

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

PERFORMANCE CERTIFICATE RX Plastics Airtech 9000 On-site Domestic Wastewater Treatment System, OSET NTP Trial 9, 2013/2014

System Tested

The **RX Plastics Airtech 9000 system** is a submerged aerated filter wastewater treatment unit. The manufacturer's rated design capacity is 2,000 litres/day. Total liquid volume is 7,000 litres (primary treatment 3300 litres; aeration tank 1,500 litres; clarification: 1,200 litres; pump chamber 1000 litres). Emergency storage is 2,165 litres. No tertiary treatment (such as UV disinfection) is incorporated. It comprises 4 plastic tanks (primary, secondary, clarifier and effluent pump chamber). The manufacturer's stated service frequency is 6 monthly.

Test Flow Rate

The **RX Plastics Airtech 9000 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 2013 to July 2014 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 37 treated effluent samples of organic matter (BOD₅) and 36 treated effluent samples of 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 1547:2012.

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 tested and the results 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 benchmarking period.

AS/NZS 1547:2012 Secondary Effluent Quality Requirements

These requirements are that 90% of all test samples must achieve a BOD₅ of ≤ 20 g/m³ and TSS of ≤ 30 g/m³ with no one result for BOD₅ being >30 g/m³ and no one result for TSS being >45 g/m³. The **RX Plastics Airtech 9000 system** achieved a performance level of **100%** for BOD₅ and **100%** for TSS based on the full set of test results in weeks 9 to 35, with no results exceeding the maximums. The **RX Plastics Airtech 9000 system** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012.

Benchmark Ratings

The **RX Plastics Airtech 9000 system** achieved the following effluent quality ratings for the sixteen benchmarking results in weeks 20 to 35.

| Indicator Parameters | Median | Std Dev | Rating | Rating System | | | | |
|-----------------------------------|--------|---------|--------|---------------|------|---------|----------|----------|
| | | | | A+ | A | B | C | D |
| BOD (mg/L) | 5 | 2 | A | <5 | <10 | <20 | <30 | ≥30 |
| TSS (mg/L) | 5 | 6 | A | <5 | <10 | <20 | <30 | ≥30 |
| Total Nitrogen (mg/L) | 23.1 | 3 | B | <5 | <15 | <25 | <30 | ≥30 |
| NH ₄ - Nitrogen (mg/L) | 6.5 | 4 | B | <1 | <5 | <10 | <20 | ≥20 |
| Total phosphorus (mg/L) | 4.4 | 0.4 | B | <1 | <2 | <5 | <7 | ≥7 |
| Faecal Coliforms (cfu/100mL) | 71,000 | 119,000 | C | <10 | <200 | <10,000 | <100,000 | ≥100,000 |
| Energy (kWh/d) (mean) | 1.49 | 0.04 | B | 0 | <1 | <2 | <5 | ≥5 |

This Performance Certificate is specific to the **RX Plastics Airtech 9000** 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 9000 system** contact **RX Plastics Ltd**, Hamilton Branch office, Ph: +64 7 829 9350 .

Authorised By:

Ray Hedgland, Technical Manager, OSET NTP
20 February 2015

On-site Effluent Treatment National Testing Programme, c/- Technical Manager, 2/12 Mt Blanc Pl, Northpark,
Howick, AUCKLAND 2013 Mob: 021 626 772 E-mail: ray@hedgland.co.nz