

Annual Environmental Report

2019



Mitchelstown

D0202-01

CONTENTS

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2019 AER

- 1.1 ANNUAL STATEMENT OF MEASURES
- 1.2 TREATMENT SUMMARY
- 1.3 ELV OVERVIEW
- 1.4 LICENSE SPECIFIC REPORT INCLUDED IN AER

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

- 2.1 MITCHELSTOWN WWTP - TREATED DISCHARGE
 - 2.1.1 INFLUENT SUMMARY - MITCHELSTOWN WWTP
 - 2.1.2 EFFLUENT MONITORING SUMMARY - MITCHELSTOWN WWTP -
 - 2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE -
 - 2.1.4 OPERATIONAL REPORTS SUMMARY FOR MITCHELSTOWN WWTP
 - 2.1.5 SLUDGE/OTHER INPUTS TO MITCHELSTOWN WWTP

3 COMPLAINTS AND INCIDENTS

- 3.1 COMPLAINTS SUMMARY
- 3.2 REPORTED INCIDENTS SUMMARY
 - 3.2.1 SUMMARY OF INCIDENTS
 - 3.2.2 SUMMARY OF OVERALL INCIDENTS

4 INFRASTRUCTURAL ASSESSMENT AND PROGRAMME OF IMPROVEMENTS

- 4.1 STORM WATER OVERFLOW IDENTIFICATION AND INSPECTION REPORT
 - 4.1.1 SWO IDENTIFICATION AND INSPECTION SUMMARY REPORT
- 4.2 REPORT ON PROGRESS MADE AND PROPOSALS BEING DEVELOPED TO MEET THE IMPROVEMENT PROGRAMME REQUIREMENTS
 - 4.2.1 SPECIFIED IMPROVEMENT PROGRAMME SUMMARY
 - 4.2.2 IMPROVEMENT PROGRAMME SUMMARY
 - 4.2.3 SEWER INTEGRITY RISK ASSESSMENT

5 LICENCE SPECIFIC REPORTS

- 5.1 PRIORITY SUBSTANCES ASSESSMENT

6 CERTIFICATION AND SIGN OFF

- 6.1 SUMMARY OF AER CONTENTS

7 APPENDIX

7.1 AMBIENT MONITORING SUMMARY

1 EXECUTIVE SUMMARY AND INTRODUCTION TO THE 2019 AER

This Annual Environmental Report has been prepared for D0202-01, Mitchelstown, in Cork 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.

1.2 TREATMENT SUMMARY

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

- Mitchelstown WWTP with a Plant Capacity PE of 5,600 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
TPEFF0500D0202SW001	Mitchelstown WWTP	Treated	Non-Compliant	Ammonia-Total (as N) mg/l

1.4 LICENCE SPECIFIC REPORTING INCLUDED IN AER

Assessment / Report	Included in AER
There are no Licence Specific Reports included in the AER.	

2 TREATMENT PLANT PERFORMANCE AND IMPACT SUMMARY

2.1 MITCHELSTOWN WWTP - TREATED DISCHARGE

2.1.1 INFLUENT MONITORING SUMMARY - MITCHELSTOWN 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	12	60.2	32.15
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	12	704	248.43
COD-Cr mg/l	12	1800	532.48
Total Phosphorus (as P) mg/l	12	10.31	4.01
Hydraulic Capacity	N/A	8904	2140

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 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 - TPEFF0500D0202SW001

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)
Chloride mg/l	2000	2400	N/A	12	N/A	N/A	1016.73	Pass
Sulphate mg/l	600	720	N/A	12	N/A	N/A	118.6	Pass
COD-Cr mg/l	80	160	N/A	12	N/A	N/A	26.59	Pass
Suspended Solids mg/l	15	37.5	N/A	12	N/A	N/A	7.79	Pass
pH pH units	9	9	N/A	12	N/A	N/A	7.99	Pass
BOD, 5 days with Inhibition (Carbonaceous BOD) mg/l	7	14	N/A	12	N/A	N/A	5.38	Pass
Ammonia-Total (as N) mg/l	0.5	0.6	N/A	12	11	11	1.89	Fail
ortho-Phosphate (as P) - unspecified mg/l	0.3	0.36	N/A	12	N/A	N/A	0.07	Pass
Fats, Oils & Greases mg/l	N/A	N/A	N/A	8	N/A	N/A	30.38	
Conductivity 20 C μ S/cm	N/A	N/A	N/A	11	N/A	N/A	10944.92	

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)
Total Phosphorus (as P) mg/l	N/A	N/A	N/A	12	N/A	N/A	0.16	
Total Nitrogen mg/l	N/A	N/A	N/A	12	N/A	N/A	7.11	

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):

The Ammonia concentrations in treated effluent from Mitchelstown WWTP exceeds the WWDL ELV of 0.5 mg/l. The existing WWTP is not designed for the treatment of wastewater to the Emission Limit Values prescribed in WWDL D0202-01.

Significance of Results:

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

2.1.3 AMBIENT MONITORING SUMMARY FOR THE TREATMENT PLANT DISCHARGE TPEFF0500D0202SW001

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	180636, 114351	RS18F050150	No	No	Yes	No	Poor
Downstream	179248, 113246	RS18F050200	No	No	Yes	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.

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. 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 Ortho-P and ammonia concentrations downstream of the effluent discharge is noted.

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 - MITCHELSTOWN WWTP

2.1.4.1 Treatment Efficiency Report - Mitchelstown 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	N/A	14424	N/A
TN	19157	11066	42

Parameter	Influent mass loading (kg/year)	Effluent mass emission (kg/year)	Efficiency (% reduction of influent load)
COD	317315	41362	87
cBOD	148042	8371	94
TP	2390	241	90

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

2.1.4.2 Treatment Capacity Report Summary - Mitchelstown 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.

Mitchelstown WWTP	
Peak Hydraulic Capacity (m³/day) - As Constructed	4860
DWF to the Treatment Plant (m³/day)	1620
Current Hydraulic Loading - annual max (m³/day)	8904
Average Hydraulic loading to the Treatment Plant (m³/day)	2140
Organic Capacity (PE) - As Constructed	6000
Organic Capacity (PE) - Collected Load (peak week)^{Note1}	6000
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 - MITCHELSTOWN 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)
Domestic /Septic Tank Sludge	1200	Volume (m3)	5333	0	Yes	Yes	No

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
There were no relevant environmental complaints in 2019.			

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)
Uncontrolled release	Blocked Sewer	1	No	Yes
Uncontrolled release	Blocked Sewer	1	No	Yes
Uncontrolled release	Inadequate Infrastructure	1	No	No

Uncontrolled release	EO caused by power failure	1	No	No
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 2019	5
Number of Incidents reported to the EPA via EDEN in 2019	5
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
SW2-MITC	181006, 113316	Yes	Medium	Not Meeting	Unknown	Unknown	Monitored
SW3-MITC	181857, 113075	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW5-MITC (a)	181638, 113133	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW5-MITC (c)	181638, 113133	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW5-MITC (f)	181638, 113133	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW6-MITC	181537, 113217	Yes	Low	Meeting	Unknown	Unknown	Not Monitored

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
TBC	182084, 113102	No	Low	Meeting	Unknown	Unknown	Not Monitored
TBC	181666, 113121	No	Low	Meeting	Unknown	Unknown	Not Monitored
SW4-MITC	182454, 111778	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW5-MITC (b)	181638, 113133	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW5-MITC (d)	181638, 113133	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW5-MITC (e)	181638, 113133	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW5-MITC (g)	181638, 113133	Yes	Low	Meeting	Unknown	Unknown	Not Monitored
SW7-MITC	181702, 113262	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?	

SWO Summary	
The SWO Assessment included the requirements of relevant of WWDL schedules?	Unknown
Have the EPA been advised of any additional SWOs / changes to Schedule C3 and A4 under Condition 1.7?	Unknown

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
D0202-SIP:02	Upgrading of 4 Storm Water Overflows to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995" (SW3 - MITC)	C	31/12/2020	No	Not Started		SWO Assessment Programme to assess performance against DoECLG criteri

D0202-SIP:04	Upgrading of 4 Storm Water Overflows to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995" (SW5 - MITC)	C	31/12/2020	No	Not Started		SWO Assessment Programme to assess performance against DoECLG criteri
D0202-SIP:01	Upgrading of 4 Storm Water Overflows to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995" (SW2 - MITC)	C	31/12/2020	No	Not Started		SWO Assessment Programme to assess performance against DoECLG criteri
D0202-SIP:03	Upgrading of 4 Storm Water Overflows to comply with the criteria outlined in the DoEHLG "Procedures and Criteria in relation to Storm Water Overflows, 1995" (SW4 - MITC)	C	31/12/2020	No	Not Started		SWO Assessment Programme to assess performance against DoECLG criteri

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
D0202-IP:23	WWTP Upgrade. The drivers for the Mitchelstown works are primarily 1) compliance with the Urban Waste Water Treatment Directive ELV Limits. 2) elimination of avoidable overflows from Storm Tank to River Gradoge. Also, Irish Water plan to reduce existing inflows by enforcement of discharge licence requirements.	Incident Reduction	23/12/2022	

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
Priority Substances Assessment	Yes	2011	No	

5.1 PRIORITY SUBSTANCES ASSESSMENT

The Priority Substances Assessment Report has been included in the AER 2011

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	Yes
List reason e.g. changes to monitoring requirements	Change of Ambient Monitoring Locations: Upstream & Downstream
Have these processes commenced?	No
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: 23/06/2020

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 - Ambient monitoring summary

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish National Grid Reference (Easting, Northing)	EPA Feature Coding Tool code	Bathing Water	Drinking Water	FWPM	Shellfish	Current WFD Status	cBOD	o-Phosphate (as P)	Ammonia (as N)
Upstream Monitoring Point	180636, 114351	RS18F050150					Poor	1.070	0.012	0.012
Downstream Monitoring Point	179248, 113246	RS18F050200	No	No	Yes	No	Poor	0.800	0.035	0.070
Difference								-0.270	0.023	0.058
EQS								1.500	0.035	0.065
% of EQS								-18.000%	66.857%	88.769%

Upstream Monitoring Location

WaterbodyName	WaterbodyCode	Waterbody	MonitoringStationCode	Monitoring	Monitoring	Monitoring	SampleCoc	SampleDat	SampleMe	Parameter	Parameter	Parameter	Result	ReportRes	ReportTextResult
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	77768	#####	Grab	Ammonia-	mg/l	milligrams	0.016	0.016	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	78581	#####	Grab	Ammonia-	mg/l	milligrams	0.026	0.026	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	79449	#####	Grab	Ammonia-	mg/l	milligrams	0.012	0.012	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	80037	#####	Grab	Ammonia-	mg/l	milligrams	0.008	0.008	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81016	#####	Grab	Ammonia-	mg/l	milligrams	0.013	0.013	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81507	#####	Grab	Ammonia-	mg/l	milligrams per litre	0.01	<0.02	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81878	#####	Grab	Ammonia-	mg/l	milligrams	0.005	0.005	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	82786	#####	Grab	Ammonia-	mg/l	milligrams	0.006	0.006	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	83364	#####	Grab	Ammonia-	mg/l	milligrams	0.01	0.01	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	84440	#####	Grab	Ammonia-	mg/l	milligrams	0.017	0.017	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	77768	#####	Grab	BOD - 5 da	mg/l	milligrams	1	1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	78581	#####	Grab	BOD - 5 da	mg/l	milligrams	1.6	1.6	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	79449	#####	Grab	BOD - 5 da	mg/l	milligrams	1.1	1.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	80037	#####	Grab	BOD - 5 da	mg/l	milligrams per litre	0.5	<1.0	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81016	#####	Grab	BOD - 5 da	mg/l	milligrams	2.1	2.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81507	#####	Grab	BOD - 5 da	mg/l	milligrams per litre	0.5	<1.0	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81878	#####	Grab	BOD - 5 da	mg/l	milligrams per litre	0.5	<1.0	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	82786	#####	Grab	BOD - 5 da	mg/l	milligrams per litre	0.5	<1.0	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	83364	#####	Grab	BOD - 5 da	mg/l	milligrams	1.4	1.4	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	84440	#####	Grab	BOD - 5 da	mg/l	milligrams	1.5	1.5	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	77768	#####	Grab	Dissolved C % Saturatic	Percentage		98.7	98.7	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	78581	#####	Grab	Dissolved C % Saturatic	Percentage		98.1	98.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	79449	#####	Grab	Dissolved C % Saturatic	Percentage		97.2	97.2	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	80037	#####	Grab	Dissolved C % Saturatic	Percentage		105.5	105.5	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81016	#####	Grab	Dissolved C % Saturatic	Percentage		103.7	103.7	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81507	#####	Grab	Dissolved C % Saturatic	Percentage		95.9	95.9	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81878	#####	Grab	Dissolved C % Saturatic	Percentage		100.5	100.5	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	82786	#####	Grab	Dissolved C % Saturatic	Percentage		97.1	97.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	83364	#####	Grab	Dissolved C % Saturatic	Percentage		97.1	97.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	84440	#####	Grab	Dissolved C % Saturatic	Percentage		95.6	95.6	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	77768	#####	Grab	ortho-Phos	mg/l	milligrams	0.014	0.014	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	78581	#####	Grab	ortho-Phos	mg/l	milligrams	0.018	0.018	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	79449	#####	Grab	ortho-Phos	mg/l	milligrams	0.006	0.006	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	80037	#####	Grab	ortho-Phos	mg/l	milligrams	0.004	0.004	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81016	#####	Grab	ortho-Phos	mg/l	milligrams	0.013	0.013	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81507	#####	Grab	ortho-Phos	mg/l	milligrams per litre	0.005	<0.01	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81878	#####	Grab	ortho-Phos	mg/l	milligrams	0.021	0.021	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	82786	#####	Grab	ortho-Phos	mg/l	milligrams	0.008	0.008	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	83364	#####	Grab	ortho-Phos	mg/l	milligrams	0.009	0.009	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	84440	#####	Grab	ortho-Phos	mg/l	milligrams	0.02	0.02	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	77768	#####	Grab	pH	pH units	pH Units	7.6	7.6	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	78581	#####	Grab	pH	pH units	pH Units	7.8	7.8	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	79449	#####	Grab	pH	pH units	pH Units	8.1	8.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	80037	#####	Grab	pH	pH units	pH Units	8.1	8.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81016	#####	Grab	pH	pH units	pH Units	8.1	8.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81507	#####	Grab	pH	pH units	pH Units	8	8	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	81878	#####	Grab	pH	pH units	pH Units	8.1	8.1	
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION	PreWfd	Cork Count	82786	#####	Grab	pH	pH units	pH Units	7.9	7.9	

FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	83364	#####	Grab	pH	pH units	pH Units	7.8	7.8
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	84440	#####	Grab	pH	pH units	pH Units	7.5	7.5
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	77768	#####	Grab	Temperatu	°C	Degrees ce	6.5	6.5
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	78581	#####	Grab	Temperatu	°C	Degrees ce	7.3	7.3
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	79449	#####	Grab	Temperatu	°C	Degrees ce	11.7	11.7
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	80037	#####	Grab	Temperatu	°C	Degrees ce	11.6	11.6
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	81016	#####	Grab	Temperatu	°C	Degrees ce	16.4	16.4
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	81507	#####	Grab	Temperatu	°C	Degrees ce	15.1	15.1
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	81878	#####	Grab	Temperatu	°C	Degrees ce	15.1	15.1
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	82786	#####	Grab	Temperatu	°C	Degrees ce	13.4	13.4
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	83364	#####	Grab	Temperatu	°C	Degrees ce	10.6	10.6
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	84440	#####	Grab	Temperatu	°C	Degrees ce	7.1	7.1
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	77768	#####	Grab	Total Nitro	mg/l	milligrams	1.9	1.9
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	78581	#####	Grab	Total Nitro	mg/l	milligrams	1.86	1.86
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	79449	#####	Grab	Total Nitro	mg/l	milligrams	2.16	2.16
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	80037	#####	Grab	Total Nitro	mg/l	milligrams	1.9	1.9
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	81016	#####	Grab	Total Nitro	mg/l	milligrams	1.8	1.8
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	81507	#####	Grab	Total Nitro	mg/l	milligrams	1.9	1.9
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	81878	#####	Grab	Total Nitro	mg/l	milligrams	1.7	1.7
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	82786	#####	Grab	Total Nitro	mg/l	milligrams	1.6	1.6
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	83364	#####	Grab	Total Nitro	mg/l	milligrams	1.5	1.5
FUNSHION_030	IE_SW_18F050310	River	RS18F050150	FUNSHION PreWfd	Cork Count	84440	#####	Grab	Total Nitro	mg/l	milligrams	1.73	1.73

Downstream Monitoring Location

WaterbodyName	WaterbodyCode	Waterbody	MonitoringStationCode	Monitoring	Monitoring	Monitoring	SampleCoc	SampleDat	SampleMe	Parameter	Parameter	Parameter	Result	ReportRes	ReportTextResult
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-00839	#####	None	Alkalinity-t	mg/l	milligrams	83		83
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-05738	#####	None	Alkalinity-t	mg/l	milligrams	191		191
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-08237	#####	None	Alkalinity-t	mg/l	milligrams	124		124
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-12540	#####	None	Alkalinity-t	mg/l	milligrams	110		110
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-15763	#####	None	Alkalinity-t	mg/l	milligrams	85		85
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-00839	#####	None	Ammonia-	mg/l	milligrams	0.1		0.1
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-05738	#####	None	Ammonia-	mg/l	milligrams	0.11		0.11
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-08237	#####	None	Ammonia-	mg/l	milligrams per litre	0.01		<0.02
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-12540	#####	None	Ammonia-	mg/l	milligrams per litre	0.01		<0.02
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-15763	#####	None	Ammonia-	mg/l	milligrams	0.12		0.12
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-00839	#####	None	BOD - 5 da	mg/l	milligrams	1.2		1.2
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-05738	#####	None	BOD - 5 da	mg/l	milligrams per litre	0.5		<1
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-08237	#####	None	BOD - 5 da	mg/l	milligrams per litre	0.5		<1
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-12540	#####	None	BOD - 5 da	mg/l	milligrams per litre	0.5		<1
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-15763	#####	None	BOD - 5 da	mg/l	milligrams	1.3		1.3
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-00839	#####	None	Chloride	mg/l	milligrams	32.4		32.4
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-05738	#####	None	Chloride	mg/l	milligrams	125		125
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-08237	#####	None	Chloride	mg/l	milligrams	15.1		15.1
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-12540	#####	None	Chloride	mg/l	milligrams	28		28
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-15763	#####	None	Chloride	mg/l	milligrams	23.8		23.8
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-00839	#####	None	Conductivi	µS/cm	Micro siem	305		305
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-05738	#####	None	Conductivi	µS/cm	Micro siem	848		848
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-08237	#####	None	Conductivi	µS/cm	Micro siem	305		305
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-12540	#####	None	Conductivi	µS/cm	Micro siem	328		328
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s	Operation	Cork Count	19-15763	#####	None	Conductivi	µS/cm	Micro siem	267		267

FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	Dissolved C mg/l	milligrams	10.6	10.6
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	Dissolved C % Saturatic Percentage		94	94
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	Dissolved C mg/l	milligrams	10.4	10.4
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	Dissolved C % Saturatic Percentage		96	96
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	Dissolved C % Saturatic Percentage		102	102
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	Dissolved C mg/l	milligrams	10.2	10.2
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	Dissolved C % Saturatic Percentage		111	111
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	Dissolved C mg/l	milligrams	11.6	11.6
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	Dissolved C % Saturatic Percentage		93	93
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	Dissolved C mg/l	milligrams	9.2	9.2
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	Nitrate (as mg/l	milligrams	2.5	2.5
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	Nitrate (as mg/l	milligrams	2.6	2.6
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	Nitrate (as mg/l	milligrams	2.1	2.1
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	Nitrate (as mg/l	milligrams	1.9	1.9
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	Nitrate (as mg/l	milligrams	2.3	2.3
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	Nitrite (as l µg/l	Microgram	25.4	25.4
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	Nitrite (as l µg/l	Microgram	15.2	15.2
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	Nitrite (as l µg/l	Microgram	12.3	12.3
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	Nitrite (as l µg/l	Microgram	4.51	4.51
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	Nitrite (as l µg/l	Microgram	12.7	12.7
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	ortho-Phos mg/l	milligrams	0.039	0.039
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	ortho-Phos mg/l	milligrams	0.034	0.034
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	ortho-Phos mg/l	milligrams	0.024	0.024
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	ortho-Phos mg/l	milligrams	0.026	0.026
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	ortho-Phos mg/l	milligrams	0.053	0.053
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	pH	pH units pH Units	7.5	7.5
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	pH	pH units pH Units	7.7	7.7
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	pH	pH units pH Units	8	8
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	pH	pH units pH Units	7.9	7.9
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	pH	pH units pH Units	7.4	7.4
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	Temperatu °C	Degrees ce	9.1	9.1
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	Temperatu °C	Degrees ce	11	11
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	Temperatu °C	Degrees ce	15.7	15.7
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	Temperatu °C	Degrees ce	15.5	15.5
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	Temperatu °C	Degrees ce	10.4	10.4
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	Total Hardi mg/l	milligrams	96	96
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	Total Hardi mg/l	milligrams	174	174
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	Total Hardi mg/l	milligrams	149	149
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	Total Hardi mg/l	milligrams	117	117
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	Total Hardi mg/l	milligrams	104	104
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	Total Oxidi mg/l	milligrams	2.5	2.5
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	Total Oxidi mg/l	milligrams	2.6	2.6
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	Total Oxidi mg/l	milligrams	2.1	2.1
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	Total Oxidi mg/l	milligrams	2	2
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	Total Oxidi mg/l	milligrams	2.3	2.3
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-00839	##### None	True Colou mg/litre Pt Milligramn		37	37
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-05738	##### None	True Colou mg/litre Pt Milligrammes per litre		2.5	<5
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-08237	##### None	True Colou mg/litre Pt Milligramn		7	7
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-12540	##### None	True Colou mg/litre Pt Milligramn		11	11
FUNSHION_030	IE_SW_18F050310	River	RS18F050200	0.5km d/s Operation: Cork County 19-15763	##### None	True Colou mg/litre Pt Milligramn		21	21