

# Annual Environmental Report

2019



Milford

D0342-01

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# 1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2019 AER

This Annual Environmental Report has been prepared for D0342-01, Milford, 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.

Milford WwTW is included on the Irish Water Capital Investment Programme 2018 - 2021.

## 1.2 TREATMENT SUMMARY

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

- MILFORD (DONEGAL) WWTP with a Plant Capacity PE of 920, 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
TPEFF0600D0342SW001	MILFORD (DONEGAL) 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 INCLUDED IN AER

Assessment / Report	Included in AER
Small Stream Risk Score Assessment	Yes

## 2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

### 2.1 MILFORD (DONEGAL) WWTP - TREATED DISCHARGE

#### 2.1.1 INFLUENT MONITORING SUMMARY - MILFORD (DONEGAL) 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 Nitrogen mg/l	11	34.9	19.24
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	11	130	67.84
Suspended Solids mg/l	11	154	72.79
COD-Cr mg/l	11	231	146.18
Total Phosphorus (as P) mg/l	11	4.28	2.05
Hydraulic Capacity	N/A	3966	1161

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 - TPEFF0600D0342SW001

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)
COD-Cr mg/l	125	250	N/A	11	5	1	114.86	Fail
Suspended Solids mg/l	25	62.5	N/A	11	6	3	52.38	Fail
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	10	20	N/A	11	8	6	28.17	Fail
pH pH units	9	9	N/A	11	N/A	N/A	7.23	Pass
Ammonia-Total (as N) mg/l	0.65	1.3	N/A	11	11	11	14.52	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.34	0.68	N/A	11	11	8	1.3	Fail
Total Nitrogen mg/l	N/A	N/A	N/A	11	N/A	N/A	18.15	
Conductivity 20 C $\mu$ S/cm	N/A	N/A	N/A	11	N/A	N/A	455.71	
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	11	N/A	N/A	1.81	

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):

Plant is overloaded

### Significance of Results:

The WWTP is non-compliant with ELV's set in the Wastewater Discharge Licence. The impact on the receiving waters is assessed further in Section 2.

## 2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF0600D0342SW001

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
Upstream	219277, 426509	RS39M010150	No	No	No	No	Poor
Downstream	218606, 424918	RS39M010300	No	No	No	No	Poor

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
<b>BOD - 5 days (Total) mg/l</b>	RS39M010150	1.944	RS39M010300	3.338	1.5	92.9
<b>Ammonia-Total (as N) mg/l</b>	RS39M010150	0.072	RS39M010300	0.539	0.065	719.3
<b>ortho-Phosphate (as P) - unspecified mg/l</b>	RS39M010150	0.028	RS39M010300	0.102	0.035	214.1
<b>Total Phosphorus (as P) mg/l</b>	RS39M010150	0.042	RS39M010300	0.189		
<b>Orthophosphate (MRP) filtered (As P) mg/l</b>	RS39M010150	0.025	RS39M010300	0.09		
<b>Dissolved Oxygen % Saturation</b>	RS39M010150	97.078	RS39M010300	67.443		
<b>Conductivity 20 C <math>\mu</math>S/cm</b>	RS39M010150	272.556	RS39M010300	268.556		
<b>Total Nitrogen mg/l</b>	RS39M010150	1.683	RS39M010300	2.62		
<b>Temperature °C</b>	RS39M010150	11.888	RS39M010300	10.938		
<b>pH pH units</b>	RS39M010150	7.411	RS39M010300	6.986		
<b>Suspended Solids mg/l</b>	RS39M010150	8.25	RS39M010300	15		

### Significance of Results:

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

The ambient monitoring results does not meet the required EQS. 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, BOD and Total Phosphorus , 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 unknown.

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 - MILFORD (DONEGAL) WWTP

### 2.1.4.1 Treatment Efficiency Report - MILFORD (DONEGAL) 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)
<b>TN</b>	488	460	5.67
<b>TP</b>	52	46	12
<b>SS</b>	1847	1329	28
<b>cBOD</b>	1721	715	58
<b>COD</b>	3708	2914	21

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

### 2.1.4.2 Treatment Capacity Report Summary - MILFORD (DONEGAL) 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.

MILFORD (DONEGAL) WWTP	
Peak Hydraulic Capacity (m <sup>3</sup> /day) - As Constructed	621
DWF to the Treatment Plant (m <sup>3</sup> /day)	207
Current Hydraulic Loading - annual max (m <sup>3</sup> /day)	3966
Average Hydraulic loading to the Treatment Plant (m <sup>3</sup> /day)	1161
Organic Capacity (PE) - As Constructed	920
Organic Capacity (PE) - Collected Load (peak week) <sup>Note1</sup>	1678
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 - MILFORD (DONEGAL) 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 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>	WWTP operating above capacity	1	Yes	No

### 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	219287, 426533	Yes	Unknown	Not Meeting	Unknown	Unknown	Not Monitored
TBC	TBC	No	Unknown	Not yet Assessed	Unknown	Unknown	Not Monitored
SW2	219237, 426535	Yes	Low	Meeting	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?	Yes
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes

## SWO Summary

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
<b>D0342-SIP:01</b>	Infiltration programme - diversion of storm water from the sewer collection network	C	31/12/2012	Yes	Not Started		The improvement programme will be reviewed by Irish Water to assess the works required to comply with the licence condition on a prioritised basis
<b>D0342-SIP:02</b>	Installation of storm water storage tank	C	31/12/2017	Yes	At Planning Stage	22/09/2023	

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
<b>D0342-SIP:03</b>	Redesign WWTP inlet works for better flow control	C	31/12/2012	Yes	Works Completed		
<b>D0342-SIP:05</b>	WWTP expansion and upgrade to provide tertiary treatment	C	31/12/2017	Yes	At Planning Stage	22/09/2023	Ramelton, Milford & Rathmullan will be served by 1 No. Secondary WWTP and have one discharge point.
<b>D0342-SIP:04</b>	Upgrading of Storm Water Overflows to comply with the criteria outlined in the DoECLG 'Procedures and Criteria in relation to Storm Water overflows, 1995'	C	31/12/2017	Yes	At Planning Stage	31/12/2023	

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>Priority Substances Assessment</b>	Yes	2015	No	
<b>Small Stream Risk Score Assessment</b>	Yes	2016	Yes	5.2

### 5.1 PRIORITY SUBSTANCES ASSESSMENT

The Priority Substances Assessment Report has been included in the AER 2015

### 5.2 SMALL STREAM RISK SCORE ASSESSMENT

The Small Stream Risk Score Assessment Report is included in Appendix 7.1 - Small Stream Risk Score Assessment. A summary of the findings of this report is included below.

Parameter	Value
<b>Condition 5 Improvement Programme Reference</b>	Ref. 4.2 Specified Improvement Programme

Parameter	Value
Does SSRS indicate discharges are posing a pollution risk?	Yes
Does improvement programme include any procedural and/or infrastructural works?	Yes
Downstream SSRS Water Quality Risk	N/A
SSRS Required?	Yes
Upstream SSRS Water Quality Risk	N/A
What is Downstream SSRS?	Q2-3
What is Upstream SSRS?	Q3

## 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?	Yes
List reason e.g. additional SWO identified	Ramelton, Milford & Rathmullan will be served by 1 No. Secondary WWTP and have one discharge point. A Licence review will be submitted to accommodate the combination of the various agglomerations.
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?	No
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: 16/06/2020

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

Appendix
Appendix 7.1 - Small Stream Risk Score Assessment

River: U/S Maggie's Burn  
 Station no. 19250 1388  
Milford

Code: \_\_\_\_\_ Date: 28/3/19  
 Location: Upstream  
 Stream Order: \_\_\_\_\_

Time: 11:45  
 Grid (6 figure): \_\_\_\_\_

Field Chemistry	
DO%	<u>95.6</u>
DO mg/l	
Temp (°C)	<u>10.4</u>
Conductivity	<u>271</u>
pH	<u>7.36</u>
Bank width (cm)	<u>350</u>
Wet width (cm)	<u>250</u>
Avg Depth (cm)	<u>70</u>
Staff gauge	
<b>Velocity</b>	<b>Colour</b>
Torrential	None
<u>Fast</u>	<u>Slight</u>
Moderate	Moderate
Slow	High
Very slow	
<b>Clarity</b>	<b>Discharge</b>
Very clear	Flood
<u>Clear</u>	<u>Normal</u>
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:** \_\_\_\_\_  
 Stony 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 Bog Forestry  
Urban  
 Tillage  
 Other  
**Sample retained:** Y N

**Stream flow:**  
 Riffle  
Riffle/Glide  
 Slow flow  
**Shading:** High Moderate Low None  
**Cattle access:** Y: upstream downstream or W  
**Photo:** Y / N  
**Sewage Fungus:** None Present Moderate Abundant  
**Sampled in Minutes:**  
 Pond net x x10  
 Stone wash x x10  
 Weed sweep x \_\_\_\_\_

General Comments:

### Macroinvertebrate Composition

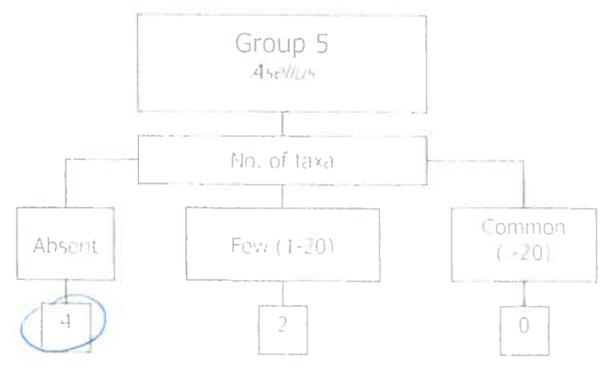
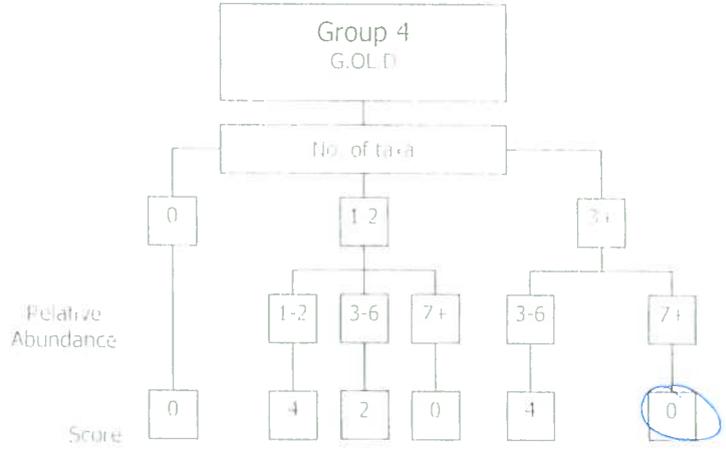
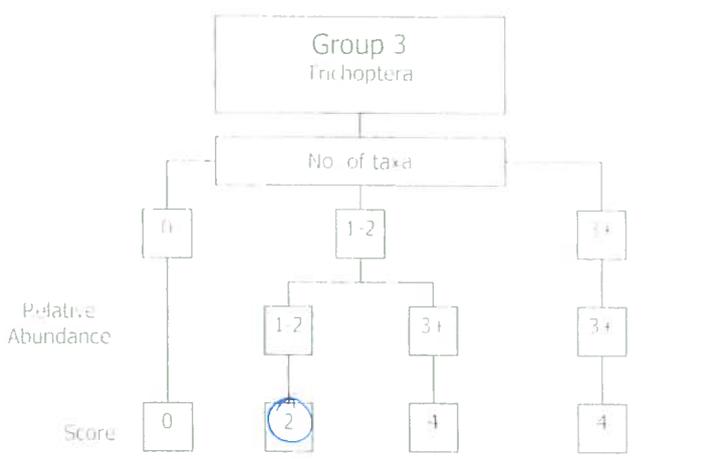
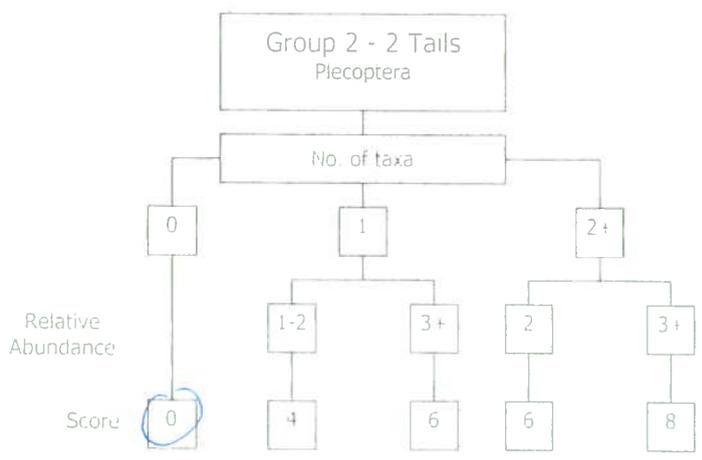
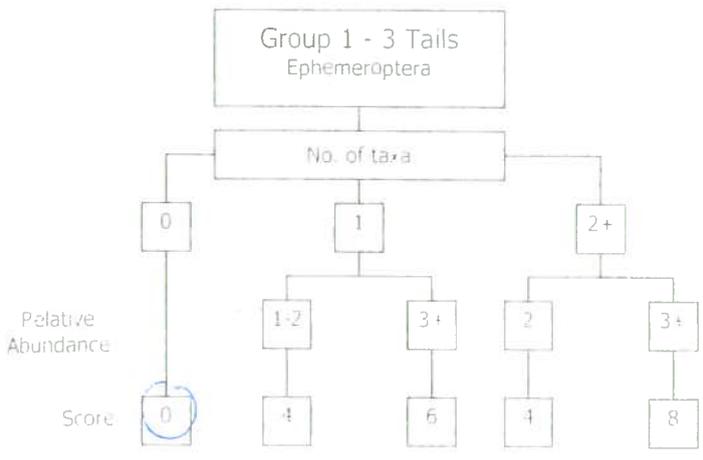
The macroinvertebrates are divided into the following 5 specific groups:  
 Group 1 = Ephemeroptera (3-tails) - note that tails may be damaged during sampling  
 Group 2 = Plecoptera (2 tails) - note that tails may be damaged during sampling  
 Group 3 = Trichoptera  
 Group 4 = G.O.L.D (Gastropoda, 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>Rhythrogena</i> Ab	_____	<i>Isoperla</i> Ab	_____
<i>Heptagenia</i> Ab	_____	<i>Protonemura</i> Ab	_____
<i>Ephemerella</i> Ab	_____	<i>Ampipemura</i> Ab	_____
<i>Caenis</i> Ab	_____	<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> <u>0</u>	<b>Total Relative Abundance</b> <u>0</u>	<b>Total no. of Taxa</b> <u>0</u>	<b>Total Relative Abundance</b> <u>0</u>
Trichoptera:		G.O.L.D:	
Hydropsychidae Ab	_____	<i>Limnoria</i> (G) Ab	_____
Polycentropodidae Ab	<u>1</u>	<i>Potamopyrgus</i> (G) Ab	<u>1</u>
<i>Rhyacophila</i> Ab	_____	<i>Panorbia</i> (G) Ab	_____
Philopotamidae Ab	_____	<i>Ancyclus</i> (G) Ab	_____
Limnephilidae Ab	_____	<i>Physa</i> (G) Ab	_____
Sericostomatidae Ab	_____	<i>Lumbriculus</i> (Ol) Ab	<u>2</u>
Glossosomatidae Ab	<u>1</u>	<i>Eiseniella</i> (Ol) Ab	<u>1</u>
Lepidostomatidae Ab	_____	Tubificidae (Ol) Ab	_____
Other Trichoptera Ab	_____		
<b>Total no. of Taxa</b> <u>2</u>	<b>Total Relative Abundance</b> <u>2</u>	<b>Total no. of Taxa</b> <u>7</u>	<b>Total Relative Abundance</b> <u>10</u>
		Asellus:	
		<i>Chironomidae</i> (D) Ab	_____
		<i>Chironomus</i> (D) Ab	<u>1</u>
		Simuliidae (D) Ab	<u>3</u>
		<i>Dicranota</i> (D) Ab	_____
		Tipulidae (D) Ab	<u>1</u>
		Ceratopogonidae (D) Ab	<u>1</u>
		Other GOLD Ab	_____
		<b>NOTE:</b> <i>Asellus</i> must be recorded as absent if none are found	
		Absent <input checked="" type="checkbox"/>	
		Few/Low _____	
		Common/Numerous _____	

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

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

Total Index Score (TIS) sum (a+b+c+d+e) 6

Average Index Score (AIS) TIS/5 (5 for 5 groups) 1.2

SSR Score (AIS x 2) 2.4

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

> 7.25 Probably not at risk

> 6.5 – 7.25 Indeterminate Stream may be at risk

< 6.5 Stream at risk

Surveyor (signed): Don Smith Name (print): DON SMITH Date: 28 / 3 / 19

River: *D/S Maggie's Burn*  
 Station no. *1925001389*

Code: \_\_\_\_\_ Date: *28/3/19*  
 Location: *Downstream*  
 Stream Order: \_\_\_\_\_

Time: *12.15.*  
 Grid (6 figure): \_\_\_\_\_

Stream flow:  
 Piffle  
 Riffle/Glide  
Slow flow

Shading: High - Moderate - Low - None  
 Cattle access: Y upstream - downstream of N

Photo: Y N

Sewage Fungus:  
 None - Present - Moderate - Abundant  
 Sampled in Minutes:  
 Pond net x  
 Stone wash x  
 Weed sweep x

Field Chemistry	
DO%	<i>82.7%</i>
DO mg/l	
Temp (°C)	<i>11°C</i>
Conductivity	<i>305</i>
pH	<i>7.17</i>
Bank width (cm)	<i>180</i>
Wet width (cm)	<i>120</i>
Avg Depth (cm)	<i>80</i>
Staff gauge	
<b>Velocity</b>	<b>Colour</b>
Torrential	None
Fast	<u>Slight</u>
<u>Moderate</u>	Moderate
Slow	High
Very slow	
<b>Clarity</b>	<b>Discharge</b>
Very clear	Flood
Clear	<u>Normal</u>
<u>Slightly turbid</u>	Low
Highly turbid	Very Low
	Dry
	Recent Flood

**Modifications:** Y/N Analysed - 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: Buddy 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 Y N  
 Forestry Other

**Sample retained:**

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.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 = An)

**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	_____
<i>Heptagenia</i> Ab	_____
<i>Ephemerella</i> Ab	_____
<i>Caenis</i> Ab	_____
<i>Paraleptophlebia</i> Ab	_____
<i>Ephemera danica</i> Ab	_____
Other Ephem Ab	_____

**Plecoptera:**

<i>Leuctra</i> Ab	_____
<i>Isoperla</i> Ab	_____
<i>Protonemura</i> Ab	_____
<i>Amphnemura</i> Ab	_____
<i>Perla</i> Ab	_____
<i>Dinocras</i> Ab	_____
Other Plecop Ab	_____
Other Plecop Ab	_____

**Trichoptera:**

Hydropsychidae Ab	_____
Polycentropodidae Ab	_____
<i>Rhyacophila</i> Ab	_____
Philopotamidae Ab	_____
Limnephilidae Ab	_____
Sericostomatidae Ab	_____
Glossosomatidae Ab	<u>1</u>
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> (Ol) Ab	<u>5</u>
<i>Eisenella</i> (Ol) Ab	_____
Tubificidae (Ol) Ab	<u>3</u>

**Asellus:**

Chironomidae (D) Ab	_____
<i>Chironomus</i> (D) Ab	_____
Simuliidae (D) Ab	<u>3</u>
<i>Dicranota</i> (D) Ab	_____
Tipulidae (D) Ab	_____
Ceratopogonidae (D) Ab	_____
Other GOLD Ab	_____

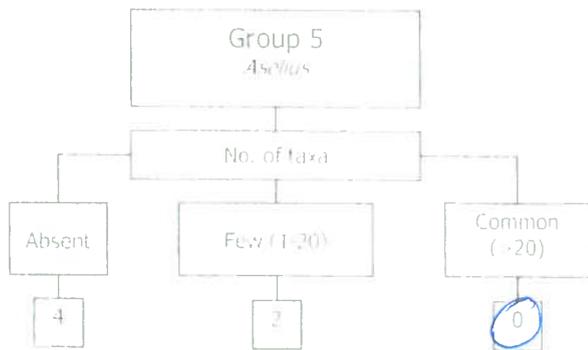
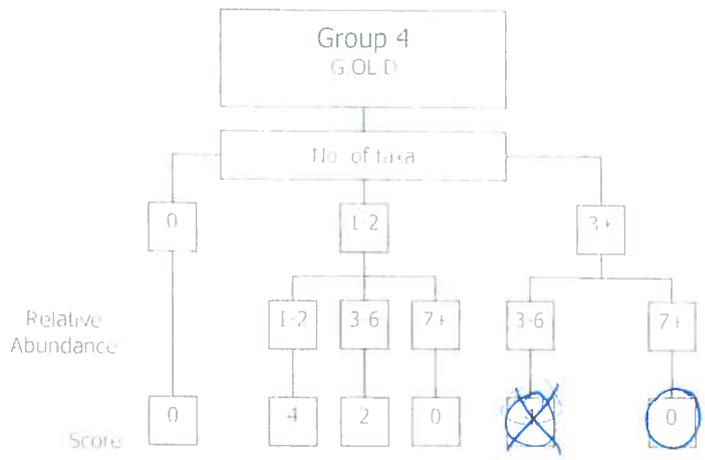
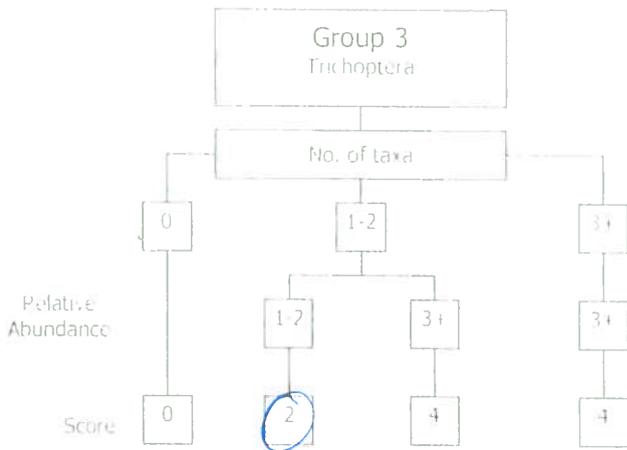
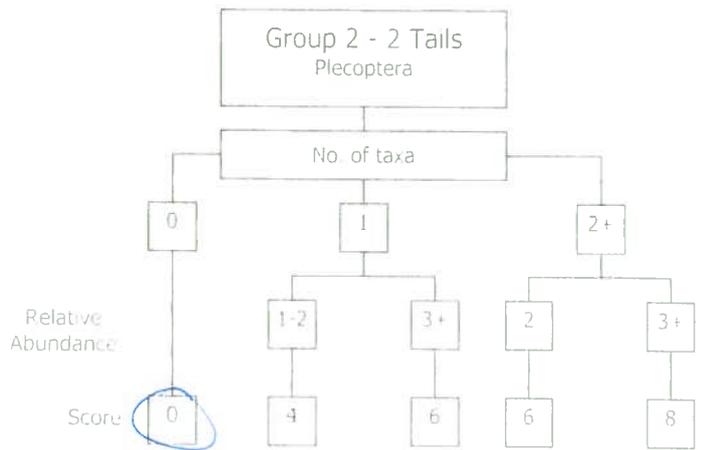
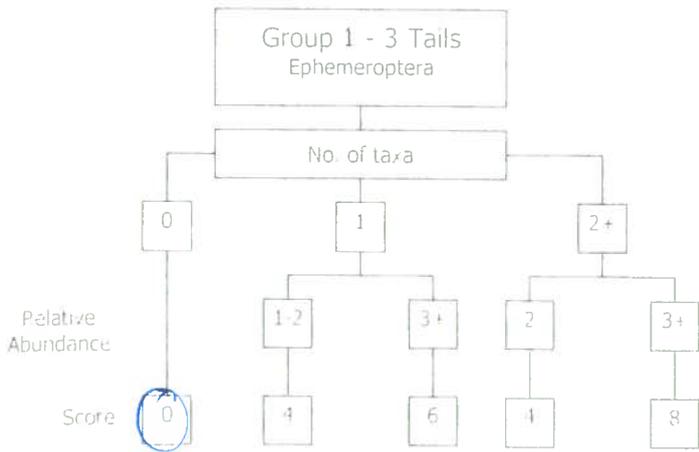
Total no. of Taxa 1 Total Relative Abundance 1

Total no. of Taxa 3 Total Relative Abundance 11

**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
- 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):

Name (print):

Date: / /