

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

PERFORMANCE CERTIFICATE Hynds COM 1 On-site Domestic Wastewater Treatment System, OSET NTP Trial 10, 2014/2015

System Tested

The **Hynds COM 1 system** is a small grade commercial Submerged Aerated Filter Wastewater Treatment Plant that includes a submerged fixed growth filter system in the aeration tank [Exponet Bio-Blok 200 (24 blocks - 200m²/m³)]. The manufacturers rated design capacity is 5,700 litres/day, with a total operational liquid volume of 45,000 litres. The system comprises two 22,500L precast concrete tanks in series. Tank 1 is a single chamber (Flow balance and Primary 1 Chamber: 19,940 litres) and Tank 2 is configured in 5 chambers (Primary 2, 6,600 litres; Three Aeration Chambers, total 8760 litres; a fifth chamber containing a Clarifier and Rapid Sand Filter: 4,650 litres, plus Pump Chamber: 1,450 litres). Emergency storage: 4,200 litres. Tertiary treatment is incorporated via the rapid sand filter. There is a Taylex TFS 100 (1.5mm) effluent filter in the Primary 2 Chamber, a 1.5kW air blower, a recirculation pump, a sludge return pump and a sand filter backwash pump. The manufacturers stated service frequency is 6 monthly.

Test Flow Rate

The **Hynds COM 1 system** was tested at 3,000 litres/day of domestic wastewater (equivalent to servicing three 3-bedroom 5 to 6 person household) over an 8 month (35 week) period November 2014 to July 2015 followed by a 1 month (4 week) high load effects test involving 5 days at 6,000 litres per day then 3000 litres/day over the following 2 weeks.

Testing and Evaluation Procedures

A total of 37 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 1547:2012.

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 16 sample days.

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. Based on the full set of 37 test results in weeks 9 to 35 the **Hynds COM 1 system achieved** a performance level of **100%** for BOD₅ and **100%** for TSS based on the full set of 37 test results in weeks 9 to 35, with no results exceeding the maximums. The **Hynds COM 1 system** thus **meets** the secondary effluent quality requirements of AS/NZS 1547:2012 at the test flow rate of 3,000 L/day (ie at 53% of the plants advised design capacity).

Benchmark Ratings

The **Hynds COM 1 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)	2	0	A+	<5	<10	<20	<30	≥30
TSS (mg/L)	2	1	A+	<5	<10	<20	<30	≥30
Total Nitrogen (mg/L)	12.9	3	A	<5	<15	<25	<30	≥30
NH ₄ - Nitrogen (mg/L)	0.1	0	A+	<1	<5	<10	<20	≥20
Total phosphorus (mg/L)	4.3	1	B	<1	<2	<5	<7	≥7
Faecal Coliforms (cfu/100mL)	2000	1,300	B	<10	<200	<10,000	<100,000	≥100,000
Energy (kWh/d) (mean)	25.7 (8.6) ¹	0.5	D	0	<1	<2	<5	≥5

1: The mean power use was 25.7 kWh/day, but the above rating system is based upon plants tested at 1000L/day whereas this plant was tested at 3000 L/day (equivalent to three 5 bedroom houses). Hence the power use has been divided by 3 to get an equivalent household power demand for rating purposes.

This Performance Certificate is specific to the **Hynds COM 1** model as specified above when operated at a flow rate of 3,000 litres/day (53% of advised plants design capacity), and is valid for 5 years from the date below. For the full OSET NTP report on the performance of the **Hynds COM 1 system** contact **Hynds Environmental**, Auckland, P: 09 271 9540, or E: Rod.Murray@hyndsenv.co.nz.

Authorised By:



Ray Hedgland, Technical Manager, OSET NTP
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