

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

PERFORMANCE CERTIFICATE

Airtech 7000 On-site Domestic Wastewater Treatment System, OSET NTP Trial 5, 2009/2010

System Tested

Airtech 7000 submerged fixed growth media treatment unit. Rated design capacity 1,600 litres/day. Total liquid volume 7,300 litres (primary treatment 4,310 litres; secondary treatment aeration 1,500 litres; clarification 1,230 litres; pump chamber 260 litres). Emergency storage 1,730 litres. No tertiary treatment (such as UV disinfection) is incorporated.

Test Flow Rate

The **Airtech 7000** 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 2009 to July 2010 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 **Airtech 7000** system **achieved** a performance level of **97%** for BOD₅ and **84%** for TSS based on the full set of 38 test results in weeks 9 to 35. However, a group of five consecutive daily TSS results in week 17 include four outliers which significantly exceed the 45 g/m^3 maximum. The reason for these exceedences has been investigated by the OSET NTP Audit Group but remains unexplained. Removing these four unexplained TSS outliers from the assessment results in a performance level based on the remaining 34 results of **94%** for TSS, thus **achieving** the secondary effluent quality requirements of the Standard.

Benchmark Ratings

The **Airtech 7000** 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)	9.0	3.3	A	<5	<10	<20	<30	≥30
TSS (g/m ³)	13.5	5.7	B	<5	<10	<20	<30	≥30
Total nitrogen TN (g/m ³)	18.7	2.7	B	<5	<15	<25	<30	≥30
Ammonia Nitrogen NH ₄ -N (g/m ³)	2.7	5.3	A	<1	<5	<10	<20	≥20
Total phosphorus TP (g/m ³)	4.2	0.73	B	<1	<2	<5	<7	≥7
Faecal Coliforms FC (cfu/100mL)	71,500	50×10^3	C	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	2.66	--	C	0	<1	<2	<5	≥5

This Performance Certificate is specific to the **Airtech 7000** 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 **Airtech 7000** system contact RX Plastics Ltd of Ashburton, (03) 307 9081.

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30 September 2011

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