20 cm
Staff gauge	No

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

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: Clean-Slight-Moderate-Heavy

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

Litter: None – Present – Moderate - Abundant

Shading: High – Moderate – Low - None

Cattle access Y: upstream – downstream or N

Photo: Y / N

Filamentous Algae:
None – Present – Moderate - Abundant

Sewage Fungus:
None – Present – Moderate - Abundant

Main land use u/s:
Pasture — Urban
Bog — Tillage
Forestry — Other

Sample retained:
Y / N

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

General Comments:

River low.

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	1
Heptagenia Ab	2
Ephemerella Ab	
Caenis Ab	1
Paraleptophlebia Ab	
Ephemera danica Ab	
Other Ephem Ab	

Total no. of taxa: 3 | Total Relative Abundance: 4

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:

Trichoptera:

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

Total no. of Taxa: 3 | Total Relative Abundance: 5

G.OL.D:

Lymnaea (G) Ab	
Potamopyrgus (G) Ab	
Planorbis (G) Ab	
Ancylus (G) Ab	
Physa (G) Ab	
Lumbriculus (Ol) Ab	
Eiseniella (Ol) Ab	
Tubificidae (Ol) Ab	

Total no. of Taxa: 2 | Total Relative Abundance: 2

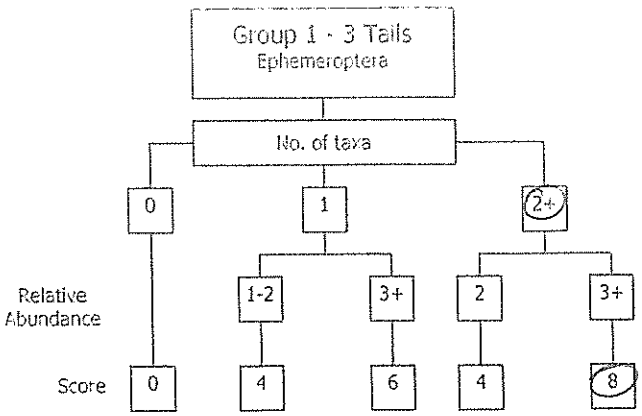
Chironomidae (D) Ab	1
Chironomus (D) Ab	
Simuliidae (D) Ab	1
Dicranota (D) Ab	
Tipulidae (D) Ab	
Ceratopogonidae (D) Ab	
Other GOLD Ab	

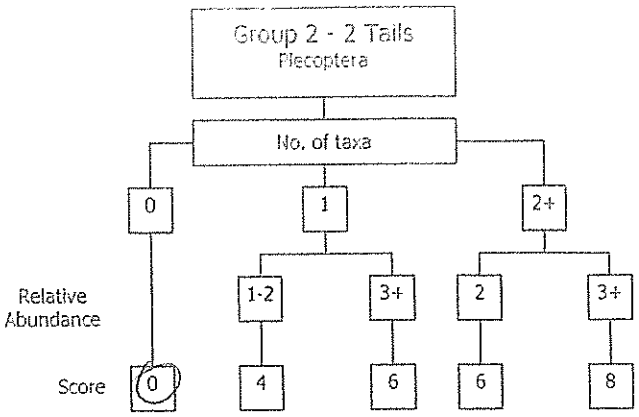
Asellus:
Absent ✓
Few/Low
Common/ Numerous

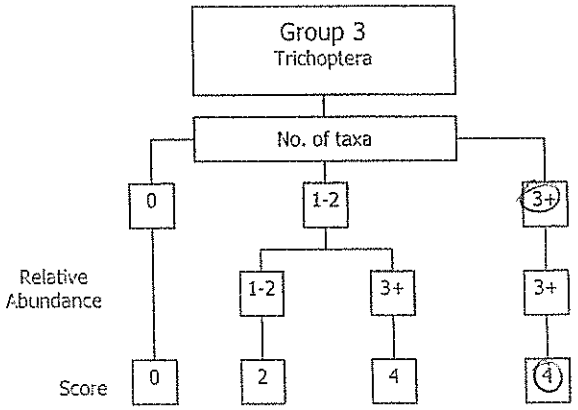
NOTE: *Asellus* must be recorded as absent if none are found

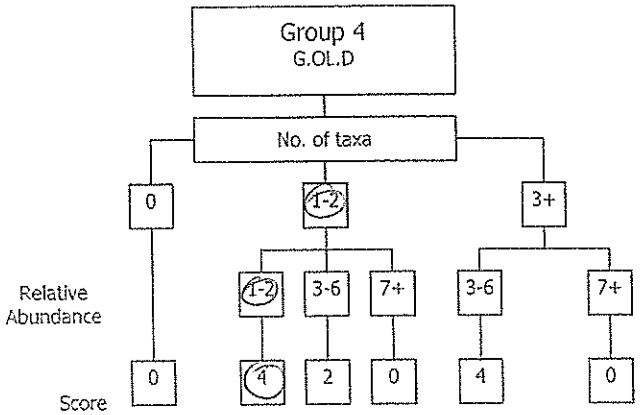
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

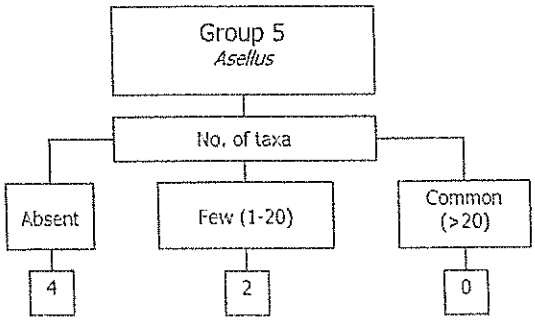
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from *each macroinvertebrate group* calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	8
b) Index Score Group 2	0
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)	20	Average Index Score (AIS) TIS/5 (5 for 5 groups)	4	SSR Score (AIS x 2)	8

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: 28 / 06 / 18