Annual Environmental Report

2021

Kilmacreannan

D0513-01

CONTENTS

7 APPENDIX

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2021 AER

This Annual Environmental Report has been prepared for D0513-01, Kilmacreannan, in Donegal 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.

Upgrade works of the existing Kilmacrennan WWTW are currently being reviewed by Irish Water and are potentially due to commence in 2023

1.2 TREATMENT SUMMARY

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

- Kilmacrennan WWTP with a Plant Capacity PE of 500, the treatment type is 2 - Secondary treatment

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
TPEFF0600D0513SW001	Kilmacrennan WWTP	Treated	Non-Compliant	Ammonia-Total (as N) mg/l BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l COD-Cr mg/l ortho-Phosphate (as P) - unspecified mg/l Suspended Solids mg/l

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
Small Stream Risk Score Assessment

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 KILMACRENNAN WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - KILMACRENNAN 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
Ammonia-Total (as N) mg/l	6	45	19
ortho-Phosphate (as P) - unspecified mg/l	6	4.35	1.92
COD-Cr mg/l	6	450	186
Suspended Solids mg/l	6	820	193
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	6	209	85
pH units	6	7.90	7.51
Hydraulic Capacity	N/A	859	424

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

2.1.2 EFFLUENT MONITORING SUMMARY - TPEFF0600D0513SW001

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	6	2	N/A	81	Fail
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	10	20	N/A	6	5	3	29	Fail
Suspended Solids mg/l	10	25	N/A	6	4	4	56	Fail
pH units	9.00	9.00	N/A	6	N/A	N/A	7.36	Pass
Ammonia-Total (as N) mg/l	1.00	1.20	N/A	6	6	6	17	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.500	0.600	N/A	6	5	4	1.78	Fail
Conductivity @20°C µS/cm	N/A	N/A	N/A	6	N/A	N/A	491	

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):

Kilmacrennan WWTW is overloaded.

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 TPEFF0600D0513SW001

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	214107, 420471	RS39L020270	No	No	Yes	No	Good
Downstream	214159, 420482	RS39L020280	No	No	Yes	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
BOD - 5 days (Total) mg/l	RS39L020270	1.80	RS39L020280	1.80	1.50	0

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	RS39L020270	0.039	RS39L020280	0.324	0.065	439.1
ortho-Phosphate (as P) - unspecified mg/l	RS39L020270	0.039	RS39L020280	0.059	0.035	56.2
Suspended Solids mg/l	RS39L020270	8.15	RS39L020280	5.99	N/A	
Dissolved Oxygen % Saturation	RS39L020270	93	RS39L020280	91	N/A	
Conductivity @20°C µS/cm	RS39L020270	158	RS39L020280	161	N/A	
pH units	RS39L020270	7.56	RS39L020280	7.62	N/A	
Temperature °C	RS39L020270	11	RS39L020280	11	N/A	

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 Phosphate, PH, concentrations downstream of the effluent discharge is noted.

A deterioration in water quality has been identified, however it is not known if it or is not caused by the WWTP.

Other causes of deterioration in water quality in the area are: No

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 - KILMACRENNAN WWTP

2.1.4.1 Treatment Efficiency Report - Kilmacrennan 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)
SS	29348	8586	71
TN	N/A	N/A	N/A
TP	N/A	N/A	N/A
COD	28322	12367	56
cBOD	12897	4475	65

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

2.1.4.2 Treatment Capacity Report Summary - Kilmacrennan 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.

Kilmacrennan WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	330
DWF to the Treatment Plant (m^3/day)	110
Current Hydraulic Loading - annual max (m^3/day)	859

Kilmacrennan WWTP	
Average Hydraulic loading to the Treatment Plant (m^3/day)	423.65
Organic Capacity (PE) - As Constructed	500
Organic Capacity (PE) - Collected Load (peak week)[Note1]	840
Organic Capacity (PE) - Remaining	0
Will the capacity be exceeded in the next three years? (Yes/No)	Yes

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 - KILMACRENNAN 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 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	WWTP upgrade required to meet ELV	1	Yes	No

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
SW002	214169, 420487	Yes	Low	Not 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
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	Yes
The SWO Assessment included the requirements of relevant of WWDL schedules?	N/A
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
D0513-SIP:01	Cessation or upgrade of storm water overflow (SW002) to comply with the criteria outlined in the DoECLG 'Procedures and Criteria in relation to Storm Water Overflows' (1995).	C	31/12/2019	Yes	At Planning Stage	2026	
D0513-SIP:02	Infiltration programme - diversion of storm water from the collection network	C	31/12/2019	Yes	Not Started		
D0513-SIP:03	Replacement of malfunctioning Rotating Biological Contactor	C	30/06/2014	Yes	Works Completed		
D0513-SIP:04	Upgrade of Kilmacrennan Waste Water Treatment Plant to provide tertiary treatment	C	31/12/2019	Yes	At Planning Stage		Post 2024
D0513-SIP:05	Upgrade of waste water collection network	C	31/12/2019	Yes	Works Completed	2021	

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	Year included in AER	Included in this AER
Priority Substances Assessment	Yes	2018	No
Small Stream Risk Score Assessment	Yes	2019	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
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	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:

Signed: Date: 09/06/2022

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

Municipal	Month	Category	Entity Name	Station	Lab Ref	Date	pH	Temperature	Conductivity @ 20°C	DO	BOD	COD	Suspended Solids	Ammonia (as N)	Nitrate (as N)	Nitrite (as N)	Orthophosphate	Total Nitrogen	TON	Dissolved Inorganic Nitrogen DIN	Total Phosphorus	E coli	Enterococci	Faecal Coliforms	Chlorophyll	Salinity	SSRS
District							pH units	°C	us/cm	% Sat	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	MPN/100mls	cfu/100mls	cfu/100mls	ug/l	PSU	Rating
Inishowen	January	River Quality	Donagh	Carndonagh - Upstream	212500040	12-Jan-21	7.2	4.8	104	97.9	1	NT	<6	0.041	0.67	<0.015	<0.05	0.737	0.68	0.721	NT	NT	NT	NT	NT	NT	NT
Letterkenny	February	River Quality	Leannan	Kilmacrennan - Upstream	212500418	18-Feb-21	7.3	4.8	100	94.4	1	NT	10	0.051	NT	NT	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	February	River Quality	Leannan	Kilmacrennan - Downstream	212500421	18-Feb-21	7.6	4.9	106	94.5	1	NT	13	0.104	NT	NT	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	March	River Quality	Lurgy	Kilmacrennan - Upstream	212500994	30-Mar-21	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	>7.25
Letterkenny	March	River Quality	Lurgy	Kilmacrennan - Downstream	212500995	30-Mar-21	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	<6.5
Letterkenny	April	River Quality	Lurgy	Kilmacrennan - Upstream	212501211	21-Apr-21	7.5	6.4	151	92.6	3	NT	<6	<0.05	NT	NT	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	April	River Quality	Lurgy	Kilmacrennan - Downstream	212501214	21-Apr-21	7.7	6.2	145	92.9	1	NT	<6	0.109	NT	NT	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	June	River Quality	Lurgy	Kilmacrennan - Upstream	212502029	16-Jun-21	8	14.5	244	94.9	1	NT	<6	<0.015	NT	NT	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	June	River Quality	Lurgy	Kilmacrennan - Downstream	212502032	16-Jun-21	7.8	14	252	88.2	2	NT	<6	0.756	NT	NT	0.09	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	August	River Quality	Lurgy	Kilmacrennan - Upstream	212502844	17-Aug-21	7.9	14.1	205	88.5	1	NT	<6	0.052	NT	NT	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	August	River Quality	Lurgy	Kilmacrennan - Downstream	212502847	17-Aug-21	7.8	13.9	212	86.5	2	NT	<6	0.6	NT	NT	0.08	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	October	River Quality	Lurgy	Kilmacrennan - Upstream	212503836	19-Oct-21	7.1	14.1	89	93	3	NT	18	0.046	NT	NT	0.055	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Letterkenny	October	River Quality	Lurgy	Kilmacrennan - Downstream	212503840	19-Oct-21	7.2	14.5	91	92.7	3	NT	<6	0.053	NT	NT	0.054	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT

Karen Mc Bride
Central Laboratory

"Orignal Test Report"

River: U/S Curry | **Code:** | **Date:** 30/3/21 | **Time:** 10.00

Station no. 212500994

Location: Kilmacrennan

Stream Order: Part of Lennan

Grid (6 figure):

Field Chemistry	
DO%	90.6
DO mg/l	
Temp (°C)	6.3
Conductivity	178
pH	7.75
Bank width (cm)	700
Wet width (cm)	650
Avg Depth (cm)	60
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

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

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 10
Stone wash x 10
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

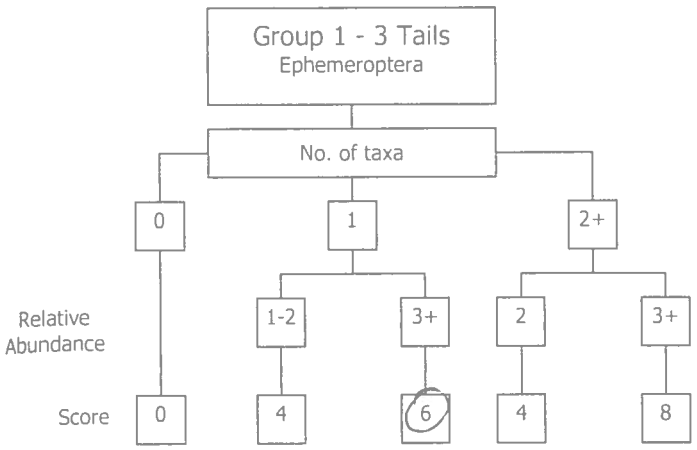
Ephemeroptera:		Plecoptera:	
Ecdyonurus Ab		*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab	3	*Protonemura* Ab	2
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa	1	**Total no. of Taxa**	1
Total Relative Abundance	3	**Total Relative Abundance**	2

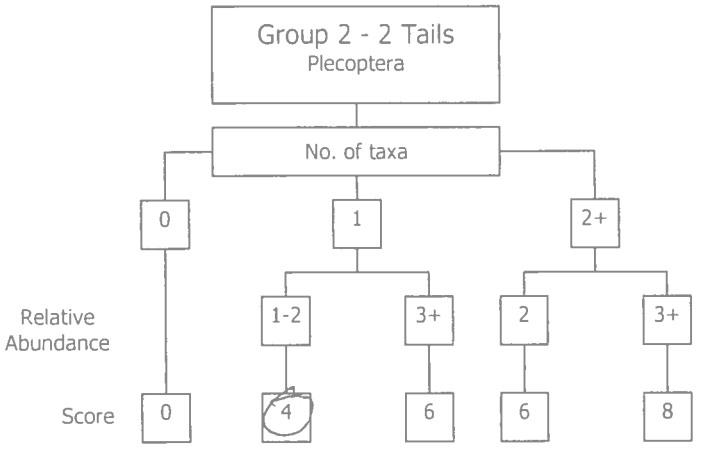
Trichoptera:		G.OL.D:				*Asellus*:	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	✓
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	
Rhyacophila Ab	1	*Planorbis* (G) Ab		Simuliidae (D) Ab	2	Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab	1	Ceratopogonidae (D) Ab			
Glossosomatidae Ab	1	*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab	1	Tubificidae (Ol) Ab	2				
Other Trichoptera Ab							
Total no. of Taxa	3	**Total no. of Taxa**	3	**Total Relative Abundance**	5		
Total Relative Abundance	3						

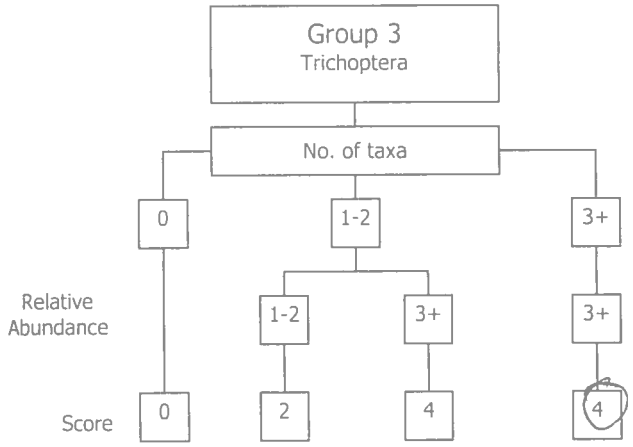
NOTE: *Asellus* must be recorded as absent if none are found

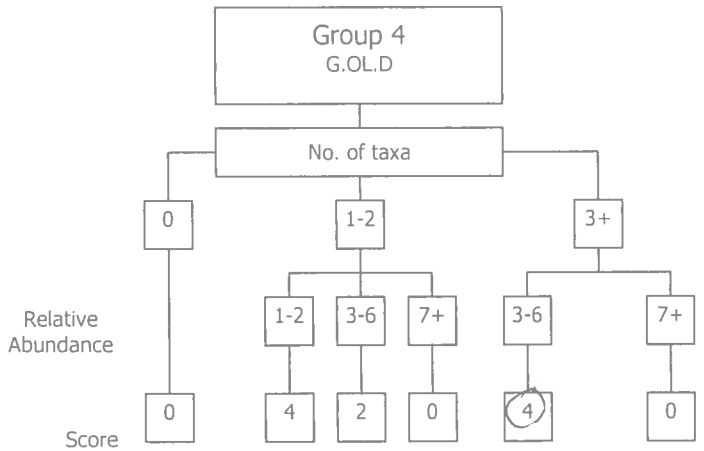
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

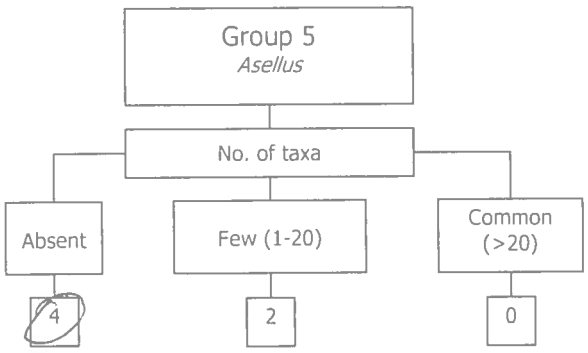
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	6
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) **22**

Average Index Score (AIS) TIS/5 (5 for 5 groups) **4.4**

SSR Score (AIS x 2) **8.8**

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): Don Smith Name (print): DON SMITH Date: 30 / 03 / 21

River:	Code:	Date:	Time:
Station no. 21250094	**Location:** Kilmacrennan		**Grid (6 figure):**
	Stream Order: 1		**Stream flow:** Riffle / Riffle/Glide / Slow flow

Field Chemistry	
DO%	89.1
DO mg/l	
Temp (°C)	6.0
Conductivity	191
pH	7.64
Bank width (cm)	
Wet width (cm)	
Avg Depth (cm)	
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

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

Filamentous Algae:
None – Present – Moderate - Abundant

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

Sample retained: Y / N

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
Stone wash x
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

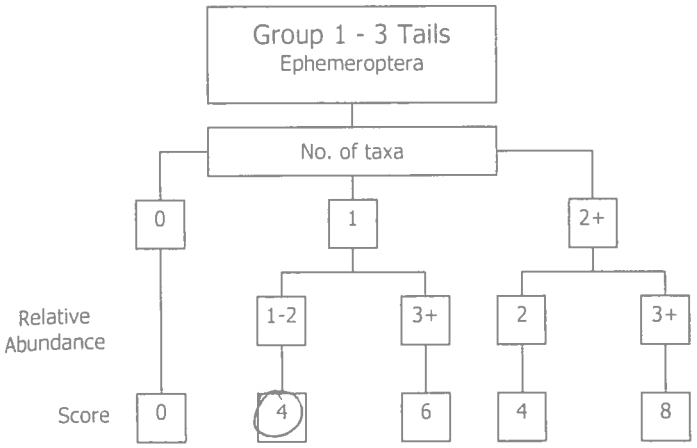
Ephemeroptera:		**Plecoptera:**	
Ecdyonurus Ab		*Leuctra* Ab	
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab	2	*Protonemura* Ab	
Ephemerella Ab		*Amphinemura* Ab	
Caenis Ab		*Perla* Ab	
Paraleptophlebia Ab		*Dinocras* Ab	
Ephemera danica Ab		Other Plecop Ab	
Other Ephem Ab		Other Plecop Ab	
Total no. of taxa	1	**Total Relative Abundance**	2
Total no. of Taxa	0	**Total Relative Abundance**	0

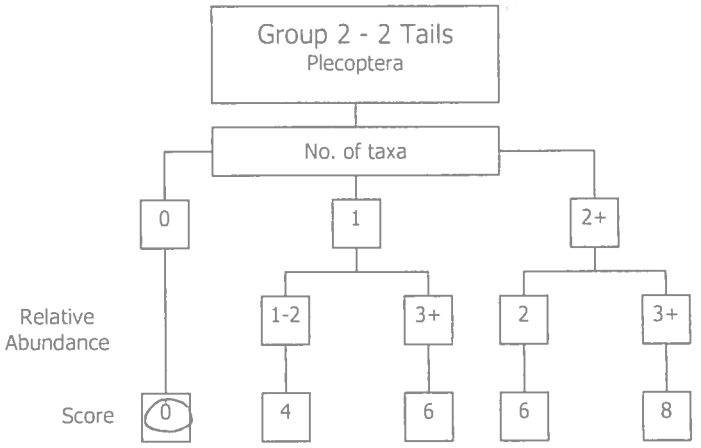
Trichoptera:		**G.OL.D:**				**Asellus:**	
Hydropsychidae Ab		*Lymnaea* (G) Ab		Chironomidae (D) Ab		Absent	
Polycentropodidae Ab		*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	X
Rhyacophila Ab	1	*Planorbis* (G) Ab		Simuliidae (D) Ab	1	Common/ Numerous	✓
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota*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

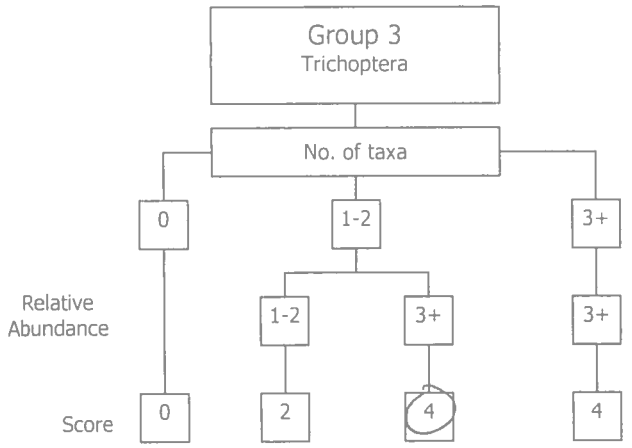
NOTE: *Asellus* must be recorded as absent if none are found

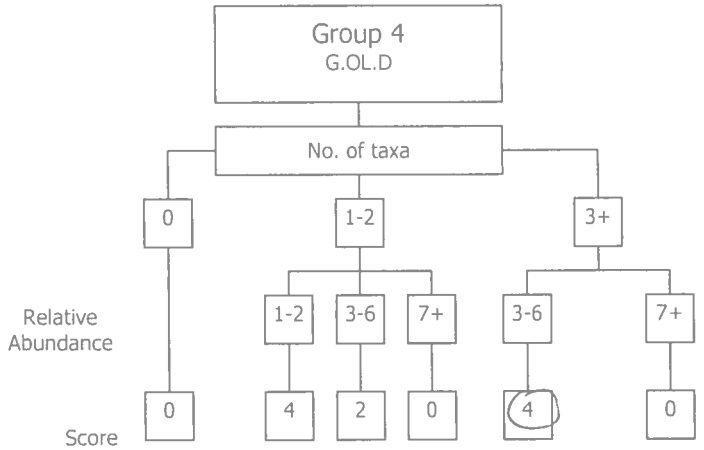
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

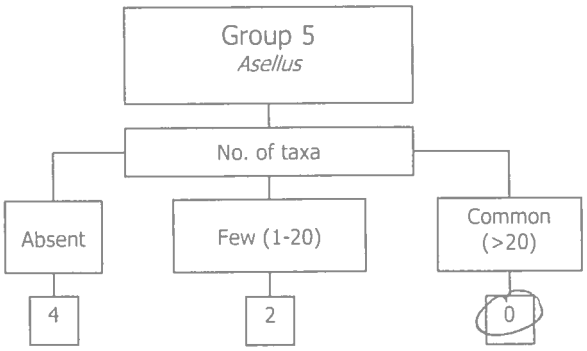
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

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

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) **12**

Average Index Score (AIS) TIS/5 (5 for 5 groups) **2.4**

SSR Score (AIS x 2) **4.8**

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): Don Smith Name (print): DON SMITH Date: 30 / 03 / 21