

On-site Effluent Treatment National Testing Programme (OSET NTP)

PERFORMANCE CERTIFICATE Quantum Eco System On-site Domestic Wastewater Treatment System, OSET NTP Trial 6, 2010/2011

System Tested

The **Quantum Eco System** is a submerged biological contact media treatment unit. Rated design capacity is 2,000 litres/day. Total liquid volume is 8,300 litres (primary treatment 2,250/2,000 litres; secondary treatment aeration 2,100 litres; clarification 750 litres; pump chamber 1,200 litres). Emergency storage is 1,012 litres. No tertiary treatment (such as UV disinfection) is incorporated.

Test Flow Rate

The **Quantum Eco System** was tested at 1,000 litres/day (equivalent to servicing a 3-bedroom 5 to 6 person household) over an 8 month (35 week) period November 2010 to July 2011 followed by a 1 month (4 week) high load effects test involving 5 days at 2,000 litres per day then 1,000 litres/day over the following 3 weeks.

Testing and Evaluation Procedures

A total of 38 treated effluent samples of organic matter (BOD₅) and suspended solids (TSS) at generally six day intervals during weeks 9 to 35 were tested and evaluated against the secondary effluent quality requirements of the joint Australia/NZ standard AS/NZS 1547:2000.

A total of 16 treated effluent samples of organic matter (BOD₅), total suspended solids (TSS), total nitrogen (TN), ammonia nitrogen (NH₄-N), total phosphorus (TP) and faecal coliforms (FC) at generally six day intervals during weeks 23 through 35 were benchmarked and rated on their median values. In addition, the energy used by the treatment system was assessed on the mean of consumption levels over the 16 sample days, weeks 23 to 35.

AS/NZS 1547:2000 Secondary Effluent Quality Requirements

These requirements are that 90% of all test samples must achieve a BOD₅ of $\leq 20 \text{ g/m}^3$ and TSS of $\leq 30 \text{ g/m}^3$ with no one result for BOD₅ being $>30 \text{ g/m}^3$ and no one result for TSS being $>45 \text{ g/m}^3$. The **Quantum Eco System** achieved a performance level of **95%** for BOD₅ and **100%** for TSS based on the full set of 38 test results in weeks 9 to 35, with no results exceeding the maximums. The **Quantum Eco System** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2000.

Benchmark Ratings

The **Quantum Eco System** achieved the following effluent quality ratings for the sixteen benchmarking results, weeks 23 to 35.

Indicator Parameters	Median	Std Dev.	Rating	Rating System				
				A+	A	B	C	D
BOD ₅ (g/m ³)	6.0	1.44	A	<5	<10	<20	<30	≥30
TSS (g/m ³)	4.0	1.55	A+	<5	<10	<20	<30	≥30
Total nitrogen TN (g/m ³)	25.7	3.34	C	<5	<15	<25	<30	≥30
Ammonia Nitrogen NH ₄ -N (g/m ³)	17.0	3.88	C	<1	<5	<10	<20	≥20
Total phosphorus TP (g/m ³)	3.2	0.32	B	<1	<2	<5	<7	≥7
Faecal Coliforms FC (cfu/100mL)	15,400	27,490	C	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	1.1	--	B	0	<1	<2	<5	≥5

This Performance Certificate is specific to the **Quantum Eco System** model as specified above when operated at a flow rate of 1,000 litres/day, and is valid for 5 years from the date below. For the full OSET NTP report on the performance of the **Quantum Eco System** contact Quantum Waste Water Systems Ltd of Levin, (0800) 555 750.

Authorised By:

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