

FIGURE 1
Standard Ontario 'box-type' 4500 L septic tank with 150 mm partition orifices close to the outlet. Turbulent plumes (in orange) short-circuit untreated sewage to outlet pipe (Lay et al., 2005).



FIGURE 2
Closed-conduit tank limits turbulence (in orange) to the inlet area, and only 'old,' treated sewage exits the tank, depicted as laminar-flow parabolic discs A to B (Lay et al., 2005).

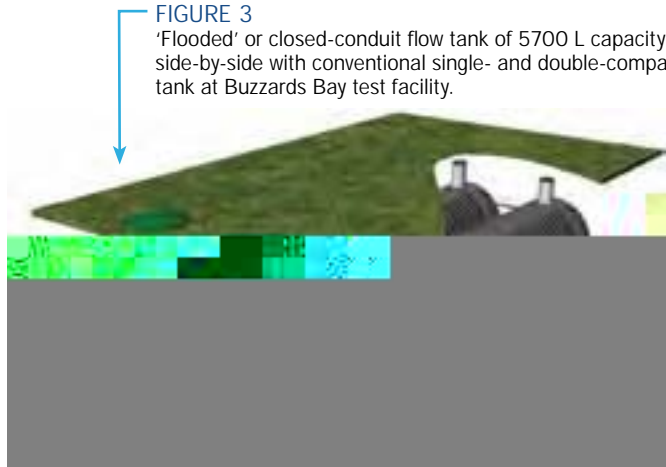


FIGURE 3
'Flooded' or closed-conduit flow tank of 5700 L capacity tested side-by-side with conventional single- and double-compartment tank at Buzzards Bay test facility.

Waterloo Biofilter

For his Doctorate degree at University of Toronto and as a NATO Science Fellow at Michigan and Cornell, Craig Jowett specialized in physical properties of rocks and fluid flow within sedimentary basins, to determine timing of flow and

met at an awards dinner (she was the award winner), and together they developed a simple, free-draining trickle filter suitable for peoples' back yards – for treatment before disposal. Beneficial microbes set up housekeeping on solid surfaces to treat sewage, but this

researchers and manufacturers from around the world to Ontario to develop a new industry of on-site treatment before disposal. Waterloo Biofilter Systems was incorporated in 1995 to manufacture and market the patncos incorporated in



do alkalinity and solubilization parameters. The performance parameters of cBOD, TSS, COD generally decrease as expected between inlet and outlet as the sewage is being treated.

Study 2: lower hydraulic loading rate

Study 2 was carried out for 12 months, with flows of 2500 L/d, increasing to 2850 L/d for the last two months. Tank A3 removed 35% cBOD and 81% TSS, and the F3 single compartment tank

removed 13% cBOD and 76% TSS (Table 3).

The F3 anomaly in cBOD values for days 170–230 (Figure 4) is not explained by sewage values, and does not appear in COD or TSS values.

Conclusions

Removing the airspace to induce closed-conduit flow in a long, narrow, shallow septic tank results in substantially less scum and sludge formation and higher quality effluent compared to a con-

ventional box-like tank with airspace. Introducing new technology into the environmental arena should be encouraged, to reduce pollution and improve health and safety. Standards organizations and regulators need to review existing prescribed designs, which may limit the treatment capabilities of the important septic tank, and to introduce performance standards and benchmarks suitable for Ontario's climate.

References

Bailey, W.A., Junnila, W.A., Aho, W.A. and Wheeler, W.C., 1957. A Heated Septic Tank for Disposal of Dead Poultry. Storrs Agricultural Experi-