

# Annual Environmental Report 2016

<b>Agglomeration Name:</b>	<b>Newport</b>
<b>Licence Register No.</b>	<b>D0325-01</b>



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## Section 1. Executive Summary and Introduction to the 2016 AER

### 1.1 Summary Report on 2016

This Annual Environmental Report has been prepared for **D0224-01, Newport**, in County **Tipperary**, in accordance with the requirements of the wastewater discharge licence for the agglomeration. Specified assessments are included as an appendix to the AER as follows:

- Priority substances assessment

The agglomeration is served by a wastewater treatment plant with a Plant Capacity PE of 1900. The treatment process includes the following:-

- Preliminary Treatment (Automated Screen)
- Secondary Treatment (Conventional Activated Sludge)
- Nutrient Removal (Spent alum dosing to remove phosphorus compounds)

The final effluent from the Primary Discharge Point was non-compliant with the Emission Limit Values in 2016.

The following parameters exceeded the emission limit values in 2016:-

- Ortho P (mg/l)

1,136,660kgs total weight sludge was removed from the wastewater treatment plant in 2016 as liquid sludge. Sludge was transferred to Sludge transferred to H&L Environmental Services Ltd. Derryville, Moyne, Thurles, Co. Tipperary (1136.66 tonnes), and Nenagh WWTP D0027-01 (27 tonnes).

The following improvement works were undertaken in 2016:-

*Flume being constructed on plant stormwater overflow. Expected to be completed in Q1 2017.*

An Annual Statement of Measures is included in **Appendix 7.1**

## Section 2. Monitoring Reports Summary

### 2.1 Summary report on monthly influent monitoring

Table 2.1 Influent Monitoring Summary

<b>2.1.1 Monthly Influent Monitoring</b>	<b>BOD (mg / l)</b>	<b>COD (mg / l)</b>	<b>SS (mg / l)</b>	<b>TP (mg / l)</b>	<b>Hydraulic Loading (m<sup>3</sup>/d)</b>	<b>Organic Loading (PE/Day)</b>
<b>Number of Samples</b>	13	13	13	4		
<b>Annual Max.</b>	282	644	414	9.2	2012	4,158
<b>Annual Mean</b>	186.58	467.49	209.64	5.41	577.20	2060.24

Other inputs in the form of sludge/leachate are added to the WWTP after the influent monitoring point and are therefore not represented by influent monitoring. Other inputs, where relevant, are detailed in Section 3.6.

#### Significance of results

The annual mean hydraulic loading is less than the peak Treatment Plant Capacity as detailed further in Section 3.2

The annual maximum hydraulic loading is greater than the peak Treatment Plant Capacity as detailed further in Section 3.2.

The annual mean organic loading is greater than the Treatment Plant Capacity as detailed further in Section 3.2.

The annual maximum organic loading is greater than the Treatment Plant Capacity as detailed further in Section 3.2.

## 2.2 Discharges from the agglomeration

Table 2.2 - Effluent Monitoring

<b>2.2.1 Effluent Monitoring Summary</b>	<b>BOD (mg/l)</b>	<b>COD (mg/l)</b>	<b>TSS (mg/l)</b>	<b>Ortho P (mg/l)</b>	<b>Ammonia NH3 (mg/l)</b>	<b>pH</b>
<b>WWDL ELV (Schedule A) where applicable</b>	25.00	125.00	25.00	1.50	3.00	6 to 9
<b>ELV with Condition 2 Interpretation included</b>	50.00	250.00	62.50	1.80	3.60	6 to 9
<b>Number of sample results</b>	13	13	13	13	13	13
<b>Number of sample results above WWDL ELV</b>	0	0	0	7	0	0
<b>Number of sample results above ELV with Condition 2 Interpretation</b>	0	0	0	7	0	0
<b>Overall Compliance (Pass/Fail)</b>	Pass	Pass	Pass	Fail	Pass	Pass

### Significance of results

The WWTP was non-compliant with the ELV's set in the wastewater discharge licence. 7 samples were non-compliant with the ELV in relation to Ortho P (mg/l). The non-compliance is due to the WWTP not being designed for P removal. The impact on receiving waters is assessed further in Section 2.3.

### 2.3.1. Ambient Monitoring Summary

**Table 2.3. Ambient Monitoring Report Summary Table**

Ambient Monitoring Point from WWDL (or as agreed with EPA)	Irish Grid Reference	EPA Feature Coding Tool code	Bathing Water	Drinking Water	FWPM	Shellfish	Current WFD Status
Upstream Monitoring Point	E171667 N161622	RS25N020290					Good
Downstream Monitoring Point	E170972 N161624	RS25N020320	No	No	No	No	Good

The results for the upstream and downstream monitoring from Tipperary County Council are included in Appendix 7.2.

#### Significance of results

- The WWTP was non-compliant with the ELV's set in the wastewater discharge licence as detailed in Section 2.2.
- The discharge from the wastewater treatment plant does not have an observable negative impact on the water quality.
- The discharge from the WWTP doesn't have an observable negative impact on the Water Framework Directive status.

### 2.4 Data collection and reporting requirements under the UWWTD

The electronic submission of data was completed on 28/02/2017

### 2.5 Pollutant Release and Transfer Register (PRTR) - report for previous year

A PRTR is not required as the PE is < 100000

## Section 3. Operational Reports Summary

### 3.1 Treatment Efficiency Report

	cBOD (kg/yr)	COD (kg/yr)	SS (kg/yr)	Total P (kg/yr)
Influent mass loading (kg/year)	45,119	113,052	50,695	1,969
Effluent mass emission (kg/year)	1,539	8,653	4,605	859
% Efficiency (% reduction of influent load)	97%	92%	91%	56%

### 3.2 Treatment Capacity Report

Table 3.2 - Treatment Capacity Report Summary

<b>Hydraulic Capacity – Design / As Constructed (dry weather flow) (m3/day)</b>	413
<b>Hydraulic Capacity – Design / As Constructed (peak flow) (m3/day)</b>	1,238
<b>Hydraulic Capacity – Current loading (m3/day)</b>	577
<b>Hydraulic Capacity – Remaining (m3/day)</b>	661
<b>Organic Capacity - Design / As Constructed (PE)</b>	1,900
<b>Organic Capacity - Current loading (PE)</b>	2,060
<b>Organic Capacity – Remaining (PE)</b>	-160
<b>Will the capacity be exceeded in the next three years? (Yes / No)</b>	Yes
<b>Is an upgrade or expansion of the WWTP proposed? (i.e. if on Minor Programme or CIP) (Yes/No)</b>	Yes - CIP 2017-2021

### 3.3 Extent of Agglomeration Summary Report

In this section Irish Water is required to report on the amount of urban waste water generated within the agglomeration. It does not include any waste water collected and created in a private system and discharged to water under a Section 4 Licence issued under the Water Pollution Acts 1977 (as amended).

**Table 3.3 - Extent of Agglomeration Summary Report**

	<b>% of P.E. load generated in the agglomeration</b>	<b>Estimated / Measured</b>
<b>Load generated in the agglomeration that is collected in the sewer network</b>	100	Estimated
<b>Load collected in the agglomerations that enters treatment plant</b>	Unknown	Estimated
<b>Load collected in the sewer network but discharges without treatment (includes SWO, EO, and any discharges that are not treated)</b>	Unknown	Estimated

**Load generated in the agglomeration that is collected in the sewer network** is the total load generated and collected in the municipal network within the boundary of the agglomeration.

**Load collected in the agglomerations that enters treatment plant** is that portion of the previous figure which enters the waste water treatment plant.

**Load collected but discharged without treatment** is that portion of the first figure which is discharged without treatment.

### 3.4 Complaints Summary

A summary of complaints of an environmental nature is included below.

**Table 3.4 - Complaints Summary Table**

<b>Number of Complaints</b>	<b>Nature of Complaint</b>	<b>Number Open Complaints</b>	<b>Number Closed Complaints</b>
1	Blocked sewer	0	1



### 3.5 Reported Incidents Summary

A summary of reported incidents is included below.

**Table 3.5.1 - Summary of Incidents**

3.5.1 Incident Type (e.g. Non-compliance, Emission, spillage, pollution incident)	Incident Description	Cause	No. of Incidents	Recurring Incident (Yes/No)	Corrective Action	Authorities Contacted. Note 1	Reported to EPA (Yes/No)	Closed (Yes/No)
Breach of ELV	Breach of Orthophosphate ELV	WWTP not designed for P removal	1	No		None	Yes	Yes
Breach of ELV	Breach of Orthophosphate ELV	WWTP not designed for P removal	4	Yes		None	Yes	No
Breach of ELV	Breach of Orthophosphate ELV	WWTP not designed for P removal	1	No		None	Yes	Yes
Breach of ELV	Breach of Orthophosphate ELV	WWTP not designed for P removal	1	Yes		None	Yes	Yes
Uncontrolled Release	Uncontrolled Release	Plant or equipment breakdown at WWTP	1	No		None	Yes	Yes

Note 1: For shellfish waters notify the Marine Institute (MI) Sea Fisheries Protection Authority (SFPA) Food Safety Authority (FSAI) and An Bord Iascaigh Mhara (BIM). This should also include any other authorities that should be contacted arising from the findings of any Licence Specific Reports also e.g. Drinking Water Abstraction Impact Risk Assessment, Fresh Water Pearl Mussel Impact Assessments etc.

**Table 3.5.2 - Summary of Overall Incidents**

<b>Number of Incidents in 2016</b>	8
<b>Number of Incidents reported to the EPA via EDEN in 2016</b>	8
<b>Explanation of any discrepancies between the two numbers above</b>	N/A

### 3.6 Sludge / Other inputs to the WWTP

Other inputs to the waste water treatment plant are summarised in Table 3.6 below.

**Table 3.6 - Other Inputs**

Input Type	m3/year	P.E.	% of load to WWTP	Included in Influent Monitoring? (Y/N)	Is there a leachate/sludge acceptance procedure for the WWTP? (Y/N)	Is there a dedicated leachate/sludge acceptance facility for the WWTP? (Y/N)
Domestic /Septic Tank Sludge	0	0	0.00%	No	No	No
Industrial / Commercial Sludge	0	0	0.00%	No	No	No
Landfill Leachate (delivered by tanker)	0	0	0.00%	No	No	No
Landfill Leachate (delivered by sewer network)	0	0	0.00%	No	No	No
Other (Alum Sludge)	750	<100	<1	No	Yes	No

## Section 4. Infrastructure Assessments and Programme of Improvements

### 4.1 Storm water overflow identification and inspection report

The Storm Water Overflow Identification & Inspection report is not included in this AER. This report will be in the 2017 AER Report. A summary of the significance and operation is included below.

**Table 4.1.1 - SWO Identification and Inspection Summary Report**

WWDL Name / Code for Storm Water Overflow	Irish Grid Ref.	Included in Schedule A4 of the WWDL	Significance of the overflow (High/Med/Low)	Compliance with DoEHLG criteria	No. of times activated in 2016 (No. of events)	Total volume discharged in 2016 (m3)	Total volume discharged in 2016 (P.E.)	Estimated / Measured data
TPEFF2800D 0325SW003	E172343 N161983	Yes	Not yet assessed	Not yet assessed	Unknown	Unknown	Unknown	N/A
tPEFF2800D 0325SW004	E171300 N161557	Yes	Not yet assessed	Not yet assessed	Unknown	Unknown	Unknown	N/A

**Table 4.1.2 - SWO Identification and Inspection Summary Report**

How much sewage was discharged via SWOs in the agglomeration in the year (m3/yr)?	Unknown
How much sewage was discharged via SWOs in the agglomeration in the year (p.e.)?	Unknown
What % of the total volume of sewage generated in the agglomeration was discharged via SWOs in the agglomeration in 2016?	Unknown
Is each SWO identified as non-compliant with DoEHLG Guidance included in the Programme of Improvements?	Not yet assessed
The SWO assessment includes the requirements of relevant WWDL Schedules (Yes/No)	Not yet assessed
Have the EPA been advised of any additional SWOs / changes to Schedules A/C under Condition 1 ?	No

#### 4.2 Report on progress made and proposals being developed to meet the improvement programme requirements.

The Improvement Programme report addresses the **Specified Improvement Programmes** as detailed in Schedules A3 and C of the WWDL. It should detail other improvements identified through assessments required under the licence.

**Table 4.2.1 - Specified Improvement Programme Summary**

Specified Improvement Programmes	Licence Schedule	Licence Completion Date	Date Expired	Status of Works	% Construction Work Completed	Licensee Timeframe for Completing the Work	Comments
Improvements to meet ELVs as specified in Schedule A.	C	31/12/2015	Yes	At planning stage	0%		
Improvements works may be required to increase the organic and hydraulic treatment capacity of the plant to ensure compliance with Condition 1.7.	C	31/12/2015	Yes	At planning stage	0%		

A summary of the status of any improvements identified by under Condition 5.2 is included below.

**Table 4.2.2 - Improvement Programme Summary**

Improvement	Improvement	Improvement	Progress	Expected	Comments
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Identifier / Name	Description	Source	(% complete)	Completion Date	
N/A	N/A	N/A	N/A	N/A	N/A

**Table 4.2.3 - Sewer Integrity Risk Assessment Tool Summary**

The Improvement Programme should include an assessment of the integrity of the existing wastewater works for the following:	Risk Assessment Rating (High, Medium, Low)	Risk Assessment Score	Reference to relevant section of AER (e.g. Appendix 2 Section 4.	Specified improvements	Comment
<b>Hydraulic Risk Assessment Score</b>	Medium	100	2015 AER	n/a	
<b>Environmental Risk Assessment Score</b>	Low	240	2015 AER	n/a	
<b>Structural Risk Assessment Score</b>	High	140	2015 AER	n/a	
<b>Operation &amp; Maintenance Risk Assessment Score</b>	Low	20	2015 AER	n/a	
<b>Overall Risk Score for the agglomeration</b>	Low	500	2015 AER	n/a	The overall assessment is probably medium risk

## Section 5. Licence Specific Reports

Licence Specific Reports Summary Table

Licence Specific Report	Never required by condition 5 in Licence	Required in this AER or outstanding from previous AER	Included in this AER / Remains outstanding	Reference to previous AER containing report or relevant section of this AER
Priority Substances Assessment	Required	Yes	Yes	Appendix 7.3
Drinking Water Abstraction Point Risk Assessment	Not Required	No	No	N/A
Shellfish Impact Assessment	Not Required	No	No	N/A
Pearl Mussel Report	Not Required	No	No	N/A
Toxicity/Leachate Management	Not Required	No	No	N/A
Toxicity of Final Effluent Report	Not Required	No	No	N/A
Small Stream Risk Score Assessment	Not Required	No	No	N/A
Habitats Impact Assessment	Not Required	No	No	N/A

Licence Specific Reports Summary of Findings

Licence Specific Report	Recommendations in Report	Summary of Recommendations in Report
Priority Substances Assessment	Yes	No impact on the receiving waters is anticipated.
Drinking Water Abstraction Point Risk Assessment	No	n/a
Shellfish Impact Assessment	No	n/a
Pearl Mussel Report	No	n/a
Toxicity/Leachate Management	No	n/a
Toxicity of Final Effluent Report	No	n/a
Small Stream Risk Score Assessment	No	n/a
Habitats Impact Assessment	No	n/a

## 5.1 Priority Substances Assessment

The Priority Substances Assessment Report is included in Appendix 7.2. A summary of the significance and operation is included below.

**Table 5.1 - Priority Substance Assessment Summary**

	Licensee self-assessment checks to determine whether all relevant information is included in the Assessment.
<b>Does the assessment use the Desk Top Study Method or Screening Analysis to determine if the discharge contains the parameters in Appendix 1 of the EPA guidance</b>	Desk Top Study and Screening Analysis.
<b>Does the assessment include a review of Trade inputs to the works?</b>	Yes
<b>Does the assessment include a review of other inputs to the works?</b>	Yes
<b>Does the report include an assessment of the significance of the results where a listed material is present in the discharge? (e.g. impact on the relevant EQS standard for the receiving water)</b>	Yes
<b>Does the assessment identify that priority substances may be impacting the receiving water?</b>	No.
<b>Does the Improvement Programme for the agglomeration include the elimination / reduction of all priority substances identified as having an impact on receiving water quality?</b>	N/A
<b>Recommendations</b>	No impact on the receiving waters is anticipated.
<b>Status of any improvement measures required</b>	N/A



## Section 6. Certification and Sign Off

Table 6.1 - Summary of AER Contents


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 modifications to the existing WWDL? Refer to Condition 1.7 (changes to works/discharges) & Condition 4 (changes to monitoring location, frequency etc.)	No
List reason e.g. failure to complete specified works within dates specified in the licence, changes to monitoring requirements	N/A
Have these processes commenced? (i.e. Request for Technical Amendment / Licence Review / Change Request)	N/A
Are all outstanding reports and assessments from previous AERs included as an appendix to this AER?	Yes
Ensure the following reports are included	Priority substances assessment

### Declaration by Irish Water

The AER contains the following:

- Introduction and background to 2016 AER.
- Monitoring Reports Summary.
- Operational Reports Summary.
- Infrastructural Assessment and Programme of Improvements.
- Licence specific reports
- Certification and Sign Off
- Appendices

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

Signed:  Date: 03/03/2017.....

**Elizabeth Arnett**  
**Head of Corporate Affairs and Environmental Regulation**

## **Section 7. Appendices**

### *Appendix 7.1 Statement of Measures / Improvement Programme*

No additional measures have been taken in 2016 in relation to prevention of environmental damage. The need for measures to prevent environmental damage will be reviewed on an annual basis.

## Appendix 7.2 Ambient Monitoring Summary

## Appendix 7.2 Ambient Monitoring Newport WWTP 2016

**Table 2.3.1. Newport Ambient Upstream Monitoring Results for 2016**

	Sample Date	25-May-2016	21-June-2016	7-July-2016	28-July-2016
Parameter		-	-	-	-
Biological Oxygen Demand	mg/l	1.9	1.8	1.3	2.32
Ammonia N	mg/l	< 0.01	< 0.01	< 0.01	0.016
Dissolved Oxygen % Saturation	% O2				99
Dissolved Oxygen	mg/l				9.62
Ortho-Phosphate P	mg/l	< 0.01	0.033	0.014	0.023
pH	pH units	7.98	7.83	8.11	8.11
Suspended Solids	mg/l	< 0.4	< 0.4	< 0.4	2
COD Chemical Oxygen Demand	mg/l				44
Temperature	Degrees C	11.8	13.3	14.5	15.5

**Table 2.3.2. Newport Ambient Downstream Monitoring Results for 2016**

	Sample Date	25-May-2016	21-June-2016	7-July-2016	28-July-2016
Parameter		-	-	-	-
Biological Oxygen Demand	mg/l	1.9	1.6	1.3	2.26
Ammonia N	mg/l	< 0.01	< 0.01	< 0.01	0.016
Dissolved Oxygen % Saturation	% O2				96.3
Dissolved Oxygen	mg/l				9.65
Ortho-Phosphate P	mg/l	< 0.01	0.01	0.025	0.026
pH	pH units	7.99	7.55	7.91	7.7
Suspended Solids	mg/l	< 0.4	< 0.4	< 0.4	0
COD Chemical Oxygen Demand	mg/l				39
Temperature	Degrees C	11.5	13.2	14.3	15.2

## Appendix 7.2 Ambient Monitoring Newport WWTP 2016

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**Table 2.3.2. Ecological Status of Newport River (upstream and downstream of Newport WWTP)**

Parameter	Upstream	Status	Overall Status for Upstream	Downstream	Status	Overall Status for Downstream
BOD	1.83(mean)	Less than Good	Less than Good	1.77 (mean)	High	Less than Good
Total Ammonia (as N)	0.012(mean)	High		0.012(mean)	High	
Orthophosphate (as P)	0.02(mean)	High		0.018(mean)	High	

**Table 2.3.3. Schedule 5 of the European Communities Environmental Objectives (Surface Waters) Regulations 2009**

Parameter	Value	Status
BOD	<1.3 (mean) or <2.2 (95%ile)	High
BOD	<1.5(mean) Or <2.6(95%ile)	Good
Total Ammonia as N	<0.040 (mean) or <0.090 (95%ile)	High
Total Ammonia as N	<0.065 (mean) or <0.140 (95%ile)	Good
MRP as P	<0.025(mean) or <0.045 (95%ile)	High
MRP as P	<0.035 (mean) or <0.075 (95%ile)	Good

## Appendix 7.2 Ambient Monitoring Newport WWTP 2016

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## Appendix 7.3 Priority Substances Assessment

# Priority Substances Assessment

<b>Agglomeration Name:</b>	<b>Newport</b>
<b>Licence Register No.</b>	<b>D0325-01</b>





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**Appendix 1 – Screening of Parameters for Priority Substances**

**Appendix 2 – Priority Substance Screening Flowchart**

**Appendix 3 – Receiving Waters Priority Substance Data**

## **1 Introduction**

This report has been prepared for D0325-01, Newport, in County Tipperary in accordance with the requirements of Condition 4.11 of the wastewater discharge licence for the agglomeration.

This desk top study has been undertaken to determine the necessity, if any, for analysis of the discharge to comply with the condition in the wastewater discharge licence based on the *Guidance on the Screening for Priority Substances for Waste Water Discharge Licences*, issued by the EPA. Relevant inputs to the waste water works and estimates of emissions from the discharge point have been taken into account in the preparation of this report. Relevant inputs to the waste water works, any relevant measurements / calculations / estimates of emissions from the discharge point and any relevant measurements undertaken at representative downstream monitoring locations have been taken into account in the preparation of this report.

Details of the emissions concentration for the primary discharge and impact on the receiving water are included in Appendix 1.

## **2 Desktop Study**

### **2.1 Assessment of Analysis Required**

#### **A. Review of all industrial inputs into WWTP**

A review of all inputs into the wastewater treatment plant (WWTP) has indicated that there are no authorised industrial type discharges, unauthorised discharges with a likelihood of priority substances, leachate discharges or other imports. The wastewater influent to the WWTP is domestic in nature.

#### **B. Discharge monitoring**

The primary discharge has been analysed for priority substances.

Analysis data is included in Appendix 1 with details of the sample data and source of the data. Analysis data does not include the full list of priority substances listed in the EPA's *Guidance on the Screening for Priority Substances for Waste Water Discharge Licences* and is therefore substituted with data from the EPA PRTR Toolkit.

#### **C. Downstream monitoring location's participation in relevant monitoring programme**

Analysis data for the relevant parameters from upstream and downstream ambient monitoring undertaken by Tipperary County Council is included in Appendix 3. No parameters have been identified as potentially being higher than the required EQS either upstream or downstream of the WWTP, however a number of parameters showed an increase in the downstream concentration (see table below). These increases in concentration did not coincide with parameters identified in the primary discharge as potentially being higher than the required EQS following dilution and are therefore unlikely to be caused by the WWTP discharge.

	PCBs µg/l	Zinc µg/l	Barium µg/l	Boron µg/l	Nickel µg/l	Chloride µg/l	TOC µg/l	Hardness mg/l	pH
<b>EQS</b>	-	1003	-	-	4	-	-	-	-
<b>Upstream</b>	0.0005	3.4	201	0.25	0.75	8600	2440	108.1	8.08
<b>Downstream</b>	0.0011	3.6	205.4	0.5	1.6	8900	2690	112.5	8.27
<b>Difference</b>	<b>0.0006</b>	<b>0.2</b>	<b>4.4</b>	<b>0.25</b>	<b>0.85</b>	<b>300</b>	<b>250</b>		

A number of parameters in the final effluent were identified as potentially being higher than the required EQS following dilution. However, there was no recorded correlating increase in the ambient water quality downstream of the WWTP.

#### **D. Participation in PRTR reporting**

Where priority substances data for the effluent was not available, the emission concentrations of priority substances has been estimated using the EPA's urban WWTP calculation tool for PRTR reporting. PRTR Tool data has been included in the table in Appendix 1 where analysis data of the primary discharge is not available.

It is noted from the EPA's report, *An Inventory of Emissions to Waters in Ireland*, that extensive assessment of emission factors was undertaken during 2011 / 2012 that focussed on the evaluation of inputs / output concentrations and removal efficiency using a variety of different sized plants and wastewater treatment options. This has led to the significant refinement of the electronic templates toolkit used for WWTP assessment using the PRTR tool. The estimated emission data relevant to the Newport agglomeration pertains to a WWTP < 10,000 p.e., with no saline intrusion, with secondary treatment, and with no nutrient removal.

#### **2.2 Review outcome of Desktop study**

Full characterisation of the primary discharge has been achieved for all priority substances included in Appendix 1. Priority substance concentrations were available for all parameters based on either analysis or the EPA PRTR toolkit.

A review of the national monitoring programme for priority substances in wastewater is proposed to be undertaken by Irish Water in 2016 in consultation with the EPA. It is proposed that this review, in consultation with the EPA, will determine the scope of future Priority Substances monitoring at Irish Water WWTP's.

### **3 Assessment of Significance and Recommendations**

An assessment of the potential for impacts on receiving waters from priority substances in the primary discharge has been carried out. The assessment considers the primary discharge relevant to Environmental Quality Standards (EQS) for priority substances in surface waters, as set out in the European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended.

A number of parameters have been identified as potentially being higher than the required EQS, following dilution, as follows:-

- Flouranthene
- Benzo[k]fluoranthene

- Benzo[ghi]perylene
- Benzo[b]fluoranthene
- Benzo[a]pyrene
- Dieldrin

However, the Limit of Detection (LOD) for the above measured parameters was greater than the EQS value prescribed in the Regulations i.e. the LODs were not sufficiently low and the values generated are not appropriate for use (e.g. the LOD was <1 whereas the EQS was <0.002, 50% of the LOD was used as the “measured value” in the calculation).

When the values generated by the EPA’s urban WWTP calculation tool for PRTR reporting are substituted for the above parameters (noting that the LODs applied in the generation of the PRTR Tool were much lower than that of the 2016 effluent monitoring), the assessment shows no parameters as potentially being higher than the required EQS following dilution (with the exception of Benzo[a]pyrene, which again is due to the Limit of Detection (LOD) was greater than the EQS value in the development of the PRTR estimation tool. It is possible therefore that the Benzo[a]pyrene result is not a true reflection of reality. On this basis no impact on the receiving waters is anticipated.

The EPA have prepared a report on priority substances, *An Inventory of Emissions to Waters in Ireland*. This document states that Ireland appears to have relatively few problems associated with the presence of Priority / Priority Hazardous substances in its surface waters. It identifies that wastewater discharges are a potential source of metals in receiving waters with lead being the main metal identified as associated with wastewater discharges. However, metals exceedences, in particular those for cadmium, lead, and nickel are primarily associated with areas of historic mining activity. Similarly PAH’s have been identified in stormwater overflows but the most significant source is considered to be rainfall.

A consultation process with the EPA is being undertaken by Irish Water to establish appropriate levels of monitoring for priority and dangerous substances nationally, taking into account the particular requirements of the Water Framework Directive. This will allow a targeted monitoring programme to be undertaken in areas where priority substances have been identified or industrial discharges or imports provide a potential source, and where there is a shortfall of existing monitoring data.

<b>Does the assessment use the Desk Top Study Method or Screening Analysis to determine if the discharge contains the parameters in Appendix 1 of the EPA guidance</b>	Desk Top Study and Screening Analysis
<b>Does the assessment include a review of licensed / authorised inputs to the works?</b>	Yes
<b>Does the assessment include a review of other (unauthorised) inputs to the works?</b>	Yes
<b>Does the report include an assessment of the significance of the results where a listed material is present in the discharge? (e.g. impact on the relevant EQS standard for the receiving water)</b>	Yes

<b>Does the assessment identify that priority substances may be impacting the receiving water?</b>	No
<b>Does the Improvement Programme for the agglomeration include the elimination / reduction of all priority substances identified as having an impact on receiving water quality?</b>	n/a

## Appendix 1 – Screening of Parameters for Priority Substances

AA: Annual Average

MAC: Maximum Allowable Concentration

EQS: Environmental Quality Standards

Dilution factor in receiving water<sup>1</sup>: 19.7 (based on 95%ile river flow of 0.11m<sup>3</sup>/s from Hydrometric Station 25054, and a normal flow of 508.2m<sup>3</sup>/day from WWTP as noted in the Inspectors Report)

No.	Compound	Group of compounds	AA-EQS Inland SW (µg/l)	AA-EQS Other SW (µg/l)	Measured /Estimated Conc. (µg/l) <sup>1</sup>	Data Source [Sample / PRTR / Other (state)]	Sample Date (if applicable)	Effluent Concentration above AA concentration (Yes/No)	Effluent Concentration above AA concentration after dilution (Yes/No)
1	Benzene	VOCs	10	8	<0.1	Sample	13/10/2016	No	No
2	Carbon tetrachloride	VOCs	12	12	<0.5	Sample	13/10/2016	No	No
3	1,2-Dichloroethane	VOCs	10	10	<0.1	Sample	13/10/2016	No	No
4	Dichloromethane	VOCs	20	20	<5.0	Sample	13/10/2016	No	No
5	Tetrachloroethylene	VOCs	10	10	0.06	PRTR	N/A	No	No
6	Trichloroethylene	VOCs	10	10	0.00	PRTR	N/A	No	No
7	Trichlorobenzenes	VOCs	0.4	0.4	<0.5	Sample	13/10/2016	No	No
8	Trichloromethane	VOCs	2.5	2.5	2.39	PRTR	N/A	No	No
9	Xylenes (all isomers)	VOCs	10	10	<0.5	Sample	13/10/2016	No	No
10	Ethyl Benzene	VOCs	n/a	n/a	<0.5	Sample	13/10/2016	No	No
11	Toluene	VOCs	10	10	<0.5	Sample	13/10/2016	No	No
12	Naphthlene <sup>2</sup>	PAHs	2	2	<1.0	Sample	13/10/2016	No	No
13	Fluoranthene <sup>1</sup>	PAHs	0.0063	0.0063	0.05	PRTR	N/A	No	No

<sup>2</sup> The EQS for these substances shall take effect from 22 December 2015

No.	Compound	Group of compounds	AA-EQS Inland SW (µg/l)	AA-EQS Other SW (µg/l)	Measured /Estimated Conc. (µg/l) <sup>1</sup>	Data Source [Sample / PRTR / Other (state)]	Sample Date (if applicable)	Effluent Concentration above AA concentration (Yes/No)	Effluent Concentration above AA concentration after dilution (Yes/No)
14	Benzo[k]fluoranthene <sup>3</sup>	PAHs	MAC of 0.017	MAC of 0.017	0.05	PRTR	N/A	Yes	No
15	Benzo[ghi]perylene <sup>2</sup>	PAHs	MAC of $8.2 \times 10^{-3}$	MAC of $8.2 \times 10^{-4}$	0.05	PRTR	N/A	Yes	No
16	Indeno[1,2,3-c,d]pyrene <sup>2</sup>	PAHs	N/A	N/A	0.05	PRTR	N/A	No	No
17	Benzo[b]fluoranthene <sup>2</sup>	PAHs	MAC of 0.017	MAC of 0.017	0.05	PRTR	N/A	Yes	No
18	Benzo[a]pyrene	PAHs	$1.7 \times 10^{-4}$	$1.7 \times 10^{-4}$	0.05	PRTR	N/A	Yes	Yes
19	Di(2-ethylhexyl)phthalate (DEHP)	Plasticiser	1.3	1.3	0.92	PRTR	N/A	No	No
20	Isodrin <sup>4</sup>	Pesticides	Σ=0.01	Σ=0.005	0.00	PRTR	N/A	No	No
21	Dieldrin <sup>3</sup>	Pesticides			<1.0	Sample	13/10/2016	Yes	No
22	Diuron	Pesticides	0.2	0.2	0.03	PRTR	N/A	No	No
23	Isoproturon	Pesticides	0.3	0.3	0.01	PRTR	N/A	No	No
24	Atrazine	Pesticides	0.6	0.6	0.01	PRTR	N/A	No	No
25	Simazine	Pesticides	1	1	0.01	PRTR	N/A	No	No
26	Glyphosate	Pesticides	60	-	1.53	PRTR	N/A	No	No
27	Mecoprop	Pesticides	N/A	N/A	0.11	PRTR	N/A	N/A	N/A
28	2,4-D	Pesticides	N/A	N/A	0.05	PRTR	N/A	N/A	N/A
29	MCPA	Pesticides	N/A	N/A	0.09	PRTR	N/A	N/A	N/A
30	Linuron	Pesticides	0.7	0.7	0.00	PRTR	N/A	No	No

<sup>3</sup> No indicative parameter is provided for this group of substances

<sup>4</sup> Σ of Aldrin, Dieldrin, Endrin and Isodrin.

No.	Compound	Group of compounds	AA-EQS Inland SW (µg/l)	AA-EQS Other SW (µg/l)	Measured /Estimated Conc. (µg/l) <sup>1</sup>	Data Source [Sample / PRTR / Other (state)]	Sample Date (if applicable)	Effluent Concentration above AA concentration (Yes/No)	Effluent Concentration above AA concentration after dilution (Yes/No)
31	Dichlobenil	Pesticides	N/A	N/A	<1.0	Sample	13/10/2016	N/A	N/A
32	2,6-Dichlorobenzamide	Pesticides	N/A	N/A	0.08	PRTR	N/A	N/A	N/A
33	PCBs	PCBs	N/A	N/A	<0.04	Sample	13/10/2016	N/A	N/A
34	Phenols (as Total C)	Phenols	8	8	<1.0	Sample	13/10/2016	No	No
35	Lead	Metals	1.2	1.3	<0.9	Sample	13/10/2016	No	No
36	Arsenic	Metals	25	20	<1.0	Sample	13/10/2016	No	No
37	Copper	Metals	30 <sup>2</sup>	5	0.011	Sample	13/10/2016	No	No
38	Zinc	Metals	100 <sup>3</sup>	40	32	Sample	13/10/2016	No	No
39	Cadmium	Metals	0.15 <sup>4</sup>	0.2	<0.3	Sample	13/10/2016	No	No
40	Mercury	Metals	MAC of 0.07	MAC of 0.07	<0.06	Sample	13/10/2016	No	No
41	Chromium VI	Metals	3.4	0.6	<3.0	Sample	13/10/2016	No	No
42	Selenium	Metals	n/a	n/a	<3.0	Sample	13/10/2016	No	No
43	Antimony	Metals	N/A	N/A	0.5	Sample	13/10/2016	N/A	N/A
44	Molybdenum	Metals	N/A	N/A	<3.0	Sample	13/10/2016	N/A	N/A
45	Tin	Metals	N/A	N/A	<3.0	Sample	13/10/2016	N/A	N/A
46	Barium	Metals	N/A	N/A	122.5	Sample	13/10/2016	N/A	N/A
47	Boron	Metals	N/A	N/A	<5.0	Sample	13/10/2016	N/A	N/A
48	Cobalt	Metals	N/A	N/A	<3000	Sample	13/10/2016	N/A	N/A
49	Vanadium	Metals	N/A	N/A	<3.0	Sample	13/10/2016	N/A	N/A
50	Nickel	Metals	4	8.6	<1.5	Sample	13/10/2016	No	No
51	Fluoride	General	500	1,500	0.16	Sample	13/10/2016	No	No
52	Chloride	General	N/A	N/A	58,000	Sample	13/10/2016	N/A	N/A
53	TOC	General	N/A	N/A	6720	Sample	13/10/2016	N/A	N/A
54	Cyanide	General	10	10	2.93	PRTR	N/A	No	No
	Conductivity	General	N/A	N/A	N/A	PRTR	N/A	N/A	N/A



No.	Compound	Group of compounds	AA-EQS Inland SW (µg/l)	AA-EQS Other SW (µg/l)	Measured /Estimated Conc. (µg/l) <sup>1</sup>	Data Source [Sample / PRTR / Other (state)]	Sample Date (if applicable)	Effluent Concentration above AA concentration (Yes/No)	Effluent Concentration above AA concentration after dilution (Yes/No)
	Hardness (mg/l CaCO <sub>3</sub> )	General	N/A	N/A	164.2	Sample	13/10/2016	N/A	N/A
	pH	General	N/A	N/A	7.18	Sample	13/10/2016	N/A	N/A

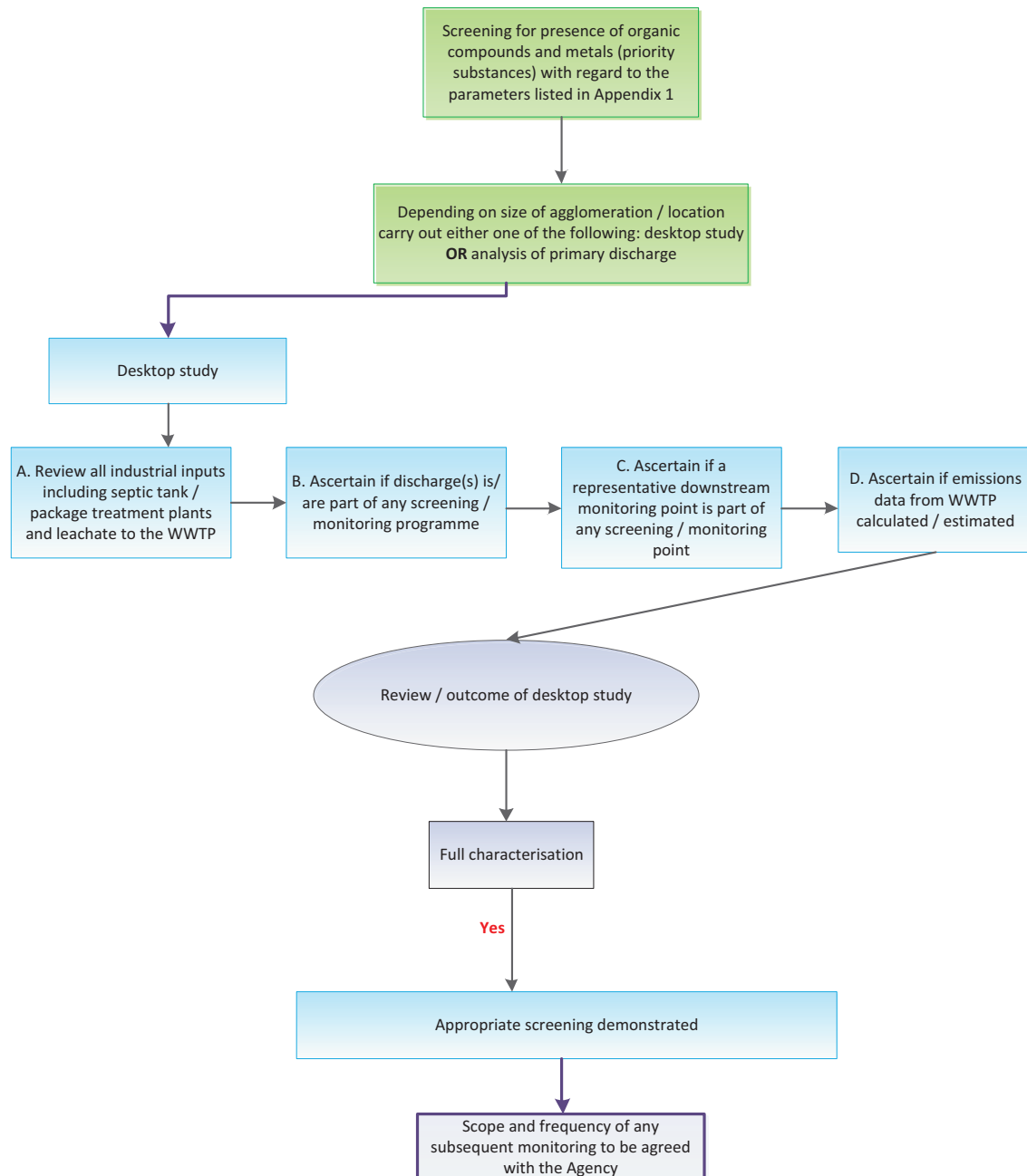
Notes:

1. Where measured values are available these should be used instead of estimated values from PRTR tool.
2. In the case of Copper the value 5 applies where the water hardness measured in mg/l CaCO<sub>3</sub> is less than or equal to 100; the value 30 applies where the water hardness exceeds 100 mg/l CaCO<sub>3</sub>. Estimated CaCO<sub>3</sub> value > 100 where no sampling data available (based on PRTR tool)
3. In the case of Zinc, the standard shall be 8 µg/l for water hardness with annual average values less than or equal to 10 mg/l CaCO<sub>3</sub>, 50 µg/l for water hardness greater than 10 mg/l CaCO<sub>3</sub> and less than or equal to 100 mg/l CaCO<sub>3</sub> and 100 µg/l elsewhere. Estimated CaCO<sub>3</sub> value > 100 where no sampling data available
4. For Cadmium and its compounds the EQS values vary dependent upon the hardness of the water as specified in five class categories (Class 1: <40 mg CaCO<sub>3</sub>/l, Class 2: 40 to <50 mg CaCO<sub>3</sub>/l, Class 3: 50 to <100 mg CaCO<sub>3</sub>/l, Class 4: 100 to <200 mg CaCO<sub>3</sub>/l and Class 5: ≥200 mg CaCO<sub>3</sub>/l)

## Appendix 2 – Priority Substance Screening Flowchart

A flow chart for the screening of the presence of organic compounds and metals (Priority Substances) from WWTP is included below. This flowchart shows that appropriate screening has been demonstrated in line with the assessment undertaken in this report.

### Full Characterisation



## Appendix 3 – Receiving Waters Priority Substance Data

Archived	Category	Entity	Entity Reference	Station	Station Reference	Station Easting	Station Northing	Laboratory	River Basin District	Water Management Unit	Water Body	Sample Template	Sample Reference	Sample Date	Sample Time	Sample Method	Sampled By	Reason
Yes	River Quality	Newport (Tipperary)	25N02	Upstream Newport Stp	RS25N020290	171667	161622	Tipperary Co Co	Shannon RBD	Mulkear	SH_Mulkear_NewportMAIN_1Lower	Licence Upstream (N Tipp) Priority Substances	1655WW0648	13-Oct-2016	09:55	Grab	Donal Mackey	Compliance

Parameter	Biological Oxygen Ammonia N	Dissolved Oxygen	Dissolved Oxygen	Ortho-Phosphate	pH	Suspended Solids	1,2-Dichloroethane	2,4-D Acid Herbicide	2,6-Dichlorobenzene	Antimony	Arsenic	Atrazine	Barium	Benzene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene
Max.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Min.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Test Method	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Analyst Conclusion	mg/l	mg/l	% O2	mg/l	mg/l	pH units	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	1.9	< 0.01	98.7	11.02	0.014	8.08	< 0.4	< 0.1	< 0.005	< 0.02	< 0.3	< 1	< 0.005	201	< 0.1	< 0.01	< 0.01

Parameter	Benzo(a)pyrene	Boron	Cadmium	Calcium	Carbon Tetrachloride	Chloride	Chloroform	Chromium	Cobalt	Copper	Cyanide	Dichlobenil	Dichloromethane	Dieldrin	Diuron	Ethylbenzene	Fluoranthene	Fluoride
Max.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Min.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Test Method	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Analyst Conclusion	µg/l	µg/l	µg/l	mg/l	µg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	< 0.003	< 0.5	< 0.3	34.7	< 0.5	8.6	< 0.5	< 3	< 3	< 0.003	< 1.2	< 0.003	< 5	< 0.005	< 0.005	< 0.5	< 0.01	< 0.1

Parameter	Glyphosate	Hardness CaCO3	Indeno(1,2,3-cd)pyrene	Isoproturon	Lead	Linuron	Magnesium	MCPA	Mecoprop Total	Mercury	Molybdenum	Naphthalene	Nickel	PCB	Phenols	Selenium	Simazine	Temperature
Max.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Min.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Test Method	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Analyst Conclusion	µg/l	mg/l	µg/l	µg/l	µg/l	µg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	Degrees C
-	< 0.005	108.1	< 0.005	< 0.005	< 0.9	< 0.005	5.2	< 0.005	< 0.005	0.07	< 3	0.019	< 1.5	< 0.001	< 1	< 3	< 0.005	9.9

Parameter	Tetrachloroethene	Tin	Toluene	Total Organic Carbon	Trichlorobenzene	Vanadium	Xylene Total	Zinc
Max.	--	--	--	--	--	--	--	--
Min.	--	--	--	--	--	--	--	--
Test Method	--	--	--	--	--	--	--	--
Analyst Conclusion	µg/l	µg/l	µg/l	mg/l	µg/l	µg/l	µg/l	µg/l
-	< 0.1	< 3	< 0.5	2.44	< 0.5	< 3	< 0.5	3.4

Archived	Category	Entity	Entity Reference	Station	Station Reference	Station Easting	Station Northing	Laboratory	River Basin District	Water Management	Water Body	Sample Temp	Sample Reference	Sample Date	Sample Time	Sample Method	Sampled By	Reason
Yes	River Quality	Newport (Tipperary)	25N02	Downstream Newport Stp	RS25N020320	170972	161624	Tipperary Co Co	Shannon RBD	Mulkear	SH_Mulkear_NewportMAIN_1Lower	Licence Downstream (Nipp) Priority Substances	1655WW0649	13-Oct-2016	10:10	Grab	Donal Mackey	Compliance

Parameter	Biological Oxygen Demand	Ammonia N	Dissolved Oxygen	Dissolved Oxygen	Ortho-Phosphate	pH	Suspended Solids	1,2-Dichloroethane	2,4-D Acid Herbicide	2,6-Dichlorobenzene	Antimony	Arsenic	Atrazine	Barium	Benzene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	
Max.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Min.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Test Method	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Analyst Conclusion	mg/l	mg/l	% O2	mg/l	mg/l	pH units	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	1.8	0.011	102.9	11.69	0.02	8.27	< 0.4	< 0.1	< 0.005	< 0.02	< 0.3	< 1	< 0.005	205.4	< 0.1	< 0.01	< 0.01	< 0.01	< 0.01

Parameter	Benzo(a)pyrene	Boron	Cadmium	Calcium	Carbon Tetrachloride	Chloride	Chloroform	Chromium	Cobalt	Copper	Cyanide	Dichlobenil	Dichloromethane	Dieldrin	Diuron	Ethylbenzene	Fluoranthene	Fluoride	
Max.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Min.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Test Method	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Analyst Conclusion	µg/l	µg/l	µg/l	mg/l	µg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
-	< 0.003	0.5	< 0.3	36.5	< 0.5	8.9	< 0.5	< 3	< 3	< 0.003	< 1.2	< 0.003	< 5	< 0.005	< 0.005	< 0.5	< 0.01	< 0.1	< 0.1

Parameter	Glyphosate	Hardness CaCl2	Indeno(1,2,3-c)isoproturon	Lead	Linuron	Magnesium	MCPA	Mecoprop Total	Mercury	Molybdenum	Naphthalene	Nickel	PCB	Phenols	Selenium	Simazine	Temperature	
Max.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Min.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Test Method	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Analyst Conclusion	µg/l	mg/l	µg/l	µg/l	µg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	Degrees C	
-	< 0.005	112.5	< 0.005	< 0.005	< 0.9	< 0.005	5.2	< 0.005	< 0.005	< 0.06	< 3	< 0.01	1.6	0.0011	< 1	< 3	< 0.005	9.6

Parameter	Tetrachloroethane	Tin	Toluene	Total Organic Carbon	Trichlorobenzene	Vanadium	Xylene Total	Zinc
Max.	--	--	--	--	--	--	--	--
Min.	--	--	--	--	--	--	--	--
Test Method	--	--	--	--	--	--	--	--
Analyst Conclusion	µg/l	µg/l	µg/l	mg/l	µg/l	µg/l	µg/l	µg/l
-	< 0.1	< 3	< 0.5	2.69	< 0.5	< 3	< 0.5	3.6