



River Finn Impact Assessment

for ABP Clones

Final

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1 Introduction

ABP Clones has an Industrial Emissions (IE) licence (P0190-02) issued by the Environmental Protection Agency (EPA) on 20th December 2013 for the following activities;

- *The operation of slaughterhouses with a carcass production capacity greater than 50 tonnes per day.*
- *The treatment and processing, other than exclusively packaging, of the following raw materials, whether previously processed or unprocessed, intended for the production of food or feed from only animal raw materials (other than exclusively milk) with a finished product production capacity greater than 75 tonnes per day.*

The facility is situated approximately 1 km south of the centre of Clones, Co. Monaghan, a town with a population of c. 3,000. The site has an area of approximately 1 hectare.

The facility employs 311 full time staff and the main processes operate from 7am to 5pm from Monday to Friday with occasional Saturday operations at busy times of the year.

The site treats process effluent using a wastewater treatment plant (WWTP) that provides tertiary treatment. The plant comprises preliminary screening, dissolved air flotation (DAF), balancing, secondary (activated sludge aeration basin) and tertiary (sand filters) treatment stages. Denitrification occurs within the waste water treatment plant and phosphorus is removed by chemical precipitation.

Currently treated effluent from the WWTP discharges to a tributary of the River Finn. The low flow of this tributary has presented issues for compliance with achieving the objectives of the Water Framework Directive, which is namely to achieve 'good status' for all waterbodies.

One option being explored is to investigate the possibility of discharging to the River Finn at an alternative location, to the south of the facility near the Cumber Bridge. The impact of an effluent discharge on a receiving water body will depend upon the characteristics and magnitude of the pollution loading and on the sensitivity of the receiving water body.

Using proposed IE Licence Emission Limit Values (ELVs), together with environmental monitoring data supplied by the EPA and recent effluent monitoring data from ABP, this report assesses the impact of discharging WWTP effluent at the proposed location at Cumber Bridge.

2 Assumptions

The following assumptions have been made in order to facilitate the production of this report:

- That all relevant information and material has been provided to Environet.

3 Water Quality Standards

Objectives and standards are set out in various EU Directives and national regulations and in River Basin District Management Plans. In general, discharges will not be allowed to compromise the ability of a water body to achieve Good Status (as defined under the Water Framework Directive and associated Regulations e.g. European Communities Environmental Objectives (Surface Waters) Regulations, 2009) nor cause any deterioration in existing status. In the absence of an available Environmental Quality Standard (EQS) in the regulations discussed below, an appropriate limit value was sought from the *Parameters of Water Quality Interpretation and Standards (2001)*, published by the Environmental Protection Agency. In the case of Oils, Fats & Greases no appropriate EQS was available for use in this assessment. A summary of the Quality Standards used in this impact assessment is presented in Table 1 below.

3.1 Salmonid Waters Regulations

The objective of these regulations is the maintenance of water quality for salmon and trout freshwater species. Legal backing was first established under the directive 78/659/EEC 'On the quality of freshwaters needing protection or improvement in order to support fish life' commonly known as the Freshwater Fish Directive. This was superseded by the European Communities (Quality of Salmonid Waters) regulations, S.I. No 84 of 1988.

The 1988 regulations define Salmonid waters as being freshwaters capable of supporting Salmon (*Salmo Salar*), Trout (*Salmo trutta*), Char (*Salvelinus*) and whitefish (*Coregonus*).

The 1988 Regulation was largely superseded by the water framework directive 2000/60/EC. This latest directive expands the scope of water protection of all waters and sets clear objectives that good status must be achieved for all European waters by 2015 and that sustainable water use is ensured throughout Europe of which Salmonid waters are included.

3.2 Water Framework Directive

The Water Framework Directive (2000/60/EC) was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters and includes heavily modified and artificial waterbodies. Its objectives

are to prevent further deterioration of and to protect, enhance and restore the status of all bodies of water with the aim of achieving at least good status by 2015.

The Water Policy Regulations (S.I. No. 722 of 2003), Surface Waters Regulations (S.I. No. 272 of 2009) and Groundwater Regulations (S.I. No. 9 of 2010) govern the shape of the WFD characterisation, monitoring and status assessment programmes in terms of assigning responsibilities for the monitoring of different water categories, determining the quality elements and undertaking the characterisation and classification assessments.

3.3 Surface Water Regulations

The Surface Waters Regulations, European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009), establish a wide-ranging set of environmental standards for Irish surface waters. These regulations allow for the establishment of legally binding quality objectives for all surface waters and environmental quality standards for pollutants. For the purposes of the Water Framework Directive, these regulations also facilitate the classification of surface water bodies and the establishment of inventories of priority substances by the EPA.

3.4 Summary Water Quality Standards

Licenced Parameter	Unit	Standard	Guideline
Temperature	°C	No greater than a 1.5°C rise in ambient temperature outside the mixing zone	SI 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations 2009
pH	pH units	≥6 ≤ 9 not exceeding ± 0.5 change in receiving waters	S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations, 1988 ¹
BOD	mg/l O ₂	<i>Good Status</i> ≤ 2.6	SI 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations 2009
COD	mg/l	≤ 40	Interim guideline value, EPA 2001
Suspended Solids	mg/l	≤ 25	S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations, 1988 ¹

¹ The Finn River is not designated as a Salmonid Water. However, as Lough Erne is used for fisheries it may be considered appropriate that the salmonid water standards be adopted for the calculation of the assimilative capacity where there is no Standard available in SI 272 of 2009

Licenced Parameter	Unit	Standard	Guideline
Total Nitrogen (as N)	mg/l N	A2 waters ² ≤ 2	European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations, 1989 (S.I. No. 294/1989)
Total Ammonia (As N)	mg/l N	<i>Good Status</i> ≤ 0.14 (95%ile)	S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations, 1988 ¹
Orthophosphate (as P)	mg/l P	<i>Good Status</i> ≤ 0.075 (95%ile)	SI 272 of 2009 European Communities Environmental Objectives (Surface Waters) Regulations 2009
Oils, Fats & Greases	mg/l	<i>No EQS available</i>	-
Sulphates (as SO ₄)	mg/l SO ₄	≤ 200	European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations, 1989 (S.I. No. 294/1989)
Chlorides (as Cl)	mg/l Cl	≤ 400	Water quality standard specified in the EPA Technical Committee Report 13/12/2013 ³
Detergents (as lauryl Sulphate)	mg/l LAS ⁴	≤ 0.2	European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations, 1989 (S.I. No. 294/1989)

Table 1: Summary Water Quality Guidelines

² Category A2; Given there is no drinking water abstraction downstream of the proposed discharge location.

³ Technical Committee Report 13/12/2013: "According to the Water Services Training Group Guidance Manual: "Guidance, Procedures and Training on the Licencing of discharges to Waters and to Sewer for Local Authorities", for discharges to freshwaters the chloride concentration in the receiving water should not exceed 400 mg/l as such a concentration is toxic to fish".

⁴ Linear Alkylate Sulphate/Sulphonate.

4 River Finn

The River Finn flows from Smithborough in Monaghan and eventually terminates at Lough Erne in neighbouring Co. Fermanagh. The EPA monitors the River Finn for biological water quality close to the proposed discharge point at Cumber Bridge (RS36F010500). The Integrated Water Quality Assessment for the North Western and Neagh Bann River Basin Districts 2013, published by the EPA, presents the latest monitoring data for the River Finn catchment. The Cumber Bridge station was assigned a Q3-4 rating in 2013 indicating Moderate water quality status (on a scale of Bad, Poor, Moderate, Good, High).

A summary of the Environmental Protection Agency's (EPA) Quality Rating System (Q-values) for monitoring at Cumber Bridge is summarised in Table 2 below. A full summary of Biological Quality Ratings (Q-Values) 1971-2013 recorded at EPA sample locations along the River Finn are shown in Appendix A of this report.

RBD	River	Full Code	Station Location	2007-2009	2008-2010	2009-2011	2010-2012	2011-2013
NWIRBD	Finn (Monaghan)	36F010500	Cumber Bridge	Fail	Fail	Fail	Pass	Pass

Table 2: Physico-chemical pass/fail assessment of surveillance rivers in NWIRBD & NBIRBD 2007–2013.

The Integrated Water Quality Assessment for the North Western and Neagh Bann River Basin Districts 2013 presents the hydrological assessment of the River Finn catchment which forms part of the North Western International River Basin District (NWIRBD).

The EPA's Report on River Water Quality in County Monaghan 2013 identifies; urbanisation pressures, point source influences and agricultural influences as the key pressures affecting the water quality of the River Finn at Cumber Bridge. The biologists assessing the river made the following observations:

“Tributary of Upper Lough Erne. Physico-chemical monitoring carried out at stations 0100, 0200 & 0500. Ortho-phosphate levels slightly elevated at all stations and ammonia slightly elevated at stations 0100 (Stone Bridge) & 0200 (Annamakiff Bridge) which are indicative of intermittent pollution. Apart from two stations, ecological conditions are no better than moderate. Agriculture and mixed rural influences are pressures in the upper reaches while point sources and urbanisation influences are pressures at station 0500 (Cumber Bridge).”

From the Cumber Bridge, the River Finn flows roughly in a south-westerly direction for ca. 8km, tracing the Monaghan-Fermanagh border, before entering a small outlying area of Upper Lough Erne SPA in County Fermanagh.

The River Finn flows through this SPA area for 2 km, then exits the designation and continues for another 7 km before entering the main section of Upper Lough Erne SAC and SPA downstream of Wattle Bridge. Upper Lough Erne SAC (UK0016614) is located in Co. Fermanagh and extends to 5738 ha. It is designated for three habitats – natural eutrophic lakes, old oak woodlands and alluvial forests.

The Water Framework Directive mapping website indicates that this cross-border river waterbody has an overall status of Moderate and an overall ecological status of Moderate. Therefore, the objective under the Water Framework Directive (2000/60/EC) is to Restore Good status by 2021. The overall risk status is ‘2b–Not at Risk’. Upper Lough Erne (IE_XB_36_east_2) also has an overall WFD status, and ecological status, of Moderate. An overview of the WFD River Water Quality Status 2010-2015 classification of surface water features in the surrounding area are presented in Figure 1.

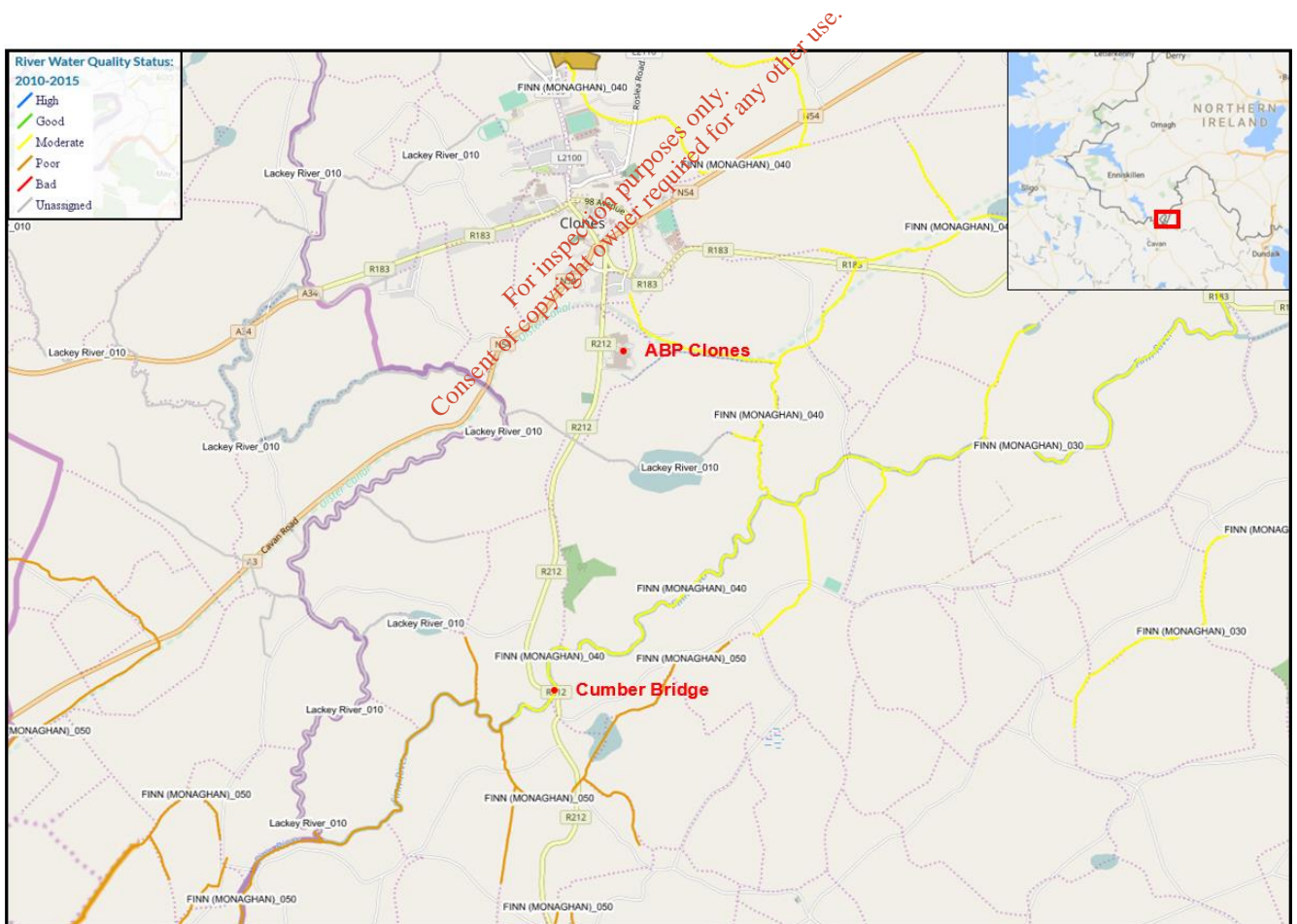


Figure 1: River Finn WFD Status – Moderate

5 Impact Assessment Data

5.1 Volumetric Flow Data

There is flow monitoring data available for the Finn River; recorded at the Office of Public Works (OPW) Hydrometric Station at Anlore, approximately 6 km upstream of Cumber Bridge (Figure 2). The OPW has published flow measurement data at Anlore as follows:

- Average flow (m³/s): 3.5923
- 95-percentile flow (m³/s): 0.19

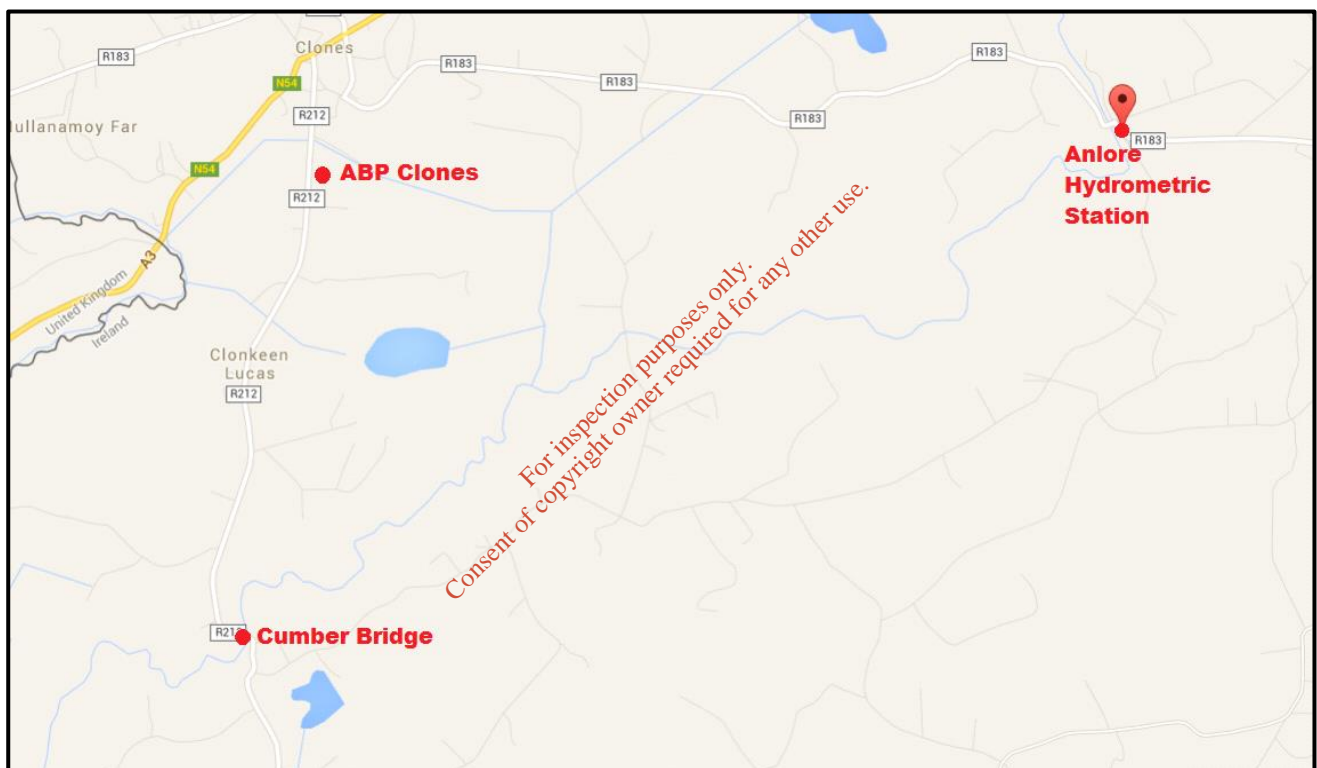


Figure 2: OPW Hydrometric Monitoring Station, Anlore

For the purpose of this assessment, the flow at the proposed outfall location at Cumber Bridge is estimated to be 10% higher than the flow at Anlore Hydrometric Station. The flowrate is therefore estimated as:

- Average flow (m³/s): 3.9515
- 95-percentile flow (m³/s): 0.209

5.2 EPA Surveillance Monitoring Data

The background water quality data of the River Finn (C_r) used for the impact assessment was obtained from the EPA Aquarius Database. The EPA monitors the quality of the River Finn at Cumber Bridge on a monthly basis. The background parameter concentrations (C_r) used in the assessment calculations were averaged from monthly monitoring results at Cumber Bridge over the 2014-2016 period (Table 3).

While ambient water quality monitoring data is available for the proposed discharge location at Cumber Bridge, it has been acknowledged that an assessment of the assimilative capacity of the River Finn using ambient monitoring data obtained at Cumber Bridge may not be an ideal representation of the receiving environment. This is primarily due to the fact that Cumber Bridge is located downstream of the current ABP WWTP discharge location and as such samples taken at this location would include effluent discharged from the facility, authorised under the current IE Licence.

Parameter	Average Concentration (mg/l) (C_r)
pH	7.794
BOD	1.46053
COD	No data available
Suspended Solids	No data available
Total Nitrogen (as N)	No data available
Total Ammonia (As N)	0.13345
Orthophosphate (as P)	0.07150
Sulphates (as SO ₄)	No data available
Chlorides (as Cl)	33.5211
Detergents (as lauryl Sulphate)	No data available

Table 3: EPA Monitoring Data (Average of Monthly Monitoring Data for 2014-2016)

5.3 Adjusted Background Concentration Values

The EPA has requested that monitoring data from Cumber Bridge be used in the assessment to account for the impact from the Clones Municipal WWTP at the proposed discharge location. If the monitoring data from Cumber Bridge is to be used as a measure of background concentrations in the impact assessment, then it follows that the current ABP discharge must be factored out to avoid double counting.

It was considered that actual ABP effluent monitoring data could be used to account for the impact of the ABP effluent on the ambient monitoring data. Accordingly, the background parameter concentrations (C_r) used in the assessment calculations were flow proportionally adjusted using actual discharge monitoring data recorded over the same 2014-2016 period (Table 4). Continuous flow monitoring data was used to calculate the average flowrate (F_{act}) of actual discharge from the facility. Monthly compliance monitoring results of treated effluent from ABP were used to calculate the relevant mean parameter concentrations (C_{act}).

Parameter	Average flow rate l/s F_{act}	Average Concentration mg/l C_{act}
BOD	5.222	9.936
COD	5.222	45.611
Suspended Solids	5.222	10.232
Total Nitrogen (as N)	5.222	5.175
Total Ammonia (As N)	5.222	0.403
Orthophosphate (as P)	5.222	0.351 ⁵
Chlorides (as Cl)	5.222	2,584.694

Table 4: ABP Clones Monitoring Data (Average of monthly monitoring data 2014-2016)

⁵ Assumes Total Phosphorus to Ortho-Phosphorus ratio of 1:0.8

5.4 Proposed Effluent Emission Limits

Emissions Point Reference No: WEP 1 (Wastewater Treatment Plant Discharge)

Name of Receiving Waters: River Finn

Location of Monitoring: 250418E, 325174N

Parameter	Emission Limit Value			
pH	6-9			
Temperature	25°C			
Volumes to be emitted	m ³ /d	m ³ /hr	m ³ /d	m ³ /hr
	360	15	720	30
	mg/l			
BOD	20		20	
COD	150		150	
Suspended Solids	30		30	
Total Nitrogen (as N)	15		15	
Total Ammonia (as N)	0.5		0.35	
Total Phosphorus (as P)	0.4		0.3	
Oils, Fats and grease	15		15	
Sulphates (as SO ₄)	2,000		1,000	
Chlorides (as Cl)	6,000		6,000	
Detergents (as Lauryl sulphate)	10		5	

Table 5: Proposed WEP-1 ELVs

Emissions Point Reference No: WEP 2 (Reverse Osmosis Reject)

Name of receiving Waters: River Finn

Location of Monitoring: 250418E, 325174N

Parameter	Emission Limit Value	
pH	6-9	
Temperature	25°C	
Volumes to be emitted	m ³ /d	m ³ /hr
	360	15
	mg/l	
BOD	2	
COD	50	
Suspended Solids	20	
Total Nitrogen (as N)	2	

Parameter	Emission Limit Value
Total Ammonia (as N)	0.3
Total Phosphorus (as P)	0.3
Oils, Fats and grease	10
Sulphates (as SO ₄)	7,000
Chlorides (as Cl)	200

Table 6: Proposed WEP-2 ELVs

5.4.1 Combined Emission Values

The characteristics of the final discharge has been calculated by flow proportionally combining the emissions from WEP-1 and WEP-2.

Parameter	Emission Limit Value			
pH	6-9			
Temperature	25°C			
Volumes to be emitted	m ³ /d	m ³ /hr	m ³ /d	m ³ /hr
	720	15	1,080	30
	mg/l			
BOD	11		14.00	
COD	100		116.67	
Suspended Solids	25		26.67	
Total Nitrogen (as N)	8.5		10.667	
Total Ammonia (as N)	0.4		0.333	
Total Phosphorus (as P)	0.35		0.30	
Oils, Fats and grease	12.5		13.33	
Sulphates (as SO ₄)	4,500		3,000	
Chlorides (as Cl)	3,100		4,066.67	
Detergents (as Lauryl sulphate)	5		3.33	

Table 7: Proposed Combined Discharge ELVs for use in the Assessment

6 Impact Assessment

Oils, Fats & Greases have been excluded from the scope of this assessment given the absence of both Environmental Quality Standards and ambient monitoring data.

6.1 Mass Balance Calculation

The impact of an effluent discharge on a receiving water body will depend upon the characteristics and magnitude of the pollution loading and on the sensitivity of the receiving water body. This mass balance formula (eq. 1) is used to calculate the concentration of a parameter in the receiving water downstream of the discharge. This downstream concentration may then be compared directly with the water quality standard (EQS) to determine whether the discharge will cause an exceedance of the EQS value.

The impact of the final effluent, from the proposed effluent emission point at Cumber Bridge, on the parameter concentrations of the receiving waters may be calculated using the following mass balance equation:

$$T_{95} = \frac{(F_{95} \times C_r) - (F_{act} \times C_{act}) + (F_{pro} \times C_{pro})}{F_{95} - F_{act} + F_{pro}} \quad [1]$$

where:

T_{95} = Combined conc. at the 95%ile flow (mg/l)

F_{95} = 95%ile flow in the river (l/s)

C_r = mean background (upstream) parameter concentration (2014-2016) (mg/l)

F_{act} = actual average effluent discharge volume (2014-2016) (l/s)

C_{act} = actual effluent concentration (2014-2016) (mg/l)

F_{pro} = proposed combined discharge volume (l/s)

C_{pro} = proposed concentration (combined licence ELVs) of the effluent (mg/l)

6.2 Assimilative Capacity Calculation

The Waste Assimilative Capacity (WAC) refers to the ability of a body of water to cleanse itself; its capacity to receive waste waters or toxic substances without deleterious effects and without damage to aquatic life or humans who consume the water. It is level to which water body or nature control the toxicity without effecting the aquatic life. This formula (eq. 2) is used to determine the capacity of the receiving waters to assimilate the effluent discharge in mg/s.

The Waste Assimilative Capacity (WAC) is calculated as follows:

$$WAC = \left[(C_{max} \times (F_{95} + F_{pro} - F_{act})) - (F_{95} \times C_r) + (F_{act} \times C_{act}) \right] \quad [2]$$

where:

WAC = Waste Assimilative Capacity (mg/s)

C_{max} = maximum permissible parameter concentration in river (EQS) (mg/l)

F_{95} = volumetric flow rate of the river (95%ile flow) (l/s)

F_{pro} = proposed combined discharge volume (l/s)

F_{act} = actual average effluent discharge volume (2014-2016) (l/s)

C_r = mean background (upstream) parameter concentration (2014-2016) (mg/l)

C_{act} = actual effluent concentration (2014-2016) (mg/l)

The maximum parameter concentration of the combined effluent which may satisfy the EQS can therefore be determined using the following equation:

$$C_{eff,max} = WAC / F_{eff} \quad [3]$$

where:

$C_{eff,max}$ = Maximum allowable parameter concentration of the combined effluent (mg/l)

The percentage of the WAC of the river required by the effluent (WAC_{usage}), at the combined proposed IE Licence ELV concentrations, can be determined using the following equation:

$$WAC_{usage} = \frac{C_{pro}}{C_{eff,max}} * 100 \quad [4]$$

The results of the impact assessment are presented below in Tables 8 and 9 below.

6.3 Assessment Summary

Cumber Data: 720 m³/day	F₉₅	F_{act}	F_{pro}	C_r	C_{act}	C_{pro}	T₉₅	C_{max}	WAC	WAC	C_{eff.max}	WAC_{Usage}
WEP-1: 360 m³/day WEP-2: 360 m³/day	95%ile flow in the river (l/s)	Average recorded ABP effluent flow (l/s)	Proposed effluent discharge volume (l/s)	Conc. in the river upstream of the discharge (mg/l)	Actual ABP mean effluent conc. (mg/l)	Proposed conc. of the effluent (mg/l)	Combined conc. at the 95%ile flow (mg/l)	Max permissible conc. in river (mg/l)	Waste Assimilative Capacity (mg/s)	Waste Assimilative Capacity (kg/day)	Max. allowable conc. in effluent (mg/l)	Discharge percentage of WAC (%)
BOD	209	5.222	8.33	1.46	9.936	11.00	1.627	2.60	298.12	25.76	35.78	30.75%
COD	209	5.222	8.33	-	45.611	100.00	2.806	40.00	8722.62	753.63	1046.76	9.55%
Suspended Solids	209	5.222	8.33	0.00	25.00	0.98	0.730	25.00	5356.21	462.78	642.77	3.89%
Total Nitrogen (as N)	209	5.222	8.33	-	5.175	8.50	0.334	2.00	451.24	38.99	54.15	15.70%
Total Ammonia (As N)	209	5.222	8.33	0.133	0.403	0.40	0.137	0.140	3.91	0.34	0.47	85.29%
Orthophosphate (as P)	209	5.222	8.33	0.072	0.351	0.28	0.073	0.075	2.80	0.24	0.34	83.35%
Sulphates (as SO ₄)	209	5.222	8.33	-	901.50	4,500.00	176.787	200.00	47,129.72	4,072.01	5,655.79	79.56%
Chlorides (as Cl)	209	5.222	8.33	33.52	2,584.694	3,100.00	91.185	400.00	91,335.41	7,891.38	10,960.69	28.28%
Detergents (as lauryl Sulphate)	209	5.222	8.33	-	0.027	5.00	0.196	0.20	42.56	3.68	5.11	97.89%

Table 8: Impact Assessment Results against Good EQS where applicable, WEP-1 = 360m³/day

Cumber Data: 1,080 m³/day	F₉₅	F_{act}	F_{pro}	C_r	C_{act}	C_{pro}	T₉₅	C_{max}	WAC	WAC	C_{eff.max}	WAC_{Usage}
WEP-1: 720 m³/day WEP-2: 360 m³/day	95%ile flow in the river (l/s)	Average recorded ABP effluent flow (l/s)	Proposed effluent discharge volume (l/s)	Conc. in the river upstream of the discharge (mg/l)	Actual ABP mean effluent conc. (mg/l)	Proposed conc. of the effluent (mg/l)	Combined conc. at the 95%ile flow (mg/l)	Max permissible conc. in river (mg/l)	Waste Assimilative Capacity (mg/s)	Waste Assimilative Capacity (kg/day)	Max. allowable conc. in effluent (mg/l)	Discharge percentage of WAC (%)
BOD	209	5.222	12.50	1.46	9.936	14.00	1.981	2.60	308.96	26.69	24.72	56.64%
COD	209	5.222	12.50	-	45.611	116.67	5.642	40.00	8889.30	768.04	711.14	16.41%
Suspended Solids	209	5.222	12.50	-	10.232	26.67	1.294	25.00	5460.38	471.78	436.83	6.10%
Total Nitrogen (as N)	209	5.222	12.50	-	5.175	10.67	0.602	2.00	459.58	39.71	36.77	29.01%
Total Ammonia (As N)	209	5.222	12.50	0.133	0.403	0.33	0.138	0.140	4.49	0.39	0.36	92.77%
Orthophosphate (as P)	209	5.222	12.50	0.072	0.351	0.24	0.074	0.075	3.11	0.27	0.25	96.40%
Sulphates (as SO ₄)	209	5.222	12.50	-	901.50	3,000.00	173.388	200.00	47963.12	4,144.01	3,837.05	78.19%
Chlorides (as Cl)	209	5.222	12.50	33.52	2,584.694	40,66.67	205.025	400.00	93002.21	8,035.39	7,440.18	54.66%
Detergents (as lauryl Sulphate)	209	5.222	12.50	-	0.027	3.33	0.192	0.20	43.40	3.75	3.47	96.01%

Table 9: Impact Assessment Results against Good EQS where applicable, WEP-1 = 720m³/day

7 Conclusions

The impact of the proposed combined effluent discharge at Cumber Bridge was calculating using ambient monitoring data recorded by the EPA at Cumber Bridge. The background concentrations of the River Finn were adjusted flow proportionally to account for the current discharge from ABP Clones. In the case of Oils, Fats & Greases, no appropriate EQS was available for use in this assessment.

The following parameters were found to comply with the relevant EQS or standard at ELVs for both flowrates:

- COD ⁶;
- BOD;
- Suspended Solids ⁶;
- Total Nitrogen ⁶;
- Sulphates ⁶;
- Total Ammonia;
- Orthophosphate;
- Chlorides;
- Detergents.

The assessment of the Waste Assimilate Capacity of the River Finn indicates that there is sufficient capacity within the river to accommodate the emissions from the ABP Clones facility within the proposed Emission Limit Values.

⁶ No ambient monitoring data available

River Finn Biological Quality Ratings

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River and Code: FINN (MONAGHAN)	36F01
Tributary of: Upper Lough Erne	OS Catchment No: 123
OS Grid Ref of confluence: H 422 200	

Date(s) Surveyed: 31/12/1971, 31/12/1973, 31/12/1977, 31/12/1980, 31/12/1982, 31/12/1984, 31/12/1989, 31/12/1993, 7/7/1997, 8/7/1997, 15/10/1998, 16/10/1998, 17/8/1998, 22/7/1998, 28/9/1998, 28/8/2001, 10/8/2004, 9/8/2004, 17/7/2007, 5/7/2007, 8/8/2007, 15/7/2010, 10/7/2013, 3/7/2013, 4/7/2013

Biological Quality Ratings (Q Values)															
Station Nos.	1971	1973	1977	1980	1982	1984	1989	1993	1997	1998	2001	2004	2007	2010	2013

0010	-	-	-	-	-	-	3-4	4-5	4-5	4	3	3-4*	4	4	4
0080	-	-	-	-	-	-	3	4	3	4	4	4	-	3-4	3-4
0100	5	5	4-5	4	4-5	4-5	3-4	4	3-4	4	3-4	3-4	3	3-4	4
0200	5	4-5	4-5	4	4	4	3-4	4	3	3-4	3	4	3-4	3-4	3-4
0400	-	-	3-4	3-4	3-4	3-4	3-4	3	3-4	3-4	3	4	-	3-4	3-4
0500	3-4	3	1	3	3	3	3	3	3	3	3	3-4	3-4	3-4	3-4
0600	-	-	-	-	3	3	3	-	-	-	-	-	-	-	-
1000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3

Assessment: The macroinvertebrate fauna continues to indicate generally unsatisfactory ecological conditions on the Finn (Monaghan) in 2013. Only the uppermost Station 0010 (SW of Shanroe) and Station 0100 (Stone Bridge) showed satisfactory standards out of the seven sites sampled. Low DO (dissolved oxygen) levels were recorded below the Magherarney confluence (station 0400 - 68%) and again below Clones (station 0500 - 72%)

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Station No.	Station Location	National X	Grid Ref. Y	Discovery Series No.	County Code
0010	Br at Mill NW of Kilcreen	256057	335418	27	MN
0080	E of Aghafin Lough	252797	329862	27	MN
0100	Stone Br	254401	328407	27	MN
0200	Annamakiff Br	254563	326483	27	MN
0400	Scarvy Br	251806	324610	27	MN
0500	Cumber Br	249939	323331	27	MN
0600	Annie's Br	0	0	0	MN
1000	Wattle Br.	242572	320237	27	

Site Altitude and Upstream Catchment Characteristics (where available):											
Station No.	Alt	Area	Sil	Cal	Pasture	Forestry	Bogs	Urban	Misc Ag.	Water	Other
0010	80	1	0	100	100	0	0	0	0	0	0
0080	56	1	0	100	94	6	0	0	0	0	0
0100	56	5	0	100	99	1	0	0	1	0	0
0200	48	79	26	74	95	1	1	0	0	0	2
0400	47	103	43	57	97	1	1	0	0	0	1
0500	47	118	41	59	96		1	1	0	0	1
0600	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1000	N/A	0	0	0	0	0	0	0	0	0	0

Alt is in metres Area is km2 and Sil, Cal are % siliceous and calcareous bedrock and Pasture, Forestry, etc., are % of catchment area.