

# Comhairle Contae Chorcaí Cork County Council

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Mr. Stuart Huskisson,  
Inspector,  
Environmental Protection Agency,  
Office of Climate, Licensing & Resource Use,  
Regional Inspectorate,  
Inniscarra,  
County Cork.

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26/07/2010

D0439-01



**Re: Notices in accordance with Regulation 18(3)(b) of the Waste Water Discharge**

**(Authorisation) Regulations 2007)**

Dear Mr. Huskisson,

Your notices dated 31<sup>st</sup>. May and 1<sup>st</sup>. June last and previous correspondence regarding the following Waste Water Discharge Licence applications refer.

Reg No.	Agglomeration Name	Date of Application
D0437-01	Boherbue	22/06/2009
D0438-01	Bweeng	22/06/2009
D0439-01	Conna	22/06/2009
D0445-01	Glanworth	22/06/2009
D0450-01	Clondulane	22/06/2009

Attached find an assessment of the impact of the discharge in relation to the requirements of the Environmental Quality Objectives regulations (S.I. No. 272 of 2009 for Conna WWTP. CD – ROM also attached.

Yours truly,  
Paddy O' Friel  
Substitute Senior Engineer  
Email: [paddy.ofriel@corkcoco.ie](mailto:paddy.ofriel@corkcoco.ie)



022- 30441.

Mobile 087/2700065



## CONNA WWTP UPSTREAM COMPARISON TABLE

<i>Physico-chemical conditions</i>	<i>Ecological quality ratio/standard</i>	<i>2008 upstream ambient sampling results at aSW01CONNAu</i>
	<i>Good boundary</i>	
	<i>Rivers (All Types)</i>	
<b><i>Oxygenation conditions Table 9</i></b>	<b><i>River water body</i></b>	<b><i>Ambient sampling results</i></b>
Biochemical Oxygen Demand (BOD) (mgO <sub>2</sub> /l)	Good status ≤1.5 (mean) or ≤2.6(95%ile)	1.125mg/L (mean) 1.85mg/L (95%ile)
<b><i>Acidification Status Table 9</i></b>	<b><i>River Water Body</i></b>	<b><i>Ambient sampling results</i></b>
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.4-737 (range)
<b><i>Nutrient conditions Table 9</i></b>	<b><i>River Water body</i></b>	<b><i>Ambient sampling results</i></b>
Total Ammonia (mg N/l)	Good status ≤0.065(mean) or ≤0.140(95%ile)	0.069mg/L (mean) 0.0985mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status ≤0.035(mean) or ≤0.075(95%ile)	0.03966mg/L (mean) 0.0675mg/L (95%ile)
<b><i>Specific pollutants Table 10</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Phenol	8	<0.1µg/L
Toulene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.7	<1µg/L
Copper (depending on water hardness)	30	<1µg/L
Cyanide	10	<5µg/L
Fluoride	500	30µg/L
Zinc (depending on water hardness)	100	<1µg/L
<b><i>Priority Substances Table 11</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	5.3µg/L
Nickel and its compounds	20	2.29µg/L
<b><i>Priority Hazardous Substances Table 12</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Cadmium and its compounds (depending on water hardness)	0.15 0.9 (Class 4) MAC	<1µg/L(value of 0 ug/l recorded).
Mercury and its compounds	0.05	<0.2 µg/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.  
Water hardness in the River Bride is 111mgCaCO<sub>3</sub>/L

**UPSTREAM COMPARISON TABLE  
(ACTUAL METAL RESULTS)**

<b>Physico-chemical conditions</b>	<b>Ecological quality ratio/standard</b>	<b>2008 upstream ambient sampling results</b>
	<b>Good boundary</b>	
	<b>Rivers (All Types)</b>	
<b>Specific pollutants Table 10</b>	<b>Inland surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Total Chromium	8.1	<1µg/L
Copper (depending on water hardness)	30	<1µg/L
Zinc (depending on water hardness)	100	<1µg/L
<b>Priority Substances Table 11</b>	<b>Inland surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Lead and its compounds	7.2	5.3µg/L
Nickel and its compounds	20	2.287µg/L
<b>Priority Hazardous Substances Table 12</b>	<b>Inland surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Cadmium and its compounds (depending on water hardness)	0.15 0.9 (Class 4) MAC	<1µg/L (value of 0 ug/l recorded).

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## DOWNSTREAM COMPARISON TABLE

<b>Physico-chemical conditions</b>	<b>Ecological quality ratio/standard</b>	<b>2008 Downstream ambient sampling results</b>
	<b>Good boundary</b>	
	<b>Rivers (All Types)</b>	
<b>Oxygenation conditions Table 9</b>	<b>River water body</b>	<b>Ambient sampling results</b>
Biochemical Oxygen Demand (BOD) (mgO <sub>2</sub> /l)	Good status ≤1.5 (mean) or ≤2.6(95%ile)	1.25mg/L (mean) 1.85mg/L (95%ile)
<b>Acidification Status Table 9</b>	<b>River Water Body</b>	<b>Ambient sampling results</b>
pH (individual values)	Soft Water 4.5<pH<9.0 Hard Water 6.0<pH<9.0	7.3-7.7 (range)
<b>Nutrient conditions Table 9</b>	<b>River Water body</b>	<b>Ambient sampling results</b>
Total Ammonia (mg N/l)	Good status ≤0.065(mean) or ≤0.140(95%ile)	0.088625mg/L (mean) 0.151mg/L (95%ile)
Molybdate Reactive Phosphorus (MRP) (mg P/l)	Good status ≤0.035(mean) or ≤0.075(95%ile)	0.06667mg/L (mean) 0.1mg/L (95%ile)
<b>Specific pollutants Table 10</b>	<b>Inland surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Phenol	8	<0.1µg/L
Toulene	10	<1.0µg/L
Xylene	10	<1.0µg/L
Arsenic	25	<0.96µg/L
Total Chromium	8.1	<1µg/L Chromium
Copper (depending on water hardness)	30	<9.28µg/L
Cyanide	10	<5µg/L
Fluoride	500	30µg/L
Zinc (depending on water hardness)	100	17.63µg/L
<b>Priority Substances Table 11</b>	<b>Inland surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Atrazine	0.6	<0.01µg/L
Dichloromethane	20	<1.0µg/L
Simazine	1	<0.01µg/L
Lead and its compounds	7.2	9.82µg/L
Nickel and its compounds	20	2.26µg/L
<b>Priority Hazardous Substances Table 12</b>	<b>Inland surface waters AA-EQS</b>	<b>Ambient sampling results</b>
Cadmium and its compounds (depending on water hardness)	0.15 0.9 (Class 4) MAC	<1µg/L (value of 0 ug/l recorded).
Mercury and its compounds	0.05	<0.2 µg/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.  
 Water hardness in the River Bride is **111mg CaCO<sub>3</sub>/L**

**DOWNSTREAM COMPARISON TABLE  
(ACTUAL METAL RESULTS)**

<i>Physico-chemical conditions</i>	<i>Ecological quality ratio/standard</i>	<i>2008 Downstream ambient sampling results at aSW01RATHd</i>
	<i>Good boundary</i>	
	<i>Rivers (All Types)</i>	
<b><i>Specific pollutants Table 10</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Total Chromium	8.1	<1µg/L
Copper (depending on water hardness)	30	9.28µg/L
Zinc (depending on water hardness)	100	17.633µg/L
<b><i>Priority Substances Table 11</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Lead and its compounds	7.2	9.815µg/L
Nickel and its compounds	20	2.256µg/L
<b><i>Priority Hazardous Substances Table 12</i></b>	<b><i>Inland surface waters AA-EQS</i></b>	<b><i>Ambient sampling results</i></b>
Cadmium and its compounds (depending on water hardness)	0.15 0.9 (Class 4) MAC	<1µg/L (value of 0 ug/l recorded).

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## 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) = 0.76m<sup>3</sup>/sec  
Mean BOD in River (upstream) = 1.125mg/L  
Max volume of discharge = 0.002m<sup>3</sup>/sec  
95ile Max value for BOD in discharge = 91mg/L\*

$$C_{\text{final}} = \frac{(0.76 \times 1.125) + (0.002 \times 91)}{(0.76 + 0.002)}$$

$$C_{\text{final}} = 1.36\text{mg/l BOD}$$

This is not in breach of the 1.5mg/L Mean EQS for BOD.

#### Normal Scenario:

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

Flow of River (Median) = 5.17m<sup>3</sup>/sec  
Mean BOD in River (upstream) = 1.125mg/L  
Normal volume of discharge = 0.0014m<sup>3</sup>/sec  
Mean value for BOD in discharge = 32.8mg/L

$$C_{\text{final}} = \frac{(5.17 \times 1.125) + (0.0014 \times 32.8)}{(5.17 + 0.0014)}$$

$$C_{\text{final}} = 1.13\text{mg/l BOD}$$

This is not in breach of 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) = 0.76m<sup>3</sup>/sec  
Mean Ammonia in River (upstream) = 0.069mg/L  
Max volume of discharge = 0.002m<sup>3</sup>/sec  
Max value for Ammonia in discharge = 20mg/L\*

$$C_{\text{final}} = \frac{(0.76 \times 0.069) + (0.002 \times 20)}{(0.76 + 0.002)}$$

$$C_{\text{final}} = 0.12\text{mg/l Ammonia}$$

This is not in breach of the 0.14mg/L 95%ile EQS for Ammonia.

This is in breach of the 0.065mg/l mean for Ammonia.

### **Normal Scenario:**

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

Flow of River (Median) = 5.17m<sup>3</sup>/sec  
Mean Ammonia in River (upstream) = 0.069mg/L  
Normal volume of discharge = 0.0014m<sup>3</sup>/sec  
Mean value for Ammonia in discharge = 7.8mg/L

$$C_{\text{final}} = \frac{(5.17 \times 0.069) + (0.0014 \times 7.8)}{(5.17 + 0.0014)}$$

$$C_{\text{final}} = 0.071 \text{ mg/l Ammonia}$$

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

This is not in breach of the 0.14mg/L 95%ile 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) = 0.76m<sup>3</sup>/sec  
Mean Orthophosphate in River (upstream) = 0.03966mg/L  
Max volume of discharge = 0.002 m<sup>3</sup>/sec  
Max value for Orthophosphate in discharge = 7mg/L

$$C_{\text{final}} = \frac{(0.76 \times 0.03966) + (0.002 \times 7)}{(0.76 + 0.002)}$$

$$C_{\text{final}} = 0.058 \text{ mg/l Orthophosphate}$$

This is in breach of the 0.035mg/L mean EQS for Orthophosphate

This is not 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) = 5.17m<sup>3</sup>/sec  
Mean Orthophosphate in River (upstream) = 0.03966mg/L  
Normal volume of discharge = 0.0014m<sup>3</sup>/sec  
Mean value for Orthophosphate in discharge = 2.83mg/L

$$C_{\text{final}} = \frac{(5.17 \times 0.03966) + (0.0014 \times 2.83)}{(5.17 + 0.0014)}$$

$$C_{\text{final}} = 0.040 \text{ mg/l Orthophosphate}$$

This is in breach of the 0.035mg/L mean EQS for Orthophosphate

This is not in breach of the 0.075mg/L 95%ile EQS for Orthophosphate

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### D0439-01 Attachment E4 Conna Inlet Table E4

Sample Date	12/04/2006	05/10/2006	31/01/2007	28/01/2009	05/02/2009	05/03/2009	17/04/2009	
Sample	Influent	Influent	Influent	Influent	Influent	Influent	Influent	Average
Sample Code				GT155	GT256	GT384	GT699	
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	
pH	7.5	7.4	7.4	7.3	7.4	7.6	7.7	7.471428571
Temperature °C	*	*	*	*	*	*	*	
Cond 20°C	913	749	760	526	602	678	897	732.1428571
SS mg/L	108	64	74	57	38	20	270	90.14285714
NH <sub>3</sub> mg/L	17	11	*	12.6	16	21.3	23.5	16.9
BOD mg/L	185	195	125	99	40	180	325	164.1428571
COD mg/L	497	411	356	227	112	392	668	380.4285714
TN mg/L	*	*	*	16.6	24	33	40	28.4
Nitrite mg/L	*	*	*	0.933	*	*	*	0.933
Nitrate mg/L	*	*	*	3.04	*	*	*	3.04
TP mg/L	20	10	2	6	2.5	4.2	12.2	8.128571429
O-PO <sub>4</sub> -P mg/L	8	5	3	2.91	1.7	3.2	4.3	4.015714286
SO <sub>4</sub> 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	<20	<20
Copper ug/L	*	*	*	10	10	10	71.3	25.325
Cyanide µg/L	*	*	*	<5	*	*	*	
Fluoride µg/L	*	*	*	32	*	*	*	32
Lead ug/L	*	*	*	<20	<20	<20	<20	<20
Nickel ug/L	*	*	*	<20	<20	<20	<20	<20
Zinc ug/L	*	*	*	10	27	10	172.9	54.975
Boron ug/L	*	*	*	<20	<20	<20	<20	<20
Cadmium ug/L	*	*	*	<20	<20	<20	<20	<20
Mercury µg/L	*	*	*	<0.2	*	*	*	
Selenium µg/L	*	*	*	1	*	*	*	1
Barium ug/L	*	*	*	10	10	10	52.6	20.65

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## D0439-01 Attachment E4 Conna Discharge Outlet Table E4

Sample Date	12/04/2006	05/10/2006	31/01/2007	18/09/2008	23/10/2008	28/01/2009	05/02/2009	05/03/2009	05/03/2009	02/04/2009	17/04/2009	Average	Kg/Day	Kg/year
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent			
Sample Code						GT154	GT257	GT319	GT385	GT473	GT700			
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	*	*	*	*			
pH	7.7	7.4	7.3	*	7.7	7.5	7.4	7.4	7.6	7.5	7.7	7.52		
Temperature °C	*	*	*	*	*	*	*	*	*	*	*			
Cond 20°C	1055	853	964	*	*	624	281	556	255	*	257	605.625		
SS mg/L	7	19	11	34	50	16	5	12	9	67	4.8	21.3454545		
NH <sub>3</sub> mg/L	13	20	*	*	*	13.5	0.1	*	0.09	*	0.06	7.79166667		
BOD mg/L	20	33	11	41.85	22.4	20	<2	21	<2	124	2	32.8055556		
COD mg/L	59	80	57	84	141	67	11	38	20	238	13	73.4545455		
TN mg/L	*	*	*	*	*	16.9	4.7	14.9	3	36	3	13.0833333		
Nitrite mg/L	*	*	*	*	*	0.451	*	*	*	*	*	0.451		
Nitrate mg/L	*	*	*	*	*	4.16	*	*	*	*	*	4.16		
TP mg/L	12	10	4	*	*	5.8	0.07	1.7	0.15	*	0.09	4.22625		
O-PO4-P mg/L	6	7	2	*	*	1.86	<0.05	*	0.07	*	0.06	2.83166667		
SO4 mg/L	*	*	*	*	*	<30	*	*	*	*	*	<30		
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	*	*	*	*	*	*		
Xylenes µg/L	*	*	*	*	*	<1	*	*	*	*	*	<1		
Arsenic µg/L	*	*	*	*	*	<0.96	*	*	*	*	*	<0.96		
Chromium ug/L	*	*	*	*	*	<20	<20	*	<20	<20	<20	<20		
Copper ug/L	*	*	*	*	*	10	10	*	10	10	21.6	12.32		
Cyanide µg/L	*	*	*	*	*	5	*	*	*	*	*	5		
Fluoride µg/L	*	*	*	*	*	32	*	*	*	*	*	32		
Lead ug/L	*	*	*	*	*	<20	<20	*	<20	<20	<20	<20		
Nickel ug/L	*	*	*	*	*	<20	<20	*	<20	<20	<20	<20		
Zinc ug/L	*	*	*	*	*	10	10	*	10	10	38.7	15.74		
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	*	*	*	*	*	1.6	*	*	*	*	*	1.6		
Barium ug/L	*	*	*	*	*	10	10	*	54.9	10	<20	21.225		

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### D0439-01 Attachment E4 Conna Upstream Table E4

Sample Date	23/10/2008	28/01/2009	05/02/2009	05/03/2009	05/03/2009	02/04/2009	17/04/2009	Average
Sample	River	River	River	River	River	River	River	
Sample Code		GT152	GT258	GT321	GT386	GT474	GT701	
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	
pH	*	7.6	*	*	7.4	7.6	7.7	7.575
Temperature °C	*	*	*	*	*	*	*	
Cond 20°C	*	236	*	*	281	255	257	257.25
SS mg/L	*	5	*	*	5	9	4.8	5.95
NH <sub>3</sub> mg/L	*	0.05	*	*	0.1	0.09	0.06	0.075
BOD mg/L	*	0.5	*	*	1	1	2	1.125
COD mg/L	*	10.5	*	*	11	20	13	13.625
TN mg/L	*	5	*	*	4.7	3	3	3.925
Nitrite mg/L	*	0.00757	*	*	*	*	*	0.00757
Nitrate mg/L	*	5.32	*	*	*	*	*	5.32
TP mg/L	*	0.1	*	*	0.07	0.15	0.09	0.1025
O-PO <sub>4</sub> -P mg/L	0.025	0.025	*	0.025	0.025	0.07	0.06	0.038333333
SO <sub>4</sub> mg/L	*	<30	*	*	*	*	*	<30
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	<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	*	1.7	*	*	*	*	*	1.7
Barium ug/L	*	49	<20	*	21.6	10	10	22.65

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### D0439-01 Attachment E4 Conna Downstream Table E4

Sample Date	23/10/2008	28/01/2009	05/02/2009	05/03/2009	05/03/2009	02/04/2009	17/04/2009	Average
Sample	River	River	River	River	River	River	River	
Sample Code		GT153	GT259	GT320	GT387	GT475	GT702	
Flow M <sup>3</sup> /Day	*	*	*	*	*	*	*	
pH	*	7.6	*	*	7.3	7.5	7.7	7.525
Temperature °C	*	*	*	*	*	*	*	
Cond 20°C	*	242	*	*	278	257	258	258.75
SS mg/L	*	5	*	*	7	11	5.2	7.05
NH <sub>3</sub> mg/L	*	0.05	*	*	0.1	0.16	0.06	0.0925
BOD mg/L	*	2	*	*	1	1	1	1.25
COD mg/L	*	24	*	*	<5	18	14	18.66666667
TN mg/L	*	5.3	*	*	4.8	3	3	4.025
Nitrite mg/L	*	0.00849	*	*	*	*	*	0.00849
Nitrate mg/L	*	5.45	*	*	*	*	*	5.45
TP mg/L	*	0.1	*	*	0.07	0.11	0.13	
O-PO4-P mg/L	0.1	<0.05	*	<0.05	0.06	0.07	0.1	0.0825
SO4 mg/L	*	<30	*	*	*	*	*	<30
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	<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	*	1.3	*	*	*	*	*	1.3
Barium ug/L	*	47	10	*	57.6	10	10	26.92

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D0439-01 Attachment E4 Tabulation of monitoring results for compliance purposes against SI 272 of 2009 for comparison purposes where results are below LOD for analytical method

Sample Date	23/10/2008	28/01/2009	05/02/2009	05/03/2009	05/03/2009	02/04/2009	17/04/2009	Average	95% percentile
Sample	Upstream River	Upstream River	Upstream River	Upstream River	Upstream River	Upstream River	Upstream River		
Sample Code	GS1128	GT152	GT258	GT321	GT386	GT474	GT701		
NH <sub>3</sub> mg/L	*	0.025	*	*	0.1	0.09	0.06	0.06875	0.0985
O-PO4-P mg/L	0.015	0.028	*	0.04	0.025	0.07	0.06	0.039666667	0.0675
Chromium ug/L	*	<1	<1	*	<1	<1	<1	<1	n/a
Copper ug/L	*	<1	<1	*	<1	<1	<1	<1	n/a
Lead ug/L	*	<1	5.3	*	<1	<1	<1	5.3	n/a
Nickel ug/L	*	2	2.3	*	1.925	<1	2.923	2.287	n/a
Zinc ug/L	*	<1	<1	*	<1	<1	<1	<1	n/a
Boron ug/L	*	<1	1.7	*	<1	<1	<1	1.7	n/a
Cadmium ug/L	*	<1	<1	*	<1	<1	<1	<1	n/a
Barium ug/L	*	48.5	11	*	21.6	15.165	<1	24.06625	n/a

Sample Date	23/10/2008	28/01/2009	05/02/2009	05/03/2009	05/03/2009	02/04/2009	17/04/2009	Average	95% percentile
Sample	Downstream River	Downstream River	Downstream River	Downstream River	Downstream River	Downstream River	Downstream River		
Sample Code	GS1130	GT153	GT259	GT320	GT387	GT475	GT702		
NH <sub>3</sub> mg/L	*	0.0345	*	*	0.1	0.16	0.06	0.088625	0.151
O-PO4-P mg/L	0.1	0.0305	*	0.0395	0.06	0.07	0.1	0.066666667	0.1
Chromium ug/L	*	<1	<1	*	<1	<1	<1	<1	n/a
Copper ug/L	*	<1	<1	*	9.28	<1	<1	9.28	n/a
Lead ug/L	*	<1	4.5	*	15.13	<1	<1	9.815	n/a
Nickel ug/L	*	1.3	2	*	2.625	<1	3.1	2.25625	n/a
Zinc ug/L	*	<1	<1	*	17.633	<1	<1	17.633	n/a
Boron ug/L	*	<1	<1	*	16.45	<1	<1	16.45	n/a
Cadmium ug/L	*	<1	<1	*	<1	<1	<1	<1	n/a
Barium ug/L	*	47	11.5	*	57.6	15.495	<1	32.89875	n/a

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