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Administration,
Environmental Licensing Programme,
Office of Climate, Licensing & Resource Use,
Environmental Protection Agency,
Headquarters,
PO Box 3000,
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County Wexford

17th June 2010

Re: D0470-01 – Drimoleague Waste Water Discharge Licence Application – Reply to Notice in accordance with Regulation 18(3)(b) of the Waste Water Discharge (Authorisation) Regulations 2007

Dear Mr. Clabby,

I refer to your letter of the 20th April 2010 concerning the above. The following is our reply to your request for further information in accordance with Regulation 18(3)(b) dealing in sequence with the points raised:

1. Section B.6 – Planning requirements for Proposed Works
Planning permission for the proposed work is not yet applied for. The scheme is expected to proceed though the WSIP Planning phase by 2012.

2. Section B.10 – Capital Investment Programme
Drimoleague Sewerage Scheme has been included in the WSIP 2010-2012 under the Schemes at Planning Stage. The scheme will be included in Cork County Council's Assessment of Needs for 2013-2015 to proceed to construction.

3. Plant Capacity
The plant has a design PE of 500 with the following design data

Hydraulic loading @ 227 l/head	= 113.5m^3/day
3 DWF	= 340.5m^3/day
BOD Loading @ 0.055kg/head	= 27.5kg/day

Aeration Tank Design

Volume	= 131.0m^3
Retention @ DWF	= 27.7 hours

Settlement Tank Design

Volume	= 29.0m^3
Surface Area	= 15.9m^2

Overflow Rate @ 3DWF	= 21.5m^3/ m^2/day
Retention @ 3DWF	= 2 hours

The current PE of Drimoleague is 635pe therefore if can be calculated that the retention time in the aeration and settlement tanks have been reduced as follows.

Hydraulic loading @ 227 l/head	= 144.1m^3/day
3 DWF	= 432.3m^3/day
BOD Loading @ 0.055kg/head	= 35kg/day

Aeration Tank Design

Volume	= 131.0m^3
Retention @ DWF	= 21.8 hours

Settlement Tank Design

Volume	= 29.0m^3
Surface Area	= 15.9m^2
Overflow Rate @ 3DWF	= 27.2m^3/ m^2/day
Retention @ 3DWF	= 1.6 hours

All wastewater from the agglomeration enters the wastewater treatment plant and pass through both the aeration & settlement tanks. As the volume entering the plant has increased since it was constructed this has resulted in the retention time of the wastewater in the plant itself being reduced as can be seen from the calculations above. As the collection system is a combined system, during periods of heavy rainfall, there is an overflow to the river.

4. Monitoring of Primary Discharge
As the agglomeration is <2000 PE the urban wastewater regulations do not apply. Table E4 is attached and has been revised & updated to include the most up to date results available.

5. Monitoring of Receiving Waters
There is no monitoring regime for sampling river waters under the Surface Water Regulations. Table E4 is attached and has been revised & updated to include the most up to date results available.

6. Environmental Quality Objectives Regulations (S.I. No. 272 of 2009)
This application was lodged with the EPA in June 2009 and this regulation did not come into effect until July 2009.

According to the SWRBD the Ruagagh River into which the treatment plant discharges has a "good status" and the risk assessment overall value of 1b "probably at risk". The table & calculations in attachment F identifies the Criteria for calculating surface water ecological status and ecological potential and compares the results of the upstream and downstream water sample taken in the receiving waters.

7. Assessment of Effects of the Waste Water Discharges
With reference to Circular L8/08 and the flow diagram in Appendix 1, it can be concluded that the wastewater discharging from the agglomeration will not have significant effects on any relevant European sites in the vicinity. The agglomeration is discharging to a river which is approximately 27km upstream of the SAC of

Roaringwater Bay & Islands where the river eventually discharges to. There are no other Natura 2000 sites within the vicinity of Drimoleague, and the treatment plant.

List of Attachments

Attachment F
Table E4

Yours sincerely,

Niall O'Mahony,
Senior Engineer,
Cork County Council

Enclosures

Tables

- Revised Table E4

D0470-01 Attachment E4 Drimoleague Inlet Table E4

Sample Date	28/01/2009	12/02/2009	
Sample	**Influent**	**Influent**	**Average**
Sample Code	GT128	GT176	
Flow M^3/Day	*	*	
pH	6.9	*	6.9
Temperature ℃	*	*	
Cond 20℃	328	*	328
SS mg/L	46	*	46
NH_3 mg/L	7.3	*	7.3
BOD mg/L	85	*	85
COD mg/L	167	*	167
TN mg/L	9.2	*	9.2
Nitrite mg/L	0.151	*	0.151
Nitrate mg/L	1.99	*	1.99
TP mg/L	3.5	*	3.5
O-PO4-P mg/L	0.67	*	0.67
SO4 mg/L	32.9	*	32.9
Phenols µg/L	<0.10	*	<0.10
Atrazine µg/L	<0.01	*	<0.01
Dichloromethane µg/L	<1	*	<1
Simazine µg/L	<0.01	*	<0.01
Toluene µg/L	<1	*	<1
Tributyltin µg/L	not required	*	not required
Xylenes µg/L	<1	*	<1
Arsenic µg/L	<0.96	*	<0.96
Chromium ug/L	<20	<20	<20
Copper ug/L	10	332	171
Cyanide µg/L	<5	*	<5
Fluoride µg/L	70	*	70
Lead ug/L	<20	<20	<20
Nickel ug/L	<20	<20	<20
Zinc ug/L	<20	<20	<20
Boron ug/L	10	51	30.5
Cadmium ug/L	<20	<20	<20
Mercury µg/L	<0.2	*	<20
Selenium µg/L	1.9	*	1.9
Barium ug/L	<20	<20	<20

half LOD for statistical purposes

D0470-01 Attachment E4 Revised Drimoleague -Discharge from Wastewater Plant

Sample Date	07/02/2008	03/04/2008	22/05/2008	19/06/2008	03/09/2008	30/07/2008	11/09/2008	28/01/2009	12/02/2009	12/03/2009	02/04/2009	06/08/2009	21/01/2010	08/04/2010	
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Average TO DATE FROM 2008
Sample Code	GS054	GS225	GS457	GS581	GS842	GS722	GS903	GT127	GT177	GT338	GT436	GT954	GU014	GU205	*
Flow M^3/Day	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
pH	7.1		6.9	6.8	6.8		6.8	7.0	*	7.1	7.0	*	*	*	6.9375
Temperature ℃	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cond 20℃	*	407	381	379	354	386	270	278	*	*	*	*	*	*	350.7143
SS mg/L	38	71	36	45	76	*	48	14	36	38	53	No Result	196	24	56.25
NH_3 mg/L	7.4	17.1	15.3	15.7	15.7	*	5.8	7.6	*	*	*	*	*	*	12.08571
BOD mg/L	36	97	92	86	108	59	61	26	56	48	56	33	130	35	65.92857
COD mg/L	79	227	205	194	242	131	118	126	95	83	186	84	320	82	155.1429
TN mg/L	11.4		22.8		33.0			9.2	15.4	15.2	31.3	16.5	*	*	19.35
Nitrite mg/L	*	*	*	*	*	*	*	0.13	*	*	*	*	*	*	0.13
Nitrate mg/L	*	*	*	*	*	*	*	1.95	*	*	*	*	*	*	1.95
TP mg/L	1.55	2.0	3.2	2.15	*	*	*	3.6	2.7	1.9	3.13	*	*	*	2.52875
O-PO4-P mg/L	0.71	1.94	1.91	1.76	1.67	*	*	0.82	*	*	*	*	*	*	1.468333
SO4 mg/L	<30	*	*	*	*	*	*	<30	*	*	*	*	*	*	<30
Phenols µg/L	*	*	*	*	*	*		<0.10	*	*	*	*	*	*	<0.10
Atrazine µg/L	*	*	*	*	*	*	*	<0.01	*	*	*	*	*	*	<0.01
Dichloromethane	*	*	*	*	*	*	*	<1	*	*	*	*	*	*	<1
Simazine µg/L	*	*	*	*	*	*	*	<0.01	*	*	*	*	*	*	<0.01
Toluene µg/L	*	*	*	*	*	*	*	<1	*	*	*	*	*	*	<1
Tributyltin µg/L	*	*	*	*	*	*	*	not required	*	*	*	*	*	*	not required
Xylenes µg/L	*	*	*	*	*	*	*	<1	*	*	*	*	*	*	<1
Arsenic µg/L	*	*	*	*	*	*	*	<0.96	*	*	*	*	*	*	<0.96
Chromium ug/L	<20	*	<20	<20	<20	*	<20	<20	<20	<20	<20	*	*	*	<20
Copper ug/L	26	*	<20	<20	40.5	*	26.0	<20	<20	<20	<20	*	*	*	<20
Cyanide µg/L	*	*	*	*	*	*	*	<5	*	*	*	*	*	*	<5
Fluoride µg/L	*	*	*	*	*	*	*	28	*	*	*	*	*	*	28
Lead ug/L	<20	*	<20	<20	<20	*	<20	<20	<20	<20	<20	*	*	*	<20
Nickel ug/L	<20	*	<20	<20	<20	*	<20	<20	<20	<20	<20	*	*	*	<20
Zinc ug/L	30.0	*	28.0	26.0	58.0	*	52.0	<20	<20	<20	<20	*	*	*	<20
Boron ug/L	<20	*	51.0	35.0	38.7	*	<20	<20	<20	<20	<20	*	*	*	<20
Cadmium ug/L	<20	*	<20	<20	<20	*	<20	<20	<20	<20	<20	*	*	*	<20
Mercury µg/L	*	*	*	*	*	*	*	<0.2	*	*	*	*	*	*	<0.2
Selenium µg/L	*	*	*	*	*	*	*	2	*	*	*	*	*	*	2
Barium ug/L	<20	*	<20	<20	31	*	34	<20	<20	<20	<20	*	*	*	<20

D0470-01 Revised Attachment E4 Drimoleague Upstream Table

Sample Date	30/07/2008	11/09/2008	30/10/2008	28/01/2009	12/02/2009	12/03/2009	02/04/2009	
Sample	**Upstream**	**Upstream**	**Upstream**	**Upstream**	**Upstream**	**Upstream**	**Upstream**	**Average**
Sample Code	GS721	GS902	GS1160	GT126	GT178	GT340	GT435	*
Flow M^3/Day	*	*	*	*	*	*	*	*
pH	*	*	*	7	*	*	*	7
Temperature ℃	*	*	*	*	*	*	*	
Cond 20℃	*	*	*	138	*	*	*	138
SS mg/L	*	*	*	7	*	*	*	7
NH_3 mg/L	*	<0.1	*	<0.1	*	*	*	<0.1
BOD mg/L	*	*	*	<1	*	*	*	<1
COD mg/L	*	*	*	<21	*	*	*	<21
TN mg/L	*	*	*	2.5	*	*	*	2.5
Nitrite mg/L	*	*	*	0.00432	*	*	*	0.00432
Nitrate mg/L	*	*	*	2.55	*	*	*	2.55
TP mg/L	*	*	*	<0.02	*	*	*	<0.02
O-PO4-P mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SO4 mg/L	*	*	*	<30	*	*	*	<30
Phenols µg/L	*	*	*	<0.10	*	*	*	<0.10
Atrazine µg/L	*	*	*	<0.01	*	*	*	<0.01
Dichloromethane	*	*	*	<1	*	*	*	<1
Simazine µg/L	*	*	*	<0.01	*	*	*	<0.01
Toluene µg/L	*	*	*	<1	*	*	*	<1
Tributyltin µg/L	*	*	*	not required	*	*	*	not required
Xylenes µg/L	*	*	*	<1	*	*	*	<1
Arsenic µg/L	*	*	*	<0.96	*	*	*	<0.96
Chromium ug/L	*	<20	*	<20	<20	<20	<20	<20
Copper ug/L	*	<20	*	<20	<20	<20	<20	<20
Cyanide µg/L	*	*	*	<5	*	*	*	<5
Fluoride µg/L	*	*	*	30	*	*	*	30
Lead ug/L	*	<20	*	<20	<20	<20	<20	<20
Nickel ug/L	*	<20	*	<20	<20	<20	<20	<20
Zinc ug/L	*	<20	*	<20	<20	<20	<20	<20
Boron ug/L	*	<20	*	<20	<20	<20	<20	<20
Cadmium ug/L	*	<20	*	<20	<20	<20	<20	<20
Mercury µg/L	*	*	*	<0.2	*	*	*	<0.2
Selenium µg/L	*	*	*	1.4	*	*	*	1.4
Barium ug/L	*	10	*	68	10	10	10	24.5

HALF LOD FOR STATISTICAL PURPOSES

D0470-01 attachment E4tabulation of monitoring results for compliance purposes against SI 272 of 2009 for comparison purposes where results are below LOD for analytical method

Sample Date	30/07/2008	11/09/2008	30/10/2008	28/01/2009	12/02/2009	12/03/2009	02/04/2009	Average	95% percentile
Sample	Upstream River	Upstream River	Upstream River	Upstream River	Upstream River	Upstream River	Upstream River		
Sample Code	GS721	GS902	GS1160	GT126	GT178	GT340	GT435		
NH_3 mg/L	*	0.019	*	0.024	*	*	*	**0.0215**	**0.02375**
O-PO4-P mg/L	0.0275	0.0215	0.014	0.013	0.024	0.005	0.0065	**0.015928571**	**0.02645**
Chromium ug/L	*	1.5	*	<1	<1	<1	<1	**1.5**	**n/a**
Copper ug/L	*	1.0	*	<1	<1	<1	<1	**1**	**n/a**
Lead ug/L	*	<1	*	2.0	1.0	2.4	1.62	**1.755**	**n/a**
Nickel ug/L	*	1.7	*	1.3	1.3	1.14	<1	**1.36**	**n/a**
Zinc ug/L	*	<1	*	<1	<1	<1	<1	**<1**	**n/a**
Boron ug/L	*	<1	*	1.3	11.7	<1	<1	**6.5**	**n/a**
Cadmium ug/L	*	<1	*	<1	<1	<1	<1	**<1**	**n/a**
Barium ug/L	*	3.5	*	68.0	3.5	1.76	2.04	**15.76**	**n/a**
Sample Date	30/07/2008	11/09/2008	30/10/2008	28/01/2009	12/02/2009	12/03/2009	02/04/2009	Average	95% percentile
Sample Code	GS723	GS904	GS1161	GT129	GT175	GT339	GT437		
Sample	Downstream River	Downstream River	Downstream River	Downstream River	Downstream River	Downstream River	Downstream River		
NH_3 mg/L	*	0.0385	*	0.044	*	*	*	**0.04125**	**0.0437**
O-PO4-P mg/L	0.032	0.0245	0.0215	0.0185	0.023	0.006	0.012	**0.019642857**	**0.02975**
Chromium ug/L	*	1.5	*	<1	<1	<1	<1	**1.5**	**n/a**
Copper ug/L	*	1.0	*	<1	<1	<1	<1	**1**	**n/a**
Lead ug/L	*	4.5	*	<1	<1	<1	<1	**4.5**	**n/a**
Nickel ug/L	*	1.0	*	1.0	1.0	1.0	<1	**1.005**	**n/a**
Zinc ug/L	*	1.3	*	<1	<1	<1	<1	**1.3**	**n/a**
Boron ug/L	*	<1	*	4.0	<1	<1	<1	**4**	**n/a**
Cadmium ug/L	*	<1	*	<1	<1	<1	<1	**<1**	**n/a**
Barium ug/L	*	4.0	*	61.5	7.5	1.7	2.08	**15.356**	**n/a**

<1 Note values of 0ug/l recorded as <1ug/l

D0470-01 Revised Attachment E4 Drimoleague Downstream Table

Sample Date	30/07/2008	11/09/2008	30/10/2008	28/01/2009	12/02/2009	12/03/2009	02/04/2009	
Sample	**Downstream**	**Downstream**	**Downstream**	**Downstream**	**Downstream**	**Downstream**	**Downstream**	**Average**
Sample Code	GS723	GS904	GS1161	GT129	GT175	GT339	GT437	*
Flow M^3/Day	*	*	*	*	*	*	*	*
pH	*	*	*	7.2	*	*	*	7.2
Temperature ℃	*	*	*	*	*	*	*	*
Cond 20℃	*	*	*	152	*	*	*	152
SS mg/L	*	*	*	<2.5	*	*	*	<2.5
NH_3 mg/L	*	<0.1	*	<0.1	*	*	*	<0.1
BOD mg/L	*	*	*	2	*	*	*	2
COD mg/L	*	*	*	<21	*	*	*	
TN mg/L	*	*	*	2.7	*	*	*	2.7
Nitrite mg/L	*	*	*	0.019	*	*	*	0.019
Nitrate mg/L	*	*	*	2.62	*	*	*	2.62
TP mg/L	*	*	*	<0.02	*	*	*	<0.02
O-PO4-P mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SO4 mg/L	*	*	*	<30	*	*	*	<30
Phenols µg/L	*	*	*	<0.10	*	*	*	<0.10
Atrazine µg/L	*	*	*	<0.01	*	*	*	<0.01
Dichloromethane	*	*	*	<1	*	*	*	<1
Simazine µg/L	*	*	*	<0.01	*	*	*	<0.01
Toluene µg/L	*	*	*	<1	*	*	*	<1
Tributyltin µg/L	*	*	*	not required	*	*		not required
Xylenes µg/L	*	*	*	<1	*	*	*	<1
Arsenic µg/L	*	*	*	<0.96	*	*	*	<0.96
Chromium ug/L	*	<20	*	<20	<20	<20	<20	<20
Copper ug/L	*	<20	*	<20	<20	<20	<20	<20
Cyanide µg/L	*	*	*	<5	*	*	*	<5
Fluoride µg/L	*	*	*	52	*	*	*	52
Lead ug/L	*	<20	*	<20	<20	<20	<20	<20
Nickel ug/L	*	<20	*	<20	<20	<20	<20	<20
Zinc ug/L	*	<20	*	<20	<20	<20	<20	<20
Boron ug/L	*	<20	*	<20	<20	<20	<20	<20
Cadmium ug/L	*	<20	*	<20	<20	<20	<20	<20
Mercury µg/L	*	*	*	<0.2	*	*	*	<0.2
Selenium µg/L	*	*	*	1.7	*	*	*	1.7
Barium ug/L	*	10	*	62	10	10	10	23

HALF LOD FOR STATISTICAL PURPOSES

Attachment F

- Ambient Upstream & Downstream Water Quality v's EQR/S & Predicted Impacts

Drimoleague D0470-01

UPSTREAM COMPARISON TABLE

Physico-chemical conditions	***Ecological quality ratio/standard*** ***Good boundary*** ***Rivers (All Types)***	***2009 upstream sampling results***
Oxygenation conditions Table 9	***River water body***	***Upstream sampling results***
Biochemical Oxygen Demand (BOD) (mgO_2/l)	Good status≤1.5 (mean) or ≤2.6(95%ile)	<1.0mg/L (mean)
Acidification Status Table 9	***River Water Body***	***Upstream sampling results***
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7
Nutrient conditions Table 9	***River Water body***	***Upstream sampling results***
Total Ammonia (mg N/l)	Good status≤0.065(mean) or ≤0.140(95%ile)	0.021mg/L (mean) 0.024mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status≤0.035(mean) or ≤0.075(95%ile)	0.016mg/L (mean) 0.026mg/L (95%ile)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Upstream sampling results***
Phenol	8	<0.1µg/L
Toluene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.1	1.5µg/L
Copper (depending on water hardness)	30	1.0µg/L
Cyanide	10	<5µg/L
Flouride	500	30µg/L
Zinc (depending on water hardness)	100	<1.0µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Upstream sampling results***
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	1.755µg/L
Nickel and its compounds	20	1.36µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Upstream sampling results***
Cadmium and its compounds (depending on water hardness)	0.25	<1.0µg/L
Mercury and its compounds	0.05	0.2µg/L

Note the following:

The black results are within the EQR/S.
The red results break the EQR/S.
The blue results may break the EQR/S.
The results highlighted grey are at the limit of detection.

DOWNSTREAM COMPARISON TABLE

Physico-chemical conditions	***Ecological quality ratio/standard*** ***Good boundary*** ***Rivers (All Types)***	***2009 Downstream sampling results***
Oxygenation conditions Table 9	***River water body***	***Downstream sampling results***
Biochemical Oxygen Demand (BOD) (mgO_2/l)	Good status≤1.5 (mean) or ≤2.6(95%ile)	2mg/L (mean)
Acidification Status Table 9	***River Water Body***	***Downstream sampling results***
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.2
Nutrient conditions Table 9	***River Water body***	***Downstream sampling results***
Total Ammonia (mg N/l)	Good status≤0.065(mean) or ≤0.140(95%ile)	0.041mg/L (mean) 0.044mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status≤0.035(mean) or ≤0.075(95%ile)	0.0196mg/L (mean) 0.0297mg/L (95%ile)
Specific pollutants Table 10	***Inland surface waters AA-EQS***	***Downstream sampling results***
Phenol	8	<0.1µg/L
Toulene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.1	1.5µg/L Chromium
Copper (depending on water hardness)	30	1µg/L
Cyanide	10	<5µg/L
Flouride	500	52µg/L
Zinc (depending on water hardness)	100	1.3µg/L
Priority Substances Table 11	***Inland surface waters AA-EQS***	***Downstream sampling results***
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	4.5µg/L
Nickel and its compounds	20	1.01µg/L
Priority Hazardous Substances Table 12	***Inland surface waters AA-EQS***	***Downstream sampling results***
Cadmium and its compounds (depending on water hardness)	0.25	<1µg/L
Mercury and its compounds	0.05	<0.2µg/L

Note the following:
The black results are within the EQR/S.
The red results break the EQR/S.
The blue results may break the EQR/S.
The results highlighted grey are at the limit of detection

BOD PREDICTED IMPACTS

Mass Balance Equations for BOD:

Worst Case Scenario:

Maximum Discharge, Low Flow in the River, Maximum BOD in Discharge.

Flow of River (95%ile) = 0.08158m3/sec
Mean BOD in River (upstream) = 1mg/L
Max volume of discharge = 0.008m3/sec
Max value for BOD in discharge = 130mg/L

$$Cfinal = \frac{(0.08158 \times 1) + (0.008 \times 130)}{(0.08158 + 0.008)}$$

Cfinal = 12.52mg/l BOD

This is in breach of the 2.6mg/L 95%ile EQS for BOD

Normal Scenario

Normal Discharge, Median Flow in the River, Mean BOD in Discharge.

Flow of River (Median) = 0.49016m3/sec
Mean BOD in River (upstream) = 1mg/L
Normal volume of discharge = 0.003m3/sec
Mean value for BOD in discharge = 62.93mg/L

$$Cfinal = \frac{(0.49016 \times 1) + (0.003 \times 62.93)}{(0.49016 + 0.003)}$$

Cfinal = 1.377mg/l BOD

This is compliant with the 1.5mg/L mean EQS for BOD

Mass Balance Equations for Ammonia:

Worst Case Scenario:

Maximum Discharge, Low Flow in the River, Maximum Ammonia in Discharge.

Flow of River (95%ile) = 0.08158m3/sec
Mean Ammonia in River (upstream) = 0.0215mg/L
Max volume of discharge = 0.008m3/sec
Max value for Ammonia in discharge = 17.1mg/L

$$Cfinal = \frac{(0.08158 \times 0.0215) + (0.008 \times 17.1)}{(0.08158 + 0.008)}$$

Cfinal = 1.547mg/l Ammonia

This is in breach of the 0.14mg/L 95%ile EQS for Ammonia

Normal Scenario

Normal Discharge, Median Flow in the River, Mean Ammonia in Discharge.

Flow of River (Median) = 0.49016m3/sec
Mean Ammonia in River (upstream) = 0.0215mg/L
Normal volume of discharge = 0.003m3/sec
Mean value for Ammonia in discharge = 12.08mg/L

$$Cfinal = \frac{(0.49016 \times 0.0215) + (0.003 \times 12.08)}{(0.49016 + 0.003)}$$

Cfinal = 0.095mg/l Ammonia

This is in breach of the 0.065mg/L mean EQS for Ammonia

Mass Balance Equations for Orthophosphate:

Worst Case Scenario:

Maximum Discharge, Low Flow in the River, Maximum Orthophosphate in Discharge.

Flow of River (95%ile) = 0.08158m3/sec
Mean Orthophosphate in River (upstream) = 0.0159mg/L
Max volume of discharge = 0.008m3/sec
Max value for Orthophosphate in discharge = 1.94mg/L

$$Cfinal = \frac{(0.08158 \times 0.0159) + (0.008 \times 1.94)}{(0.08158 + 0.008)}$$

Cfinal = 0.188mg/l Orthophosphate

This is in breach of the 0.075mg/L 95%ile EQS for Orthophosphate

Normal Scenario

Normal Discharge, Median Flow in the River, Mean Orthophosphate in Discharge.

Flow of River (Median) = 0.49016m3/sec
Mean Orthophosphate in River (upstream) = 0.0159mg/L
Normal volume of discharge = 0.003m3/sec
Mean value for Orthophosphate in discharge = 1.47mg/L

$$Cfinal = \frac{(0.49016 \times 0.0159) + (0.003 \times 1.47)}{(0.49016 + 0.003)}$$

Cfinal = 0.0247mg/l Orthophosphate

This is compliant with the 0.035mg/L mean EQS for Orthophosphate