

# Annual Environmental Report

2019



Killmallock

D0106-01

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# 1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2019 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.

None

## 1.2 TREATMENT SUMMARY

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

- KILMALLOCK 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	KILMALLOCK WWTP	Treated	Non-Compliant	Ammonia-Total (as N) mg/l ortho-Phosphate (as P) - unspecified mg/l

## 1.4 LICENCE SPECIFIC REPORTING INCLUDED IN AER

Assessment / Report	Included in AER
There are no Licence Specific Reports included in the 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
COD-Cr mg/l	12	532	169.89
Total Nitrogen mg/l	12	94.9	22.51
Total Phosphorus (as P) mg/l	12	4.71	2.66
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	208	66.98
Suspended Solids mg/l	12	220	91.54
Hydraulic Capacity	N/A	1428	702

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 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	9.42	Pass
<b>BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l</b>	15	30	N/A	12	N/A	N/A	1.62	Pass
<b>Suspended Solids mg/l</b>	15	37.5	N/A	12	N/A	N/A	5.26	Pass
<b>pH pH units</b>	9	9	N/A	12	N/A	N/A	7.72	Pass
<b>Ammonia-Total (as N) mg/l</b>	1	1.2	N/A	12	1	1	0.14	Fail
<b>Total Phosphorus (as P) mg/l</b>	1	1.2	N/A	12	N/A	N/A	0.24	Pass
<b>ortho-Phosphate (as P) - unspecified mg/l</b>	0.3	0.36	N/A	12	2	1	0.1	Fail
<b>Total Nitrogen mg/l</b>	N/A	N/A	N/A	2	N/A	N/A	4.6	

Notes:

1 – This represents the Emission Limit Values after the Interpretation provided for under Condition 2 of the licence is applied

### Cause of Exceedance(s):

Under dosing Ferric for phosphate and ammonia failure unexplained plant operational samples were ok.

### Significance of Results:

The WWTP is not compliant with the ELVs set in the WWDL.

## 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 Status
<b>Upstream</b>	161054, 127818	RS24L010380	No	No	No	No	Moderate
<b>Downstream</b>	166554, 124729	RS24L010200	No	No	No	No	Moderate

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 meet the required EQS. 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)
COD	46311	2564	94
SS	24952	1433	94
cBOD	18257	440	98
TP	725	65	91
TN	6135	1188	81

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.

KILMALLOCK WWTP	
Peak Hydraulic Capacity (m <sup>3</sup> /day) - As Constructed	2220
DWF to the Treatment Plant (m <sup>3</sup> /day)	780
Current Hydraulic Loading - annual max (m <sup>3</sup> /day)	1428

KILMALLOCK WWTP	
Average Hydraulic loading to the Treatment Plant (m <sup>3</sup> /day)	702
Organic Capacity (PE) - As Constructed	4000
Organic Capacity (PE) - Collected Load (peak week) <sup>Note1</sup>	1831
Organic Capacity (PE) - Remaining	2169
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 - 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)
Other	2386.47	Weight (Tonnes)	1200	2	No	Yes	Yes

## 3 COMPLAINTS AND INCIDENTS

### 3.1 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
<b>There were no relevant environmental complaints in 2019.</b>			

### 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)
<b>Breach of ELV</b>	Other	1	No	Yes

### 3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2019	1
Number of Incidents reported to the EPA via EDEN in 2019	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	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 2019 (No. of events)	Total volume discharged in 2019 (m3)	Monitoring Status
SW3	160258, 128282	Yes	Unknown	Not Meeting	Unknown	Unknown	Not Monitored
TBC	161316, 127733	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	159985, 128253	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
TBC	TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored

SWO Summary	
How much sewage was discharged via SWOs in the agglomeration in the year (m3)?	Unknown
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	N/A

SWO Summary	
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 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 improvements identified by under Condition 5.2 is included below.

## 4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
<b>There are no Improvements Programme for this Agglomeration.</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 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
<b>Small Stream Risk Score Assessment</b>	Yes	2016	No	

### 5.1 SMALL STREAM RISK SCORE ASSESSMENT

The Small Stream Risk Score Assessment Report has been included in the AER 2016

## 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	No

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

Signed:    Date: 18/03/2020

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

<b>Appendix</b>
<b>Appendix 7.1 - Ambient monitoring summary</b>
<b>Appendix 7.2 - Small Stream Risk Score Assessment</b>

River Loobagh Upstream kilmallock Outfall.

Location						Parameter						
Station	Station Reference	Station Easting	Station Northing	Sample Reference	Sample Date	Ammonia NH3-N	Biological Oxygen Demand	Dissolved Oxygen % Saturation	Ortho-Phosphate PO4-P	pH	Temperature	Total Nitrogen N
						mg/l	mg/l	% O2	mg/l	pH units	Degrees C	mg/l
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19370104	15-Jan-2019	0.02	1	98.4	0.04	8.2	8.2	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19370490	12-Feb-2019	0.02	1	92	0.034	8.1	8.8	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19370930	12-Mar-2019	0.02	1	100	0.049	8	7.3	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19371319	9-Apr-2019	0.02	1	88	0.018	8.4	9.3	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19371699	14-May-2019	0.02	1	105	0.01	8.3	11.2	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19372055	11-June-2019	0.04	1	98	0.0025	8.3	12	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19372316	9-July-2019	0.07	1	102	0.044	8.3	16.3	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19372703	13-Aug-2019	0.04	3.42	95	0.103	8.1	13.7	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19373007	3-Sep-2019	0.02	1	111	0.046	8.3	14	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19373496	8-Oct-2019	0.02	1	98.5	0.053	8.1	11.6	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19373939	12-Nov-2019	0.02	1	91.8	0.055	7.9	6.9	
North Bridge U/S Kilmallock STP - E11	RS24L010410	160645	128426	19374353	10-Dec-2019	0.04	1	96.6	0.081	8.1	9.1	
			EQS Std	individual value						6-9		
			EQS Std	good status mean		≤0.065	≤1.5		≤0.035	n/a	n/a	n/a
			EQS Std	good status 95%ile mean		≤0.14	≤2.6	>80, <120	≤0.075	n/a	n/a	n/a
				95%ile mean compliance		0.029	1.202	98.025	0.045	8.175	10.700	#DIV/0!
				95%ile compliance		0.054	2.089	107.700	0.091	8.345	15.035	#NUM!
				mean compliance		yes	yes		no	yes		
				95%ile compliance		yes	yes	yes	no	yes	--	--

half of level of detection for statistical purposes  
exceeds Surface Waters Regulations good status

Note: Individual results which exceed the good status mean are highlighted in red

River Deel Downstream of Kilmallock Outfall.

Location						Parameter						
Station	Station Reference	Station Easting	Station Northing	Sample Reference	Sample Date	Ammonia NH3-N	Biological Oxygen Demand	Dissolved Oxygen % Saturation	Ortho-Phosphate PO4-P	pH	Temperature	Total Nitrogen N
						mg/l	mg/l	% O2	mg/l	pH units	Degrees C	mg/l
Ballinanima Br E10	RS24L010200	166554	124729	19370103	15-Jan-2019	0.02	1	104	0.017	7.8	9.4	
Ballinanima Br E10	RS24L010200	166554	124729	19370102	15-Jan-2019	0.04	1	96.5	0.026	8	8	
Ballinanima Br E10	RS24L010200	166554	124729	19370489	12-Feb-2019	0.07	1	75	0.015	8	9.1	
Ballinanima Br E10	RS24L010200	166554	124729	19370929	12-Mar-2019	0.02	1	97	0.022	7.8	7.6	
Ballinanima Br E10	RS24L010200	166554	124729	19371318	9-Apr-2019	0.02	1	81	0.015	7.9	9.6	
Ballinanima Br E10	RS24L010200	166554	124729	19371698	14-May-2019	0.02	1	111	0.011	8.3	10.3	
Ballinanima Br E10	RS24L010200	166554	124729	19372054	11-June-2019	0.02	1	99	0.129	8	11.9	
Ballinanima Br E10	RS24L010200	166554	124729	19372315	9-July-2019	0.12	1	108	0.025	8.2	14.5	
Ballinanima Br E10	RS24L010200	166554	124729	19372702	13-Aug-2019	0.02	1	100	0.025	7.9	12.9	
Ballinanima Br E10	RS24L010200	166554	124729	19373006	3-Sep-2019	0.21	1	110	0.034	8.1	14	
Ballinanima Br E10	RS24L010200	166554	124729	19373495	8-Oct-2019	0.02	1	97.1	0.012	7.9	11.6	
Ballinanima Br E10	RS24L010200	166554	124729	19373938	12-Nov-2019	0.02	1	95.7	0.016	7.7	7.2	
Ballinanima Br E10	RS24L010200	166554	124729	19374352	10-Dec-2019	0.08	1	97	0.016	7.9	10.1	
			EQS Std	individual value						6-9	n/a	
			EQS Std	good status mean		≤0.065	≤1.5		≤0.035	n/a	n/a	n/a
			EQS Std	good status 95%ile mean		≤0.14	≤2.6	>80, <120	≤0.075	n/a	n/a	n/a
				95%ile mean compliance		0.052	1.000	97.792	0.028	7.962		#DIV/0!
				95%ile compliance		0.156	1.000	110.400	0.072	8.240		#NUM!
				mean compliance		yes	yes		no	yes	--	
				95%ile compliance		yes	yes	yes	no	yes	--	--

half of level of detection for statistical purposes  
exceeds Surface Waters Regulations good status

Note: Individual results which exceed the good status mean are highlighted in red

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish National Grid Reference (Easting, Northing)	EPA Feature Coding Tool code	Receiving Waters Designation (Yes/No)				Current WFD Status	Mean (mg/l)		
			Bathing Water	Drinking Water	FWPM	Shellfish		cBOD	o-Phosphate (as P)	Ammonia (as N)
Upstream Monitoring Point	160645, 128426	RS24L010410					Moderate	1.202	0.045	0.029
Downstream Monitoring Point	166554, 124729	RS24L010200	No	No	No	No	Good	1.000	0.028	0.052
<i>Difference</i>								-0.202	-0.017	0.023
EQS								2.600	0.075	0.140
% of EQS								-7.769%	-22.667%	16.429%

River: <u>Loobagh</u>		Code:	Date: <u>27-05-19</u>	Time: <u>10:15 a.m.</u>
Station no. <u>X 159 700</u> <u>Y 128 286.</u>		Location: <u>AS Kilmallock Outfall</u>		Grid (6 figure):
Field Chemistry		Stream Order:		Stream flow: Riffle <input checked="" type="checkbox"/> Riffle/Glide Slow flow
DO%	<u>98%</u>	Modifications: Y/N Canalised-widened-bank erosion-arterial drainage		
DO mg/l	<u>7.10</u>	Dominant Types:		
Temp (°C)	<u>13.0</u>	Bedrock		
Conductivity	<u>254</u>	Boulder (>128mm)		
pH	<u>7.1</u>	Cobble (32-128mm) <input checked="" type="checkbox"/>		
Bank width (cm)	<u>8m</u>	Gravel (8-32mm)		
Wet width (cm)	<u>5m</u>	Fine Gravel (2-8mm)		
Avg Depth (cm)	<u>30cm</u>	Sand (0.25-2mm)		
Staff gauge	<u>No.</u>	Silt (<0.25mm)		
Velocity	Colour	Slope: Low - Medium - High - Very High		Shading: High - Moderate - Low - None
Torrential	None	Geology: <u>Calcareous-Siliceous-Mixed</u>		Cattle access Y: upstream - downstream or N
Fast <input checked="" type="checkbox"/>	Slight	Substratum Condition: <u>Calcareous-Compacted-Loose - Normal</u>		Photo: <u>Y N</u>
Moderate	Moderate <input checked="" type="checkbox"/>	Substratum:		
Slow	High	Stoney bottom - Muddy bottom - Mud over stones		
Very slow		Degree of siltation: <u>Clean - Slight - Moderate - Heavy</u>		
Clarity	Discharge	Depth of mud: None: <1cm: 1-5cm: 5-10cm: >10cm		Sewage Fungus: <u>None - Present - Moderate - Abundant</u>
Very clear	Flood	Litter: <u>None - Present - Moderate - Abundant</u>		Sampled in Minutes: Pond net x <u>2</u>
Clear <input checked="" type="checkbox"/>	Normal	Filamentous Algae: <u>None - Present - Moderate - Abundant</u>		Stone wash x <u>1</u>
Slightly turbid	Low	Main land use u/s:		Weed sweep x <u>1</u>
Highly turbid	Very Low <input checked="" type="checkbox"/>	Pasture <input checked="" type="checkbox"/> Urban <input checked="" type="checkbox"/>		
	Dry	Bog		
	Recent Flood	Forestry		
		Sample retained: Y / N		

General Comments:

River as normal

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)

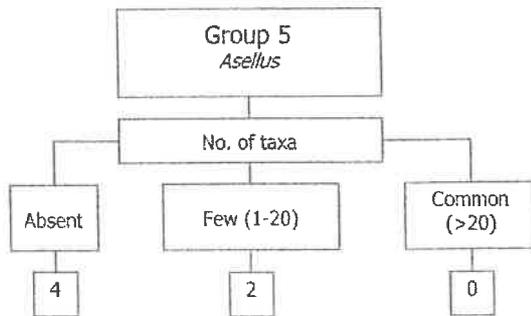
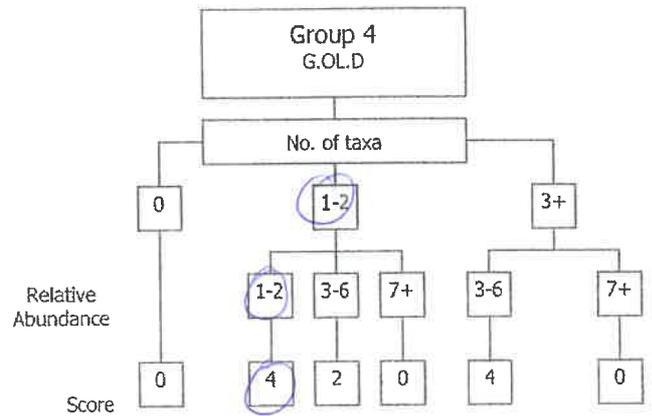
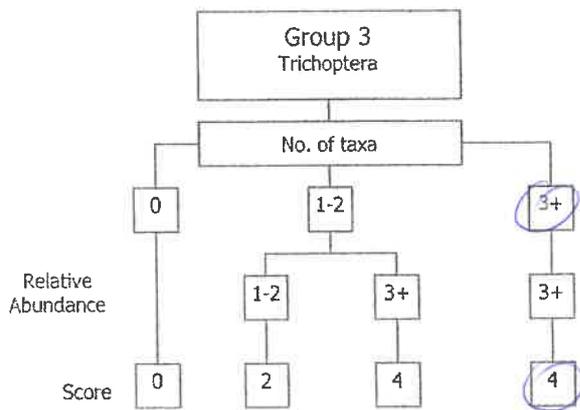
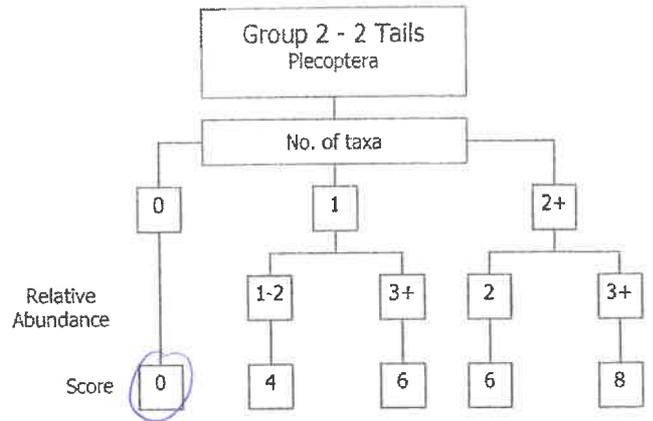
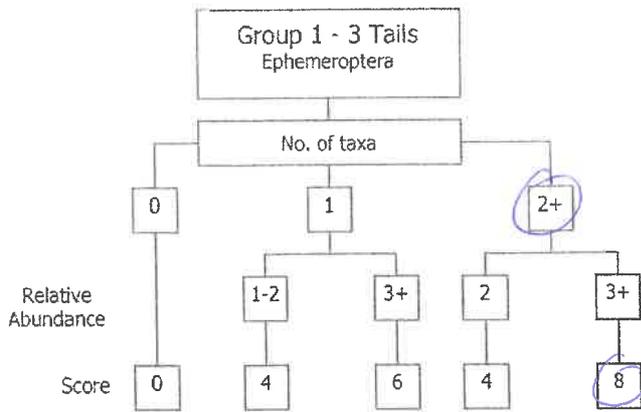
Relative Abundance

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

Ephemeroptera:		Plecoptera:	
<i>Ecdyonurus</i> Ab		<i>Leuctra</i> Ab	
<i>Rhithrogena</i> Ab	<u>1</u>	<i>Isoptera</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	
Total no. of taxa	<u>3</u>	Total no. of Taxa	<u>0</u>
Total Relative Abundance	<u>4</u>	Total Relative Abundance	
Trichoptera:	G.O.L.D:	Chironomidae (D) Ab	<i>Asellus</i> :
Hydropsychidae Ab	<i>Lumnaea</i> (G) Ab	<u>1</u>	Absent <input checked="" type="checkbox"/>
Polycentropodidae Ab	<i>Potamopyrgus</i> (G) Ab		Few/Low
<i>Rhyacophila</i> Ab	<i>Planorbis</i> (G) Ab	<u>1</u>	Common/ Numerous
Philopotamidae Ab	<i>Ancyclus</i> (G) Ab		
Limnephilidae Ab	<i>Physa</i> (G) Ab		
Sericostomatidae Ab	<i>Lumbriculus</i> (O) Ab		
Glossosomatidae Ab	<i>Eiseniella</i> (O) Ab		
Lepidostomatidae Ab	<i>Tubificidae</i> (O) Ab		
Other Trichoptera Ab			
Total no. of Taxa	<u>3</u>	Total no. of Taxa	<u>2</u>
Total Relative Abundance	<u>5</u>	Total Relative Abundance	<u>2</u>

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
- b) Index Score Group 2
- c) Index Score Group 3
- d) Index Score Group 4
- e) Index Score Group 5

**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)

**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: 27 / 05 / 2019

River: <u>Loobagh</u>		Code:	Date: <u>27-05-19</u>	Time: <u>9:00</u>
Station no. <u>Y</u>		Location: <u>u/s Kilmallock Outfall</u>		Grid (6 figure):
Field Chemistry		Stream Order:		
DO%	<u>101</u>	Modifications: Y/N Canalised-widened-bank erosion-arterial drainage		
DO mg/l	<u>7.26</u>	Dominant Types:		
Temp (°C)	<u>13.1</u>	Bedrock		
Conductivity	<u>250</u>	Boulder (>128mm)		
pH	<u>7.2</u>	Cobble (32-128mm) ✓		
Bank width (cm)	<u>8m</u>	Gravel (8-32mm)		
Wet width (cm)	<u>5m</u>	Fine Gravel (2-8mm)		
Avg Depth (cm)	<u>35cm</u>	Sand (0.25-2mm)		
Staff gauge	<u>no</u>	Silt (<0.25mm)		
Velocity	Colour	Slope: Low – Medium – High – Very High		
Torrential	None	Geology: Calcareous-Siliceous-Mixed		
Fast ✓	Slight	Substratum Condition: Calcareous-Compacted-Loose - Normal		
Moderate	Moderate ✓	Substratum:		
Slow	High	Stoney bottom-Muddy bottom-Mud over stones		
Very slow		Degree of siltation: Clean-Slight-Moderate-Heavy		
Clarity	Discharge	Depth of mud: None: <1cm: 1-5cm: 5-10cm: >10cm		
Very clear	Flood	Litter: None – Present – Moderate - Abundant		
Clear ✓	Normal	Filamentous Algae:		
Slightly turbid	Low	None – Present – Moderate - Abundant		
Highly turbid	Very Low ✓	Main land use u/s:		Sample retained: Y / N
	Dry	Pasture	Urban ✓	Sewage Fungus: None – Present – Moderate - Abundant
	Recent Flood	Bog	Tillage	
		Forestry	Other	
				Sampled in Minutes: Pond net x <u>2</u> Stone wash x <u>1</u> Weed sweep x <u>1</u>

General Comments:

Litter Present.

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

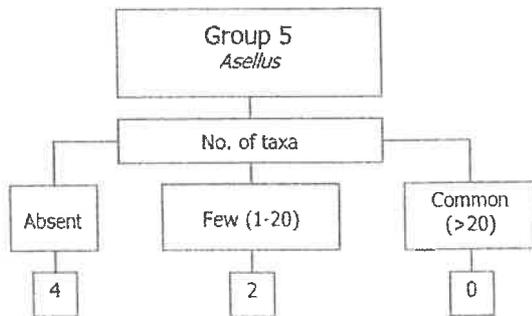
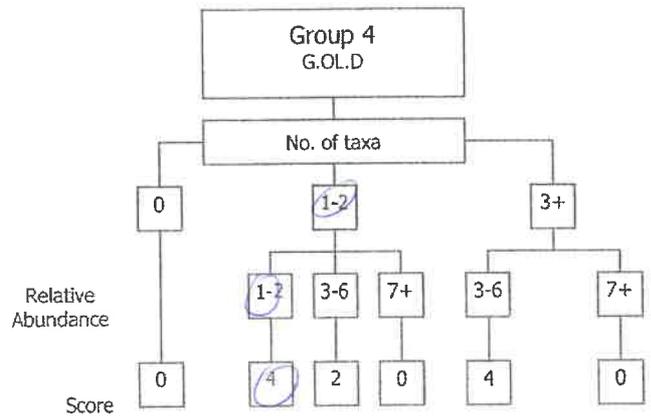
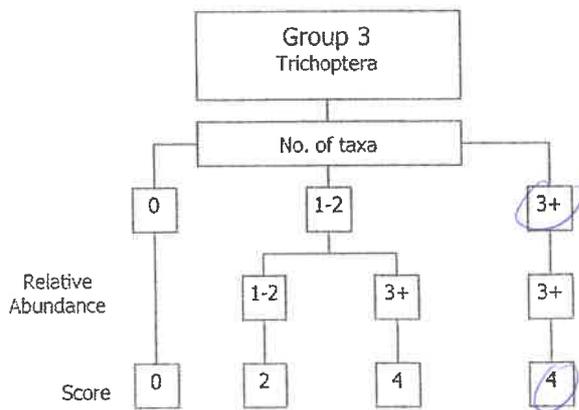
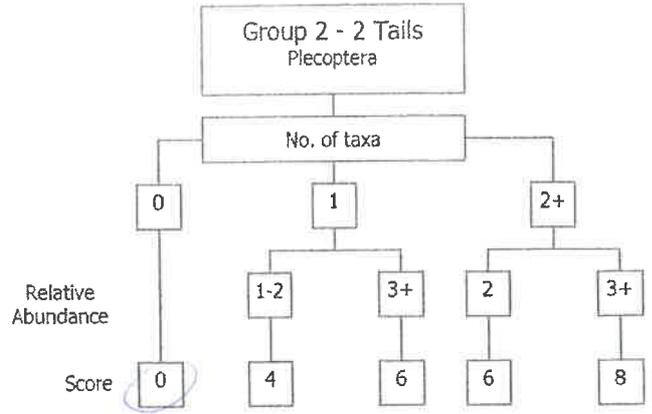
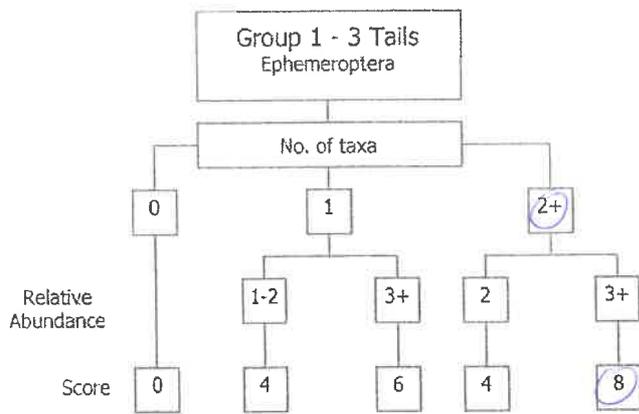
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Ephemeroptera:		Plecoptera:	
<i>Ecdyonurus</i> Ab		<i>Leuctra</i> Ab	
<i>Rhythrogena</i> Ab	<u>1</u>	<i>Isoneria</i> Ab	
<i>Heptagenia</i> Ab	<u>2</u>	<i>Protonemura</i> Ab	
<i>Ephemerella</i> Ab		<i>Amphinemura</i> Ab	
<i>Caenis</i> Ab	<u>1</u>	<i>Perla</i> Ab	
<i>Paraleptophlebia</i> Ab		<i>Dinocras</i> Ab	
<i>Ephemera danica</i> Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa	<u>3</u>	Total no. of Taxa	<u>0</u>
Total Relative Abundance	<u>4</u>	Total Relative Abundance	
Trichoptera:	G.O.L.D:	Chironomidae (D) Ab	<i>Asellus</i>
Hydropsychidae Ab	<i>Lymnaea</i> (G) Ab	<u>1</u>	Absent ✓
Polycentropodidae Ab	<i>Potamoopyrgus</i> (G) Ab		Few/Low
<i>Rhyacophila</i> Ab	<i>Planorbis</i> (G) Ab	<u>1</u>	Common/
Philopotamidae Ab	<i>Anoetus</i> (G) Ab		Numerous
Linnephilidae Ab	<i>Physa</i> (G) Ab		
Sericostomatidae Ab	<i>Lumbriculus</i> (O) Ab		
Glossosomatidae Ab	<i>Eiseniella</i> (O) Ab		
Lepidostomatidae Ab	Tubificidae (O) Ab		
Other Trichoptera Ab			
Total no. of Taxa	<u>3</u>	Total no. of Taxa	<u>2</u>
Total Relative Abundance	<u>5</u>	Total Relative Abundance	<u>2</u>

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*.

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< 6.5 Stream at risk

Surveyor (signed): Adriana Name (print): ADRIANA INSLEY Date: 27 / 05 / 2019