



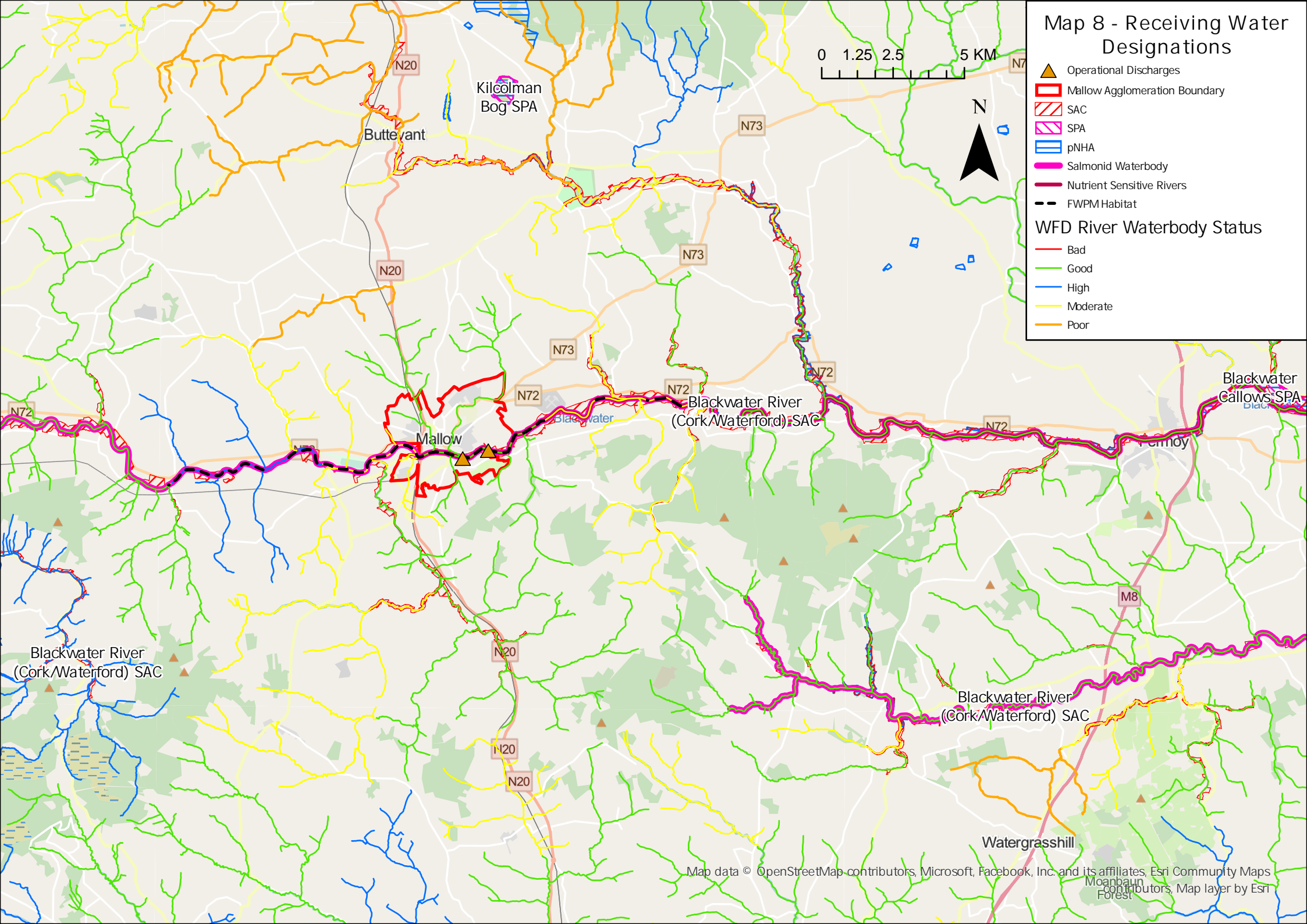
ATTACHMENT D.1:

MAP 8 - RECEIVING WATER DESIGNATIONS

Map 8 - Receiving Water Designations



- Operational Discharges
 - Mallow Agglomeration Boundary
 - SAC
 - SPA
 - pNHA
 - Salmonid Waterbody
 - Nutrient Sensitive Rivers
 - FWPM Habitat
- WFD River Waterbody Status**
- Bad
 - Good
 - High
 - Moderate
 - Poor





ATTACHMENT D.2:

**ASSESSMENT OF IMPACT ON RECEIVING
WATERS**



ATTACHMENT D.2.1:

IMPACT ASSESSMENT REPORT

NOVEMBER 2022

Attachment D.2.1: Impact Assessment Report

1. Introduction

This Report provides a summary of the Impact Assessments prepared to determine the impact of the discharges from the Mallow agglomeration on the receiving waterbody, the Blackwater River (Blackwater(Munster)_140), and associated downstream receptors, and also addresses the criteria as outlined in **Section D.2** of the EPA guidance document.

2. Water Environment

Mallow WwTP discharges to the Blackwater River (Blackwater (Munster)_140). The Blackwater(Munster)_140 is within the Blackwater (Munster) Catchment (Hydrometric Area 18). This catchment includes the area drained by the River Blackwater and all streams entering tidal water between East Point and Knockaverry, Youghal, Co. Cork, draining a total area of 3,310km². Mallow is the largest urban centre within the catchment.

The draft 3rd Cycle Catchment Report (2021) for this Hydrometric Area (HA), determined that for the At Risk waterbodies within the agglomeration Agriculture remains the most prevalent significant pressure, along with forestry, hydromorphology, industry, urban waste water, urban run-off, domestic waste water, mines and quarries, and other significant pressures such as abstractions, historically polluted sites, and windfarm construction. The Mallow agglomeration is not listed as a significant pressure in At Risk waterbodies in the draft 3rd cycle catchment assessment. The Blackwater (Munster)_140 and further downstream water bodies (Blackwater (Munster)_150 – Blackwater (Munster)_190) are listed as a nutrient sensitive area within the catchment downstream of large urban waste water discharges. By providing additional nutrient removal to the waste water the objective of providing tertiary treatment has been met.

The Blackwater (Munster)_140 is not listed as an area for action under the 3rd Cycle or the 2nd Cycle. The WFD Status (2013-2018 & 2016-2021) for the Blackwater (Munster)_140 is Good, and Not At Risk of achieving Good Water Quality Status by 2027. There were no significant pressures for the Blackwater (Munster)_140 identified.

The EPA monitor biological water quality at Station RS18B021500 (Rly Br Mallow LHS) which is ca. 1.5km upstream of SW010. This station was assigned a Q4 score in 2021 indicating Good water quality conditions. The station RS18B021510 (Rly Bridge, Mallow) just downstream of RS18B021500 was assigned Q3-4 – Moderate Status at the last measurement (2021). The next Q value monitoring point downstream is RS18B021800 (NE of Ballymagooly) ca. 2.5km downstream of SW001, which was monitored in 2020 and also assigned a Q4 score.

The Blackwater (Munster)_140 waterbody trend at Station RS18B021720 (downstream of the operational discharges) for Ammonium is Downwards (*i.e.*, decreasing concentrations) and for Ortho-P is Upwards (*i.e.*, increasing concentrations).

There are two ambient monitoring river stations upstream and downstream of the WwTP primary discharge location. The upstream river station (RS18B021600) is located 1.5km upstream and the downstream river station (RS18B021720) is located 560m downstream.

Recent ambient monitoring data for Blackwater(Munster)_140 can be found in **Table D.2.1** and **D.2.2** below.

Table D.2.1 - Ambient Monitoring – upstream monitoring results (Data Source: catchment.ie, samples taken at RS18B021600 from Jan 2020 – July 2022)

Parameter	Total Ammonia	BOD	DO	pH	Total Nitrogen	Ortho-P
Unit	mg/l	mg/l	%sat	pH Unit	mg/l	mg/l
Number of Samples	32	31	32	32	32	32
Maximum	0.22	3.70	113	8.2	3.9	0.106
Minimum	0.007	0.10	85	6.9	1.8	0.005
Mean Value	0.047	1.207	97.7	7.7	2.31	0.031
<i>Mean EQS as per S.I. No. 77/2019 Good Status *</i>	≤ 0.065	≤ 1.5		4.5-9		≤ 0.035
<i>Mean EQS as per S.I. No. 77/2019 High Status *</i>	≤ 0.040	≤ 1.3		4.5-9		≤ 0.025
<i>95%ile EQS as per S.I. No. 77/2019 Good Status *</i>	≤ 0.14	≤ 2.6		4.5-9		≤ 0.075
<i>95%ile EQS as per S.I. No. 77/2019 High Status *</i>	≤ 0.09	≤ 2.2		4.5-9		≤ 0.045
<i>Overall compliance with relevant Mean EQS Good Status *</i>	Yes	Yes		Yes		Yes
<i>Overall compliance with relevant Mean EQS High Status *</i>	No	Yes		Yes		No
<i>Overall compliance with relevant 95%ile EQS Good Status *</i>	Yes	Yes		Yes		Yes
<i>Overall compliance with relevant 95%ile EQS High Status *</i>	Yes	Yes		Yes		Yes

* EQS under S.I. No. 77 of 2019

Note: Where data was reported as less than the limit of detection, LOD/SQRT2 was applied

Table D.2.2 - Ambient Monitoring – downstream monitoring results (Data Source: catchment.ie, taken from RS18B021720 from Feb 2020 – August 2022)

Parameter	Ammonia	BOD	DO	pH	Total Nitrogen	Ortho-P
Unit	mg/l	mg/l	%sat	pH Unit	mg/l	mg/l
Number of Samples	23	23	23	23	22	22
Maximum	0.123	8.500	102.000	8.100	3.000	0.073
Minimum	0.0040	0.2000	86.0000	6.9000	1.7000	0.0070
Mean Value	0.038	1.687	96.2	7.72	2.280	0.033
<i>Mean EQS as per S.I. No. 77/2019 Good Status *</i>	≤ 0.065	≤ 1.5		4.5-9		≤ 0.035
<i>Mean EQS as per S.I. No. 77/2019 High Status *</i>	≤ 0.040	≤ 1.3		4.5-9		≤ 0.025
<i>95%ile EQS as per S.I. No. 77/2019 Good Status *</i>	≤ 0.14	≤ 2.6		4.5-9		≤ 0.075
<i>95%ile EQS as per S.I. No. 77/2019 High Status *</i>	≤ 0.09	≤ 2.2		4.5-9		≤ 0.045
<i>Overall compliance with relevant Mean EQS Good Status *</i>	Yes	No		Yes		Yes
<i>Overall compliance with relevant Mean EQS</i>	Yes	No		Yes		No

Parameter	Ammonia	BOD	DO	pH	Total Nitrogen	Ortho-P
Unit	mg/l	mg/l	%sat	pH Unit	mg/l	mg/l
High Status *						
Overall compliance with relevant 95%ile EQS Good Status *	Yes	Yes		Yes		Yes
Overall compliance with relevant 95%ile EQS High Status *	Yes	Yes		Yes		Yes

* EQS under S.I. No. 77 of 2019

Note: Where data was reported as less than the limit of detection, LOD/SQRT2 was applied

For the time period of January 2020 – July 2022 the mean concentrations of Ortho-P and Ammonia at upstream RS18B021600 station fails to meet the High Status EQS (mean) for both parameters. However, the 95%ile EQS for High status are met. In terms of BOD, the mean and 95%ile EQSs are met for High and Good status. In terms of the downstream station, RS18B021720 (February 2020- August 2022), for Ammonia, the mean and 95%ile EQSs are met for High and Good status. In terms of Ortho-P, the mean High status EQS is not met. Finally in terms of BOD, the mean and 95%ile Good status EQS are met, but the mean and 95%ile EQSs are not met.

The Blackwater (Munster)_140 is designated as a nutrient sensitive area in accordance with the Urban Waste Water Treatment (UWWT) Directive 91/271/EEC on Urban Waste Water Treatment and S.I. No. 254 of 2001, S.I. No. 440 of 2004 and S.I. No. 48 of 2010, with P being the limiting nutrient in this waterbody. One completed the upgraded WwTP will be compliant with the Urban Wastewater Treatment Directive and will provide for P and also N removal.

The Blackwater River is designated as a Salmonid River (Blackwater [Munster) under the Salmonid River Regulations (S.I. No. 293 of 1988). The completion of the upgrade works at the WwTP to meet the proposed ELVs, and the completion of the proposed Networks Projects will contribute towards compliance with the European Communities Environmental Objectives (Surface Water) Regulations, 2009, as amended (now S.I. No. 77 of 2019), and will assist in the efforts to maintain the Good WFD Status of the waterbody, and also in maintaining the current High status for both Ammonium and Ortho-P. This will provide a high level of protection to the Blackwater (Munster)_140 and the Atlantic Salmon contained therein; thereby ensuring that the operational discharges do not cause a breach of the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I No. 203 of 1988) in the River.

The River Blackwater (Munster) is a designated Freshwater Pearl Mussel (*Margaritifera Margaritifera*) site listed under the first Schedule of the European Communities

Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009). The assimilative capacity calculations completed to inform this WWDA review, indicate that under low flow conditions (worst case scenario), that High status water chemistry conditions can be achieved by the primary discharge in the receiving waterbody even in the context of background/upstream pressures. Given the proposed stringent ELV's and the network upgrades, the operational discharges will support appropriate water chemistry conditions and will therefore not hinder the restoration of the conservation objectives (and FPM Regulation standards) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation. Thereby ensuring that the Ecological Quality Objectives as set out in the fourth schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) can be maintained.

The Blackwater Valley (Killavullen) pNHA is located ca. 9km downstream of Mallow primary discharge point and the Blackwater Valley (Ballinvurrig Wood) pNHA is located ca. 12km downstream along the River Blackwater.

The operational discharges are direct into the Blackwater River (Cork/Waterford) SAC. Further downstream of the operational discharges (ca. 27km), the next closest European site is the Blackwater Callows SPA (Site code: 004094) and then the Blackwater Estuary SPA (Site code: 004028) which is located > 50km downstream. The Kilcoman Bog SPA is located ca. 11km north of the agglomeration, and although not hydrologically connected there is the potential pathway for *ex-situ* bird species.

The Blackwater River (Cork/Waterford) SAC is a Special Area of Conservation (SAC) selected for many habitats and/or species listed on Annex I / II of the E.U. Habitats Directive, this includes water dependent species such as, Freshwater Pearl Mussel (*Margaritifera margaritifera*), [1092] White-clawed Crayfish (*Austropotamobius pallipes*), [1095] Sea Lamprey (*Petromyzon marinus*), [1096] Brook Lamprey (*Lampetra planeri*), [1099] River Lamprey (*Lampetra fluviatilis*), [1103] Twaite Shad (*Alosa fallax*), [1106] Atlantic Salmon (*Salmo salar*), [1355] Otter (*Lutra lutra*), and [1421] Killarney Fern (*Trichomanes speciosum*).

The Blackwater Callows SPA's qualifying interests are Whooper Swan (*Cygnus cygnus*) [A038], Wigeon (*Anas penelope*) [A050], Teal (*Anas crecca*) [A052], Black-tailed Godwit (*Limosa limosa*) [A156] and Wetland and Waterbirds [A999].

The Blackwater Estuary SPA qualifying interests are Wigeon (*Anas penelope*) [A050], Golden Plover (*Pluvialis apricaria*) [A140], Lapwing (*Vanellus vanellus*) [A142], Dunlin (*Calidris alpina*) [A149], Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157], Curlew (*Numenius arquata*) [A160], Redshank (*Tringa totanus*) [A162] and Wetland and Waterbirds [A999].

The Kilcoman Bog SPA's qualifying interests are the Whooper Swan (*Cygnus cygnus*) [A038], Teal (*Anas crecca*) [A052], Shoveler (*Anas clypeata*) [A056] and Wetland and Waterbirds [A999].

The AA Screening which accompanies this application concludes that, with the exception of the River Blackwater (Cork/Waterford) SAC, there is no potential for direct or indirect significant effects to the qualifying interests of the above-mentioned European sites (Refer to **Section 4** below).

The WAC calculations which support this application show that Blackwater (Munster) River has adequate assimilative capacity for the proposed discharge. Proposed ELV of 1 mg/l for

Ortho-P and 2 mg/l for Ammonia have been proposed to ensure compliance with the High status standards set in European Communities Environmental Objectives (Surface Water) Regulations, 2009, as amended (now S.I. No. 77 of 2019). These ELVs take account of the sensitivity of the receiving Blackwater River as a SAC with sensitive water dependent qualifying interests.

In summary, the upgrade works to the Mallow WwTP and associated effluent discharge standards, the decommissioning of 9 no. SWOs in the current agglomeration, along with and the operational design of the Dual Function Overflow from the new Bridge Street Pumping Station will ensure compliance with the European Communities Environmental Objectives (Surface Water) Regulations, 2009, as amended (now S.I. No. 77 of 2019) and will assist the receiving waterbody in maintaining its Good WFD Status and its current High status for both Ammonium and Ortho-P.

3. Waste Assimilative Capacity Calculations

A Waste Assimilative Capacity (WAC) analysis has been carried out on the receiving waterbody, the Blackwater_140 on the basis of the proposed ELVs, design p.e of 22,000 and the most recent available upstream ambient monitoring data for RS18B021600.

The calculations were based on the EPA adopted approach utilising dry weather flows from the treatment plant mass-balanced against 95%ile flows in the river. The calculations were performed using 2020 to 2022 mean background river water quality data from Station RS18B021600 and the “*notionally clean river*” concentrations. The long-term 95-%ile flow for the relevant reach of the Blackwater River as obtained from the EPA Hydrometrics and Groundwater Section is 4.870m³/sec.

The stated water body objective for the River Blackwater is to maintain Good status, as defined by the standards specified in the Surface Waters Regulations and detailed in **Table D.2.3** below. BOD, Ammonia and Orthophosphate meet the specified standards for both the background water quality and notionally-clean scenarios. The 95%ile High status limits are also met. For 2013-2018, both the Ammonium and Ortho-P status elements are noted as High under WFD status in the Blackwater (Munster)_140.

Table D.2.3 – Assimilative Capacity Calculations

Parameter	Background		Proposed ELVs	Predicted D/S Concentration	Relevant Standards ^{Note 1}
BOD	Actual	1.207	25	1.510	95%ile: ≤2.6 (good) ≤2.2 (high)
	Notionally Clean	0.26		0.575	
Ortho-phosphate	Actual	0.031	1	0.044	95%ile: ≤0.075 (good) ≤0.045 (high)
	Notionally Clean	0.005		0.018	
Ammonia	Actual	0.047	3	0.085	95%ile: ≤0.14 (good) ≤0.090 (high)
	Notionally Clean	0.008		0.046	

Note 1: European Union Environmental Objectives (Surface Waters) (Amendment). Regulations 2019 (S.I. No. 77 of 2019) – 95%ile High Status EQS.

4. Appropriate Assessment

A combined Appropriate Assessment (AA) Screening Report and Natura Impact Statement was prepared in November 2022 to accompany this WWDL review application. This Report will enable the EPA as competent authority to conduct an Appropriate Assessment (AA) Screening Determination and Stage 2 AA in respect of the Mallow agglomeration operational discharges, for the purposes of the European Union (Waste Water Discharge) Regulations 2007 to 2020.

The Appropriate Assessment (AA) Screening of the proposed operational discharges assessed whether the discharge activity, alone or in combination with other plans and projects, are likely to have significant effects on a European Site(s) in view of best scientific knowledge and the conservation objectives of the site(s). The screening assessment concluded on the basis of the information set out in the AA Screening, and the documentation referenced therein, that the likelihood of significant effects to the Blackwater River (Cork/Waterford) SAC cannot be excluded, and a Stage Two Appropriate Assessment is therefore provided.

This NIS was prepared following the EPA (2009) '*Note on Appropriate Assessments for the purposes of the Waste Water Discharge (Authorisation) Regulations, 2007 (S.I. No. 684 of 2007)*'. The Department of the Environment, Heritage and Local Government guidance '*Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities*' (DoEHLG, 2009) has also been taken into account. This NIS investigates the potential adverse effects on the aquatic qualifying interests of the Blackwater River (Cork/Waterford) SAC arising from the Mallow agglomeration operational discharges, in combination with other plans / projects affecting the aquatic environment. The assessment considers whether the discharges, alone or in combination with other projects or plans, will have adverse effects on the integrity of this European site.

The NIS has concluded that the operational discharges (*i.e.*, SW001 and SW010) from the Mallow agglomeration will not prevent the achievement of the conservation objectives of the qualifying interests of the Blackwater River (Cork/Waterford) SAC and that there will be no adverse effects on the integrity of this SAC, or indeed any other European Site, in view of this sites conservation objectives, and that the conservation status of the Annex I habitats, Annex II species or Annex I bird species, will not be compromised by the agglomeration discharges either directly, indirectly or cumulatively.

It is therefore concluded that the Mallow agglomeration operational discharges, alone or in-combination with other plans and / or projects will not give rise to adverse effects on the integrity of the Blackwater River (Cork/Waterford) SAC or any other European Site.

Please refer to **Attachment D.2.2** for a copy the Appropriate Assessment Screening Report and NIS (November 2022) prepared to inform this WWDL review process.

5. Environmental Impact Assessment

This WWDA application review is for a WwTP with a capacity of greater than 10,000 p.e. as defined in Article 2, point (6), of the Urban Waste Water Treatment Directive (*i.e.*, Mallow 22,000 p.e). Therefore, a mandatory EIA, and the preparation of an EIAR is required to inform the WWDA process.

The EIAR includes an assessment of the operational discharge from the agglomeration (*i.e.*, Primary Discharge (SW001) from the WwTP and Dual Function Overflow (SW010) from the new Mallow Bridge Pumping Station) to the receiving water *i.e.*, River Blackwater.

The approach adopted in this impact assessments, and the overall preparation of the EIAR, was based on the recommendations in the Guidelines on information to be contained in Environmental Impact Assessment Reports (EPA, 2022) and is in line with the EIA Directive 2014/52/EU, and indeed takes account of all current and relevant guidance documents published at the time of preparing the EIAR. Due regard has also been taken of the scoping responses received from the EIA Scoping Process.

The EIAR has concluded that the Mallow agglomeration operational discharges would not be likely to have significant effects on the environment.

This EIAR will enable the EPA as competent authority to conduct an EIA in respect of the Mallow agglomeration operational discharges, for the purposes of the European Union (Waste Water Discharge) Regulations 2007 to 2020.

Please refer to **Attachment B.5** for a copy of the Environmental Impact Assessment Report (November 2022) prepared to inform this WWDL review process.

6. Priority Substance Assessment

An assessment of the potential for impacts on receiving waters from priority substances in the primary discharge has been carried out to inform this WWDL application. The assessment considered 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 (now S.I No. 77 of 2019). It was concluded that after dilution none of the substances listed in the Specific Pollutants, Priority and Priority Hazardous Substances as outlined in the Surface Water Regulations, are likely to be present in the effluent discharge to the Blackwater River, at concentrations above the specified standards as per European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended (now S.I No. 77 of 2019).

This Report is contained in **Attachment D.2.4**: Priority Substance Assessment Report, November 2022.

7. Designated Shellfish Water/Area

There are no designated shellfish waters located in the downstream in the vicinity of the discharges.

8. Bathing Waters

There are no designated bathing waters on any of the receiving waters downstream of the WwTP.

9. River Flow Estimation

The 95%ile river flow estimation for the River Blackwater is 4.87m³/s (Source: EPA Estimated 95%ile flow (up to 2018 data)).

10. Combined Approach

The Waste Water Discharge Authorisation under the European Union (Waste Water Discharge) Regulations 2007 to 2020, specify that a '*combined approach*' in relation to licensing of waste water works must be taken, whereby the emission limits for the discharge are established on the basis of the stricter of either or both, the limits and controls required under the Urban Waste Water Treatment Regulations, 2001, as amended, and the limits determined under statute or Directive for the purpose of achieving the environmental objectives established for surface waters, groundwater or protected areas for the water body into which the discharge is made.

The design of the WwTP is greater than 15,000 p.e. and is therefore in line with Article 4 of the directive, "*Member States shall ensure that urban waste water entering a collecting system shall before discharge be subject to secondary treatment or an equivalent treatment for all discharges from agglomerations of more than 15,000 p.e.*". The Mallow WwTP has been upgraded in order to be compliant with the Urban Wastewater Treatment Directive and provides for secondary treatment, with P and also N removal.

The effluent standards for the updated WwTP give effect to the principle of the Combined Approach as defined in Waste Water Discharge (Authorisation) Regulations, 2007 to 2020 in that they accommodate the Urban Waste Water Regulations and the relevant designations /status of the receiving waterbody, the Blackwater River.

11. Compliance with Relevant National or EU Legislation

As per **Attachment B.6**, the Mallow WwTP has been designed to ensure that the emissions from the agglomeration will comply with and will not result in the contravention of EU Legislation and National Regulations.

The discharge standard will not compromise the achievement of the objectives and EQSs established for any European sites water dependant species and natural habitats and designations in the wider environs or downstream of the agglomeration. The operation of the updated WwTP and network is expected to have a positive impact in terms of a reduction in the levels of nutrients being discharged in the Blackwater River. The discharge activities will not cause a deterioration in the chemical status in the Blackwater River.

12. Data Sources

The following key data sources were used to complete this application.

- Online data available on held by the NPWS, EPA, and Irish Water:
 - www.npws.ie
 - epawebapp.epa.ie
 - gis.epa.ie/EPAMaps
 - catchments.ie
- GIS data for European site boundaries obtained in digital format online from European Environmental Agency
- Irish Water/Cork County Council sampling and monitoring data.

13. Cumulative and In Combination Effects

The combined Appropriate Assessment Screening Report and NIS (November 2022), and the Environmental Impact Assessment Report (November 2022) address cumulative and in-combination effects. Refer to **Attachments D.2.2** and **Attachment B.5**, respectively.

14. Mixing zone or transitional areas of exceedance

Based on the 95%ile river flow (4.87 m³/s) and the Mallow WwTP DWF (5,435 m³/d), there are ca. 74 dilutions estimated immediately in the proximity of the primary discharge point.

15. Dilutions and retention times for lakes

Not applicable. No discharges to lakes.

16. The impact of the discharges on any environmental media other than those into which the emissions are to be made

Not applicable. No other relevant media into which the emissions are to be made.

17. Groundwater Details

Not applicable. No discharge to ground waters.

18. High Status Waterbodies

Not applicable. No High status waterbodies within the region of the Mallow WwTP and/or the operational discharges.

19. Fresh Water Pearl Mussels

As noted in **Section 2** above, the River Blackwater (Munster) is a designated Freshwater Pearl Mussel (*Margaritifera Margaritifera*) site listed under the first Schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009). Given the proposed stringent ELV's and the network upgrades, the operational discharges will support appropriate water chemistry conditions and will therefore not hinder the restoration of the conservation objectives (and FPM Regulation standards) for macroinvertebrates, filamentous algae, phytobenthos, macrophytes and siltation. Thereby ensuring that the Ecological Quality Objectives as set out in the fourth schedule of the European Communities Environmental Objectives (Fresh Water Pearl Mussel) Regulations (S.I. No. 296 of 2009) can be maintained).

20. Impacts on Transboundary / Territory of other States

The operational discharges to which this application relates will not result in transboundary impacts or impacts on the territory of other states.

21. For waste water treatment plants with coastal discharges, provide evidence that the end of the discharge pipe is below the mean spring tide low water line

Not applicable. Discharge is not to coastal water.



ATTACHMENT D.2.3:

WAC CALCULATIONS
OCTOBER, 2022



Project Number: 20893 Project Name: Mallow Sheet: 1 of 1	Rev	Date	By
	1.0	07-Aug-22	CAS
	2.0	19-Oct-22	CAS

Waste Assimilative Capacity (WAC) Calculation

Name of River	Blackwater (Munster)_140		WFD 2013-2018 Status & 2016-2021 Status	Good		
River Flow	m ³ /s	Data Source	m ³ /d	PE		
95% ile Flow	4.870	EPA - Estimated 95% ile flow (up to 2018 data)	420,768	Treatment Plant Capacity (Design)	22,000	
Background Concentration			Current Effluent Standards as per D0052-01 (Tech A) ^{Note 2}	Max Allowable D/S (mg/l)		EQS ^{Note 1}
	mg/l	Data Source	(mg/l)	Good Status ^{Note 1}	High Status ^{Note 1}	EQS ^{Note 1}
Carbonaceous BOD	1.207	Data Source: Catchments.ie (Station RS18B021600 - Mean Data from Jan 2020 – July 2022)	25.00	2.60	2.20	95% ile EQS Status
Total Ammonia (NH ₃)	0.047		3.00	0.14	0.09	95% ile EQS Status
Ortho-Phosphate (OP)	0.031		1.00	0.075	0.045	95% ile EQS Status
Dry Weather Flow	Flow in River	Allowable Effluent Concentration	WAC	Predicted Downstream Concentration	Comments	Legislation
m ³ /d	95% ile m ³ /d	BOD mg/l	BOD kg/d	BOD mg/l	Treatment Plant Capacity	Comply with SW Regulations
5435	420,768	110.47	600.40	1.510	22,000 p.e	Yes
m ³ /d	95% ile m ³ /d	NH ₃ mg/l	NH ₃ kg/d	NH ₃ mg/l		
5435	420,768	7.31	39.73	0.085	22,000 p.e	Yes
m ³ /d	95% ile m ³ /d	OP mg/l	OP kg/d	OP mg/l		
5435	420,768	3.44	18.72	0.044	22,000 p.e	Yes

Note 1: S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019

Note 2: More onerous Ortho-P ELV to that cited in D0052-01 required in order to meet High Status EQS.



Project Number: 20893 Project Name: Mallow Sheet: 1 of 1	Rev	Date	By
	1.0	07-Aug-22	CAS
	2.0	19-Oct-22	CAS

Waste Assimilative Capacity (WAC) Calculation

Name of River	Blackwater (Munster)_140		WFD 2013-2018 Status & 2016-2021 Status	Good		
River Flow	m ³ /s	Data Source	m ³ /d	PE		
95% ile Flow	4.870	EPA - Estimated 95% ile flow (up to 2018 data)	420,768	Treatment Plant Capacity (Design)	22,000	
Background Concentration			Current Effluent Standards as per D0052-01 (Tech A) ^{Note 2}	Max Allowable D/S (mg/l)		
	mg/l	Data Source	(mg/l)	Good Status ^{Note 1}	High Status ^{Note 1}	EQS ^{Note 1}
Carbonaceous BOD	0.260	Background Concentration mg/l (Notionally Clean)	25.00	2.60	2.20	95% ile EQS Status
Total Ammonia (NH ₃)	0.008		3.00	0.14	0.09	95% ile EQS Status
Ortho-Phosphate (OP)	0.005		1.00	0.075	0.045	95% ile EQS Status
Dry Weather Flow	Flow in River	Allowable Effluent Concentration	WAC	Predicted Downstream Concentration	Comments	Legislation
m ³ /d	95% ile m ³ /d	BOD mg/l	BOD kg/d	BOD mg/l	Treatment Plant Capacity	Comply with SW Regulations
5435	420,768	183.76	998.73	0.575	22,000 p.e	Yes
m ³ /d	95% ile m ³ /d	NH ₃ mg/l	NH ₃ kg/d	NH ₃ mg/l		
5435	420,768	10.36	56.30	0.046	22,000 p.e	Yes
m ³ /d	95% ile m ³ /d	OP mg/l	OP kg/d	OP mg/l		
5435	420,768	5.49	29.86	0.018	22,000 p.e	Yes

Note 1: S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019

Note 2: More onerous Ortho-P ELV to that cited in D0052-01 required in order to meet High Status EQS.



ATTACHMENT D.2.4:

**PRIORITY SUBSTANCE ASSESSMENT
REPORT
NOVEMBER 2022**

Priority Substances Assessment

Agglomeration Name:	Mallow
Licence Register No.	D0052 Licence Review



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Appendix 1 – Screening of Parameters for Priority Substances

1 Introduction

This report has been prepared for the Mallow agglomeration, in County Cork, to inform a Waste Water Discharge Licence (WWDL) Review Application for D0052-01.

Mallow is a town in County Cork, approximately 30km north of Cork City and West of Fermoy. The town falls at the intersect of the N20 and N72. The River Blackwater runs through the town. The agglomeration is spread over 10 no. townlands namely, Mallow, Annabella, Lackanalooha, Kilknockan, Spaglen, Ballydahin, Quartertown Lower, Killetra, Gooldshill, and Carhookeal.

The Mallow waste water works under this WWDL review will consist of an upgraded WwTP (design capacity 22,000 p.e.) at Ballyellis Townland (157318E, 097988N); an existing Primary Discharge (SW001) which discharges to the Blackwater River at NGR 157530E, 098140N; a new Dual Function Overflow (*i.e.*, SW010 which can act as a Storm Water Overflow or Emergency Overflow depending on the event) at the new Bridge Street Pumping Station which discharges to River Blackwater at NGR 156636E, 097862N; and an associated sewer network.

This desk top study has been undertaken to determine the necessity, if any, for further analysis of the discharge based on the *Guidance on the Screening for Priority Substances for Waste Water Discharge Licences*, issued by the EPA. Relevant inputs to the Mallow WwTP and estimates for the emissions from the discharge point have been taken into account in the preparation of this report.

2 Desktop Study

2.1 Assessment of Analysis Required

A. Review of all industrial inputs into WWTP

A review of available online mapping and EPA licensed facilities was undertaken to determine the non-domestic discharge types being received at the Mallow WwTP. The IW Technical Assessment Manual Sectoral Profile Data was reviewed to determine the potential dangerous substances which could be released to sewer from industrial inputs.

The effluent from the agglomeration arises from mainly from domestic, commercial and education sources.

It is considered that the Priority Substances which are possibly being emitted to sewer have been well represented in this partial characterisation of the wastewater (**Table 2.1**).

Upon review of the types of businesses, amenities and educational facilities in Mallow, **Table 2.1** provides an indicative list of non-domestic discharge types to the WwTP and details potential dangerous/priority substance.

Table 2.1 – List of Non-Domestic Discharge Types to WwTP and Details of Potential Dangerous/Priority Substance

Type of Industry within the Agglomeration	Potential Source of Dangerous / Priority Substances (Yes / No)	Dangerous / Priority Substances Monitoring Undertaken (Yes / No)	List of Potential Dangerous Substances Based on Industry Type (Source: <i>Technical Assessment Manual - Sectoral Profile Data</i>)
Bitumen production	Yes	Unknown	Polyaromatic Hydrocarbon (PAH)
Manufacture of food products and beverages	Yes	Unknown	Lead and its compounds Nickel and its compounds Cadmium and its compounds Mercury and its compounds Chromium (III) Copper Phenol Toluene Xylenes (Total) Zinc
Production, processing and preserving of meat and meat products	Yes	Unknown	Naphthalene Trichloroethylene Cadmium and its compounds Hexachlorocyclohexane (Lindane) Chromium (VI) Cypermethrin Toluene Xylenes (Total)
Transport <i>via</i> railways	Yes	Unknown	Atrazine Diuron Simazine Polyaromatic Hydrocarbon (PAH)
Schools and Universities	Yes	Unknown	Dichloromethane Lead and its compounds Nickel and its compounds Trichloromethane
Hospitals	Yes	Unknown	Dichloromethane
Lauderettes and Dry Cleaners	Yes	Unknown	Di (2-ethylhexyl) phthalate (DEHP)
Hairdressers	Yes	Unknown	Nickel and its compounds Cadmium and its compounds
Dentists	Yes	Unknown	Octylphenols Mercury and its compounds
Garages and filling stations	Yes	Unknown	Benzene Di (2-ethylhexyl) phthalate (DEHP) Lead and its compounds Naphthalene Nickel and its compounds Cadmium and its compounds Mercury and its compounds Chromium (III)

Type of Industry within the Agglomeration	Potential Source of Dangerous / Priority Substances (Yes / No)	Dangerous / Priority Substances Monitoring Undertaken (Yes / No)	List of Potential Dangerous Substances Based on Industry Type (Source: <i>Technical Assessment Manual - Sectoral Profile Data</i>)
			Copper Toluene Xylenes (Total) Zinc
Construction	Yes	Unknown	Lead and its compounds Nickel and its compounds Mercury and its compounds Arsenic Chromium (III) Copper Zinc
Sewage and refuse disposal, sanitation, and similar activities	Yes	Unknown	Lead and its compounds Nickel and its compounds Dieldrin Cadmium and its compounds Mercury and its compounds Arsenic Chromium (VI) Copper Cyanide Fluoride Zinc
Manufacture of chemicals and chemical products	Yes	Unknown	Alachlor Atrazine Benzene Chlorpyrifos 1,2-Dichloroethane Dichloromethane Di (2-ethylhexyl) phthalate (DEHP) Diuron Fluoranthene Isoproturon Lead and its compounds Naphthalene Nickel and its compounds Octylphenols Pentachlorophenol (benzo-a-pyrene) Simazine Trichlorobenzene (all isomers) Trichloromethane Trifluarin Anthracene Pentabromodiphenlyether Cadmium and its compounds

Type of Industry within the Agglomeration	Potential Source of Dangerous / Priority Substances (Yes / No)	Dangerous / Priority Substances Monitoring Undertaken (Yes / No)	List of Potential Dangerous Substances Based on Industry Type (Source: <i>Technical Assessment Manual - Sectoral Profile Data</i>)
			C10-13-Chloralkanes Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclohexane (Lindane) Mercury and its compounds Nonylphenols Polyaromatic Hydrocarbon (PAH) Arsenic Chromium (III) Copper Cyanide Dimethoate Fluoride Glyphosate Mecoprop Phenol Toluene Xylenes (Total) Zinc

B. Discharge monitoring

Primary discharge monitoring for the possible presence of Specific Pollutants, Priority and Priority Hazardous Substances as outlined in Table 10, 11 and 12 of European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended is available for this agglomeration. Samples taken on the 12th of November 2014 have been used to inform this Priority Substance Report.

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

There is no priority substances monitoring data for the downstream ambient monitoring location, Blackwater River.

D. Participation in PRTR reporting

All parameters listed in Appendix 1 have emissions data available for the discharge.

The emission concentration from the PRTR has been included in the table in Appendix 1 where analysis data is not available.

2.2 Review Outcome of Desktop Study

Following the desktop study, all parameters in Appendix 1 have been assessed to establish any potential impact on the receiving waters.

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.

No parameters have been identified as potentially higher than the required EQS following dilution at 95%ile flow, therefore no impact on the receiving water is anticipated.

Based on the measured data, no parameters were identified as potentially being higher than the required EQS after dilution.

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	Desk Top Study <i>and</i> Screening Analysis
Does the assessment include a review of licensed / authorised inputs to the works?	Yes
Does the assessment include a review of other (unauthorised) inputs to the works?	Yes
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)	Yes
Does the assessment identify that priority substances may be impacting the receiving water?	No
Does the Improvement Programme for the agglomeration include the elimination / reduction of all priority substances identified as having an impact on receiving water quality?	N/A

4 Conclusion

An assessment of the potential for impacts on receiving waters from priority substances in the primary discharge has been carried out to inform this WWDL application. The assessment considered 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. After dilution it can be concluded that none of the substances listed in the Specific Pollutants, Priority and Priority Hazardous Substances, are likely to be present in the effluent discharge to the River Blackwater, at concentrations above the standards in the Surface Water Regulations 2009, as amended.

Based on the results of this desk top study, it can be determined that **no for further analysis** of the discharge, based on the *Guidance on the Screening for Priority Substances for Waste Water Discharge Licences*, issued by the EPA, is required.

Appendix 1 – Screening of Parameters for Priority Substances

AA: Annual Average

MAC: Maximum Allowable Concentration

EQS: Environmental Quality Standards

Dilution factor in receiving water: 77 dilutions estimated immediately in the proximity of the discharge point (based on the Blackwater River 95%ile flow 4.87 m³/s and DWF 5,435 m³/d)

No.	Compound	Group of compounds	AA-EQS Inland SW (µg/l)	AA-EQS Other SW (µg/l)	Measured Conc. (µg/l) ¹	Data Source	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	<0.47	Sample	12/11/14	No	No
2	Carbon tetrachloride	VOCs	12	12	<5.00	Sample	12/11/14	No	No
3	1,2-Dichloroethane	VOCs	10	10	<0.65	Sample	12/11/14	No	No
4	Dichloromethane	VOCs	20	20	<5.00	Sample	12/11/14	No	No
5	Tetrachloroethylene	VOCs	10	10	<0.39	Sample	12/11/14	No	No
6	Trichloroethylene	VOCs	10	10	<5	Sample	12/11/14	No	No
7	Trichlorobenzenes	VOCs	0.4	0.4	<0.61	Sample	12/11/14	No	No
8	Trichloromethane	VOCs	2.5	2.5	1.767	Sample	12/11/14	No	No
9	Xylenes (all isomers)	VOCs	10	10	<0.70	Sample	12/11/14	No	No
10	Ethyl Benzene	VOCs	n/a	n/a	<0.45	Sample	12/11/14	N/A	N/A
11	Toluene	VOCs	10	10	<0.54	Sample	12/11/14	No	No
12	Naphthlene ¹	PAHs	2	2	<0.01	Sample	12/11/14	No	No
13	Fluoranthene ¹	PAHs	0.0063	0.0063	<0.01	Sample	12/11/14	No	No
14	Benzo[k]fluoranthene ²	PAHs	MAC of 0.017	MAC of 0.017	<0.01	Sample	12/11/14	No	No

¹ The EQS for these substances shall take effect from 22 December 2015

² No indicative parameter is provided for this group of substances

No.	Compound	Group of compounds	AA-EQS Inland SW (µg/l)	AA-EQS Other SW (µg/l)	Measured Conc. (µg/l) ¹	Data Source	Sample Date (if applicable)	Effluent Concentration above AA concentration (Yes/No)	Effluent Concentration above AA concentration after dilution (Yes/No)
15	Benzo[ghi]perylene ²	PAHs	MAC of 8.2×10^{-3}	MAC of 8.2×10^{-4}	<0.01	Sample	12/11/14	No	No
16	Indeno[1,2,3-c,d]pyrene ²	PAHs			<0.01	Sample	12/11/14	N/A	N/A
17	Benzo[b]fluoranthene ²	PAHs	MAC of 0.017	MAC of 0.017	<0.01	Sample	12/11/14	No	No
18	Benzo[a]pyrene	PAHs	1.7×10^{-4}	1.7×10^{-4}	<0.01	Sample	12/11/14	No	No
19	Di(2-ethylhexyl)phthalate (DEHP)	Plasticiser	1.3	1.3	<0.001	Sample	12/11/14	No	No
20	Isodrin ³	Pesticides	Σ=0.01	Σ=0.005	<0.001	Sample	12/11/14	No	No
21	Dieldrin ³	Pesticides			<0.001	Sample	12/11/14	No	No
22	Diuron	Pesticides	0.2	0.2	<0.001	Sample	12/11/14	No	No
23	Isoproturon	Pesticides	0.3	0.3	<0.001	Sample	12/11/14	No	No
24	Atrazine	Pesticides	0.6	0.6	0.02	Sample	12/11/14	No	No
25	Simazine	Pesticides	1	1	<0.001	Sample	12/11/14	No	No
26	Glyphosate	Pesticides	60	-	0.008	Sample	12/11/14	No	No
27	Mecoprop	Pesticides	n/a	n/a	<0.001	Sample	12/11/14	N/A	N/A
28	2,4-D	Pesticides	n/a	n/a	0.005	Sample	12/11/14	N/A	N/A
29	MCPA	Pesticides	n/a	n/a	0.017	Sample	12/11/14	N/A	N/A
30	Linuron	Pesticides	0.7	0.7	<0.001	Sample	12/11/14	No	No
31	Dichlobenil	Pesticides	n/a	n/a	<0.001	Sample	12/11/14	N/A	N/A
32	2,6-Dichlorobenzamide	Pesticides	n/a	n/a	<0.0001	Sample	12/11/14	N/A	N/A

³ 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 Conc. (µg/l) ¹	Data Source	Sample Date (if applicable)	Effluent Concentration above AA concentration (Yes/No)	Effluent Concentration above AA concentration after dilution (Yes/No)
33	PCBs	PCBs	n/a	n/a	<0.05	Sample	12/11/14	N/A	N/A
34	Phenols (as Total C)	Phenols	8	8	<0.10	Sample	12/11/14	No	No
35	Lead	Metals	1.2	1.3	2.386	Sample	12/11/14	Yes	No
36	Arsenic	Metals	25	20	1.289	Sample	12/11/14	No	No
37	Copper	Metals	5 or 30 ²	5	<0.51	Sample	12/11/14	No	No
38	Zinc	Metals	8 or 50 or 100 ³	40	6.593	Sample	12/11/14	No	No
39	Cadmium	Metals	0.08 or 0.09 or 0.15 or 0.25 ⁴	0.2	<0.05	Sample	12/11/14	No	No
40	Mercury	Metals	MAC of 0.07	MAC of 0.07	<0.04	Sample	12/11/14	No	No
41	Chromium VI	Metals	3.4	0.6	<0.28	Sample	12/11/14	No	No
42	Selenium	Metals	n/a	n/a	<2.12	Sample	12/11/14	N/A	N/A
43	Antimony	Metals	n/a	n/a	<2.06	Sample	12/11/14	N/A	N/A
44	Molybdenum	Metals	n/a	n/a	<5	Sample	12/11/14	N/A	N/A
45	Tin	Metals	n/a	n/a	<2.8	Sample	12/11/14	N/A	N/A
46	Barium	Metals	n/a	n/a	5.685	Sample	12/11/14	N/A	N/A
47	Boron	Metals	n/a	n/a	17.87	Sample	12/11/14	N/A	N/A
48	Cobalt	Metals	n/a	n/a	0.353	Sample	12/11/14	N/A	N/A
49	Vanadium	Metals	n/a	n/a	0.489	Sample	12/11/14	N/A	N/A
50	Nickel	Metals	4	8.6	<2.29	Sample	12/11/14	No	No
51	Fluoride	General	500	1,500	0.29	Sample	12/11/14	No	No
52	Chloride	General	n/a	n/a	41.97	Sample	12/11/14	N/A	N/A
53	TOC	General	n/a	n/a	4.34	Sample	12/11/14	N/A	N/A

No.	Compound	Group of compounds	AA-EQS Inland SW (µg/l)	AA-EQS Other SW (µg/l)	Measured Conc. (µg/l) ¹	Data Source	Sample Date (if applicable)	Effluent Concentration above AA concentration (Yes/No)	Effluent Concentration above AA concentration after dilution (Yes/No)
54	Cyanide	General	10	10	<5	Sample	12/11/14	No	No
	Conductivity	General	n/a	n/a	469	Sample	12/11/14	N/A	N/A
	Hardness (mg/l CaCO ₃)	General	n/a	n/a	182	Sample	12/11/14	N/A	N/A
	pH	General	n/a	n/a	7.2	Sample	12/11/14	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 CaCO₃ is less than or equal to 100; the value 30 applies where the water hardness exceeds 100 mg/l CaCO₃. Estimated CaCO₃ 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 CaCO₃, 50 µg/l for water hardness greater than 10 mg/l CaCO₃ and less than or equal to 100 mg/l CaCO₃ and 100 µg/l elsewhere. Estimated CaCO₃ 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 CaCO₃/l, Class 2: 40 to <50 mg CaCO₃/l, Class 3: 50 to <100 mg CaCO₃/l, Class 4: 100 to <200 mg CaCO₃/l and Class 5: >200 mg CaCO₃/l)