

Millstreet – Initial Assessment of Assimilative Capacity

The initial assessment of the assimilative capacity is based on:

- Current background concentrations as per Table 1
- Design Flow of 1507.44 m³/d – this will be revised depending on findings of infiltration study
- Existing legislation

Table 1. Background concentrations

Sample Location	Median Background Concentration				
	BOD (mg/l)	Ammonia (mg/l as N)	Nitrate (mg/l as N)	Ortho-P (mg/l as P)	SS (mg/l)
Tanyard, immediately upstream of the existing outfall (May – Aug 2008)	3.0	0.800	3.80	0.110	2.4
Tanyard, upstream of the confluence with sister stream and downstream of existing outfalls (May – Aug 2008)	3.5	0.340	3.80	0.100	5.0
Tanyard, d/s of confluence with sister stream (May – Aug 2008)	3.0	0.450	3.61	0.150	6.0
Finnow, at Finnow Bridge (May – Aug 2008)	2.0	0.050	1.80	0.050	2.0
Finnow, d/s of Finnow/Tanyard confluence but upstream of discharge from Drishance Convent (May – Aug 2008)	2.0	0.090	1.80	0.050	2.0
Blackwater, Charles Bridge (Cork County Council data Jan 2007- Nov 2008)	1.0	0.035	1.17	0.024	2.0

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Table 2. Comparison of Receiving Waters and Outfall Locations

Option Nr.	Receiving Waters & Outfall Locations	Level of Treatment	Parameter	Effluent Conc. (mg/l)	Increase in River Conc. (mg/l)	Resultant Receiving Water Conc. (mg/l)	Max. Permissible Conc. (mg/l)
1A	Tanyard Stream - Existing outfall adjacent to WWTP	Secondary treatment with nutrient reduction	BOD	< 25 mg/l BOD	15.892	18.892	BOD < 4.0
			SS	< 35 mg/l SS	22.248	24.648	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	1.635	2.663	NH ₄ tot < 1.00
			OrthoP	< 2.0 mg/l P	1.271	1.381	P < 0.05
1B		Tertiary treatment with nutrient reduction	BOD	< 5 mg/l BOD	3.178	6.178	BOD < 4.0
			SS	< 5 mg/l SS	3.178	5.578	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	1.635	2.663	NH ₄ tot < 1.00
			OrthoP	< 0.5 mg/l P	0.318	0.428	P < 0.05
2A	Tanyard Stream - Downstream of confluence with sister stream	Secondary treatment with nutrient reduction	BOD	< 25 mg/l BOD	11.648	14.648	BOD < 4.0
			SS	< 35 mg/l SS	16.307	22.307	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	0.227	0.806	NH ₄ tot < 1.00
			OrthoP	< 2.0 mg/l P	0.177	0.327	P < 0.05
2B		Tertiary treatment with nutrient reduction	BOD	< 5 mg/l BOD	2.330	5.330	BOD < 4.0
			SS	< 5 mg/l SS	2.330	8.330	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	0.227	0.806	NH ₄ tot < 1.00
			OrthoP	< 0.5 mg/l P	0.044	0.194	P < 0.05
3A	River Finnow - Finnow Bridge	Secondary treatment with nutrient reduction	BOD	< 25 mg/l BOD	3.714	5.714	BOD < 3.0
			SS	< 35 mg/l SS	5.199	7.199	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	0.382	0.446	NH ₄ tot < 1.00
			OrthoP	< 2.0 mg/l P	0.038	0.088	P < 0.03
3B		Tertiary treatment with nutrient reduction	BOD	< 5 mg/l BOD	0.743	2.743	BOD < 3.0
			SS	< 5 mg/l SS	0.743	2.743	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	0.382	0.446	NH ₄ tot < 1.00
			OrthoP	< 0.5 mg/l P	0.009	0.059	P < 0.03
4A	River Finnow - Downstream of confluence with Tanyard	Secondary treatment with nutrient reduction	BOD	< 25 mg/l BOD	3.173	5.173	BOD < 3.0
			SS	< 35 mg/l SS	4.443	6.443	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	0.326	0.442	NH ₄ tot < 1.00
			OrthoP	< 2.0 mg/l P	0.032	0.082	P < 0.03
4B		Tertiary treatment with nutrient reduction	BOD	< 5 mg/l BOD	0.635	2.635	BOD < 3.0
			SS	< 5 mg/l SS	0.635	2.635	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	0.326	0.442	NH ₄ tot < 1.00
			OrthoP	< 0.5 mg/l P	0.008	0.058	P < 0.03
5A	River Blackwater - Near Wallis's Bridge	Secondary treatment with nutrient reduction	BOD	< 25 mg/l BOD	0.486	1.486	BOD < 3.0
			SS	< 35 mg/l SS	0.680	2.680	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	0.050	0.095	NH ₄ tot < 0.1 (as N)
			OrthoP	< 2.0 mg/l P	0.004	0.028	P < 0.03
5B		Tertiary treatment with nutrient reduction	BOD	< 5 mg/l BOD	0.097	1.097	BOD < 3.0
			SS	< 5 mg/l SS	0.097	2.097	SS < 25.0
			NH4 tot	< 2 mg/l NH ₄ tot (as N)	0.050	0.095	NH ₄ tot < 0.1 (as N)
			OrthoP	< 0.5 mg/l P	0.001	0.025	P < 0.03

In consideration of the outfall options assessed above, the discharge of a tertiary treated effluent with nutrient reduction to the River Finnow is considered most favourable.

There is greater assimilative capacity at location 4 i.e. downstream of the confluence of the Tanyard. A review of the draft Ecology Report also indicates that outfall 4 “is considered the least detrimental to the existing aquatic environment”. The waters at Finnow Bridge are part of the spawning section of the river it is considered unfavourable to increase nutrient concentrations in this section.

Therefore the proposed outfall location on the River Finnow – downstream of the confluence with the Tanyard is considered the best outfall option.

Please note the resultant orthophosphate concentration downstream of the discharge is primarily due to the elevated background concentrations in the river (i.e. the standard is already exceeded). The increase in orthophosphate concentration in the receiving water is 0.01 mg/l based on a discharge of 0.5 mg/l orthop.

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