

STANDARD 350 (2020) REQUIREMENTS ONSITE RESIDENTIAL AND COMMERCIAL WATER REUSE TREATMENT SYSTEMS

The performance of the system shall be evaluated for a minimum of 26 weeks. During the testing and evaluation period, the system shall be subjected to 16 weeks of design loading, followed by 7.5 weeks (52 days) of stress loading, and an additional period of design loading to obtain a minimum of 55 influent and effluent data sets collected during non-stress dosing period.

The system shall be dosed 7 days per week with a wastewater volume equivalent to the daily hydraulic capacity of the system. The following schedule shall be adhered to for dosing:

Design Loading	
Time Frame	Percent Rated Daily Hydraulic Capacity
6 - 9 AM	35
11 AM - 2 PM	25
5 - 8 PM	40

Stress loading

Stress loading is designed to evaluate a system's performance under four non ideal conditions. Systems shall be subjected to each stress condition once during the 6 months (26 weeks [182 days]) testing and evaluation period, and each of the four stress conditions shall be separated by 1 week (7 days) of design loading (see Section 8.2.2.2.1).

Wash-day stress

The wash-day stress shall consist of three wash-days in a 5-day period. Each wash-day shall be separated by a 24-hour period. During a wash-day, the system shall be loaded at times and capacities similar to those delivered during design loading (see Section 8.2.2.2.1), however during the first two dosing periods per day, the design loading shall include three wash loads (three wash cycles and six rinse cycles).

Working-parent stress

For five consecutive days, the system shall be subjected to a working-parent stress. During this stress, the system shall be dosed with 40% of its daily hydraulic capacity between 6:00 a.m. and 9:00 a.m. Between 5:00 p.m. and 8:00 p.m., the system shall be dosed with the remaining 60% of its daily hydraulic capacity, which shall include one wash load (one wash cycle and two rinse cycles).

Power/equipment failure stress

On the day the power / equipment failure stress is initiated power to the system shall be turned off at 9:00 p.m. After the last dosing period of the day, dosing shall be discontinued for 48 hours. After 48 hours, power shall be restored and the system shall be dosed over a 3-h period with 60% of its daily hydraulic capacity, which shall include one wash load (one wash cycle and two rinse cycles).

Vacation stress

On the day that the vacation stress is initiated, the system shall be dosed at 35% of its daily hydraulic capacity between 6:00 a.m. and 9:00 a.m. and at 25% between 11 :00 a.m. and 2:00 p.m. Dosing shall then be discontinued for eight consecutive days, beginning the day after initiating the stress (power shall continue to be supplied to the system). Between 5:00 p.m. and 8:00 p.m. on Day 9, the system shall be dosed with 60% of its daily hydraulic capacity, which shall include three wash loads (three wash cycles and six rinse cycles).

Sample Collection

Influent residential wastewater samples shall be collected three times per week, except for the following (which shall be collected one time per week): total phosphorous, COD, and total coliforms. Effluent samples shall be collected three times per week during design loading periods and three times during each stress recovery period. Influent samples shall be collected on the same day as effluent samples during each stress recovery period. Effluent samples shall be collected two times per week during all stress events, except power/ equipment failure stress and vacation stress where no samples shall be collected. Color, odor, oily film and foam on the effluent once every 2 months (8 weeks [56 days]) for a total of three samples over the course of the test.

All sample collection methods shall be in accordance with Standard Methods unless otherwise specified. Influent and effluent wastewater samples shall be collected in accordance with the table below. Influent samples shall be obtained during periods of system dosing, and effluent samples shall be obtained during periods of system discharge. Effluent samples shall be representative of all treated effluent discharged from the system, as sampled from a central point of collection of all treated effluent. 24-hour composite samples shall be flow-proportional. The location of the grab sample shall be appropriate to provide a sample that is representative of the influent or effluent. Grab samples shall be collected during the morning dosing period for gravity flow systems and during a time of discharge for systems that are pump discharged.

Parameter	Sample type	Sample location		Frequency/week		Total Samples	
		Raw influent	Treated effluent	Raw influent	Treated effluent	Raw influent	Treated effluent
BOD ₅	24-hour composite	X	–	3		78	
CBOD ₅	24-hour composite	–	X		3		70
total suspended solids	24-hour composite	X	X	3	3	78	70
pH	Grab	X	X	3	3	78	70
temperature (°C)	Grab	X	–	3		78	
<i>E. coli</i>	Grab	X	X	3	3	78	70
turbidity	24-hour composite	X	X	3	3	78	70
disinfectant ¹	Grab or 24-hour composite	–	X		3		70
TKN	24-hour composite	X	–	3		78	
NO ₂ /NO ₃	24-hour composite	X	–	3		78	
total phosphorous	24-hour composite	X	–	1		26	
COD	24-hour composite	X	–	1		26	
total coliforms	Grab	X	–	1		26	
alkalinity	Grab or 24-hour composite	X	–	1		26	
hardness	Grab or 24-hour composite	X	–	1		26	

If the treatment system introduces a disinfectant, the disinfectant shall be measured in the effluent sample. The sample type shall be 24-hour composite except when the disinfectant is not stable for 24 hours, in which case grab samples shall be collected. Influent residential wastewater samples shall be collected three times per week, except for the following (which shall be collected one time per week): total phosphorous; COD; total coliforms.

NOTE - Manufacturers may request additional sampling during testing dependent on end use of the effluent.

Effluent samples shall be collected three times per week during design loading periods and three times during each stress recovery periods.

Influent samples shall be collected on the same day as effluent samples during each stress recovery period.

Effluent samples shall be collected two times per week during all stress events, except power/equipment failure stress and vacation stress when no samples shall be collected.

Color, odor, oily film and foam on the effluent once every 2 months for a total of three samples over the course of the test.

Measure	Criteria	
	Test Average	Single Sample Maximum
CBOD ₅ , mg/L	10	25
TSS, mg/L	10	30
turbidity, NTU	5	10
<i>E. coli</i> ² , MPN/100 mL	14	240
pH, SU	6.0 - 9.0	NA ¹
Storage Vessel disinfectant ³ , mg/L	≥ 0.5 to ≤ 2.5	NA
color	MR ⁴	NA
odor	Nonoffensive	NA
oily film and foam	Nondetectable	Nondetectable
energy consumption	MR	NA

¹NA: Not Applicable

²Calculated as geometric mean

³If Chlorine disinfection is used with a storage vessel, systems containing storage of treated restricted reuse water shall provide adequate disinfection. In the case of chlorine, the average total residual chlorine concentration of all effluent samples shall be ≥ 0.5 mg/L and ≤ 2.5 mg/L. Other disinfection procedures shall provide adequate disinfection to prevent microorganism growth in the treated reuse water storage while avoiding degradation of plumbing components and fixtures exposed to the treated reuse water.

⁴MR: Measured and reported only.