Annual Environmental Report

2022

Ballymore Eustace

D0238-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2022 AER

This Annual Environmental Report has been prepared for D0238-01, Ballymore Eustace, in Kildare 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.

There were no capital works, significant changes or operational changes undertaken in 2022.

1.2 TREATMENT SUMMARY

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

- BALLYMORE EUSTACE NEW WWTP with a Plant Capacity PE of 2000, 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
TPEFF1400D0238SW001	BALLYMORE EUSTACE NEW WWTP	Treated	Compliant	N/A

1.4 LICENCE SPECIFIC REPORTING

Assessment / Report
Small Stream Risk Score Assessment

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 BALLYMORE EUSTACE NEW WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - BALLYMORE EUSTACE NEW WWTP

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

Parameters	Number of Samples	Annual Max	Annual Mean
Total Phosphorus (as P) mg/l	11	10	5.95
Ammonia-Total (as N) mg/l	11	90	56
BOD, 5 days with Inhibition (Carbonaceous) mg/l	11	245	158
ortho-Phosphate (as P) - unspecified mg/l	11	2.90	1.52
COD-Cr mg/l	11	1344	715
Suspended Solids mg/l	11	693	281
pH pH units	11	6.95	6.54
Hydraulic Capacity	N/A	304	131

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 - TPEFF1400D0238SW000

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	11	N/A	N/A	19	Pass
Suspended Solids mg/l	35	88	N/A	11	N/A	N/A	5.80	Pass
BOD, 5 days with Inhibition (Carbonaceous) mg/l	25	50	N/A	11	N/A	N/A	2.37	Pass
pH pH units	6.00	9.00	N/A	11	N/A	N/A	6.25	Pass
Ammonia-Total (as N) mg/l	5.00	6.00	N/A	11	N/A	N/A	0.328	Pass
Total Phosphorus (as P) mg/l	2.00	2.40	N/A	11	N/A	N/A	0.526	Pass
ortho-Phosphate (as P) - unspecified mg/l	1.00	1.20	N/A	11	N/A	N/A	0.283	Pass

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)
Faecal coliforms MPN/100ml	N/A	N/A	N/A	6	N/A	N/A	5523	
Conductivity @20°C µS/cm	N/A	N/A	N/A	10	N/A	N/A	577	

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):

Not applicable

Significance of Results:

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

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF1400D0238SW000

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	292660, 209723	RS09L010400	No	No	No	No	Good
Downstream	292478, 209783	RS09L010500	No	No	No	No	Good

The table below provides a summary of monitoring results for designated ambient monitoring points. The upstream and downstream annual mean values are shown (mg/l), and the difference between both monitoring stations is given as a percentage of the Environmental Quality Standard (EQS) where relevant.

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
BOD - 5 days (Total) mg/l	RS09L010400	0.766	RS09L010500	0.806	1.50	2.7
Ammonia-Total (as N) mg/l	RS09L010400	0.069	RS09L010500	0.065	0.065	-6.1
ortho-Phosphate (as P) - unspecified mg/l	RS09L010400	0.008	RS09L010500	0.007	0.035	-4
Nitrite (as N) µg/l	RS09L010400	6.21	RS09L010500	6.23	N/A	

Parameter Name	Upstream Monitoring Point Location	Upstream Monitoring Point Annual Mean	Downstream Monitoring Point Location	Downstream Monitoring Point Annual Mean	EQS	% of EQS
Dissolved Oxygen % Saturation	RS09L010400	98	RS09L010500	102	N/A	
Dissolved Oxygen mg/l	RS09L010400	10	RS09L010500	11	N/A	
Conductivity @25°C µS/cm	RS09L010400	170	RS09L010500	184	N/A	
Total Oxidised Nitrogen (as N) mg/l	RS09L010400	0.886	RS09L010500	0.948	N/A	
Alkalinity-total (as CaCO3) mg/l	RS09L010400	61	RS09L010500	67	N/A	
Nitrate (as N) mg/l	RS09L010400	0.882	RS09L010500	0.944	N/A	
pH pH units	RS09L010400	7.80	RS09L010500	7.88	N/A	
True Colour mg/litre Pt Co	RS09L010400	43	RS09L010500	44	N/A	
Chloride mg/l	RS09L010400	10	RS09L010500	11	N/A	
Temperature °C	RS09L010400	13	RS09L010500	13	N/A	
Total Hardness (as CaCO3) mg/l	RS09L010400	73	RS09L010500	81	N/A	

Significance of Results:

The WWTP discharge was 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 BOD concentration downstream of the effluent discharge is noted.

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

As per the 3rd Cycle Draft Liffey and Dublin Bay Catchment Report (HA 09), the significant pressures on the At Risk Liffey_050 waterbody are Agriculture, Domestic Waste Water & Hydromorphology

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 - BALLYMORE EUSTACE NEW WWTP

2.1.4.1 Treatment Efficiency Report - BALLYMORE EUSTACE NEW WWTP

Treatment efficiency is based on the removal of key pollutants from the influent wastewater by the treatment plant. In essence the calculation is based on the balance of load coming into the plant versus the load leaving the plant. The efficiency is presented as a percentage removal rate.

A summary presentation of the efficiency of the treatment process including information for all the parameters specified in the licence is included below:

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
cBOD	6514	98	99
SS	11600	239	98
TP	245	22	91
COD	29459	800	97

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

2.1.4.2 Treatment Capacity Report Summary - BALLYMORE EUSTACE NEW 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.

BALLYMORE EUSTACE NEW WWTP	
Peak Hydraulic Capacity (m^3/day) - As Constructed	1350
DWF to the Treatment Plant (m^3/day)	450
Current Hydraulic Loading - annual max (m^3/day)	304
Average Hydraulic loading to the Treatment Plant (m^3/day)	131
Organic Capacity (PE) - As Constructed	2000
Organic Capacity (PE) - Collected Load (peak week)[Note1]	844
Organic Capacity (PE) - Remaining	1156
Will the capacity be exceeded in the next three years? (Yes/No)	No

Note 1: 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 - BALLYMORE EUSTACE NEW 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 2022.			

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 Uisce Éireann 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)
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes

Incident Type	Cause	No. of incident occurrences	Recurring (Y/N)	Closed (Y/N)
Uncontrolled release	SWO exceptional rainfall and overflow expected	1	No	Yes

3.2.2 SUMMARY OF OVERALL INCIDENTS

Question	Answer
Number of Incidents in 2022	4
Number of Incidents reported to the EPA via EDEN in 2022	4
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 2022 (No. of events)	Total volume discharged in 2022 (m^3)	Monitoring Status
New SW2	Unknown	Yes	Low Significance	Meeting Criteria	Unknown	867	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 monitored SWOs in the agglomeration in the year (m^3)?	867
Is each SWO identified as not meeting DoEHLG Guidance included in the Programme of Improvements?	N/A
The SWO Assessment included the requirements of relevant of WWDL schedules?	Yes
Have the EPA been advised of any additional SWOs / changes to Schedule C3 and A4 under Condition 1.7?	No

4.2 REPORT ON PROGRESS MADE AND PROPOSALS BEING DEVELOPED TO MEET THE IMPROVEMENT PROGRAMME REQUIREMENTS.

4.2.1 SPECIFIED IMPROVEMENT PROGRAMME SUMMARY

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

Specified Improvement Programmes (under Schedule A and C of WWDL)	Description	Licence Schedule	Licence Completion Date	Date Expired? (N/NA/Y)	Status of Works	Timeframe for Completing the Work	Comments
D0238-SIP:01	Discharges from SW1-P (existing WWTP discharge) to cease	A	31/12/2012	Yes	Works Completed		
D0238-SIP:02	SW2 - Upgrading of SWO to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995".	C	31/12/2012	Yes	Works Completed		
D0238-SIP:03	SW3 - Upgrading of SWO to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995".	C	31/12/2012	Yes	Works Completed		
D0238-SIP:04	Waste Water treatment plant and ancillary works	C	31/12/2012	Yes	Works Completed		

A summary of the status of any other improvements identified by under Condition 5 assessments- is included below.

4.2.2 IMPROVEMENT PROGRAMME SUMMARY

Improvement Identifier	Improvement Description / or any Operational Improvements	Improvement Source	Expected Completion Date	Comments
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	2011	No
Small Stream Risk Score Assessment	Yes	2017	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
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	N/A

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

Date: 23/02/2023

This AER has been produced by Uisce Éireann'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

There are no Appendices included.

Ballymore Eustace Small Stream Risk Score 2022

Produced by

AQUAFACT International Services Ltd

For

Kildare County Council

November 2022

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Report Approval Sheet

Client	Kildare County Council
Report Title	Ballymore Eustace Small Stream Risk Score 2022
Job Number	JN1741
Report Status	Final
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Rev	Status	Issue Date	Document File Name	Author (s)	Approved by:
1	Draft	30/11/2022	JN1741 Ballymore Eustace SSRS 2022	Aaron Skehan	E. McCormack
2	Final	05/12/2022	JN1741 Ballymore Eustace SSRS 2022 Final	Aaron Skehan	E. McCormack

AQUAFACT
APEM Group

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1. Introduction

AQUAFACT was contracted by Kildare County Council to carry out an SSRS assessment of the discharge belonging to Ballymore Eustace wastewater treatment plants. A sample was taken upstream and downstream of the discharge point. The sampling was carried out on the 25th of October 2022.

2. Methodology

2.1. Sampling

Two kick samples were taken (See Figure 2.1 and Table 2.1). The two-minute kick and one minute stone wash sampling method was employed to collect samples of macroinvertebrates for analysis. This involved placing a standard hand net of pore size 500µm in the river, facing upstream and disturbing the riverbed in front of the net mouth. The surveyor then moved in a diagonal direction upstream to ensure that different micro-habitats were included in the sample. Net sweepings of any submerged marginal plants were also conducted. The kick sample method dislodges macroinvertebrates from the substrates and submerged plant material. This was continued for approximately two minutes and followed by one minute of stone washing (Lucey *et al.*, 1999).

The macroinvertebrate assemblages of each sample were returned to the lab, preserved in 70% industrial methylated spirits, identified and enumerated. The details of the macroinvertebrate assemblages were recorded on data sheets. The resulting species list was then used to assign the SSRS score to the sampled streams.

The IFI's 2010 Biosecurity Protocol for Field Survey Work document was followed during sampling. Nets and all other equipment were thoroughly disinfected between stations.

Figure 2.1: Ballymore Eustace SSRS sampling sites.

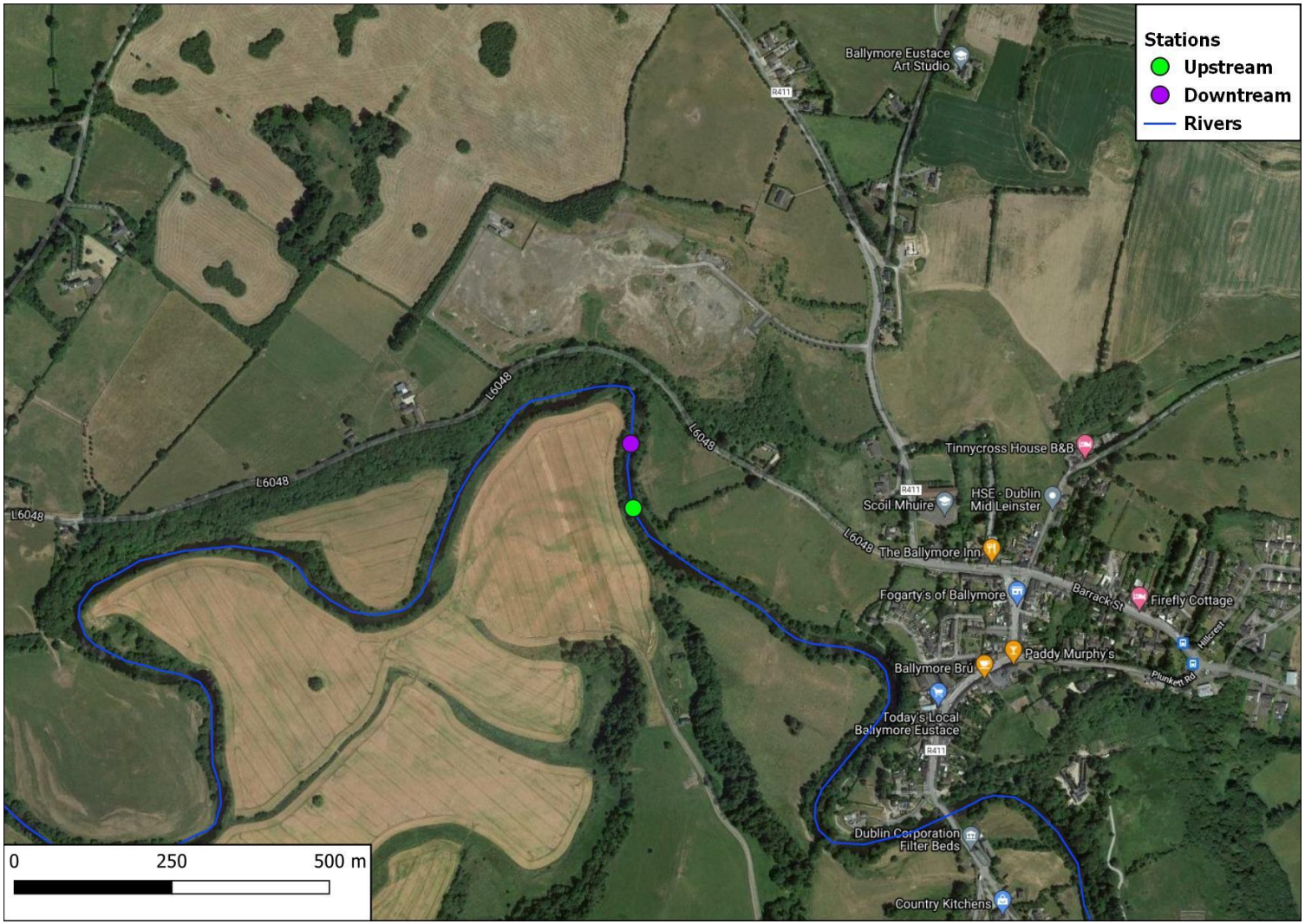


Table 2.1: Ballymore Eustace SSRS station coordinates.

Station	Easting	Northing
Ballymore Eustace aSW1-PU	292154	210202
Ballymore Eustace aSW1-PD	292148	210304

2.2. Small Stream Risk Score

The Small Streams Risk Score (SSRS) is a biological risk assessment system for identifying rivers that are 'at risk' of failing to achieve the 'good' water quality status goals of the Water Framework Directive (WFD). It was developed by the Environmental Protection Agency (EPA) in association with the Western River Basin District (WRBD) in 2006 and revised in 2009.

The SSRS method is a rapid field methodology for risk assessment that is based solely on macroinvertebrate indicators of water quality and their well-understood response to pollution. Importantly, the SSRS score indicates whether or not the stream is at risk from pollution and is not a measurement of the ecological health of the stream. The SSRS score ranges from 0-11.2. Table 3.1 presents a list of the taxa recorded in each sample and their relative abundance.

Table 2.2: SSRS Categories.

SSRS range	Category
<6.5	Stream at Risk
>6.5-7.25	Indeterminate stream may be at risk
>7.25	Probably not at risk

3. Results

Table 3.1 presents a list of the taxa recorded in each sample and their relative abundance, and Table 3.2 presents the SSRS. The full SSRS data sheets and scoring are presented in Appendix 2. Both the upstream and downstream station were categorised as 'Probably not at Risk'. The river substrate was the same at both stations with a mix of boulders, cobbles and gravel. The flow in the river was torrential and the water very clear. There was no siltation present. The habitat is suitable for white-clawed crayfish although none were captured or observed during sampling.

Table 3.1: SSRS relative abundance of taxa

Taxa	Upstream	Downstream
Trichoptera		
Limnephilidae	1	
Polycentropodidae	1	1
Hydropsychidae	5	5
Rhyacophila	1	3
Ephemeroptera		
Heptagenia	3	2
Plecoptera		
Leuctra	2	1
Gastropoda		
Ancylus	2	
Diptera		
Chironimidae	2	1
Tipulidae		1

Table 3.2: Biological sampling results.

Station	SSRS score	SSRS category
Ballymore Eustace aSW1-PU	8.0	Probably not at Risk
Ballymore Eustace aSW1-PD	8.0	Probably not at Risk

4. Ballymore Eustace WWTP comparison 2015 to 2022

Table 4.1 compares the SSRS results from 2015 to 2022 and Figure 4.1 displays the trend over time. The downstream station was categorised as 'Probably not at risk' in 2017, 2018, 2020, 2021 and 2022. The upstream station has an improved score, compared to the 'At risk' in 2021. However, the upstream station was 'Probably not at risk' in 2015, 2018 and 2020. Apart from 2019 the downstream station has been categorised as not at risk since 2017. In those years the downstream station has also recorded a higher SSRS score except for 2018.

Table 4.1: Ballymore Eustace WWTP- SSRS Comparison 2015 -2022

Site	SSRS								SSRS Risk Category							
	2015	2016	2017	2018	2019	2020	2021	2022	2015	2016	2017	2018	2019	2020	2021	2022
U/S	8.0	3.2	5.6	9.6	n/a	8.0	4	8.0	PNAR	AR	AR	PNAR	n/a	PNAR	AR	PNAR
D/S	7.2	4.8	8.8	8.0	n/a	8.8	8.0	8.0	Indet.	AR	PNAR	PNAR	n/a	PNAR	PNAR	PNAR

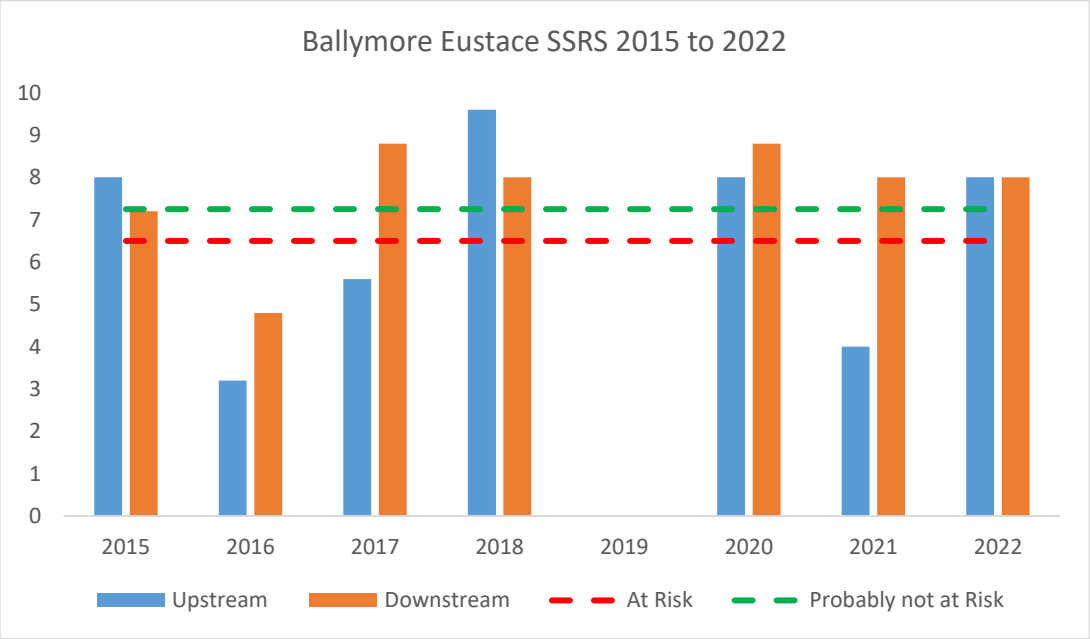


Figure 4.1: Ballymore Eustace WWTP SSRS scores 2015 to 2022

5. References

EPA. 2015. Guidance on Application and Use of the SSRS in Enforcement of Urban Waste Water Discharge Authorisations in Ireland. https://www.epa.ie/publications/compliance--enforcement/waste-water/SSRS-in-Enforcement-of-UWWDAs.pdf Accessed September 2021.

Lucey, J., Bowman, J.J., Klabby, K.J., Cunningham, P., Lehane, M., MacCarthaigh, M., McGarrigle, M.L. and Toner, P.F. 1999. Water Quality in Ireland, 1995 – 1997. EPA.

Appendix 1

Photo log

Ballymore Eustace upstream

Ballymore Eustace downstream

Appendix 2

SSRS Data Sheets

BALLYMORE EUSTACE UPSTREAM

River: LIFFEY	**Code:**	**Date:** 25-10-22	**Time:** 13.45
Station no. UPSTREAM	**Location:** BALLYMORE EUSTACE		**Grid (6 figure):**
	Stream Order:		**Stream flow:** Riffle ~~Riffle~~ (Riffle/Glide) Slow flow

Field Chemistry	
DO%	
DO mg/l	
Temp (°C)	
Conductivity	
pH	
Bank width (cm)	7m
Wet width (cm)	6M
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

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) ~~Bog~~ Forestry (Urban) Tillage Other

Sample retained: Y / N

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	5
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab	30	*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 Relative Abundance** 3	**Total no. of Taxa** 2	**Total Relative Abundance** 2

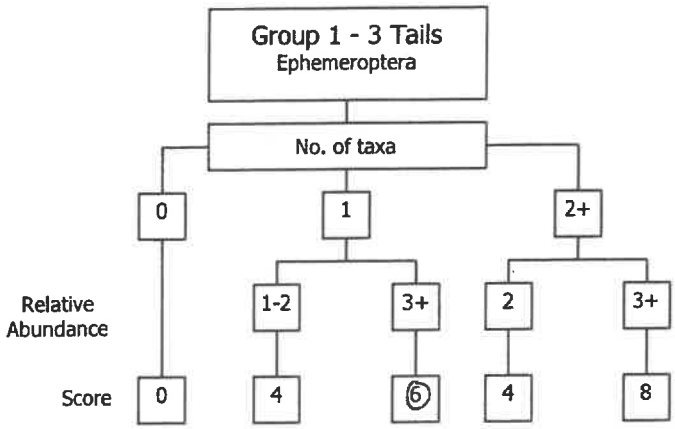
Trichoptera:		**G.OL.D:**			**Asellus:**	
Hydropsychidae Ab	10	*Lymnaea* (G) Ab		Chironomidae (D) Ab	15	Absent	
Polycentropodidae Ab	3	*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	✓
Rhyacophila Ab	1	*Planorbis* (G) Ab	6	Simuliidae (D) Ab		Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab	1	*Physa* (G) Ab		Tipulidae (D) Ab			
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab		*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab							
Total no. of Taxa 4	**Total Relative Abundance** 8	**Total no. of Taxa** 2		**Total Relative Abundance** 4			

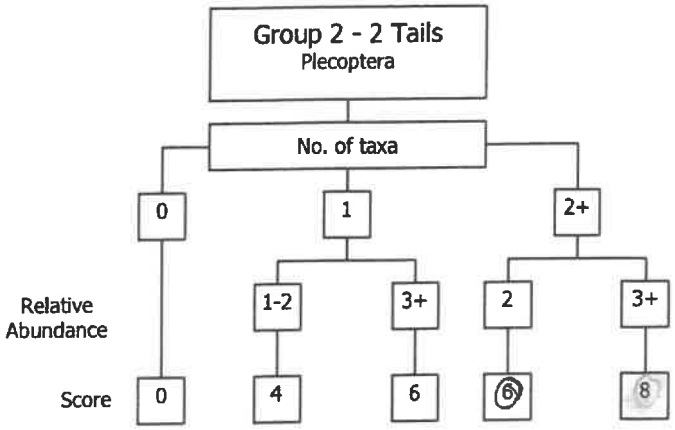
NOTE: *Asellus* must be recorded as absent if none are found

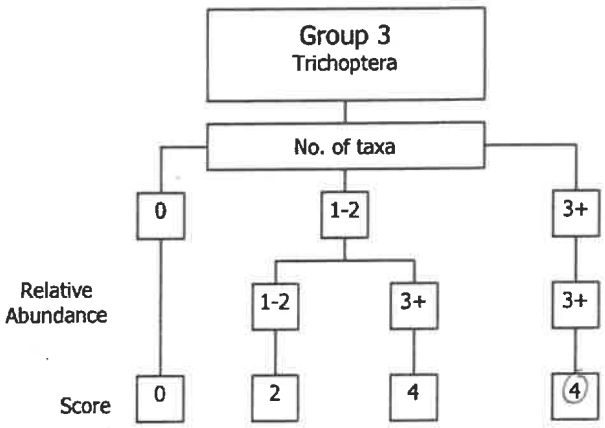
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

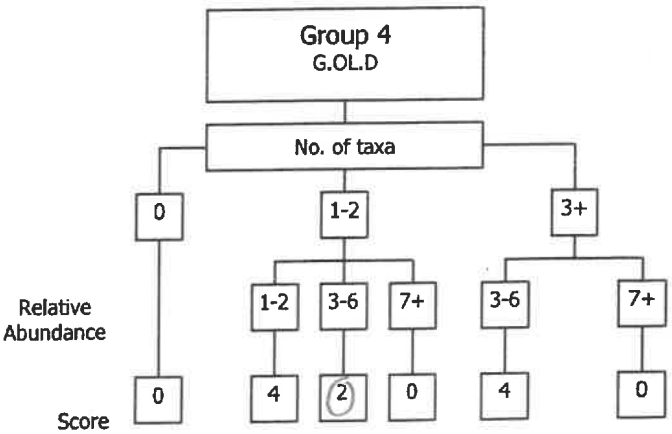
BALLYMORE EUSTACE UPSTREAM

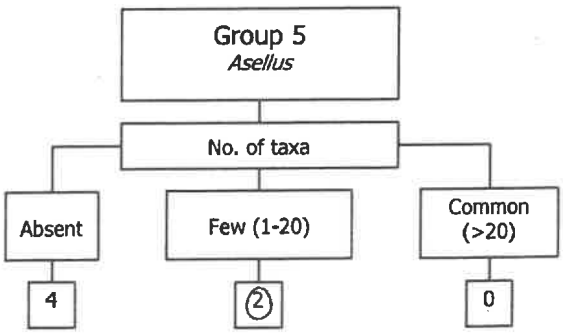
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	6
b) Index Score Group 2	6
c) Index Score Group 3	4
d) Index Score Group 4	2
e) Index Score Group 5	2

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) **8.0**

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): Karen Mahon Name (print): AARON SKEHAN Date: 25 / 10 / 22

BALLYMORE EUSTACE DOWNSTREAM

River: LIFFEY	**Code:**	**Date:** 25-10-22	**Time:** 13.36
Station no.	**Location:** BALLYMORE EUSTACE		**Grid (6 figure):**
	Stream Order:		**Stream flow:** Riffle / (Riffle/Glide) / Slow flow

Field Chemistry	
DO%	
DO mg/l	
Temp (°C)	
Conductivity	
pH	
Bank width (cm)	8m
Wet width (cm)	7m
Avg Depth (cm)	30
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

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
Stone wash x
Weed sweep x

General Comments:
CONSTRUCTION NEARBY

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	2
Rhithrogena Ab		*Isoperla* Ab	
Heptagenia Ab	8	*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** 1	**Total Relative Abundance** 1

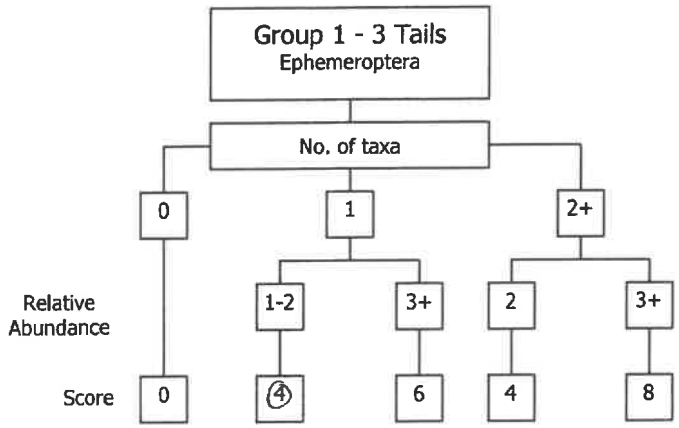
Trichoptera:		**G.OL.D:**				**Asellus:**	
Hydropsychidae Ab	110	*Lymnaea* (G) Ab	1	Chironomidae (D) Ab	2	Absent	✓
Polycentropodidae Ab	4	*Potamopyrgus* (G) Ab		*Chironomus* (D) Ab		Few/Low	
Rhyacophila Ab	21	*Planorbis* (G) Ab		Simuliidae (D) Ab		Common/ Numerous	
Philopotamidae Ab		*Ancylus* (G) Ab		*Dicranota* (D) Ab			
Limnephilidae Ab		*Physa* (G) Ab		Tipulidae (D) Ab	1		
Sericostomatidae Ab		*Lumbriculus* (Ol) Ab		Ceratopogonidae (D) Ab			
Glossosomatidae Ab		*Eiseniella* (Ol) Ab		Other GOLD Ab			
Lepidostomatidae Ab		Tubificidae (Ol) Ab					
Other Trichoptera Ab							
Total no. of Taxa 3	**Total Relative Abundance** 9	**Total no. of Taxa** 3		**Total Relative Abundance** 3			

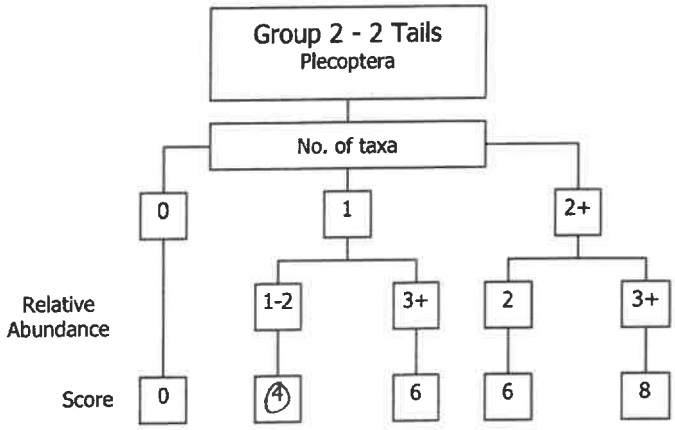
NOTE: *Asellus* must be recorded as absent if none are found

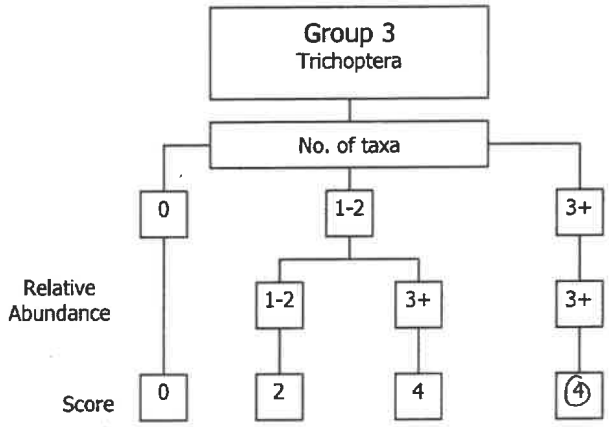
NOTE *Baetis* is an Ephemeropteran and is the most commonly occurring invertebrate genus in streams in Ireland. It is vital that *Baetis* is not counted in SSRS. See Appendix B for more details on how to identify *Baetis*.

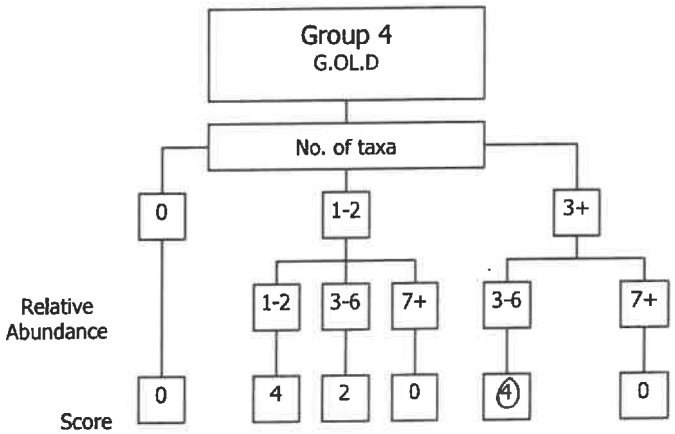
BALLYMORE EUSTACE DOWNSTREAM

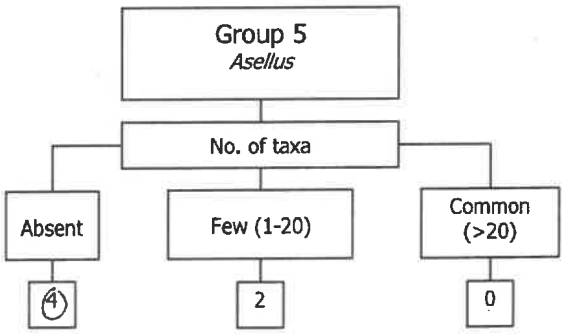
Step 1. Calculate the Index Score by circling the appropriate box representing the total number of taxa and the total abundance calculated from ***each macroinvertebrate group*** calculated from page 1 of the recording sheet and enter in to the boxes in Step 2.











Step 2

a) Index Score Group 1	4
b) Index Score Group 2	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)	20	Average Index Score (AIS) TIS/5 (5 for 5 groups)	4	**SSR Score** (AIS x 2)	8.0

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): AARON SKEHAN Date: 25 / 10 / 22