

Onsite Wastewater Aerobic Treatment Units Ratings for 2009

To rate each of the available onsite sewage wastewater aerobic treatment units (ATU) certain items or features will be assessed and others will not be considered.

Not Considered

Product market price will not be considered, as the price is not a suitable indicator of reliability but a reflection of market conditions. Price is also variable from market place to market place.

System pump-out frequency is also not considered as there is a reliance on the user of the systems to maintain a certain behaviour or operational habit.

Considered Items & Rating Schedule

The rating score is designed that the higher the value the better the system for those items considered.

Systems that use as part of that system's operation or function a septic tank or pre-tank, the prescribed tank and any parts placed into are considered as a component to the treatment system.

1. Type of Treatment Technology

Suspended Growth technologies are susceptible to surge loadings and over-aeration, whereas, the Attached Growth technologies were developed partially to overcome the suspended growth problems. Hybrid systems are systems that have technological advantages of suspended and attached to create a system that maximizes the benefits of both into one unit.

Rating for Suspended Growth is a value of one (1).

Rating for Attached Growth is a value of two (2).

Rating for a Hybrid Technology is a value of three (3).

2. Listed with a Recognized Independent Performance Agency

Systems that are certified under NSF International Standard 40 Class 1 or the equivalent Bureau d' Normalization du Quebec (BNQ) are given a rate value of 1. Systems that are not NSF International or BNQ listed as meeting are given a rate value of zero (0).

Systems that are listed by NSF International as meeting Standard 245 for nitrogen reduction or the equivalent BNQ standard are assigned an additional value of one (1).

3. Treatment Level - Tertiary

Systems that meet the BNQ testing standard for BOD5 and TSS of 10 mg/l each are assigned a value of one (1).

4. Diffusion & Air Contact Method

Suspended Growth systems use either a coarse or a fine diffusion method. Coarse is viewed as being the better as it is not susceptible to clogging. Fine diffusion slowly reduces efficiency over time as the diffuser slowly clogs.

Rating for Fine Diffusions is a value of one (1).
Rating for Coarse Diffusion is a value of two (2).

Attached Growth systems typically introduce air to make contact with the sewage either passively (atmosphere air makes contact) or actively (using an air blower, pump or mixer)

Rating for active air contact is one (1)
Rating for passive air contact is two (2)

5. Media – Attached Growth

Attached Growth technologies use a wide variety of materials to have the micro-organisms attached to the provide the treatment. Media on the market today consists of corrugated plastic sheets, plastic shavings, fabric, foam, sand, gravel, peat, glass, and plastic bottles.

These materials are rated for their ability to self-clean (sloughing off) and whether they need either replenishing or replacement.

Rating for media that does not need replenishing, replacement or cleaning a value of 2 is given.

Rating for media that needs replenishing only is a value of one (1) is given

Rating for media that is to be disposed of by composting or in a sanitary landfill a value of zero (0) is given.

6. Years of Service

The years of in-service-use is an indicator of the systems reliability and the technical abilities of the primary technology owner/manufacturer to support the product in the field. The years of service in North America is based on the date of start-up of the primary technology owner/manufacturer.

<u>Years in Service</u>	<u>Rate Value</u>	<u>Years in Service</u>	<u>Rate Value</u>
0 – 5	1	16 – 20	4
6 – 10	2	21 – 30	5
11 – 15	3	31 – 40	6
16 – 20	4	+ 41	7

7. Number of Serviceable Parts

System components or parts that need to be serviced or maintained are counted. Inspection points are counted. Any part that requires service and is also an inspection point is counted once only. The rating value granted is:

<u>No. of Parts/Points</u>	<u>Rating Value</u>	<u>No. of Parts/Points</u>	<u>Rate Value</u>
1	6	4	3
2	5	5	2
3	4	6	1

8. Location of Serviceable Parts

If the component part is located with the wastewater or is sometimes exposed to or in the wastewater prior to discharge from the system, this means that the service provider is directly interface and make contact with sewage wastewater during the performance of inspection of the mechanical / operational parts of the system. Sludge testing or sampling is not counted or rated.

<u>Parts in Wastewater</u>	<u>Rating Value</u>
0	7
1	6
2	5
3	4
4	3
5	2
+6	1

9. Pre-Discharge Filter

Systems that have, just prior to discharge, a filter of any type are matched against systems that do not have a filter.

Rating for Systems that have a pre-discharge filter are given a value of one (1).
Rating for Systems that do not have a pre-discharge filter are given a value of two (2).

10. Power Consumption Demands

We have 3 categories that the treatment systems are arranged into.

Category 1 is for systems that do not have any electrical power demands.

Category 2 is for systems that have intermittent electrical power demands.

Category 3 is for systems that have a constant electrical power demand.

Ratings for each category are:

Category 1 = 4

Category 2 = 3

Category 3 = 2 for systems that have a wattage of 1 = 75

1 for systems that have a wattage of 76 – 150

We have selected to use treatment systems that are most commonly used in Canada for 4 bedroom homes (i.e. 450 imp gallons per day).

Suspended Growth Based Treatment Systems							
	Maximum						
	Available	White	Clear	Nay		Nor	Bio
	Rate	water	Stream	adic	JetBat	weco	Cycle
Type	1	1	1	1	1	1	1
Listed	1	1	1	1	1	1	0
Nitrogen	1	0	0	0	0	0	0
Treatment	1	0	0	0	0	0	0
Air	2	2	1	2	2	2	1
Years	7	6	6	6	5	5	3
No. Parts	6	6	1	5	4	5	3
Location	7	7	2	6	4	5	3
Filter	2	2	1	2	1	1	1
Power	4	2	2	2	1	1	2
TOTAL	32	27	15	25	19	21	14
	100%	84%	47%	78%	59%	66%	44%

Attached Growth Based Treatment Systems									
	Maximum								
	Available	Water	Eco	Ad		Bio	Enviro	Chrom	Bio
	Rate	loo	Flo	Vantex	FAST	Nest	Septic	aglas	Green
Type	3	2	2	2	3	2	3	3	2
Listed	1	1	1	1	1	1	1	0	0
Nitrogen	1	0	0	1	1	0	0	0	0
Treatment	1	1	1	1	1	1	1	0	0
Air	2	2	2	1	1	1	2	1	1
Media	2	0	0	1	2	2	2	1	2
Years	7	3	3	3	7	2	4	6	3
No. Parts	6	2	6	1	6	3	6	3	4
Location	7	2	5	1	7	4	7	3	4
Filter	2	2	2	2	2	2	2	1	2
Power	4	3	4	3	3	1	4	2	2
TOTAL	36	15	22	14	31	18	28	18	18
%	100%	42%	61%	39%	86%	50%	78%	50%	50%

Summary

For the suspended growth technologies it would appear that the coarse bubble based systems have lower costs of operation and maintenance resulting in a higher rating.

For attached growth technologies it would appear that the systems that have a lower number and location of the serviceable parts results in a higher rating.

To compare the suspended versus the attached growth technologies, it appears that the key factors for the highest ratings relate to the systems that offer a design that provide lower operation and maintenance costs.

END of REPORT