Field Test Results: UK Hotel Wastewater Plant

Industry	Wastewater
Target	Treatment of hotel wastewater including human, restaurant and laundry waste
Product Used	Eco-System Plus, Eco-Cat
Customer	A hotel in Wales, UK (name available under NDA)
Date	18 Dec 2023 to 15 Mar 2024
Problem To Solve	Effluent BOD is out of consent / compliance, mainly due to high fat oil and grease content from kitchen waste. BOD = 86 mg/l. Consent is 20. Far out of compliance. SS = 29 mg/l. Consent is 30. Acceptable. NH4 = 4.9 mg/l. Consent is 20. Well within limits.
Facility	62.5K liters/day waste treatment plant.
Product, Dosage, Tools and Application Method	Eco-System Plus for first few weeks, then changed to Eco-Cat. 18 Dec 2023: 6ppm = 400 ml/day 17 Jan 2024: 7.5 ppm = 500 ml/day 27 Feb 2024: 11.3 ppm = 750 ml/day
Results & Comments	Plant discharge is now within consent. As of 15 Mar 2024: BOD = 11 Reduced 87% SS = 12 Reduced 59% NH4 = 3 Reduced 39%

4 Jan 2024

Email from customer, 2 weeks into testing:

Gentlemen,

The biomass and liquor in the reactors has gone from a creamy white appearance to now being a clear liquor with a lovely dark brown biomass.

We have no analysis as yet, however a clear liquor would indicate we now have excellent biological process.

…

Regards,
Don

12 Jan 2024

Email from customer:

Hi Parker/Simon,

The system has struggled to treat the restaurant and kitchen waste, low oxygen bacteria have been dosed which has helped, but the discharge is not within consent and is on the Resources Wales radar.

Prior to dosing BOC, the dosing of low oxygen bacteria was ceased, discharge COD was measured at 300mg/l. The biomass was cream in colour, with the liquor opaque.

BOC dosing commenced on the 18th December, dosing 400ml/day into the first reactor.

Unit fully loaded over the Christmas / New Year period, loading now running at 50%.

Initial results from yesterday's site visit show COD has dropped to 200mg/l. Ph neutral. … Clear liquor in BZ2 & BZ3.

Dissolved oxygen levels, BZ1 2.0mg/l, BZ2 12.0mg/l, BZ3 13.0mg/l, amazing.

Second 10ltr container of BOC started yesterday.

Attached media picture showing first biozone on the left, clearly the majority of the work being done in this reactor, dark biomass in BZ2, BZ3 has minimal biomass.

The dosing was reduced to 300ml/day last week but the process took a backward step, therefore dosing was returned to 400ml/day.

It was decided yesterday that the dose would be split, 200ml in the first reactor and 200ml into the kitchen discharge.

Official samples have been taken, awaiting results.

…

Regards,
Don

Biozone 1



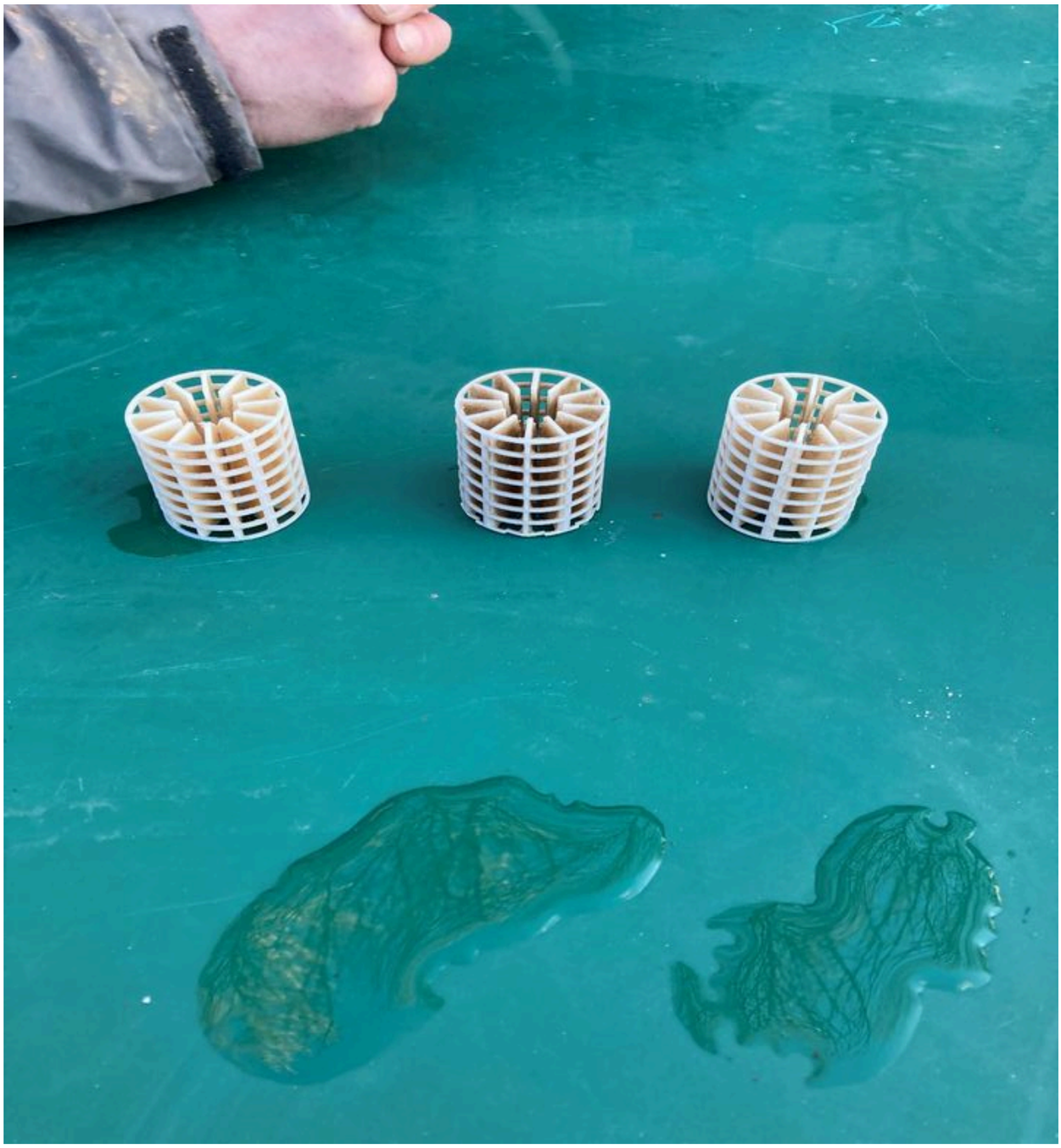
Biozone 2



Biozone 3



Media



21 Mar 2024

Email from customer:

Good morning, Parker/Simon,

The outlet discharge on the trial site is now within consent, discharge summary sheet SO attached.

The site has two treatment plants, one which is fed by the hotel (TT) and discharges into the second tank (AT) which is fed by the kitchens and venue via inline grease traps, the discharge from the second tank discharges into a bespoke final settlement tank before the sampling point (SO).
…..

Best regards,
Don.

Morning Don,
The result we have been hunting has finally arrived
Kind regards,
Ryan

Hi Ryan,
Please find attached the latest results for the outlet plant, well done.
Many thanks,
Rog.

Discharge Summary Sheet

Summary of Test Results 12001/RH/

[redacted]

Plant Sample Point Outlet

Determinand	Unit	Sample Date + Time 08.03.24 12.30pm		Discharge Limit Natural Resources Wales Permit No. [redacted]
Ammoniacal Nitrogen as N	mg/l	**6.3**		20mg/l
BOD (Biochemical Oxygen Demand)	mg/l	**9.3**		20mg/l
Total Suspended Solids	mg/l	**14**		30mg/l

Results exceeding the discharge limits are in **red bold type.**

Integral Geotechnique (Wales) Limited)

Summary Of Test Results

Date	Dosage ml / day	Dosage ppm	BOD mg/l	BOD Consent mg/l	SS mg/l	SS Consent mg/l	NH4 mg/l	NH4 Consent mg/l
18-Dec-23	400	6.0		20		30		20
22-Dec-23	400	6	86	20	29	30	4.9	20
29-Dec-23	400	6	42	20	16	30	4.2	20
5-Jan-24	400	6	31	20	19	30	0.39	20
17-Jan-24	500	7.5		20		30		20
30-Jan-24	500	7.5	55	20	50	30	2.1	20
9-Feb-24	500	7.5	36	20	22	30	0.64	20
27-Feb-24	750	11.3		20		30		20
8-Mar-24	750	11.3	9.3	20	14	30	6.3	20
15-Mar-24	750	11.3	11	20	12	30	3	20
	Change		**-87%**		**-59%**		**-39%**	