



Atlantic Shellfish Ltd.

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Environmental Licensing Programme, Office of Climate, Licensing and Resource Use, Environmental Protection Agency, P.O.Box 3000, Johnstown Castle Estate, Co. Wexford, Ireland.



ENVIRONMENTAL PROTECTION AGENCY 2 5 NOV 2008

21st November 2008

Dear Sirs,

esofth' any other use. Application by Cork County Council for a Waste Water Discharge Licence for Midleton WWTP, Co. Cork : D0056-01.

Further to my letter of 4th November, and thank you for your acknowledgement, I thought it might be helpful to add a few pages from September's Operational Report for Midleton WWTP, restricting myself to comments on the hydraulic and organic loading.

In the order in which they were reported, you will see that an average hydraulic load of 7,589 m3/day was received at the plant in the month of September. The design DWF, which we were given by the plant designers, M.C.O'Sullivan's, and which was later accepted for the Tender Contract Documents in 2006, was 2,256 m3/day. Thus this flow for September, above, was 3,36 times the design DWF. Are you happy that the plant can work when the retention time is, therefore, 3.36 times less than design every day of the month, and when the upward flow of clearly poorly settling sludge (at the highest level 6 on the scale of filamentous bacteria for the last 6 months) is, again, for every day of the month, 3.36 times as fast as was calculated necessary in the sizing of the settling tanks?

I enclose the daily rainfall for Cloyne (the closest weather station to Midleton now and showing a very good correlation with the old Ballinacurra records in the past) and you will see that there was only 0.5mm rainfall between the 15th and 29th of the month. On the eleven days between the 19th and 29th there was no rainfall at all. This did not prevent there being storm overflows on every day except one from Bailick 1 storm tank (details enclosed). A prolonged dry spell like this normally gives one a chance to assess the actual dry weather flow in the sewerage system, according to standard accepted methodology and used by the Environment Agency in the UK. Allowing the first 7 days without rain, we can assess the flow of sewage from the data given on page 13 of the Monthly Report for the 4 day period from 26th -29th as 28,817 m3, to which we must add the storm overflows for the same period totalling 3,425 m3.

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This gives a total flow of 32,242 m3, or 8,061 m3/day. This is 3.7 time Sthe DWF that was used to size this plant. This would seem to show that the real hydraulic load in Midleton, especially after $\epsilon 2 \text{m}$ was spent on infiltration remediation, has grown by over 3 times, which supports the figure I gave you in my last letter, obtained by extrapolating the first 4 years' growth in organie-load, before it fell off.

The Plant Operator records the average BOD load received by the plant in September as only 484 kg/day (pp. 9, 14 & 15) – which is **less** than the original 1993 design load of 600kg/day. Calculating the BOD load from the site laboratory COD determinations in the ratios found the previous week by the external laboratory, the system on which the Plant Operator charges for his work in the new contract, you will see that the plant is receiving **less than half of the 16-year old design load** on the 8th, 10th, 29th and 30th September. In the letter that I enclosed 2 weeks ago, we were told by the consulting engineers, M.C. O'Sullivan, that the PE for Midleton was already over design by 1999 (11,141 PE). If the town has grown 2-3 times since then and thus also the organic load – where did it all go each day, if as little as 484kg/day, on average, was getting to the plant throughout this month?

On the 24th and 25th September, in contrast, COD loads of 6,821 kg and 8,053 kg were recorded as coming in to the plant by the 24-hour recorders (p.9 Influent Results). We were not given COD : BOD ratios for the external laboratory analyses for the previous 2 weeks (why?), but we are told that the ratio was 4 : 1 on the 26th. We note that these ratios have been creeping up progressively this last year. I am advised that the ratio for domestic sewage is more like 1.65 : 1, which is why it is normally taken as 2 : 1, as done by the Plant Operator for the early years of these Midleton monthly records. It is surely unlikely that a high chemical content would be allowed into the plant, when all other inputs such as leachate have been carefully excluded for so long? However, even taking the ratio COD : BOD at this high 4 : 1 level, the two loads, above, translate into 3,718kg BOD (62,000 PE) in a single 48-hour period.

Surely no plant can suddenly take 10 times (or even 5 times over 2 days) the daily design load of BOD without completely running out of oxygen and turning anoxic, with the death of the activated sludge bacteria? This, of course, is not allowed to happen in Midleton, and you will see on p.17, Aeration Tank Checklist, that dissolved oxygen levels are actually 3 times HIGHER than design at the end of the aeration stream in tank 4 (design is 0.8 mg/l) on the 25th (the second day of these big loads) and in tank 7 on the 27th they even rise to 6 mg/l. There can surely be very little BOD of this enormous load being broken down in this tank? The avoidance of plant closure on this occasion can only be explained by most of this load by-passing the WWTP.

Support for this conclusion is also provided by looking at the SS loads recorded on these 2 days, which are given in the Influent Results (p.9) as 11,395 kg and 5,408 kg or 16.8 tons of suspended solids. This is greater than the total biomass already present in the aeration streams. The average MLSS of the 8 tanks on the 22^{nd} (p.17) is 4,153 mg/l, thus the biomass in the 3,249 m3 of the 8 tanks is 13,493 kg. On the 26^{th} , the average MLSS has risen to 5,142 mg/l, or a rise in the total biomass to 16,706 kg, but this is only an increase of 3,213 kg – less than a fifth of the loads received. Where has the rest gone? At least 60-70% of the SS load is normally thought of as being mineral – clays and silts – these cannot have been oxidised away and must appear in the sludge disposed figure? Even the remaining 30-40% of organic fibres etc. are unlikely to have been touched in this short stay in the tanks? But an amount, at least equivalent to the existing biomass of the tanks, has gone missing.

Average suspended solids coming into the plant for the month are given in the Influent Results and the Plant Process Parameters and Statistics on pp. 9, 14 & 15 as 2,284 kg/day, or 68.5 tons in the month. If we continue to take just 60% as mineral, there should be at least 41 tons of mineral matter alone coming out in the sludge from the plant – without even factoring in the growth in the activated sludge produced during the BOD oxidation process – and yet only 22.2 tons of dry solids came out of the plant in skips this month (p.14). Where did all the rest go? If you agree with me that this rudiment of a routine sludge balance shows such a shortfall in sludge produced and the only other discharge from the WWTP is by pipeline to Rathcoursey, then I again trust you will refuse to licence this primary (largely untreated) discharge to our shellfish water, with its associated danger to human health.

If you, too, cannot find a way of explaining these discrepancies and agree that the conclusion that material has by-passed the treatment process is inescapable, you may also feel that an offence under the Regulations may have been committed, in which case it must clearly have been by the actions of the Plant Operator (trying to save his plant), but we would look to you to prosecute the water services authority and any other persons you may hold responsible, under the powers that are available to you, for taking such action, together with allowing the huge daily loss of untreated sewage to the estuary via the daily storm overflows, because of the impact of these actions, in this particular case, on human health. Many people are still receiving oysters for consumption from these waters and it is important that we know the truth about the working of this treatment plant and its discharges to the environment and that these are not allowed to continue.

To restate the position, the losses from the treatment plant itself are on top of the 300,000 m3 p.a. losses of crude (sic) sewage to the river from the Bailick 1 & 2 storm tanks and the 1 million m3 p.a. discharged at Rathcoursey, whose origin is not stated, but which has not been through the WWTP. Discharges, such as those discussed above, to Rathcoursey by pipeline, will be the most damaging to the oyster fisheries, as they are delivered without any of the buffering effect of 5 km of Owenacurra estuary and arrive less than an hour on the tide from the nearest oysters.

This month's Plant Operator's Report (the most recent we have) would appear to exemplify and highlight the major problems we have with this treatment plant and its discharges, about which we have written to you at length in the past, and we hope it has been of value to bring these things to your notice once more, whilst these waste water discharges are still subject to your scrutiny and, in the hope that, as our regulatory body for protecting the environment, you will take some urgent action towards rectifying matters.

Yours faithfully,

Ke-Kt-h. foren.

D. Ll. Hugh-Jones Copies : The Legal Unit, DG Environment, Brussels The Minister for the Environment, DOEHLG, Dublin (together with my letter of Nov. 4th)



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Introduction / Summary

September 2008

This report covers the period of September 2008 for the operation of Midleton Waste Water Treatment Plant by E.P.S. on behalf of Cork County Souncil.

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Flow to Plant The average flow to Midleton WWTP for September 2008 was approximately 7589 m³/d (\cong 3.0 DWF). These flows were recorded with weather records showing dry weather 66% of the time.

There were no additional discharges to Midleton WWTP during the month of Cours September.

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Flow Records

WWTP Flows –September 2008

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Operational Report – EPS 12

WWTP Flows - September 2008 -

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720529 726886 733280 737695 744177 750834 757209 763617 770128 7776573 783132 789582 796288 802375 809470 815669	6357 6394 4415 6482 6657 6375 6408 6511 6445 6559 6450 6706 6087 7095 6199 4830	259907 260826 261718 262628 263536 264461 265346 266205 267080 267957 268843 269722 270622 271448 272471	919 892 910 908 925 885 859 875 877 886 877 886 879 900 826 1023 782	392 375 583 585 615 602 412 487 626 609 576 408 419 602 546	7668 7661 5908 7975 8197 7862 7679 7873 7948 8054 7905 8014 7332 8720
726886 733280 737695 744177 750834 757209 763617 776573 776573 776573 7783132 789582 796288 802375 809470 815669	6394 4415 6482 6657 6375 6408 6511 6445 6559 6450 6706 6087 7095 6199 4830	260826 261718 262628 263536 264461 265346 266205 267080 267957 268843 269722 270622 271448 272471	892 910 908 925 885 859 875 877 886 877 886 879 900 826 1023 782	375 583 585 615 602 412 487 626 609 576 408 419 602 546	7661 5908 7975 8197 7862 7679 7873 7948 8054 7905 8014 7332 8720
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815669	1020			010	/52/
0.0000	4039	273253	988	452	6279
820508	6582	274241	1023	438	8043
827090	6604	275264	1272	416	x ⁸ 292
833694	4300	276536	813	398	5511
837994	7380	277349	1172	439	8971
845374	6058	278521	793	S369	7220
851432	6662	279314	873	N 352	7887
858094	6659	280187	863	4 ⁰ 346	7868
864753	6301	281050	895,1	341	7537
871054	5963	281945	15749	328	7040
877017	5853	282694	X 804	340	6997
882870	6521	283498	938	347	7806
889391	5553	284436	820	346	6719
894944	6014	285256	964	317	7295
900958	6052 ᢗ	286220	980	338	7370
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	371054 377017 382870 389391 394944 900958 907010	371054 5963 377017 5853 382870 6521 389391 5553 394944 6014 900958 6052 C 907010 907010	371054 5963 281945. 377017 5853 282694 382870 6521 283498 389391 5553 284436 394944 6014 285256 300958 6052 286220 307010 287200	371054 5963 281945 749 377017 5853 282694 804 382870 6521 283498 938 389391 5553 284436 820 394944 6014 285256 964 300958 6052 286220 980 307010 287200 387200	371054 5963 281945 249 328 377017 5853 282694 804 340 382870 6521 283498 938 347 389391 5553 284436 820 346 394944 6014 285256 964 317 900958 6052 286220 980 338 907010 287200 446.4 446.4

Legend:

Weekends Holidays

Midleton WWTP

Operational Report – EPS 13 ſ

Plant Process Parameters September 2008

Process Calculations - Sept 2008 -

Period Covered: 1st - 30th Sept 2008

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	Value	Unit	T
Plant Volume	3249	m3	I I
MISS	4557	ma/l	
Total Biomass	14805 7	ka	
	14000.7	~y	
Daily Sludge Wastage	740.5	kg/d	
Sludge Age	20	days	1
Daily BOD Load	484	kg/d	
Daily Sludge Wastage	740.5	kg/d	
		kg sludge/kg	
Sludge Yield	1.5	BOD	
			01.
Daily BOD Load	484.0	kg/d	x 150
Total Biomass	14805.7	kg/d	ner
F/M Ratio	0.03	to to	
		official	
Average Sludge Cake	15.59	%dfy solids	
Total Poly used	250	JUIP JUIL	
Active Poly used per tonne of sludge	5.6	L/ton	
Skips Sludge Cake Removed	25	with skips	
Total Volume Sludge Removed	.1042.5	tonnes	
Total TDS Sludge Removed	x 22.2	tds	
Consent	ofcor		-

Process Statistics

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September 2008

	Parameters	Units	WWTP Design	Minimum	Maximum	Average
Influent	Flow	L/s	90	63	103	88
	BOD	mg/L		59	81	67.3
	COD	mg/L		107	1144	340
	SS	mg/L		60	1512	304
	TN	mg/L		8	24.9	13.6
	TP	mg/L		1.35	4.3	2.7
Effluent	BOD	mg/L	25*	2	4	3
	COD	mg/L	125*	3.0	35.1	17
	SS	mg/L	35*	2	22	9.9
	TN	mg/L	15*	1.1	8.0	3.18
	TP	mg/L	2*	0.34	0.42	0.38
		T				.e
Loading	BOD Load	Kg/d	600	325	567	484
-	COD Load	Kg/d		810	8053	2536
	SS Load	Kg/d		472	x ² 11395	2284
	TN Load	Kg/d		64	° 175	101
	TPLoad	Ko/d		101 21	19	15

TP Load Kg/d 10 15 Legend: (*) – S.I.No.419 of 1994 – "Urban Waste Water Treatment Regulations, 1994", EPA Act 1992 For inspection net contribution of the construction of the construc

× 30 days = 68.5tas

(c. HI time mineral) That appear in studge disposed?

			Tank 1		Tan	k 2	Tani		Tan	k 4		Tank 5		T.**	k 6				
Date	Time	DO mg/L	svi	MLSS MLSS	DO mg/L	MLSS MLSS	DO mg/L	MLSS ma/L	DO mg/L	MLSS mo/l	DO mg/L	INS	MLSS mg/t	DO mg/L	MLSS mg/L	DO mg/L	MLSS mg/L	DO mo/L	MLSS m
01-Sep		00.0	144	5038	0.2	4504	0.18	4788	2.19	4814	0.00	195	4102	0.57	4246	317	1310	010	04.77
02-Sep		00.00			0.15		10		3 11	ľ	000		-	5 u c	0.5.7	14.0	10104		41/0
03-Sep		0.00			0.44		1.56		0.89		000			0.54 1.04		Q/ 7		2.24	
04-Sep		0.00			1.45		2.97		5 78	Ī	000			10.1		01.0		1.54	
) 05-Sep		0.00	142	4934	0.93	4554	2.04	4688	212	4532	000	134	5000		CVCV	000	4060	3.95	0001
06-Sep		0.00			2.4		3.32		1.49		00.0	5	0000	3.10	C#77	2.30 R 35	7014	90 -	4008
07-Sep		0.00			0.46		3.09		2.34		0.00			237	Ì	1 C B 1	T	7/-	
08-Sep		00.0	159	4702	0.66	4422	2.30	4458	0.25	4620	00.0	199	4748	0.70	AACA		aver	07-1	0101
09-Sep		000			0.56		2.89		1.53		0.00		2	2.1	00.74	5.61	4240	1.21	42/U
10-Sep		00.0			0.42		0.96		2.17		0.00			0.32		2.49		2 03	
11-Sep		00.00			2.17		0.86		2.20		0.00			1 95		5.04		0.80	
12-Sep		0.00			2.86		3.12	ce	1.44		0.00			3.25		6.39		14	
13-560		00.0			2.72		3.41		S 1.86		00.0			3.97		7.16	T	1.35	
14-Sep		00.00			0.83		2.53		12.34		0.00			2.26		5.8		81	
15-560		00.0			0.58		1.78		0.8%	~	00.0			2.20		6.18		1.55	
10-060		0.00			0.62		1.23		0.560	s'i	00.0			2.33		5.25		1 23	
1/-760		0.00			0.59		1.36		0.78	255	0.00			2.63		5.36		1.42	
10.560					2.59		4.02		3.10	ser Ser	0.00			3.35		11.7.		1.60	
Job Con					27 I		0.26		0.93	0,00	0.00			0.33		0.57		0.26	
21 Cap					1.44		3.53		0.80	De.	00.00			3.12		(6.38 \		(5.28)	
22.Sep			774	0001	3.28		1.59		1.60		000			0.54		3.65		1.34	
73 500				4392	0.54	4210	1.59	4216	1.24	4224	200 00/C	189	4274	0.31	3936	1.66	3964	1.3	4008
24 Con					2.03		1.77		0.13		0:00	2		0.88		5.09		0.91	
25 Sep					1./3		0.78		0 30		0:00	KI.		0.24		1.18		0.19	
26.05		300			ch i		0.81		2.48		0:00	2.		0.33		0.41		0.8	
77-Sep				4902	1.8	5100	0.81	5118	2.48	5144	00.0	E.	5348	0.33	5138	D.42	5278	0.85	5114
28 Cap		3.0			3.55		4.02		2.14		0.00	jî Î		2.34		6.08		1.6	
20 Cep			000	0070	80.1		1.37		3.35		00:0	ð,		2.4		(2:93 /		0.63	
30-San			007	3490	201	4490	0.53	4538	1.41	4704	0000	186	<mark>s</mark> 4286	0.24	4372	2 24	4496	2.25	4520
22		3.5			707		1.16		0 52	-	000			0,10		, c			

Midleton WWTP Operational Report - EPS 18

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Analysis Results for Microscopic Examination

Sample Date: 09/09/08

Analyst: A. Murphy

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Sample Ref. no: AT 1,2,3,4, 5, 6, 7& 8

Activated Sludge Characteristics	Comments
Flock Shape: (Round, Irregular, Cylindrical)	Irregular
Floc Size	Large
Floc Form & Strength: (Open, Closed, Weak, Strong)	Strong
Colonies:	-
Dispersed Bacteria:	-
Filamentous Bacteria (on a scale 1-6):	6
Effect of Filaments (Bridged, Attached Material, Disrupting Floc):	Affecting settlement of flocs, prowth on branching filaments evident
Fungi:	No
Protozoa: Ciliates:	Yes
instructure Flagella:	Yes
for Amoeboid:	No
Higher Organisms: Rotifers:	Yes
Nematodes:	Yes

Midleton WWTP Operational Report – EPS 18

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Operation and Maintenance Issues

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Date	Process Reporting
24/9/08	Large amounts of solids entering plant. Large amount of grit and rags in macerator
25/9/08	High solids entering plant



Midleton WWTP Operational Report – EPS 35 1

DAILY RAINFALL (mm) AT CLOYNE, CO. CORK

Day	Sep-08	
1	0.6	
2	1.4	
3	6.6	
4	13.7	
5	11.3	
6	0.0	
7	0.0	CANDAGANA CANTAL DONTO TION
8	30.0	
9	0.2	AUSENUT
10	9.6	2.5 Mar 2008
11	1.6	
12	0.0	
13	6.5	The state of the
14	6.4	
15	0.0	
16	0.0	
17	0.0	
18	0.5	
19	0.0	
20	0.0	A HEC
21	0.0	otter
22	0.0	22. 213
23	0.0	et al a start
24	0.0	100 jieb
25	0.0	M Pricely
26	Tr	ectionnet
27	0.0	. HS H O
28	Tr	FOLITE
29	Tr	X COV
30	2.9	attor
Total	91.3	Const

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	Bailick No.1:	No.1:	hours run	0.17	0.23	0.20	0.62	0.02	0.80	0.25	0.18	0.77	0.98	0.91	0.55	0.43	0.42	0.76	0.37	0.69	0.30	0.23	0.54	0.24	0.13	0.12	110	000	0.16	0.12	0.13 0.18	0 11	0.12	11.19
č	Storm discharge as	total volume	%	16	20	16	48	0 T C	44	. 00	13	45	45	45	31	25	28	40	26	45	21	16	39	15	11	80	6	0	12	10	<u>1</u>	6) [26
Total volume	arising in cheme; storm + treated	effluent	m3	8,058	9,004	8,658	9 658	10,855	13.009	8,830	8,376	12,730	13,255	13,243	10,616	10,200	9,557	13,123	9,419	10,250	9,596	9,386	8,393	10,019	7,677	8,228	8.235	7,196	7,643	7 429	8,528	7.034	7,792	285994.00
	Volume s pumped to	treatment plant	m3	6,811	7,276	7,286	5.325	7,390	7,582	7,260	7,267	7,386	7,322	7,445	7,329	7,606	6,913	8,058	7,041	5,827	7,605	№ 7,876	5,113	8,552	6,851	7,535	7,522	7,196	6,712	6.657	7,459	6,373	6,978	213553.00
	Total volume of storm effluent	pumped to river	m3	1,247	1,728	1,372	4,333	3,465	5,427	1,570	1,109	5,344	5,933	5,798	0, ti, 3, 287	191794 191594	0.644	5,0659	2,3780.4	4,423 14	1,991	1,510	3,280	1,467	826	693	713	0	931	772	1,069	661	814	72441.00
		No. 2 minutionse								Ċ	5788 C	<u>ب</u> ب م	5	vie O	0			Ċ	•	0		0	0	0		Ö	0			0	0	0		0.00 0.00
	Volume pumped to river from Bailick	No. 2 pumphouse	m3	238	302	223	590	554	734	65	0	170	151	274	0	0	209	511	101	403	209	144	72	22	14	0	0	0	0	0	o	7 ~	101	5695.20
	Volume pumped to river from Bailick	No. 1 pumphouse	83	1009.80	1425.60	1148.40	3742.20	2910.60	4692.60	1504.80	1108.80	4573.80	5781.60	5524.20	3286.80	2593.80	2435.40	4554.00	2277.00	4019.40	1782.00	1366.20	3207.60	1445.40	811.80	693.00	712.80	0.00	930.60	772.20	1069.20	653.40	712.80	66745.80
		Date		01-Sep-U8	02-Sep-08	U3-Sep-U8	04-Sep-08	05-Sep-08	06-Sep-08	07-Sep-08	08-Sep-08	09-Sep-08	10-Sep-08	11-Sep-08	12-Sep-08	13-Sep-U8	14-Sep-08	15-Sep-08	16-Sep-08	1/-Sep-U8	18-Sep-U8	19-Sep-08	20-Sep-U8	21-Sep-U8	22-Sep-U8	23-Sep-U8	24-Sep-08	25-Sep-08	26-Sep-08	27-Sep-08	28-Sep-08	29-Sep-08	30-Sep-08	Totals