



Onsite

NEWSLETTER

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The Impact of Low-Flow Plumbing Fixtures on Residential Wastewater Strength: A Literature Review

By: Marie-Christine Bélanger, Product Director, Premier Tech Water and Environment Ltd.



Abstract

The widespread adoption of low-flow plumbing fixtures has significantly reduced per capita indoor water use in homes. While good for freshwater conservation, this trend affects wastewater quality and concentration, especially for homes with onsite wastewater treatment systems (OWTS). This article reviews key scientific findings, focusing on the WERF 2009 study and its regulatory impact on unsewered homes.

Introduction

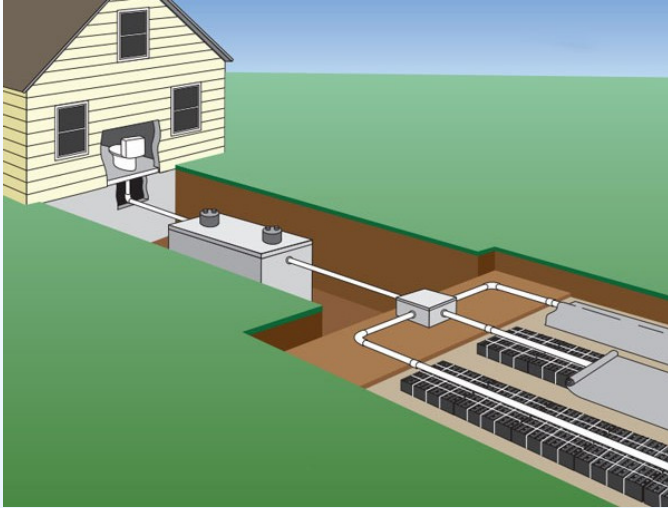
Water conservation has shaped plumbing fixture design since the early 1990s. The U.S. Energy Policy Act of 1992 (EPACT) set a 6 L/flush maximum, replacing the then-common 12-18 L/flush fixtures. The market now offers high-efficiency toilets (HET) at 4.8 L/flush or less, and dual-flush models as low as ~3 L/flush. Similar trends in other appliances and fixtures have reduced residential water use by 30–50% over the past generation (Siegrist, 2014).

Onsite wastewater designers and regulators face a key question: if less water carries the same waste, how does wastewater strength change? Without centralized dilution from commercial, industrial wastewater, or water infiltration within the collection network, this carries significant design and health implications.

Continued on page 4

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President's Message

As another Ontario summer moves quickly by, I find myself reflecting on the people who make our industry what it is. Every day, across cities, towns, rural communities, cottages, and remote locations, OOWA members are doing important work. It may not always be visible, but it protects our environment, safeguards public health, and supports the communities where we live and work.

When most people think about essential infrastructure, they think about roads, bridges, and buildings. Few people think about the professionals who design, install, inspect, maintain, and manufacture the systems that safely manage wastewater. Yet we know just how important that work is. Through your efforts, you help protect one of Ontario's most valuable resources: clean water.

This has been another busy year for OOWA. Since our convention in Niagara Falls this spring, our Board, committees, volunteers, and staff have continued moving forward on the priorities identified in our Strategic Plan. We have been working to strengthen member services, expand educational opportunities, improve communication resources, and represent the interests of our industry with government and industry partners.

One of the things I appreciate most about OOWA is the willingness of members to help one another. Whether it is answering a technical question, sharing experiences, mentoring someone new to the industry, volunteering on a committee, or supporting an OOWA event, our members are always willing to step up. That spirit of cooperation is one of the reasons our association continues to grow and succeed.

As we head into the fall, there will be plenty of opportunities to get involved. Attend a course, participate in an event, support Septic Awareness Week activities, or consider volunteering with OOWA. Fresh ideas and new perspectives help keep our association moving forward.



Our industry continues to evolve. New technologies are emerging, communities continue to grow, and expectations around environmental protection remain high. While there will always be challenges, I am confident that our members are well positioned to meet them. The experience, knowledge, and professionalism that exists throughout this association is something we should all be proud of.

I would also like to thank our volunteers, committee members, Board of Directors, and staff for everything they do throughout the year. Much of their work happens behind the scenes, but it plays an important role in ensuring OOWA continues to provide value to its members and remains a trusted voice for the onsite wastewater industry in Ontario.

Thank you for your continued support of OOWA and for the work you do every day. Enjoy the rest of your summer, stay safe, and I look forward to seeing many of you in the months ahead.

A handwritten signature in dark ink, consisting of stylized, overlapping loops and a final flourish.

Bill Goodale, President

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The Impact of Low-Flow Plumbing Fixtures on Residential Wastewater Strength: A Literature Review

Continued from Front Cover

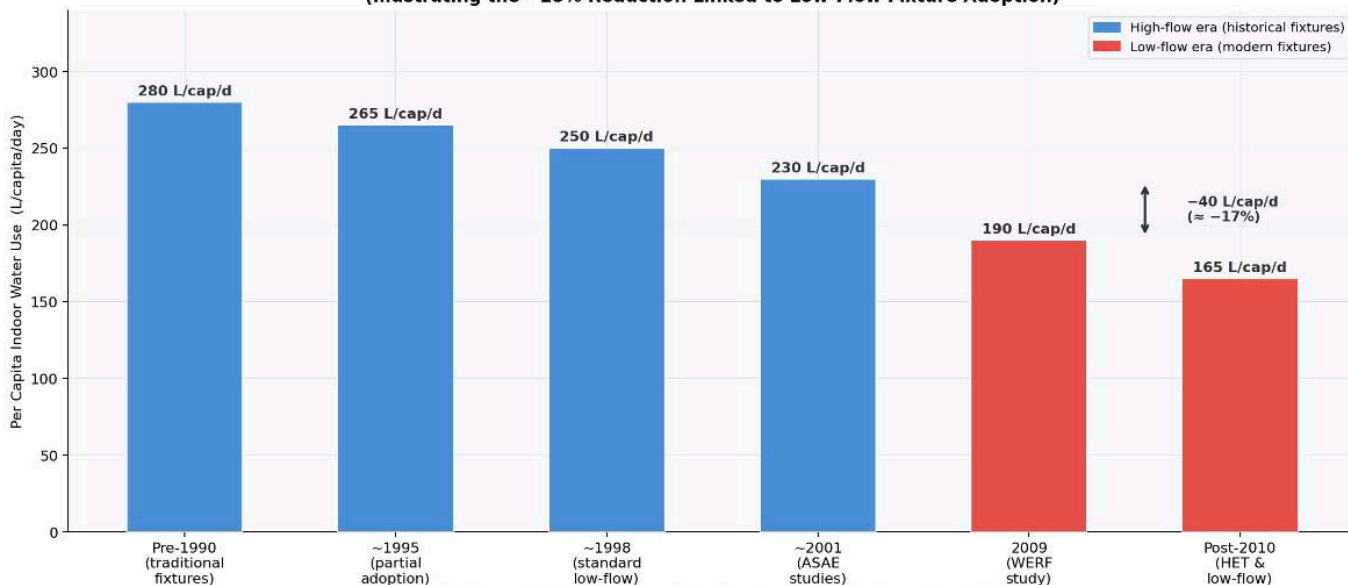


What the Evidence Shows: WERF 2009 and the Historical Literature

The most comprehensive study on this question remains the WERF report by Lowe et al. (2009) "Influent Constituent Characteristics of the Modern Waste Stream from Single Sources" (WERF 04-DEC-01, Colorado School of Mines). Based on field monitoring at 17 residential sites across Colorado, Florida, and Minnesota over four seasons, it documented a clear shift in wastewater composition.

Hydraulic findings showed that median per capita indoor water use dropped by about 25%, from ~280 to ~190 L/cap-d, reflecting the adoption of low-flow fixtures. However, Table 1 indicates not all parameters changed similarly. Counterintuitively, septic tank effluent (STE) quality does not decline for cBOD_5 , TSS, and TP. Indeed, system components designed for higher flow rates are now oversized, leading to longer retention times and improved performance. Additionally, measures like effluent filters and detergent phosphate bans (cutting per capita TP loads by 40–50% since the 1970s) have further stabilized concentrations within historical ranges.

Figure 1. Residential Per Capita Indoor Water Use Over Time
(Illustrating the ~25% Reduction Linked to Low-Flow Fixture Adoption)



Sources: Metcalf & Eddy (1991); Crites & Tchobanoglous (1998); ASAE symposia proceedings (2001); Lowe et al., WERF 04-DEC-01 (2009). Post-2010 value represents an estimated continuation of the trend.

Table 1. STE parameter trends — historical literature (1981–2002) vs. WERF 2009.

Parameter	Historical avg.	WERF 2009	Direction	Primary driver(s)
cBOD ₅ (mg/L)	~183	~170	↓ slightly	Effluent filters + increased HRT offset concentration effect
TSS (mg/L)	~90	~75	↓ slightly	Same as above
Total N (mg-N/L)	~51	~70	↑ significantly	Higher dietary protein + concentration effect
Total P (mg-P/L)	~10	~10	→ stable	Detergent P-bans offsetting concentration effect
Fecal coliforms (log ₁₀)	~6.5	~6.0	→ stable*	No offsetting technology; +0.27 log ₁₀ theoretical
E. coli (log ₁₀)	~6.0	~6.0	→ stable*	Same as above

* *Theoretical concentration effect of +0.27 log₁₀ applies in the absence of offsetting technology.*

Historical avg = unweighted mean-of-means from Connecticut DEP literature review (Jacobson, 2002).

Modern = medians from WERF 04-DEC-01 (Lowe et al., 2009).

Total nitrogen is the exception. The WERF 2009 median (~70 mg-N/L) exceeds the historical average (~51 mg-N/L), mainly due to higher dietary protein intake, with urinary N comprising ~80–90% of wastewater N (Rose et al., 2015; Magee et al., 2004). There has also been a shift in household cleaning products containing nitrogen compounds, like surfactant metabolites, quaternary ammonium compounds, and EDTA/NTA chelating agents. Lowe et al. (2009) detected EDTA and NTA levels in raw wastewater and STE across sites. No compensating improvements offset this trend.

Fecal indicators show no clear trend over time, with concentrations in raw wastewater and STE from 10⁵ to 10⁸ CFU/100 mL and medians near 10⁶ CFU/100 mL, similar to earlier studies (EPA, 2002; Jantrania et al., 1998; Christopherson et al., 2001). No technology offsets this. Septic tanks remove less than 1 log regardless of flow. The theoretical concentration effect remains: the same fecal coliform mass load, in about 25% less water, causes roughly +0.27 log₁₀ or a 1.9 times increase in concentration.



The Concentration Effect — and Why “Mass Balance” Is Not Enough

The governing relationship is simple:

$$C = \frac{M}{Q}$$

Where C = concentration (mg/L), M = daily mass load per capita (g/cap-d), and Q = daily water usage per capita (L/cap-d). If M stays constant and Q decreases, C increases proportionally.

Some argue this is a “wash” since reduced hydraulic load and increased concentration cancel out, leaving mass loads unchanged and the existing design assumptions valid. For cBOD₅, TSS, and TP, this argument has merit, but it fails in three key aspects.

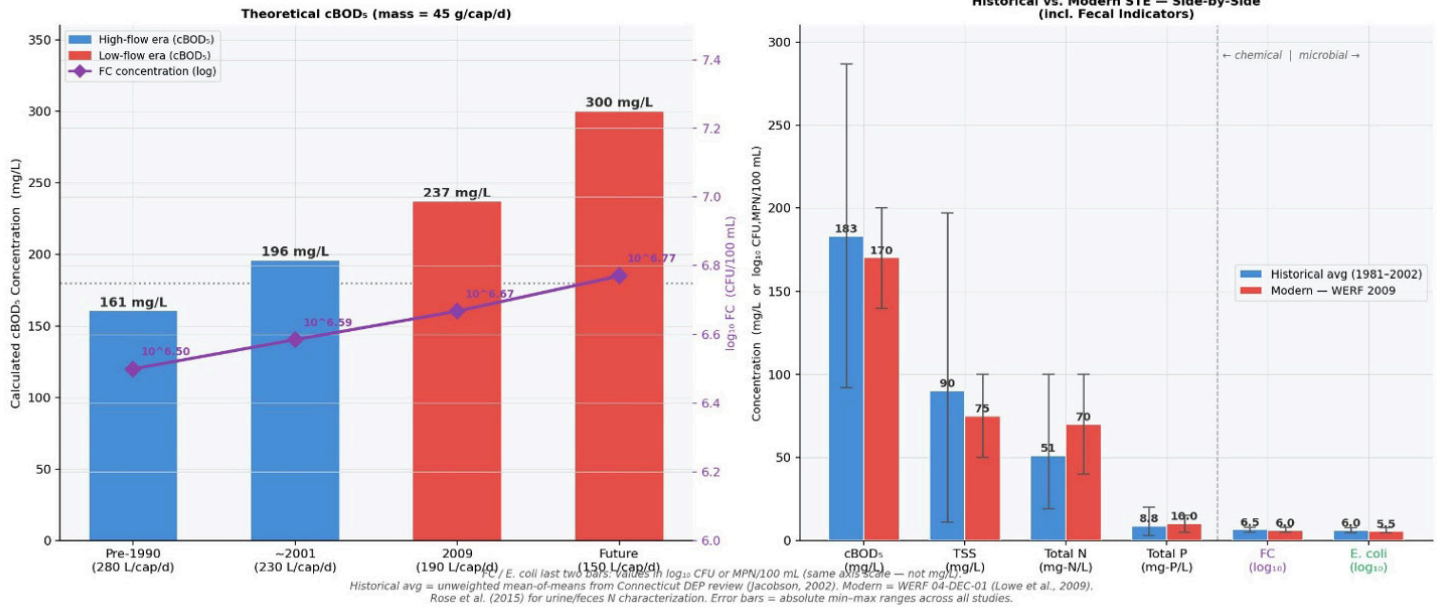
Total nitrogen: both M and C have genuinely increased. The mass balance does not hold.

Biomat dynamics: soil clogging at the infiltrative surface is governed by both concentration and hydraulic loading independently — not by mass load alone (Siegrist & Boyle, 1987; Van Cuyk et al., 2001). A concentrated effluent at low hydraulic rate does not behave the same as a dilute effluent at high rate, even at equal mass loads.

Pathogens: the concentration effect applies without any compensating mechanism, increasing breakthrough risk particularly in coarse-soil, shallow water-table configurations.

While the concern that “everything is simply stronger” overstates the case, the assertion that existing design bases remain fully adequate is equally an oversimplification that the evidence does not support.

**Figure 2. The Concentration Effect: Same Daily Mass Load, Reduced Water Volume
(Chemical Constituents and Fecal Indicator Organisms)**



Regulatory Implications

Literature highlights a disconnect: plumbing codes require lower water use, but onsite wastewater codes still rely on pre-EPACT assumptions. This causes hydraulically oversized systems to handle nitrogen-rich, pathogen-laden effluent that septic systems may not necessarily be designed for. Section 3 shows that systems designed for higher-flow and lower-concentration effluent might underperform or fail under modern low-flow conditions—not because mass loads change, but because concentration and hydraulic loading independently affect biomat dynamics. This stresses the need to consider flow and concentration in design and supports regulatory modernization. Two additional concerns exist: 1) total nitrogen loading to soils and groundwater has increased in concentration and mass, 2) concentrations of fecal indicators and pathogens increase pathogen burden per liter to the soil surface without any compensation in conventional septic systems.

Colorado's Regulation 43 (2013) is the most cited model, linking effluent quality to permitted hydraulic loading and requiring larger or carefully managed infiltration areas for stronger effluents, consistent with Siegrist's design framework.

Alberta's 2021 Private Sewage Systems Standard of Practice goes furthest among Canadian provinces, stating explicitly: "Where the development includes low-flow or water conservation fixtures... the system shall be designed to treat the increased wastewater strength that will result" (Article 2.2.1.6). It further prohibits reducing design flows for low-flow fixtures "unless adequate consideration of the increased wastewater strength is made" (Article 2.2.2.4).

Québec's RETOURI (Q-2, r.22) is prescriptive but performance-based for certified systems: higher-performing systems get smaller polishing fields, and certification flow rates are lowered for modern water use — making it among the more progressive Canadian frameworks.

Ontario's Building Code Part 8 sets design flows based on square footage, fixture units, and bedroom count, resulting in some of the highest residential flows in Canada, often 50–100% above modern low-flow standards. This hydraulic overdesign provides a safety margin, sizing systems for flows above actual use to account for biomat growth, seasonal peaks, and occupancy changes. While practical for recreational properties with variable occupancy, it raises concerns in the low-flow era. Overdesign doesn't address nitrogen-loading, governed by load per infiltrative area, nor does it reduce pathogen concentration. Low-flow systems may apply more concentrated effluent, potentially accelerating biomat growth despite generous sizing.

Climate change will further intensify the concentration effect, reinforcing the urgency of regulatory modernization.

“Systems designed for higher-flow and lower-concentration effluent might underperform.”



Conclusions

The evidence converges on several actionable conclusions:



Not all parameters are equally affected. cBOD_5 , TSS, and TP have stabilized through improvements. Total nitrogen truly increased in concentration and mass load. Fecal indicators face an unmitigated concentration effect.



Concentration and hydraulic loading are independent design variables, not surrogates for mass load. The 'mass balance' argument fails for nitrogen, pathogens, and biomat dynamics.



The WERF 2009 study remains the essential design reference. Its ~190 L/cap-d water use should replace outdated defaults in codes and manuals.



The regulatory gap is real and warrants updates — adjusting sizing parameter to account for peak oxygen demand driven by elevated nitrogen concentrations of low-flow households.



Climate change will worsen these trends, stressing the need to modernize design codes for systems built today to last decades.

Selected References

Lowe et al. (2009). WERF Report 04-DEC-01. | Siegrist & Boyle (1987). *J. Env. Eng.* | Van Cuyk et al. (2001). *Water Research*. | Rose et al. (2015). *Crit. Rev. Env. Sci. Tech.* | Magee et al. (2004). *Am. J. Clin. Nutr.* | EPA (2002). *Onsite WW Treatment Systems Manual*. | Alberta SCC (2021). *Private Sewage Systems Standard of Practice, 4th Ed.* | Colorado DPHE (2013). *Regulation 43*. | Siegrist (2014). *SSSA Conference Proc.* | Amador et al. (2014). *SSSA Conference Proc.*



ABOUT THE AUTHOR

Marie-Christine Bélanger is Product Director at Premier Tech Water and Environment. With a degree in Physics Engineering (Laval University) and a Master's in Chemical Engineering (Polytechnique Montréal), she brings 25 years of experience in the onsite wastewater industry. Since 2002, she has helped shape North American standards and regulations through committees such as CSA, BNQ, and NSF, working closely with provincial and state bodies. She served 11 years on OOWA's Board of Directors and is still serving on the Technical Onsite and External Relations Committees.

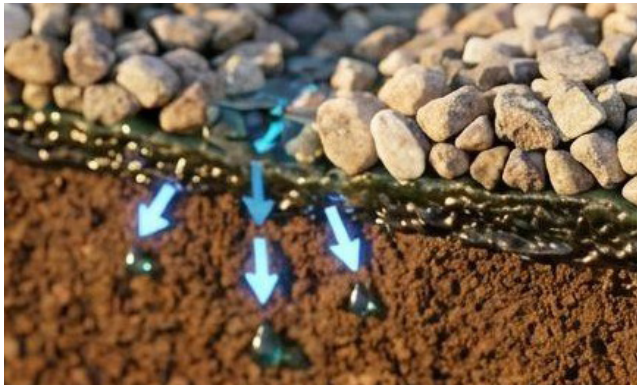


The Biomat: An Essential in Septic Systems

By Dominic Mercier, P. Eng. M. A.Sc., Enviro-STEP Technologies

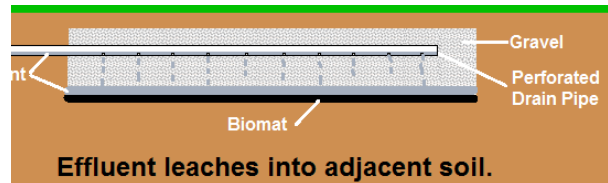
Many people view Biomat as undesirable, but it is essential for treatment in septic systems.

Biomat is a biological layer of microorganisms that naturally develops when effluent comes into direct contact with soil or other types of media. Biomat contains the complex microorganisms responsible for breaking down BOD, transforming nitrogen, and removing pathogens. Simply put, without Biomat, treatment does not occur.



Biomat is not limited to soil-based systems; it develops in all types of treatment systems, including biofilters, trickling filters, and biological reactors. It may be called biofilm or biomass, but it serves the same essential function in treatment. In soil-based systems, Biomat permeability controls how quickly effluent enters the soil, helping maintain the desired unsaturated conditions.

Over the life of a septic system, Biomat constantly changes. In a perfectly controlled environment, Biomat would begin developing as soon as effluent is received and eventually reach equilibrium, where the number of new cells formed equals the number of dead cells consumed. In reality, this equilibrium rarely occurs as numerous factors influence Biomat growth, including wastewater composition, such as oil, fat, grease, and chemicals; the area available for Biomat development; and the presence of sufficient oxygen. In most systems, Biomat grows faster than it decays, increasing its thickness and progressively reducing permeability. This restricts effluent from entering the soil, a process known as progressive failure.



One paradox in our industry is the perceived benefit of always designing the smallest system possible. Larger systems provide more surface area for Biomat to form, allowing a thinner Biomat to develop that remains permeable longer and operates closer to equilibrium. This results in slower clogging and a longer system lifespan, which we refer to as better "Biomat management." The same principle applies to other treatment systems. In biofilters, biofilm can grow thicker, slough off, and accumulate in the filter. In bioreactors, excess biomass can accumulate, generating more sludge and leading to additional sludge pumpouts, media cleaning, or, in extreme cases, complete replacement.

In summary, Biomat, also known as biofilm or biomass, is a necessary evil: it is essential for treatment, but it also contributes to soil-based system failure and increases maintenance and operating costs in biofilters and bioreactor systems.

In septic systems, as in life, nothing is lost, nothing is created, and everything is transformed. If septic systems transform pollution into byproducts every day for years, some of those byproducts will inevitably accumulate and require management. This is the burden of all wastewater treatment systems, whether septic systems or municipal plants.

Designers and installers play a critical role in providing the best conditions for ideal "Biomat management," which directly leads to increased performance and extended lifespan. Best practices suggest avoiding the design of systems that are too small, selecting systems that provide greater surface area for Biomat development, ensuring effluent is distributed evenly over the contact area to avoid overloading, and accounting for wastewater strength. Applying these simple guidelines will ensure the Biomat functions at peak capacity, efficiency, and reliability.



ABOUT THE AUTHOR

Dominic Mercier is the President and CEO of Enviro-STEP Technologies. Mr. Mercier believes that on-site sanitation technologies should be simple, efficient, offered at a fair price and supported by cutting-edge expertise. It is on these principles that Enviro-STEP Technologies has developed its solutions.

MEMBER Profile Questionnaire

Samantha Martin

Cromar Environmental

Name of Organization: Cromar Environmental

Owners: John Martin

Services/Mandate: Septic supplies

Service Area: Ontario

Number of Years in Role: Three years



Samantha Martin

What got you started in the onsite wastewater industry?

I was finishing university and I found the job via my father (John).

Give us one reason/secret for your success.

My drive to always do better would be one reason for my success. I want to learn, and gain as much industry experience as possible so I can provide the best service to our customers.

What was the most challenging onsite job you worked on or participated in?

We work with installers to assist them in organizing their Eljen GSF systems, so we do not experience a lot of specific onsite work, unless we are working with new installers.

If you could change one thing about the onsite/decentralized industry, what would it be?

The one thing I would like to change is the thought that everything is gross. There is so much science behind our industry and so much work behind the scenes that I feel like we don't get the credit or recognition that we deserve.

Where do you see the onsite industry going?

I see the onsite industry gaining more attention as a source of environmental protection as topics like climate change become more prominent.

Case Study from Georgian Bay, Septic Bed Maintenance



By: Ella Bird, Bird's Septic Designs

Recently, I was retained to complete a third-party replacement septic system design for a water-access island property on Georgian Bay. The existing septic system had been installed in 2006 and at first glance appeared to be nearing the end of its service life. However, the investigation uncovered several interesting findings and highlighted the importance of routine septic bed maintenance.

Initial Observations

Upon arriving at the property, it became immediately apparent that the septic bed had received little maintenance over the years. The entire bed area was heavily overgrown with sumac, raspberry brambles, various weeds and numerous small trees.



Like many cottage and rural property owners, the homeowners were from a city background and did not understand how a septic bed functions or the importance of keeping the area maintained. They were surprised to learn that a septic bed is not an area that should be allowed to return to nature.

A septic bed relies on oxygen movement through the soil and proper evapotranspiration at the surface. Heavy vegetation and root systems can interfere with these processes and potentially shorten the lifespan of the system.

Investigating the Existing Bed

As part of the permit process a test hole was dug in the previously imported mantle loading area surrounding the bed. One of the first observations was that the imported sand fill was wet and not functioning as intended. Under normal conditions the mantle should remain relatively dry in order to provide effective treatment and dispersal of effluent.

Unexpected Discovery

Given the extensive vegetative growth on the bed, it was anticipated that root invasion would be extensive throughout the stone layer. Surprisingly, this was not the case.

While roots were present around the perimeter and upper portions of the system, the interior of the bed was not nearly as root-bound as originally expected.

The more significant issue turned out to be the septic stone itself.

The original bed had been constructed using limestone septic stone. After nearly twenty years of service, much of the stone had completely broken down and disintegrated. Instead of clean, open void spaces between the aggregate, the material had become smeary and almost clay-like in consistency.

This deterioration significantly reduced the available void space for effluent to travel through and likely contributed to the poor hydraulic performance observed during the test hole process.



Lessons for Homeowners

This project serves as an excellent reminder that septic systems require ongoing maintenance and periodic inspection.

Property owners should:

- Keep septic beds free of trees, shrubs and woody vegetation.
- Mow vegetation over the bed regularly.
- Do not allow deep rooted vegetation such as sumac and brambles to become established.
- Monitor for unusually wet conditions or lush vegetation over the bed area.
- Have septic tanks pumped regularly and systems inspected when concerns arise.

Many homeowners do not think about their septic system until a problem develops. By that point, repair/replacements are often costly and disruptive.

Moving Forward

Based on the findings of the site investigation, a replacement septic system was designed to meet current Ontario Building Code requirements and provide reliable long-term performance for the property owners.

The replacement system installation was completed by Groves Marine Ltd., whose experience with water-access properties and island construction helped ensure the project was completed successfully.

While no septic system lasts forever, proper maintenance and vegetation control can significantly extend the service life of a system and help property owners avoid premature failures.



ABOUT THE AUTHOR

Ella Bird is a third party sewage system designer predominantly working in the area of West Parry Sound, Muskoka region and the Highway 69 corridor up to Greater Sudbury. She is entering her second year in the business of design. Her professional experience includes ten years as a regulator with the North Bay-Mattawa Conservation Authority (NBMCA), where she served as a Sewage System Inspector, Deputy Chief Building Official and Interim Program Manager, specializing in Part 8 (Sewage Systems) of the Ontario Building Code. Ella is a member of the communications committee at OOWA.



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Going With the Flow

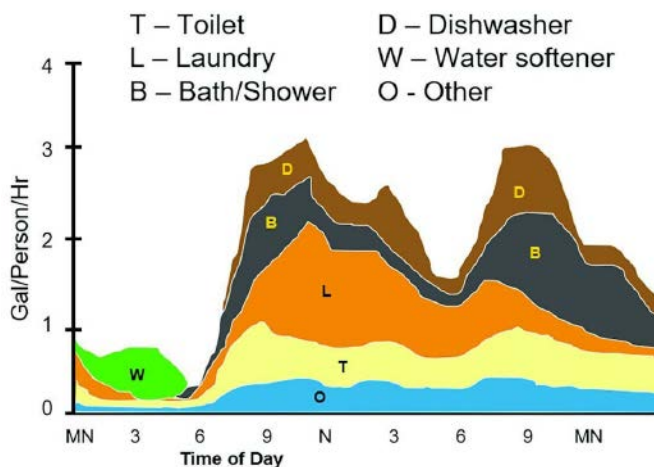
Breaking down the variances in onsite wastewater treatment design

This article first appeared in the Dec. 2025 issue of Onsite Installer, published by COLE Publishing, Eagle River, Wis. It is reprinted by permission.

[See original article](#)

By Sara Heger

Across the U.S. and Canada design flows for residential households vary significantly. What's interesting is that even though we see flows as low as 90 to upwards of 200 gpd per bedroom, total indoor water usage does not generally vary significantly, so why do we see such a range? The varying regulatory approaches primarily relate to how much safety factor is included in the design flow.



To better understand these flows there are many items to consider. One of the most crucial factors is that design flows should be viewed as peak flows in onsite wastewater treatment systems. Maximum and minimum flows and instantaneous peak flow variations are various methods to calculate wastewater generally that should be considered when properly sizing and designing system components.

For many homes, most of the hydraulic load occurs over several short periods of time in the morning and the evening. The system must be capable of accepting and treating normal peak events without compromising performance or backing up. Peak events such as large gatherings will occur, and during these events the system must also perform.

Dissecting peak flow

The peak flow rate from a residential household is a function of the fixtures and appliances present.

The peak discharge rate from a given fixture or appliance is typically around 5 gpm with the exception of large bathtubs. The use of several fixtures or appliances simultaneously can increase the total flow rate above the rate for isolated fixtures or appliances. However, attenuation occurring in the residential drainage system tends to decrease peak flow rates observed in the sewer pipe leaving the residence. Although field data is limited, peak discharge rates from a single-family household of 5 to 10gpm can be expected.

The image above shows how a municipal central sewer system influent varies throughout the day with the two main peaks in the morning as folks are preparing for school or work and in the evening when they prepare dinner, run the dishwasher or bathe. This municipal data never goes to zero, but with onsite wastewater treatment systems it is likely that there will be periods of no flow.

This variability in flow can affect gravity systems by potentially causing hydraulic overloads during peak flow conditions. Minimum hourly flows of zero are typical for residential households. Maximum hourly flows as high as 100 gallons are not unusual given the variability of typical fixture and appliance usage characteristics and residential water use demands.

Hourly flows exceeding this rate can occur in cases of plumbing fixture failure and appliance misuse such as a leaking toilet or faucets are left running. Wastewater flow can vary significantly from day to day, which can create challenges with some systems due to an inconsistent supply of food for bacteria within the system. Systems with time dosing can help mitigate some of these challenges. Most OWTS do not have flow equalization, so what comes in, goes out at the same rate.

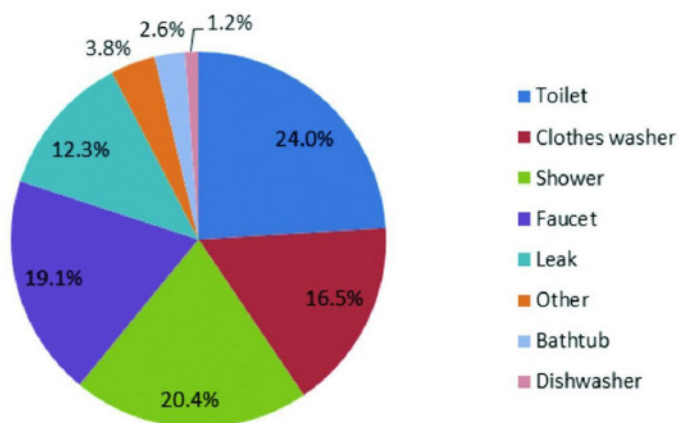
Designing around peak flow

The average flows should be much less than peak flows for a system. Treatment systems are not designed to receive design peak flows every day.

There is a safety factor built into design flows that increases the life expectancy of systems and often increases the time needed between service visits. Safety factors are typically used to account for potential variability in wastewater characteristics at a particular household or establishment.

These predictions attempt to ensure adequate treatment by the OWTS without requiring actual analysis of the variability

in flow or wastewater quality. However, actual measurement of wastewater flow and quality from a residential household always provides the most accurate estimate for sizing, designing and evaluating performance.



Understanding where water is being used within a household can help calculate a more accurate estimate of flows going to an onsite treatment system. This image shows average water usage in a residential setting.

Meeting requirements

Using realistic flow estimates and safety factors to determine wastewater characteristics in order to design will result in the most cost effective OWTS that meets performance requirements.

Most onsite code requirements for system design of residential households call for estimating the flow on a per person or per bedroom basis. Codes typically specify design flows of 100 to 150 gpd per bedroom, or 50 to 75 gpd per person with occupancy rates of between one and one-half to two persons per bedroom. Since we want the system to work for a range of family sizes, the maximum occupancy is typically used.

For example, if an average daily flow of 75 gallons per person per day and an occupancy rate of two persons per bedroom were the selected design parameters, the flow prediction for a three-bedroom home would include a factor of safety of approximately two, when compared to typical conditions. In lieu of using conservative design flows, a direct factor of safety may be applied to estimate the design flow from a residence or nonresidential establishment. Multiplying the typical flow estimated by a safety factor of two yields a design flow of 280 gpd.

Ratios

Factors of safety used for individual systems will usually be higher than those used for larger systems of 10 homes or more. When more homes are connected the variability between household numbers and water generating practices are averaged out.

There is one item to consider with this typical regulatory approach, and that is as more people are in a household, the per-person usage goes down versus the linear approach that most regulations take. This may be due to the wider age range of people in households with more than four people and the sharing of water using activities such as dish washing and laundry. It is wise with normal residential homes to use a higher peak flow for the first two bedrooms but reduce that peak flow for additional bedrooms in the home.

Accounting for failures

Leaks are still a large challenge when it comes to wastewater generation. The last study done on this topic published in 2016 showed that 12.3% of our water usage is due to leaks and the average per capita leakage was 9.5 gpd per person, or 22 gpd per household. However, this value was the result of high leakage rates at a small percentage of homes with 67% of the homes in the study logging average leakage rates of less than 10 gpd. Of the study homes, 6% had leakage rates of more than 100 gpd.

Faulty toilet flapper valves and leaking faucets were the primary sources of leaks in these high-leakage-rate homes. Leakage rates like those measured in this study could significantly increase the hydraulic load to OWTS and impact performance. It is important that these large leaks be identified and corrected.

Hydraulic overloading is a frequent problem identified when troubleshooting OWTS and can be caused by wastewater flow or pollutant loads that exceed system design capacity. When more water is processed than an OWTS is designed to manage, detention time within the components is reduced, which can decrease pollutant removal in the tank and overload the soil treatment area. Reducing water use in a residence can decrease hydraulic loading to the treatment system and improve system performance.

As we have seen average design flows decrease there has been discussion about reducing code required peak flows in regulations. Care should be taken as the amount of contaminant as measured in mg/L of BOD, TSS, total nitrogen and phosphorus has conversely increased. Our onsite systems need to deal with the overall same amount of mass loading and therefore decreasing the flow value without accounting for these increased concentrations could impact system longevity.

Throwback Article

A Look Back

This article was
originally published
Volume 7, Issue 1,
March 2006

Flows across the Nation — How does Ontario Compare?

Doug Joy and Katherine Rentsch, ORWC

The rules which cover the design and installation of on-site systems in Ontario have remained relatively unchanged for the past three decades. One might ask then, is the code used in Ontario up-to-date? To look at this question we begin a series of articles comparing the requirements of the *Ontario Building Code* with codes used in five other jurisdictions — two in Canada and three in the U.S. Since the codes cover a wide range of conditions from design flows, tank requirements to leaching bed design, we will begin by looking at flows and tank requirements and go on in subsequent articles comparing other aspects of the code.

For comparison we will use the Provinces of Quebec (1995) and Alberta (1999) and the States of North Carolina (2001), Massachusetts (1996) and Arizona (2003). These jurisdictions were selected partly because of the availability of their codes, but also because they have large numbers of on-site systems and have relatively up-to-date codes. The dates of the codes used are given in brackets behind each state above.

Before beginning the comparison we also need to keep in mind that while we may be examining a single aspect of the design of an on-site system, it is the overall design and how all the components work together that is most important. This we'll tackle in the final instalment.

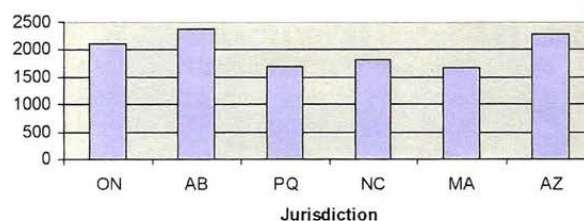
The essential starting point for all on-site designs is the flow used for design. As we all know this will depend on the size, type and use of the building. To keep the comparison relatively straightforward, we'll look at a single family home, with four bedrooms and 210 m² in area. In Ontario, for residential homes, design flows are based on the number of bedrooms, area and fixture units. Let's assume that the fixture units are less than 20 so they do not change the flows over those dictated by the flow area and number of bedrooms. Ontario's code results in a design flow of 2,100 L/day.

Table 1: Design Characteristics for 4 Bedroom, 210 m², Residential Home

Jurisdiction	Design Flow (litres per day)	Tank Volume (litres)
Ontario	2,100	4,200
Quebec	1,680	3,900
Alberta	2,400	2,700
North Carolina	1,800	3,800
Massachusetts	1,700	5,700
Arizona	2,300	4,800

For Quebec their code does not use design flows directly, rather, they use the number of bedrooms to dictate the design of the various components. Of course the number of bedrooms suggests the number of occupants, which in turn suggests the flows. Digging a bit deeper into the Quebec code a suggested flow per bedroom is given and this results in suggested design flows. Design flows for these and the other jurisdictions are listed in Table 1 and graphically in Figure 1.

Figure 1: Design Flow Comparison



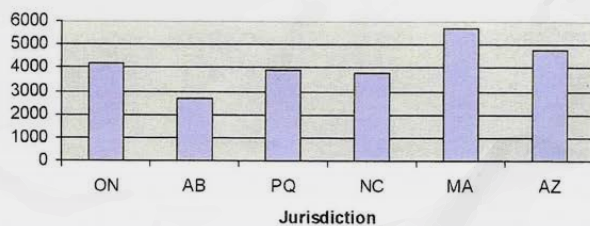
The design flows for this situation vary significantly from a minimum of 1,700 L/day in Massachusetts to a maximum of 2,400 L/day in Alberta. Ontario is about the average for this four bedroom case. Of note, Ontario is the only jurisdiction in which the size of the dwelling, beyond the number of bedrooms, factors into the calculation of the design flows. A few of the others use fixture units, but for the most part the focus is what is the number of bedrooms in the home and this dictates the design flows.

In our code the design flows are then used to determine the sizes of all components of the system, such as tank volumes, size of treatment units and soil absorption requirements. For this article we'll just look at tank sizes.

Some jurisdictions (e.g., Quebec) do not use the design flows to determine tanks sizes but go directly from the number of bedrooms to the tank volume. Others use the design volume with ratios of 1.5 to 2 times the daily flow. Figure 2 shows the comparison of the tank volumes that would be required for the 4 bedroom under consideration.

For our case Ontario would require a tank size of 4,200 L (2x2,100 L) and this of course exceeds our minimum size of 3,600 L. For the other areas the required volumes range from a minimum of 2,700 L in Alberta to a maximum of 5,700 L in Massachusetts. This is exactly the opposite trend observed in

Figure 2: Tank Comparison



the flow comparison, which may come as a surprise. Although we use 2x the design flows, Alberta uses the number of bedrooms to indicate tank size and in the case of Massachusetts the 5,700 L is the minimum tank size allowed.

In all jurisdictions but Alberta there is a requirement for a two-chamber septic tank. In the case of Massachusetts this only applies for larger systems with flows greater than 3800 L/day and would not apply in this case.

As with the design flows, Ontario's tank size is about the average for these six jurisdictions.

So what does this all mean for the design of systems for Ontario? Well, it suggests that for design flows and septic tank sizing for single family homes, Ontario is typical of regulations across the country — although they are highly variable. We are unusual in that we make adjustments for the size of the home since none of the other jurisdictions go beyond considerations of bedrooms and in one case, fixture units. It would be interesting to see if data collected today would support the notion that we should base our flow calculations on house area in addition to the number of bedrooms. Of course we have not looked at non-residential applications and differences here may be quite a bit larger. We'll look at that at another time.

Next issue we'll look at sizing of soil absorption systems.



OOWA Members Who Joined or Renewed Their Membership

Between the Dates of January 27, 2026 and July 10, 2026

NEW MEMBERS

- Muhammad Ahmed, Danfoss
- Christopher Allan, Waterloo Biofilter Systems Inc.
- Brandon Asher
- Joe Attardi, Ontario Septic Pumping
- Francys Auclair
- Connor Bajadda
- Gurdevinder Bal
- Mike Bannon, Bandura Construction Inc
- Brittany Barrie
- Mike Beagan
- Dennis Brianski
- Jesse Brownson, Arbor Vitae Landscape & Design
- Colin Brush, Cedarwood Contracting & Excavation
- Josh Campbell, ESSE Canada
- Jon Carino
- James Chapman
- Chloe Chen
- Brad Cooney, Cooney Excavating Ltd.
- Robby Courtemanche
- Colton Craig, Plumbing By Colt
- Adam Crookes, National Capital Commission
- Jaime de Jonge, 98 Construction Inc
- Lucas DePooter
- Michael Deverell, Tarstone Canada Ltd
- Ed deVos, Edscavating Disposal Services
- Jake Donohue, Summit Services Inc
- Ashley Dubuc, Township of Perry
- Eric Dwyer, Dwyer Landscaping LTD
- Noah Empke, University of Guelph
- Lucas Eskritt, Eskritt Construction
- Adam Ewanovich
- Wilko Finger, LinScott Drainage LTD
- Jayme Fortier, From Now to Zen
- Kevin Fortier
- Bryce Fraser
- Daniel Gaucher, Goulet Septic Pumping & Design
- Julie Gaucher, Goulet Septic Pumping & Design
- Devin Gordon, ON EX Limited
- Nick Guikema, Top Shelf Plumbing
- Cooper Halpenny
- Trever Hanna
- Andrew Harman, Allto Construction Services Ltd.
- Ashley Henderson Osmar, Township of Frontenac Islands
- Justin Henderson, Waterloo Biofilter Systems Inc.
- Hector Isaac Hernandez Castaned, Seneca Polytechnic
- Glen Howald, Make-Way Environmental Technologies Inc
- Peter Inglis, P E Inglis Holdings Inc
- Wanda Inglis, P E Inglis Holdings Inc
- Dana Jagt, Waterloo Biofilter Systems Inc.
- Allen Johns,
- Ahmet Kilicaslan, Ontario Tech University
- Claude Larue, TDC Excavating Ltd.
- Alex Lautenbach, Engage Engineering
- Marcel Lavigne, Township of Frontenac Islands
- Thomas Lebeau, Sharpworks Landscaping
- Rick Leeson, HEAVYS Construction Inc.
- Mike Leger, LinScott Drainage LTD
- Yongsheng Liang, Indigenous Services Canada
- Adam MacIntosh, Tailor-Made Landscapes Inc
- Joanne Madere, Black Water Construction & Septic
- Nyklus Madere, Black Water Construction & Septic
- Rene Madere, Black Water Excavating & Septic
- Danielle-Rose Maheu
- Lindsey Maier, Newmarket Precast
- Tia Maltais, Envision Consultants Ltd.
- Chantal Markou, Thunderbolt Contracting Ltd.
- Noel McCleery, Irongate Inspections
- Jeff McHardy, Oro Septic Service Ltd.
- Megan McKinlay, Waterloo Biofilter Systems Inc.
- Mohit Mehra, University of Ottawa
- Quintin Michlik, Niagara Region
- Keenan Mihalcin, LTM Construction Services
- Naznin Nahar, Seneca Polytechnic
- Cristian Obregon, Seneca Polytechnic
- Martin Ouellet, Premier Tech Water and Environment
- Megan Peacock, Rideau Valley Conservation Authority
- Conrad Peters
- Vincent Pignataro, VK Excavation Services
- Samuel Polletta
- Debbie Quarrington
- Rebecca Rail, RVSS - Rideau Valley Septic Services
- Nick Ranieri, NHD North Inc
- Caleb Raymond, QCR Contracting
- Terry Roberts
- Nolan Rogers, Ottawa West Excavation
- Ben Rukavina
- Michael Rup, 5th North Excavating
- Riley Russell, Rcomm Construction & Excavation
- Scot Sandrelli
- Ehsan Shafiepour, University of Ottawa
- Nik Sieber
- Natasha Simpson-Campbell, Waterloo Biofilter Systems Inc.
- Alexander Smirnov, Seneca College
- Thomas Smith, Reliable Brokers
- Tanya St. Michel, Waterloo Biofilter Systems Inc.
- Jason St. Amour, Clear Line Site Solutions
- Robert Stewart, G&S Xcavating
- Quinn Strelow, Strelow Landworks
- Madeline Swart, Western University
- Kris Tache
- Laura Teran Simancas, Toronto Metropolitan University
- Aidan Walsh, Boulder and Beam
- Riley Wark, Arnott Brothers Construction

- Brian Weddel, Newmarket Precast
- Todd Williams, Ottawa Valley Engineering
- Nicholas Wilson, Brent-Reg Construction Inc
- Chad Yates, Peters Paving Inc
- David Young
- Michaela Zacharoff

RENEWED MEMBERS

- Christopher Allan, Waterloo Biofilter Systems Inc.
- Yancy Ambing, Town of Bradford West Gwillimbury
- Chris Anderson, JAC Mechanical
- Kelly Andrews, OOWA
- Jim Anesta, Infiltrator Water Technologies
- Imad Aouli, WSP Canada Inc.
- Sarah Baltare, Municipality of Chatham-Kent
- Kevin Baltessen, Baltessen Excavating
- Mark Barber, BSI Septic Solutions
- James Barnes, Geo Barnes & Sons Ltd
- Marie-Christine Belanger, Premier Tech Water and Environment
- Jasper Belding, Waterloo Biofilter Systems Inc.
- Allison Bennett, Clearford Water Systems
- Brad Billings, Billings Construction
- Roddy Bolivar, Make-Way Environmental Technologies Inc
- Sandy Bos, BOS Environmental Consulting
- Lisa Bowley, Novatech
- Jeff Brett, MNT Consulting Group Inc.
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- Teresa Buckman, Make-Way Environmental Technologies Inc
- Brent Bunker, AAAA Sanitation
- Joseph Burns, Howard Burns Equipment Rentals
- Josh Campbell, ESSE Canada
- Brian Campbell, Wyevalle Concrete Products Limited
- Patrick Casey, Total Site Services Inc.
- Frank Charlebois, S Charlebois Haulage And Excavating LTD

- Mikael Chav-Gregoire, M.G Excavation & Solutions
- Louie Chiarappa, Hernandez Sanitation Services
- Kevin Cooney, Cooney Construction & Landscaping Ltd.
- Charles Courchesne, Guy Courchesne Excavation Ltd
- David Cousens, Kinburn Plumbing & Heating
- Ron Cousins, Cousins and Johnson Inc
- Elmer Covill, Elmer's Construction
- Michelle Dada, MNT Consulting Group Inc.
- William Dainty, Headwaters Construction Ltd.
- Robert DeAcetis, Deson Construction
- Anthony DeDominicis, Roswell Concrete Products
- Dash Delarosbel, Temagami Barge Limited
- Cornelia Depeuter, Town of Bradford West Gwillimbury
- Lisa Dolderman, Pioneer Septic Solutions Inc
- Ryan Dolderman, Pioneer Septic Solutions Inc
- Kevin Dolderman, Pioneer Septic Solutions Inc
- Wyatt Dolderman, Pioneer Septic Solutions Inc
- John Doner, Metropolitan Pump Co.
- Johnny D'Orazio, G&G Septic Solutions
- Glenn Dryden, Dryden Excavation Inc
- Keith Dunn, Plumbing Dunn right
- Cliff Eborall, Walters Custom Works Inc
- Mike Eisses, Eisses Bros. Excavating
- Nick Eisses, Eisses Bros. Excavating
- Fritz Enzlin, Norfolk County
- Soheil Fatehi, Clearford Water Systems
- Tara Fice, Excav8te Inc.
- David Finch, Wes Finch & Sons Excavating
- Jillian Fitzmaurice, Jillian's Septic Design
- Ray Foster, Bionest
- Nicolas Fournier, DBO Expert
- Tracy Gallipeau-Nolan, Township of Elizabethtown-Kitley

- Etienne Gaudette, Soluo
- Caitlin Goodale, Niagara Region
- Mark Goodman, Pump My Tank Inc
- Adrian Greco, Greenwood Excavating
- Riley Greer, Paul Greer & Son's Exc Ltd.
- Stefan Gruescu, Claramy Designs Incorporated O/A LSK Septic and Drain
- Liam Hand, Coulson Bros Scow Service
- Seth Harder, Tamarack North Ltd.
- Lyndsay Harness, Clarington Septic Repair
- David Harsch, K. Smart Associates Limited
- Kirk Hastings, Onsite Septic Solutions
- Frick Heilingbrunner, Township of Cavan Monaghan
- Justin Henderson, Waterloo Biofilter Systems Inc.
- Jordan Hoekstra, Dig'R Wright Excavating Inc
- Andrew Hole, Hole Landscaping Incorporated
- Russell Hollett, RJH Excavating & Septic
- Justin Hoskin, Haldimand County
- Ian Hutcheson, Pinchin Ltd.
- Aaron Jantzi, Rhino Excavation
- Scott Jeffrey, Peto MacCallum Ltd
- Kyle Jenkin, Compass Resorts
- Keith Karl, Caledon Excavation & Grading
- Robert King,
- Bert Knip, Make-Way Environmental Technologies Inc
- Jordan Kuipers, Kuipers Construction
- Lloyd Laidman, Intuitive Water Systems Inc
- Devin Lake, Jp2g Consultants Inc.
- Nathan Latchford, MacGregor Concrete Products
- Marcel Lavigne, Township of Frontenac Islands
- John Levie, Clearford Water Systems
- Yongsheng Liang, Indigenous Services Canada
- Peter Libicz, Home Inspection Right Away
- Tyler Lodder, Pelican Excavating
- Adam Mageean, Heritage Excavation and Siteworks

CNTD: OOWA Members Who Joined or Renewed Their Membership

Between the Dates of January 27, 2026 and July 10, 2026

- Matthew Malloy, Pioneer Septic Solutions Inc
- Chad Mann, Lloyd Collins Construction Ltd.
- Jacob Maragh, Safe Sewage Systems Consulting Inc.
- Cathy Marcellus, Wyevale Concrete Products Limited
- John Martin, Cromar Environmental
- Dylan Martin, MXC Excavating Inc
- Samantha Martin, Cromar Environmental
- Tom Matthews, Northumberland County
- Mac McGill, Mac McGill Excavating
- Norm Medley, P. Medley and Sons, Ltd
- Dominic Mercier, Enviro-STEP Technologies Inc.
- Jarod Milko, Sturgeon Industries
- Kim Millen, Norfolk County
- Steve Milton, Milton Property Inspections
- Duncan Mitchell, Charles Morden Construction
- Gerry Mitchell, Peto MacCallum Ltd
- Paul Monks, Township of Otonabee-South Monaghan
- Stephen Morash, MTE Consultants Inc
- Ryan Morgan, South Frontenac Township
- Jad Mouhanna, Infiltrator Water Technologies
- Lance Nachoff, Ontario Onsite Wastewater Association
- Adam Nayler, Northumberland County
- Crystal Nedow, Township of Central Frontenac
- Kevin Norlock, Township of South Frontenac
- Bill Ormsby, Premier Tech Water and Environment
- Steve Ott, Ottawa Valley Home Inspections
- Chris Owen, C.O. Construction Ltd.
- Dennis Pardy, Xerxes
- Mike Parsons, Dirty Deeds Contracting Inc
- Gary Pearson, Pearson Engineering Ltd.
- Jacob Phillips, Arbor Vitae Landscape & Design
- Doug Post, D.F.Post Contracting Inc.
- Nick Preikschas, GRIT Engineering Inc
- Kathleen Pulfer, Township of South Frontenac
- Jason Rail, The Septic Store Inc.
- Roger Reaume, Make-Way Environmental Technologies Inc
- Laura Reavie, Skootamatta Environmental Consulting Inc.
- Greg Reimer, Alfred Beam Excavating Limited
- Derek Roberts, Derek Roberts Excavating Ltd.
- Darryl Robins, Darryl M. Robins Consulting Inc.
- Bill Robinson, Robinson Enterprises/SepticCheck.ca
- Nathalie Roy, DBO Expert
- Lloyd Rozema, Aqua Treatment Technologies
- Frank Salaris, Insight360 Home Inspections
- Troy Sampson, Thunder Bay District Health Unit
- Rob Sanna, Boyd Brothers Concrete
- Amanda Savage, Township of Perry
- Jason Schoenfeld, Boyd Brothers Concrete
- Doug Schultz, Township of Whitewater Region
- Kevin Scott, CopperWood General Contracting Inc
- Dylan Seeley, Seeley Group Inc.
- Brian Shepherd, George Burnett Ltd.
- Kathleen Shepherd, Township of Cavan Monaghan
- Brad Smale, SCS (Smale Consulting Services)
- Mike Smith, Smith Excavating, Grading & Septic Services
- Tracey Spragg, Robinson Enterprises/SepticCheck.ca
- Noah St. Bernard, St. Bernard Septic Design and Consult
- Tanya St. Michel, Waterloo Biofilter Systems Inc.
- Jason Stephens, Stephens Excavating
- Ryan Streicher, OnGrade Inc.
- Paul Studholme, Professional Home Inspections
- Sandra Swanton, K. Smart Associates Limited
- Ryan Thomas, Make-Way Environmental Technologies Inc
- Dale Thompson, Thompson Construction Inc.
- Simon Thome, James Thome Construction Ltd
- Michael Tinney, Tinney's Septic Service & Construction
- Peter Vanderboom, Septex Design Engine
- Andrew Vangerven, Van Gerven Excavating
- Kristian Vincent, Paradise Construction
- Andrew Vitaterna, Clearford Water Systems
- Aidan Walsh, Boulder and Beam
- Matthew Walters, Walters Custom Works Inc
- Devon Webb, Dynamic Septic & Drainage
- Dawn Weber, Dawn J Weber
- Chris Whalen, Whalen & Sons Septic Transfer
- Dave Whidden, Waubaushene Septic & Landscaping Supplies Ltd
- David White, Ken White Construction
- Ed Whitmore, Township of Asphodel Norwood
- Amanda Willis, City of Belleville
- Lindsay Wolfenberg, Clearford Water Systems
- Dan Woodhead, Site Ex Inc.
- Jesse Woodward, The Pump Shop
- John Yantha, Yantha Backhoe & Trucking Ltd.



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The Impact of US Tariffs on the Ontario Onsite Sewage System Industry

By Lance Nachoff, OOWA Membership Coordinator

As of 2025, the once-stable trading relationship between Canada and the United States is being tested by a new wave of tariffs, countermeasures, and political recalibration. Triggered initially by U.S. tariffs on Canadian goods like aluminum, steel, dairy, and softwood lumber, Canada's April 2025 response introduced new duties on U.S. auto imports, marking a significant escalation in their economic standoff.

As Canadian businesses and industries have experienced firsthand, the introduction of these historically high, prohibitive, and restrictive trade tariffs imposed by the United States has had an immediate and profoundly negative effect throughout Canada. Countless Canadian businesses and consumers continue to experience the financial and economic pressures stemming from the new tariffs, while the outlook for the short and long-term viability of Canada's relationship with its largest and most influential trading partner remains uncertain.

According to Strader-Ferris International, the Canadian industries most impacted by these tariffs include:

- **Automotive** (90% exposure). 90% of all cars produced in Canada are sold in the US.
- **Energy & Natural Resources** (90%)
- **E-Commerce** (80%)
- **Manufacturing & Industrial Goods** (75% exposure)
- **Construction & Real Estate** (65%)
- **Technology & Electronics** (60%)
- **Food & Beverages** (60%)
- **Pharmaceutical & Healthcare** (55%).

The unforeseen implementation of these new US tariffs has indirectly increased costs and operational pressure on Ontario's sewage system industry by raising prices for key construction inputs particularly steel, electrical equipment, and diesel fuel; all of which are heavily used in sewage tank

manufacturing, installation, and maintenance. These impacts stem from broader tariff effects on Ontario's construction sector rather than sewage systems specifically.

What's actually happening

Although no single source directly analyzes "the sewage system industry," it is possible to map tariff impacts on the industry because sewage systems rely on the same materials and equipment as Ontario's construction and civil infrastructure sectors.

1. Higher input costs for septic tank manufacturers and installers

Ontario's construction sector relies on the US for ~25% of its material and fuel inputs, including:

- Steel (about 20% of Ontario's construction steel comes from the US)
- Electrical equipment (pumps, control panels, and alarms used in advanced treatment units)
- Diesel fuel (for excavation equipment, transport trucks)

US tariffs of between 15-50% on steel, aluminum, copper, and other manufactured goods raise the cost of these inputs. Ontario municipalities and contractors face higher capital expenditures estimated at +2.1% over two years due to tariff-driven price increases.

Since sewage system installation is highly equipment-based, and steel-intensive (tanks, piping, excavation machinery), these cost increases flow directly into:

- Higher installation costs
- Higher repair/maintenance costs
- Higher equipment rental and fuel costs

2. Construction-sector slowdown affects sewage system demand

US tariffs are projected to slow Ontario's GDP growth and reduce construction activity:

- Ontario's real GDP growth drops to 0.6% under tariff conditions (vs. 1.7% without tariffs).
- Construction is one of the hardest-hit industries, losing \$2.6 billion in 2026.

A weaker construction sector means:

- Fewer new homes built in rural areas
- Fewer commercial builds requiring sewage systems

This reduces demand for sewage system installations and upgrades.

3. Municipal infrastructure costs rise—including environmental services

Municipal capital expenditure (CAPEX) program, which includes environmental services and civil infrastructure, is projected to rise to \$1.04 billion due to tariffs.

Environmental services include:

- Wastewater treatment
- Sewage system oversight
- Rural infrastructure supporting sewage system or decentralized wastewater system installations

Higher CAPEX pressures can lead municipalities to:

- Delay onsite wastewater infrastructure projects
- Increase permitting or inspection fees
- Tighten budgets for rural wastewater programs



Net effect

The industry faces **higher operating costs** and **lower demand growth**, but not a collapse. Sewage systems remain essential infrastructure, so the industry is resilient—but squeezed.

4. Relief programs soften—but don't eliminate—impacts

Canada has implemented temporary tariff exemptions for goods used in manufacturing, public safety, and agricultural production. Some sewage system businesses may benefit if they can demonstrate:

- Short supply
- Contractual obligations
- Use of US goods in manufacturing or public safety contexts

But these exemptions are temporary and limited.



What this means specifically for Ontario's sewage system industry

Direct impacts

- Higher cost of pumps, alarms, and electrical controls
- Higher excavation and transport costs due to diesel tariffs
- Higher equipment rental costs (excavators, skid steers, dump trucks)

Indirect impacts

- Reduced new construction → fewer installations
- Municipal budget pressure → slower permitting and infrastructure support
- Higher consumer prices → homeowners delay upgrades or repairs

Impact Area	Effect on Septic Industry
Steel tariffs (15-50%)	Higher tank & component costs
Electrical equipment tariffs	Higher pump/control system costs
Diesel tariffs	Higher excavation & transportation costs
Construction Costs	Reduced septic installation demand
Municipal CAPEX increase (2.1%)	Higher fees, slower approvals
GDP slowdown	Industry-wide economic pressure

Overall Future Outlook (2026–2030)

Short term (1–2 years):

Challenging but manageable

- Higher installation and repair costs
- Slower demand due to construction downturn
- Municipal delays and tighter budgets
- Businesses absorbing or passing on cost increases

Medium term (3–5 years):

Stabilization through adaptation

- Supply chains diversify away from U.S. metals
- More Canadian-made sewage system components
- Increased use of plastic tanks and alternative materials
- Municipal infrastructure investment may offset some economic drag

Long term (5+ years):

Moderate growth resumes

If tariffs persist, the industry will evolve into a more domestically sourced, cost-stable sector. If tariffs ease, construction rebounds and industry demand increases.

CUSMA today, and what happens next

While the current Canada-United States-Mexico Agreement (CUSMA) on trade does not expire until 2036, each of the three respective countries had until July 1, 2026, to declare whether they wanted to extend CUSMA beyond its 2036 expiry date.

On July 1, 2026 Mexico and Canada collectively voted in favour of an extension, while the U.S. declared that it would not seek an extension beyond 2036, and instead favours a complete renegotiation of the deal's terms and commitments.

Ultimately, Ontario's sewage system industry is unlikely to be defined by tariffs alone, but by how effectively it responds to the uncertainty they create. Rising material costs, tighter municipal budgets, and slower construction activity will continue to test manufacturers, installers, inspectors, and homeowners; however, the essential nature of onsite wastewater infrastructure provides a strong foundation for long term resilience. By diversifying suppliers, exploring Canadian-made and alternative materials, and maintaining open communication with clients and municipalities, the industry can manage near term pressure while positioning itself for renewed stability and growth as trade conditions evolve.

Sources:

Government of Canada - Business & Industry - Trade & Investment
Financial Accountability Office of Ontario
Canadian Broadcasting Corporation (CBC)
Association of Municipalities of Ontario (AMO)
Strader-Ferris International
www.tradecommissioner.gc.ca

Michael Gibbs

Ontario Regional Manager

We are pleased to announce that Michael Gibbs has joined Enviro-STEP Technologies sales team, June 29th, 2026, as our Ontario Regional Manager.

In this role, Mike will drive our residential and commercial business development across the province, working closely with our Engineering, Sales, and Marketing departments, as well as with you, our valued partners, installers, designers and regulators.

Mike brings a wealth of experience and an unparalleled understanding of the Ontario onsite wastewater market. His background includes serving for many years as Membership and Outreach Coordinator of the Ontario Onsite Wastewater Association (OOWA), followed by a successful tenure as inspector, marketing coordinator and regional hub manager for a major septic system service company.

Widely known and highly respected in the industry, Mike's extensive network will be a tremendous asset in supporting our growth and streamlining our regional operations.

We are thrilled to welcome him to the team and look forward to the valuable perspective he will bring to our collaboration with all of you.



Contact Mike:

-  mgibbs@enviro-step.ca
-  705-627-7042



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It was an honour to receive this prestigious award from the OOWA. However, Make-Way Environmental Technologies Inc. would not be where it is today if it weren't for my wife's hard work and dedication to our company. I would like to dedicate this award to Elaine, my wife and life partner of 49 years. She's also my business partner who works tirelessly behind the scenes.



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Name:

Andy Bauman

Name of the business:

Bergmann North America Inc. (BNA)

What is your title:

Project/Sales Manager

Bergmann North America (BNA) was founded in 2018 by a team of experienced wastewater professionals united by a shared passion for advancing Moving Bed Biofilm Reactor (MBBR) technology and effective onsite treatment in North America. BNA has set out to deliver high-performance solutions tailored to the unique needs of each project—whether commercial, institutional, or community-based. From the beginning, our focus has been simple: to protect water resources through smart engineering, trusted partnerships, and technologies that deliver sustainable results.

What is one thing you want our members to know about your company?

At BNA, we see ourselves as more than a technology supplier—we're partners in protecting Ontario's water resources. Our team takes pride in supporting designers, contractors, and regulators with practical, innovative wastewater solutions that are built to perform and easy to maintain. Whether it's a small residential project or a complex commercial installation, we bring the same commitment to collaboration, transparency, and continuous improvement. We're proud to be part of this industry and to work alongside the professionals who keep our communities healthy and sustainable.

Where can people learn more about your company?

www.bna-inc.ca | [LinkedIn](#) | [YouTube](#)

Phone (Main Office): 519-220-0698

How do you support your community? (Sponsorships, donations, volunteering, collaborations, etc.)

Within the "industry community", BNA benefits from sponsorship opportunities with OOWA at events/annual conference, and supports employee development through volunteered staff time on OOWA's Board of Directors and Committees. More local to our office in Kitchener, BNA has supported staff sports teams and acknowledges the community work our staff does through organizations like Rotary International and other causes/organizations that resonate with our staff and local communities.

Do you have any exciting new projects, products, or events coming up?

BNA is constantly looking to improve on design, execution of installations and maintaining systems and performance. Stay tuned on the latest tweaks and improvements we've come up with on our control panels and MBBR process.

What products or services do you offer to the onsite wastewater industry?



BNA offers Decentralized Wastewater Treatment Plants, Equipment, Controls, and System Servicing for both subsurface and surface discharge. Systems provide modular design, flexible scalability and long-term reliability. Full process customization is designed to meet the needs of a specific property, application and the regulated requirements. BNA controls offering 24/7 remote notification are standard for our plants, and also available for individual pump stations as well.

What geographic areas do you serve?



Having our head office in Kitchener, ON, the bulk of our current work and projects are located within Ontario. With distributors based in Edmonton, AB and another near Montreal, QC, BNA endeavours to bring effective MBBR wastewater treatment across Canada and throughout North America.

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MEMBERZ

Profile Questionnaire

Alex Dekleine

Rideau Valley Conservation Authority

Name of Organization: Rideau Valley Conservation Authority

Services/Mandate: Part 8 Permit Regulations

Service Area: Ottawa area

Number of Years in Role: Five years



Alex Dekleine

What got you started in the onsite wastewater industry?

In 2014 I graduated from Algonquin College with a diploma in Civil Engineering Technology. I found employment with a local Engineering firm as a field technician conducting construction site inspections, doing topographic surveying and soils investigation. Most of my time was spent working with the septic designers in the firm collecting site data for designs. This led to conducting septic inspections for real estate transactions and growing connections within the septic industry.

Give us one reason/secret for your success.

I was very fortunate to start my career with well-known Engineer, Kaleb Lakew. He has taught me so much about septic systems. From how to locate them, checking the functionality, to designing and answering the tough questions. He set me up for success each day and for my future, and through him I met P.Eng Terry K Davidson, who hired me to be Regulations Inspector for Part 8 of OBC. My success in the industry is directly related to meeting the right people, absorbing information that they provide and applying it with a positive attitude each day.

What was the most challenging onsite job you worked on or participated in?

Being a Part 8 regulator brings a lot of challenges, but the biggest one is dealing with the enforcement of property owners with failing septic systems. Septic systems are expensive and we are living in a time when daily life is expensive. The toughest part of the job is pleading with a property owner to fix a system that is breaking out of

the ground, causing a health hazard to themselves and neighbors, and they are telling me that they can't afford to fix it. It can become a long-drawn-out process that may involve lawyers and courts to enforce the replacement. Being an enforcer and sympathetic of the situation is challenging.

If you could change one thing about the onsite/decentralized industry, what would it be?

I would change the Daily Design Flow in the OBC. Research has proven that they are not accurate anymore with the water saving plumbing fixtures we have now. I also believe that the floor area for bedrooms should not be included as they are already accounted for with the number of bedrooms as the baseflow. The safety factor built into the code is outdated. It is causing systems to be overdesigned, and a shortage of septic sand is growing across area, which in turn, is creating a larger carbon footprint having to haul sand from farther away.

Where do you see the onsite industry going?

I see the industry going more towards level 4 treatment. Most good building sites are developed and what's left are low lying areas or elevated bedrock sites with small footprints to develop and limited space for a conventional sewage system. Houses seem to be getting bigger with pools and landscaping features. I also believe that Level 4 treatment will become the primary system due to the ongoing shortage of filter sand in Eastern Ontario and the cost of hauling the material rising.

Membership Benefits

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Clarifying Designer Qualifications and the Installer Design Exemption

Qualification requirements are prescribed in the Ontario Building Code (OBC), Division C, Part 3. Section 3.2, Qualifications for Designers, which prescribes the qualifications for any person who carries out design activities.

Design Activities is a defined term in the OBC and means the activities described in subsection 15.11(5) of the Building Code Act, which states :

Qualifications for Designers

- (5) A person is not eligible to engage in any of the following activities unless he, she or it has the qualifications and meets the requirements set out in the building code to be a designer:
1. Prepare a design or give other information or opinion concerning whether a building or part of a building complies with the building code, if the design, information or opinion is to be submitted to a chief building official in connection with,
 - i. an application for a permit,
 - ii. a request for the authorization referred to in subsection 8(12) or (13), or
 - iii. a report described in paragraph 2.
 2. If a general review of the construction of a building or part of a building is required by the building code, prepare a written report based on the general review. 2002, c. 9, s. 27; 2006, c. 19, Sched. O, s. 1(7).

Persons who are engaged in providing design activities to the public are required to be registered and carry designer's insurance in accordance with Ministry of Municipal Affairs and Housing (MMAH) requirements. This means that any person who is preparing a design or giving other information or opinion about whether a sewage system complies with the building code must be qualified and insured as a designer.

There is, however, an exemption for sewage system installers. Division C, Sentence 3.2.4.1.(4) of the OBC states that a person is exempt from the requirements to comply with the requirements for qualification, if the person's design activities relate only to a sewage system to be constructed by that person if the person is registered under Article 3.3.3.2.

3.2.4. Qualifications – Persons Engaged in the Business of Providing Design Activities to the Public

3.2.4.1. General

- (1) Except as provided in Sentences (3) and (4), every person engaged in the business of providing *design activities* to the public must have the following qualification:
- (a) the person must be registered with the *director*.
 - (2) A registration shall be in a form established by the *director*.
 - (3) A person is exempt from the requirement to comply with the qualification in Sentence (1), if the person's *design activities* relate only to,

- (e) a *sewage system* to be constructed by that person if the person is registered under Article 3.3.3.2.

What does this all mean?

If you are a licensed sewage system installer, you are exempt from having to register as a third-party designer, and you are exempt from having to carry errors and omissions insurance for providing design activities. However, this exemption only applies when the sewage system is being designed and installed by the same firm.

A sewage system installer who is not also separately qualified as a designer, registered and insured to provide designs or design opinions, cannot legally provide these services if they are not the person constructing the sewage system.

Is this a regularly occurring problem?

Yes. Despite the many diligent practitioners and regulators in this province, this situation does arise. There are many examples of applications where an installer firm will provide a design and permit application to an owner and for any number of reasons, this particular installer does not end up being the installer of that system. In these cases, a new design is required by whomever is going to be doing the actual installation, or by a third-party designer, and a new application with the appropriate Schedule 1 and Schedule 2 attachments would need to be submitted and approved by the regulator.

What are the risks with not complying with these requirements?

As noted in the preceding paragraphs, the OBC requires designers to be qualified and carry insurance to cover errors and omissions, which is different than a contractor's general liability insurance. If there were to be a situation



where a system that was designed by one installer ends up being installed by a different installer, this puts the first installer into a position of providing design activities which they are not registered nor insured to provide. What would happen in this situation, if there were to be a problem with the sewage system that is determined to be a design issue as opposed to a workmanship issue related to how it was installed? If the owner pursues legal action, who is responsible? This situation would expose both of the installer firms, the regulator and the owner to financial and reputational risks.

The lines of design responsibility can be furthered blurred when we consider activities such as reviewing an existing sewage system and providing an opinion of its design capacity relative to the building code, for the building being serviced. This is a design activity. If an installer firm is providing this type of design capacity assessment and they are not the installer of the sewage system in question, the exemption does not apply. In these situations, the installer must be qualified, registered and insured as a third-party designer to provide this type of design opinion. Installers who portray themselves as qualified designers may need to exercise caution so as not to be conducting activities outside their scope of qualifications under the OBC.

If an installer firm regularly does design activities but relies entirely on the installer exemption, carrying the additional qualification and insurance as a designer would be something to consider. When a situation goes sideways, the finger-pointing begins and having the designer qualification and carrying the necessary errors and omissions insurance is a method of protecting the installer, their business, and the client. It is incumbent on all industry practitioners (designers, installers, regulators) to be diligent in following these requirements as prescribed in the act and the code.

Informed Clients Make Better Decisions

Ultimately, there is nothing wrong with operating under a valid exemption provided by the OBC, nor is there anything wrong with obtaining additional qualifications and carrying professional design insurance beyond the minimum requirements. What is important is that practitioners accurately represent their qualifications, the legal authority under which they are providing services, and whether they carry insurance applicable to the activity being undertaken. Clients can then evaluate the experience, qualifications, insurance coverage, and value offered by different service providers and make informed decisions based on their own priorities and risk tolerance. Transparency promotes trust, supports professionalism within the industry, and allows the marketplace to determine the value of the services being offered.



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Intermediate Design Training Course *Recap*

Our newest Intermediate Design training course brought together 21 attendees from across the industry, including installers, designers, engineers, suppliers, and maintenance professionals. The session built on key Intro to Design concepts and gave participants practical opportunities to strengthen their skills through flow calculation examples, flow balancing scenarios, alternative solution walkthroughs, and hands-on workshop exercises.

A key takeaway was that good design improves with practice, exposure to a variety of situations, and a willingness to gather more information when needed. Participants explored how different scenarios may call for different approaches, reinforcing that one size does not fit all.

The group was highly engaged throughout the course, asking thoughtful questions and contributing to lively discussion. Their enthusiasm helped make the training a valuable and interactive learning experience for everyone involved.



Good design improves with practice, exposure to a variety of situations, and a willingness to gather more information when needed.



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Meet OOWA's 2026-2027 Newest Board Members

We are grateful to our outgoing Board member, Katherine Rentsch. Katherine served on the OOWA board first in 2008-2010, again 2012-2014 and most recently 2022-2025, holding the role of Vice President for two years. As a testament to her dedication to the Association, Katherine remains involved in the Governance committee, contributing her knowledge from many years of being involved, including in her role as Secretary in earlier years. She also continues to participate in several other committees and task groups and remains committed to her role as an instructor of several of OOWA's training courses throughout the year. We are incredibly grateful for her hard work and dedication towards the organization.

Each year OOWA holds elections for our Volunteer Board of Directors. This takes place at our Annual General Meeting, held at the Annual Convention & Expo. Attendance and voting was available both in-person or online.

OOWA's Board of Directors is pleased to welcome Jameson Gallinger, Waterloo Biofilter Systems Inc., to the board. With almost 20 years experience in the industry and a passion for protecting Ontario's groundwater resources, we look forward to Jameson's contributions to the association.

OOWA's Board of Directors would like to thank the Executive Committee members for their continued dedication to ensuring smooth operations on behalf of the board.



Jameson Gallinger

Production Manager
Waterloo Biofilter Systems Inc.

*The new Board
and Executive
team wish you
a prosperous
summer season!*



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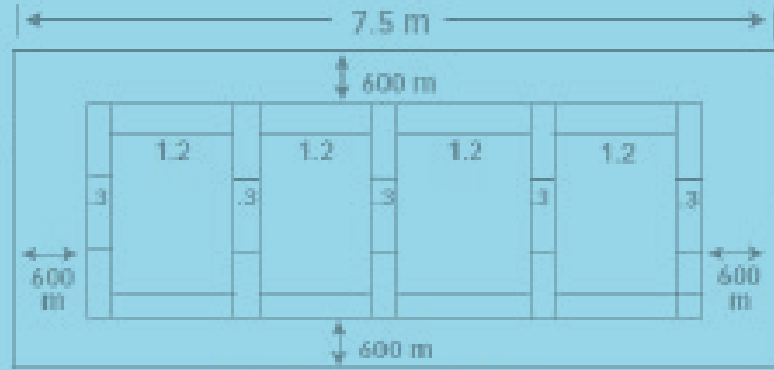
The Board of Directors is always interested in hearing from our members. If there is something you would like to share with any of our volunteers, contact the office and we will connect you.

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Greywater Systems

A much-anticipated addition to OOWA's Guidance Document series

After considerable time, discussion, and technical review, OOWA is pleased to release the newest addition to our Guidance Document Series: Greywater Systems.

Produced by the Onsite Technical Committee, this guidance document provides an overview of greywater systems in Ontario, including regulatory requirements, design considerations, system configurations, and emerging approaches to water reuse.

Greywater systems have long been an important option for certain properties and applications, particularly cottages, remote properties, hunting camps, and workshops where a conventional onsite sewage system may not always be the most practical solution. By separating greywater from toilet waste, these systems can provide a smaller-footprint approach to managing a portion of a property's wastewater.

A resource for designers, practitioners, and regulators

The new guidance document brings together information on the current Ontario regulatory framework for Class 2 sewage systems, including applicable Ontario Building Code requirements for design flow, construction, maximum sewage flow, and sizing. It also explores practical design considerations such as site conditions, soil characteristics, groundwater and bedrock, available space, clearance distances, and the quality and sources of greywater.

The document also looks beyond the traditional vertical greywater pit, discussing horizontal or linear configurations and factors that may influence the orientation and layout of a system. A case study illustrates how design flow, loading rate, and sidewall area are used to work through a greywater system design.

As water reuse continues to gain attention, this document also provides an introduction to emerging trends and existing standards and guidelines related to greywater reuse and non-potable water systems.

We want to hear from you

This document has been a long time in the making, and we know it has been much anticipated by OOWA members and the broader onsite wastewater community.

Now that it's here, we want your feedback.

As with all OOWA Guidance Documents, this is a living document. Our guidance is intended to evolve alongside changes in regulations, technology, industry practice, and our collective understanding of onsite wastewater management.

We encourage members to review the document and share their comments, questions, suggestions, and practical experience. Whether you have identified something that needs clarification, have a different perspective on a design approach, or have experience that could strengthen future versions, we want to hear from you.

Your feedback helps OOWA ensure that our guidance remains useful, relevant, and grounded in the realities of onsite wastewater practice.

Read the new Greywater Systems Guidance Document by [visiting our website](#).

Thank you to the members of the Onsite Technical Committee and everyone who contributed their time and expertise to bringing this document to completion.

We look forward to continuing the conversation — and continuing to improve this guidance with your help.



Installers Corner

Paul Saffioti

What is the name of the business or organization that you represent?

Colron Excavating

Who are the business owners? (if applicable)

Paul Saffioti, Jordan Walker

What is the service area?

Ottawa, Cumberland, North Grenville

In your opinion, what do you see as the three most challenging technical issues faced by septic system installers today?

1. Lack of meaningful building code changes
2. Unlicensed/inexperienced installers
3. Material costs

Briefly, how might these be addressed?

1. Complicated, maybe a panel that could review and request changes.
2. Require further licensing and training for new installers, including on-site training. Make installers a licensed trade similar to plumbers/electricians. Heavier fines for home owners and contractors installing without a permit and/or license
3. Incentives for preferred installers

What advice would you give to contractors wanting to make a go of installing septic systems?

Research, join OOWA, collaborate with other installers.

What would be the most impactful thing that OOWA could do to improve the industry?

Help make changes listed above.

How do you communicate homeowner operation and maintenance responsibilities to your clients when the install is complete?

We usually communicate this before we even begin the job, in the consultation and pricing phase. We also explain how the system and maintenance works upon completion.



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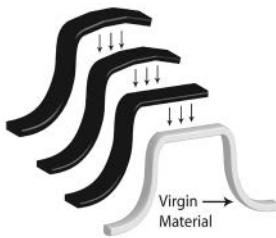
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Hip-hip-hOOWA! Building safety through collaboration

Originally published on Ministry of Municipal Affairs and Housing LinkedIn channel

By Municipal Affairs and Housing / Affaires municipales et Logement

[See original article](#)

June 4, 2026

Building safety is the result of many disciplines working together (often quietly and behind the scenes) to protect the health and well-being of our communities. While conversations about building safety typically focus on structural integrity, fire protection and health, a fundamental component is often overlooked: wastewater management.

Proper wastewater management ensures building sewage systems remove pathogens and harmful viruses, prevent backups and flooding, meet all health and safety requirements, and protect the environment. When wastewater is not managed effectively, the consequences can be significant, posing serious health risks to residents and the environment. Because of this, Ontario's Building Code has comprehensive requirements for its onsite wastewater systems, supported by the Building Code Policy Development (BCPD) team.

Led by Manager James Ross, BCPD's partnership-driven approach and close collaboration with industry stakeholders has delivered meaningful improvements to building systems, including onsite wastewater systems.



James Ross speaking at the Ontario Onsite Wastewater Association's (OOWA) annual conference.

Good to know: Onsite wastewater systems are more commonly known as septic tanks or septic systems.

An award-winning team

The team's commitment to collaboration did not go unnoticed when it was recently recognized with the Best Collaborator Award (2025-2026) at the Ontario Onsite Wastewater Association's (OOWA) annual conference.

OOWA is a non-profit organization representing Ontario's onsite and decentralized wastewater industry. OOWA annually recognizes industry experts whose commitment and achievements reflect the association's vision of promoting onsite wastewater systems treatment as reliable, effective and permanent servicing solutions.

The ministry's onsite wastewater system team, which includes five members with policy and technical expertise, works closely with OOWA on Building Code updates relating to onsite wastewater management, plus advancing education and safety awareness. According to James, the award came as a surprise, but he was honoured that the collaboration between his team and OOWA was recognized by the OOWA executive committee.

Improving septic safety

2025 was a notable year in collaboration between BCPD for many reasons, but supporting the first joint Septic Awareness Week (Sept. 15–19, 2025) between the two organizations was a key moment. BCPD and MMAH Communications worked in close collaboration with OOWA's communications team to ensure consistent and aligned messaging across various social media platforms during the week.

Examples of social media messaging during Septic Awareness Week

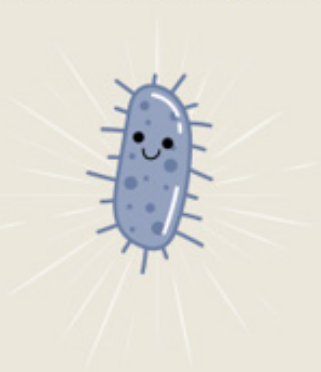
James and Team Lead Penny Carter also reflect on another significant and deeply impactful project — one that emerged from a tragic incident in which a toddler lost her life after falling into a septic tank.

Penny, who attended the coroner's review, describe the experience as profoundly challenging.



"Our role is to help ensure this never happens again. The issue affected the entire industry."

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“Hearing from the family about the loss of their daughter, its impacts and consequences was emotional, but it reinforced how important this work is. Our role is to help ensure this never happens again.”

Collaboration that builds trust — and results

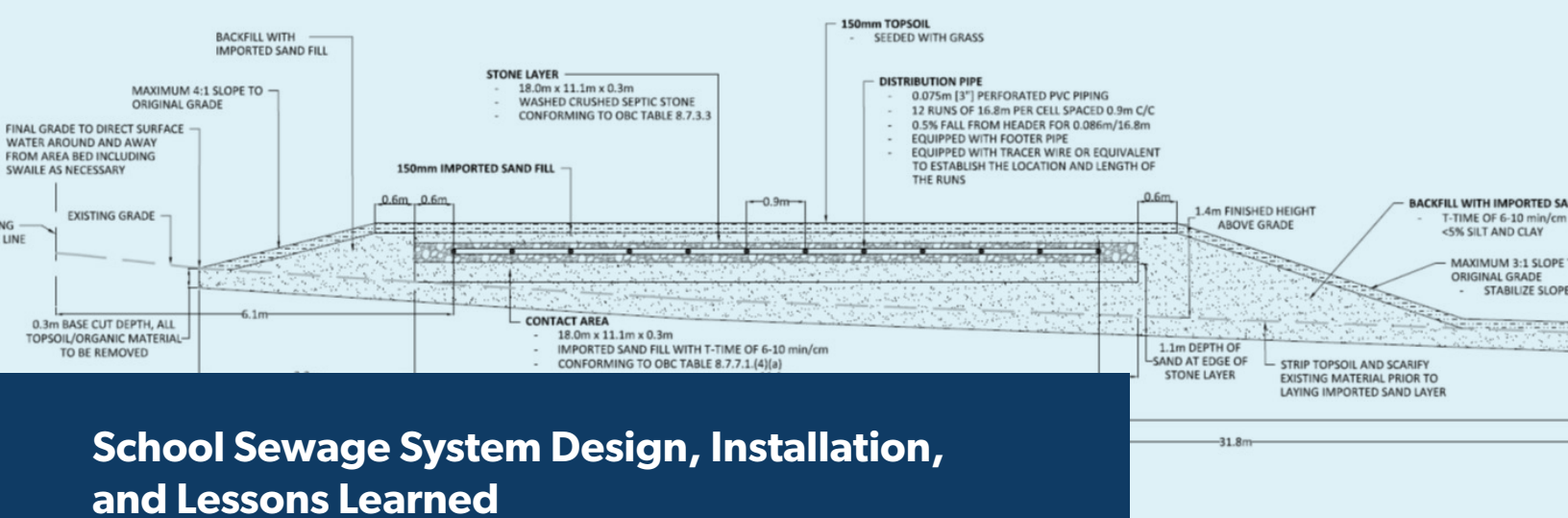
Going far beyond annual communications initiatives, BCPD conducts monthly meetings with OOWA and other partners to discuss progress on initiatives. Collaboration is not limited to virtual meetings. Penny says it also includes

in-person working groups and, at times, simply picking up the phone or sending an email to confirm technical details. Additionally, the unit actively participates in industry conferences to reinforce trust with partners.

James emphasizes that OOWA's Best Collaborator Award reflects the team's collective effort and broader commitment to improving safety.

“For me, it confirms that we should keep doing what we're doing as it appears to be working,” says James. “In government, our job is to provide sound advice, implement direction, and support good outcomes for Ontarians. To do that well, we need strong relationships with associations like OOWA to understand practical needs, strengthen our work, and build trust. This recognition reinforces the value of that approach.”





School Sewage System Design, Installation, and Lessons Learned

By Stew Dolstra, B.Sc., Hon., Dipl., BCIN, Water & Wastewater Group Manager

A school in Quinte West was in the process of planning for the construction of an addition. The school lies outside the municipal sanitary sewage service area, and the existing on-site sewage system condition and capacity was, unfortunately, not considered early in the process. Regardless, Cambium was retained and quickly determined the existing sewage system was undersized and reaching its end of useful life. As such, we were on our way down the Ministry of Environment Conservation & Parks (MECP) Environmental Compliance Application (ECA) path since the design flow of the school is approximately 28,500 L/day.

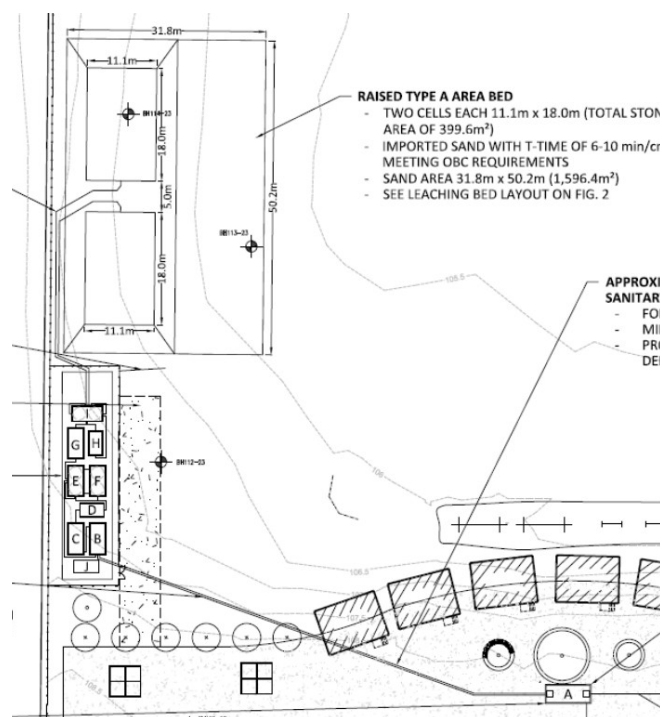
Our approach began with a field investigation including a topographic survey, boreholes, and sewage strength assessment. The soil samples (analyzed in our own soils lab) exhibited a percolation rate of 35 min/cm and spring groundwater approximately 1.3 m deep.

Although we had a late start to this project, we were fortunate to work with a strong team of consultants, an architect, a planner, and school board staff to work towards obtaining site plan approval under the condition of obtaining the ECA prior to obtaining occupancy for the addition.

With the local authorities satisfied and site assessment results in hand we proceeded with the water resource impact assessment (WRIA) and preliminary design. Based on diligent water use records from a school with similar occupancy as the project school (upon addition completion) we were able to calculate the peak daily actual flow of 18,000 L/day. This lower peak design flow is of course certainly favorable from a system size and capital cost perspective. We collected sewage samples from the existing sewage system for laboratory analysis and utilized sewage sample results from other schools within Cambium's sampling network to characterize the sewage quality. Overall, the sewage quality was at the higher end of domestic strength with the exception of total kjeldahl nitrogen (TKN) which was much greater than domestic strength.

Considering the sewage strength, design flow, and area available, the preliminary design included a raw sewage flow balancing tank conveying sewage to a Waterloo Biofilter advanced treatment system complete with anaerobic digester tanks, biofilter tanks, and denitrification tanks. A fully raised two cell Type A area bed with extended sand mantle was selected for dispersal. The

treated effluent objectives included 10 mg/L for TSS and CBOD5 and 20 mg/L for nitrate.



The WRIA included a review of municipal source water protection resources, MECP Reasonable Use Concept (RUC) groundwater nitrate assessment, and surface water total phosphorus loading assessment. While the site had no municipal source water protection issues, the RUC calculation determined that the nitrate concentration at the downgradient property boundary did not meet the MECP criteria. Although an effort was made to negotiate that the replacement system would be considered a nitrate loading betterment due to location and advanced treatment, the MECP hydrogeologist reviewer was not satisfied sufficiently.

Cambium's assessment determined no appreciable phosphorus impact on a watercourse approximately 235 m from the system based on relatively favorable soil and subsurface conditions (iron and aluminum rich).

While the reviewers generally agreed there would be no appreciable impact on groundwater and surface water receivers and requested no additional treatment, they did require a 2-year monitoring program to verify with a groundwater monitoring well and surface water sampling program.

With the MECP consultation completed, Cambium worked with Waterloo Biofilter utilizing Brooklin Concrete products to prepare the design drawings and design brief suitable for the ECA application. This included the advanced treatment tanks, control building, and a large heavy rated deep burial balancing tank to receive gravity flow from three sanitary sewers. The design also incorporated groundwater mounding and tank buoyancy calculations based on the design and site conditions. The calculation results indicated no concern with mounding or tank buoyancy.



The ECA application package was submitted and while the application sat in the review queue, Cambium moved forward with coordinating with the other engineering consultants, architect and school board to prepare and issue tender drawings as part of the over-all addition project. The ECA was issued approximately 5 months following submission which is considered speedy compared to the MECP 12-month "service standard".

The ECA was approved, site plan approval obtained, drawings issued for construction, and general contractor retained, the construction began. Construction was strategically phased to avoid school interruption with the majority of the sewage system installation being completed while the existing system

was temporarily kept in use and finished in the summer months to avoid interruption of school activities.

Cambium completed the installation inspections and communicated with the general contractor, sewage system subcontractor as well as the school board and architect as progress proceeded. With so many interested parties involved, miscommunication resulted in the initial sand fill in the area bed placed without sub-grade inspection. Luckily, the contractor had documented the subgrade condition with photos depicting the scarification and prepared subgrade as specified. In addition, during construction the school board requested the balancing tank to be relocated to a more aesthetically and operationally preferred location. As such, between Cambium and the other interested parties we were able to relocate the tank without any serious delay to the project.



At the eleventh hour, at the end of August, the system was commissioned successfully!



The biggest lesson from working in a scenario with many interested parties is the importance of clear, concise, documented communication and to always follow up on action items.

A large hurdle in this specific project was working with interested parties including the architect, school board, and general contractor who had not worked on a project that required an ECA for a large on-site sewage system. Extra effort was needed on our part to listen to and educate all parties. Luckily, all of those involved stayed curious and were happy to learn about the entire process.



ABOUT THE AUTHOR

Stew Dolstra is the Water & Wastewater Group Manager at Cambium Inc. with over 17 years of experience with on-site drinking water and sewage system inspection, design, and compliance consulting.



OOWA in Southwestern Ontario

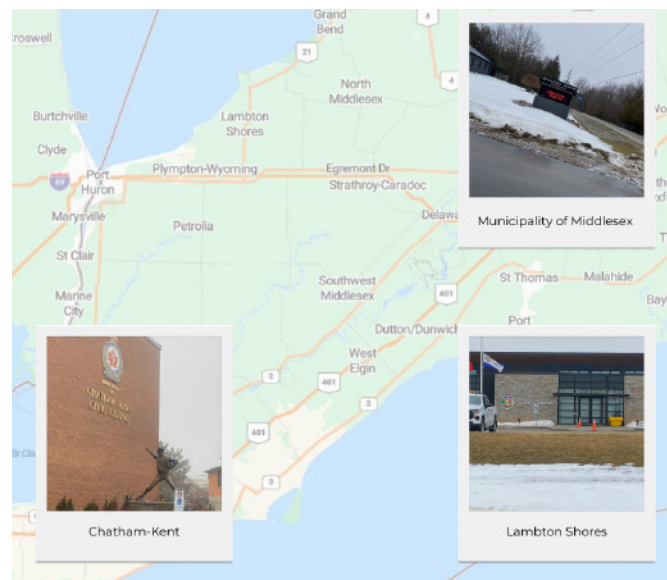
Regulator Outreach

Earlier this year, OOWA visited nine municipal offices across Southwestern Ontario to strengthen relationships with local regulators and increase awareness of our homeowner and professional resources.

Each visit provided an opportunity to share educational materials and highlight OOWA's role in supporting responsible onsite wastewater management across the province.

Municipal staff were welcoming and expressed strong interest in continued engagement. Several offices also identified a growing need for homeowner education and indicated they would welcome future opportunities to collaborate with OOWA through information sessions and resource sharing.

This outreach has helped expand OOWA's presence in Southwestern Ontario and supports our ongoing efforts to build relationships, share resources, and encourage long-term membership growth.

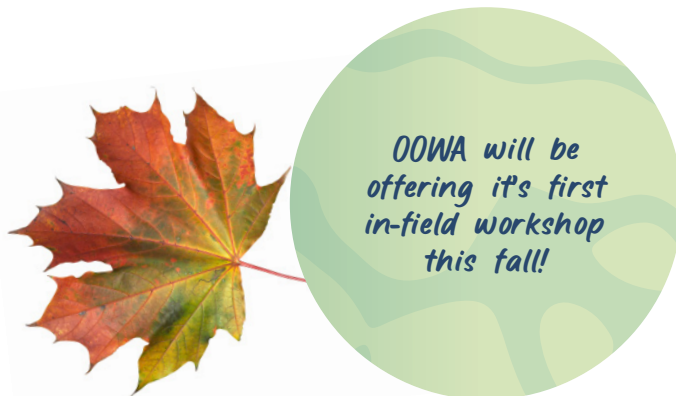


Feedback Leads to an In-Field Workshop

OOWA's previous membership coordinator, Tiffany, invested significant time connecting with people across the industry, including current members, former members, and individuals who had not yet joined the association. A number of these conversations took place in Southern Ontario and highlighted a strong interest in training opportunities, particularly among those entering the industry and seeking practical, hands-on learning.

These discussions reinforced an ongoing education gap within the industry and confirmed the value of OOWA's efforts to help address that need. In response, we are pleased to host our first in-field demonstration workshop this fall in Goderich, Ontario.

The workshop is designed to give participants a practical look at septic system installation from the ground up. Attendees will rotate through key site stations, hear from experienced installers, and gain real-world insight into design, soil evaluation, installation practices, safety expectations, and site coordination. This hands-on learning opportunity is well suited to professionals looking to strengthen their field knowledge in a live project setting.



Regional Meeting 2027

In early 2027, OOWA will host a regional meeting at the BMO Centre in London as part of our annual series. These meetings provide an opportunity for members and non-members alike to come together, network, and learn from one another.

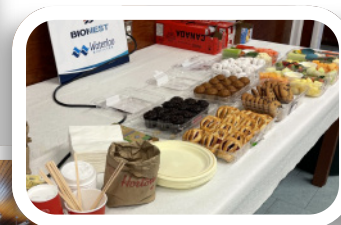
This event will feature a presentation titled “Preparing to Estimate,” which will introduce a practical framework for assessing site-specific factors that influence onsite wastewater system projects. The presentation organizes key considerations into five categories including Design Flow & Use, Soils, Water, Accessibility, and Serviceability, and demonstrates how these factors can be translated into consistent, accurate project quotations for new builds, replacements, and retrofit projects.

OOWA is excited to continue building relationships and strengthening engagement with communities, regulators, professionals, and homeowners in the southernmost areas of our province. We look forward to maintaining this momentum through meaningful outreach, practical education, and ongoing collaboration that supports the needs of the onsite wastewater sector across the region.



2027 REGIONAL MEETING SERIES

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MEMBER Profile Questionnaire

Dave O'Malley

Brooklin Concrete

Name of Organization: Brooklin Concrete

Services/Mandate: Manufacturer of concrete tanks and supplier of multiple tertiary systems.

Service Area: Ontario

Number of Years in Role: Eighteen

Dave O'Malley

What got you started in the onsite wastewater industry?

Hired as an Inside Sales Rep which turned into a Sales position

Give us one reason/secret for your success.

Honesty. Whether it's why the customer wants to hear or not, you should never be dishonest with a customer.

What was the most challenging onsite job you worked on or participated in?

Almost every job has some sort of a challenge with it. The best way to overcome these challenges is to work closely with the customer, delivery driver, and anyone onsite.

If you could change one thing about the onsite/decentralized industry, what would it be?

Honestly, I'm not sure what I would change. Everyone is great to deal with. Even employees from other manufacturers are always friendly down for a good chat.

Where do you see the onsite industry going?

With the increasing costs of purchasing a home, I see this industry going to more communal systems throughout Ontario to satisfy "tiny home" communities.



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Smarter Biology for Resilient Ontario Onsite Systems

Understanding the Microbial Ecology Behind Odour Control and System Performance

Written by Rick Esselment, Founder and President of ESSE Canada

Ontario's onsite wastewater systems serve hundreds of thousands of homes, cottages, and small businesses. While many discussions about system performance focus on hydraulic loading, maintenance schedules, or treatment technologies, one of the most important factors is often invisible: the microbial community within the septic tank itself.

The biology inside a septic tank determines not only how effectively organic waste is stabilized, but also influences odour generation, infrastructure durability, and the quality of effluent reaching downstream treatment components.

The Biology of a Septic Tank

A conventional septic tank functions as an anaerobic bioreactor. As wastewater enters the tank, solids settle to form sludge while fats, oils, and grease accumulate as scum. Within this environment, naturally occurring microorganisms break down organic matter through several stages.

Complex organic compounds are first hydrolyzed into simpler molecules before being fermented into volatile fatty acids. Under stable conditions, methanogenic archaea convert these intermediate products into methane and carbon dioxide. This final stage of anaerobic digestion helps stabilize waste while reducing the organic load entering soil absorption systems or advanced treatment units.

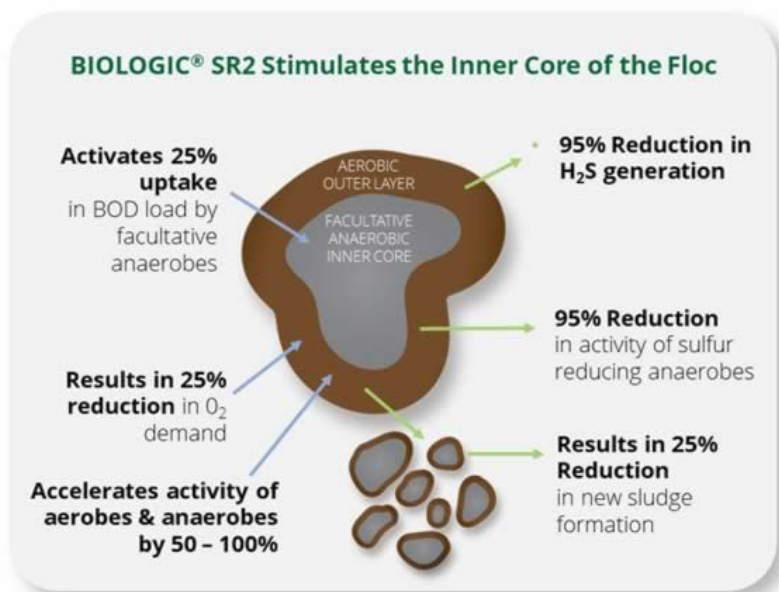
When this biological process functions efficiently, wastewater leaving the septic tank generally contains lower concentrations of biodegradable organic material and suspended solids, reducing stress on downstream treatment components.

When Microbial Competition Changes the Outcome

Not all microorganisms within a septic tank contribute equally to desirable treatment outcomes. Sulfate-reducing bacteria (SRB) occupy the same oxygen-limited environment as methanogens and compete for many of the same carbon sources.

Instead of producing methane, these organisms generate hydrogen sulfide (H_2S), the gas responsible for the characteristic "rotten egg" odour associated with failing or poorly balanced septic systems.

Hydrogen sulfide creates more than an odour nuisance. As it migrates into aerobic areas such as tank headspaces, piping, pump chambers, and distribution structures, naturally occurring sulfur-oxidizing bacteria convert it into sulfuric acid. Over time, this process contributes to biogenic corrosion of concrete, mortar, and reinforcing steel—a common maintenance concern in aging wastewater infrastructure.



Suboptimal biological performance can also result in higher concentrations of biochemical oxygen demand (BOD), chemical oxygen demand (COD), and total suspended solids (TSS) entering downstream treatment systems. Increased loading may accelerate biomat development in soil absorption systems, reduce treatment efficiency, and shorten the service life of onsite infrastructure.

Supporting Native Biology

Research in biological wastewater treatment has increasingly focused on supporting the microorganisms already present within treatment systems rather than introducing new bacterial cultures.

One approach involves providing targeted micronutrients or other biological supports that encourage the activity of desirable native microbial populations. By improving conditions for methanogens and other beneficial anaerobic organisms, it may be possible to shift microbial competition away from sulfate-reducing bacteria.

This approach does not sterilize the system or eliminate unwanted organisms entirely. Instead, it seeks to encourage a more balanced microbial community that naturally favours efficient digestion while reducing hydrogen sulfide production.

Because these strategies work with existing microbial populations, they may provide stable performance across a variety of operating conditions, including seasonal occupancy, variable loading patterns, and the temperature fluctuations commonly experienced in Ontario.

Potential Benefits of Improved Biological Balance

When the microbial community within a septic tank functions efficiently, several operational benefits may follow.

Reduced hydrogen sulfide production can improve working conditions during maintenance activities while minimizing nuisance odours around treatment systems.

Lower hydrogen sulfide concentrations may also reduce the production of sulfuric acid responsible for concrete corrosion, potentially extending the service life of tanks, pump chambers, and other infrastructure.

More complete anaerobic digestion can improve the breakdown of fats, oils, grease, and other organic materials, reducing sludge accumulation rates while recognizing that

routine pumping remains essential for removing inorganic solids and maintaining system capacity.

Improved digestion may also result in cleaner effluent with lower BOD, COD, and TSS concentrations. This reduces loading on downstream treatment components, including advanced treatment units, media filters, and soil absorption systems, supporting more reliable long-term performance.



Biological Management Is One Part of Good System Maintenance

Biological optimization should be viewed as one component of a comprehensive maintenance program rather than a replacement for established best practices.

Regular inspections, routine septic tank pumping, effluent filter cleaning, water conservation, and proper system use remain the foundation of successful onsite wastewater management. Biological strategies are intended to complement these practices by supporting the natural treatment processes already occurring within the system.

Working With Biology

Ontario's onsite wastewater systems perform best when management practices align with the biology that drives treatment. Understanding how microbial communities influence odour generation, corrosion, sludge accumulation, and effluent quality allows practitioners to make more informed maintenance decisions.

As research into onsite wastewater treatment continues to evolve, biologically informed management strategies represent another tool that may help improve system resilience, protect valuable infrastructure, and support the long-term performance of onsite wastewater systems throughout Ontario.



ABOUT THE AUTHOR

Rick Esselment is the Founder and President of ESSE Canada, a family-owned Ontario company specializing in septic system performance management, warranty, inspections, compliance, and advanced treatment solutions. With a BSc in Biology and extensive expertise in onsite wastewater microbiology and public health, he is a longtime OOWA leader (Past President, Vice President, and board member) who advocates for resilient, managed decentralized wastewater systems across the province.

Wastewater Basics and Biological Health & Safety Awareness Course *Recap*

As we continue our mission to provide more educational opportunities to the communities we serve throughout Ontario, OOWA brought the show on the road to the Newmarket Public Library on June 3, 2026; where we hosted two separate educational workshops.

The morning session, Wastewater Basics: Terminology, Process and Sampling Techniques, hosted by instructor Anne Egan of RJ Burnside & Associates, provided practitioners in the onsite wastewater industry with an understanding of the basics of wastewater treatment processes that occur in onsite systems. Topics included explanations of onsite wastewater and soil treatment process theory, terminology, treatment objectives and how different systems can achieve those objectives. The course also included an overview of sampling techniques, including where, when, and how to sample, types of samples, and interpreting results.

The afternoon workshop, Biological Health & Safety Awareness, hosted by instructor Rick Esselment of ESSE Canada, covered a myriad of Health & Safety need-to-knows including the microbiology of wastewater hazards, risk analysis for health & safety of workers, considerations for risk mitigation, planning and personal protection, and the impacts of pathogen transfer through cross-contamination to coworkers, clients and the public.

The workshop not only highlighted the importance and value of pathogen removal in onsite wastewater treatment processes, but also the inherent risks working in the industry that must be addressed for occupational health and safety.

The interactive instruction was both informative and well-received. Attendees truly appreciated the use of real-life examples, which sparked valuable group discussion and inquiry while providing a practical, fundamental understanding of the importance of Health & Safety.

What Participants Said:



"It was obvious both of the instructors had both a knowledge and passion for their industry!"



"I walked away from these workshops with a greater understanding of both the basics of wastewater treatment and the importance of health & safety requirements."



"I think these courses should be standard learning for anyone entering this industry."

When asked if they would recommend the course, the answer was not only a yes, but one attendee remarked:

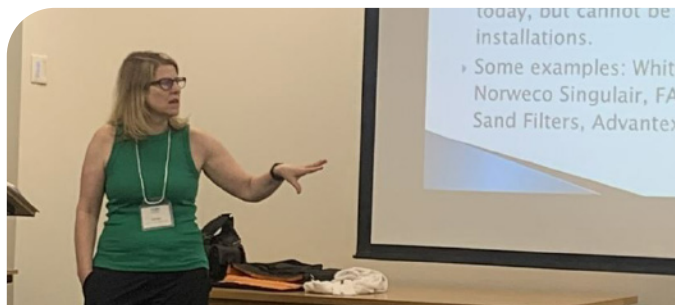


"This was great! I can't wait to attend the next training workshop hosted by OOWA."

OOWA is proud to offer high-quality training opportunities that directly support the professional development of our industry. Our next course, Introduction to Design of Onsite Sewage Treatment Systems, is scheduled for Thursday, October 22, 2026, in Peterborough, Ontario. This one-day course will once again be led by Eric Kohlsmith, Part 8 CBO with the Rideau Valley Conservation Authority.

Registration is now open:

visit www.oowa.org/events for details and to secure your spot.



“ On Instructor Anne Egan:

“It was obvious both of the instructors had both a knowledge and passion for their industry.”

“As a woman in this industry, it was great seeing another woman setting the path for others to follow.”

“Anne was great! Smart, concise, and easy to follow.”

“ On OOWA Staff

“Accommodating, helpful, and friendly.”

“Pleasant and organized.”

“Very good and informative.”



“ On Instructor Rick Esselment:

“Funny, engaging, and highly relatable. An excellent educator.”

“The perfect mix of substance and style.”

“Made me appreciate the importance Health & Safety plays in this industry.”



Par for a Purpose

Join us for OOWA's 2nd Annual Golf Tournament!

Mark your calendars for Thursday, October 1, 2026, and join us at the beautiful Smuggler's Glen Golf Course in Lansdowne, Ontario, for our 2nd Annual Golf Tournament.

After the incredible success of our inaugural tournament, we're excited to tee off once again in support of our Scholarship Program. Thanks to the generosity of our golfers, sponsors, and volunteers, last year's event exceeded our fundraising goal of \$5,000. Those funds are helping make educational opportunities possible for deserving students, and we're hoping to achieve—or even surpass—that success again this year.

Whether you're an experienced golfer or simply looking for a fun day on the course while supporting a meaningful cause, we'd love to have you join us. Every registration, sponsorship, and donation of raffle prizes helps invest in the next generation of innovative industry leaders.

We're also seeking raffle prize donations to help make this year's event even more exciting. Gift baskets, gift cards, merchandise, services, experiences, or other raffle items are all greatly appreciated. Your generosity helps increase our fundraising efforts and directly supports our scholarship program.

Together, we can make a lasting impact one swing at a time.

*Par for a Purpose
because every drive helps build
a brighter future.*

Event Details:

Date: Thursday, October 1, 2026

Location: Smuggler's Glen Golf Course,
418 Thousand Islands Pkwy,
Leeds and the Thousand Islands,
ON K0E 1L0

Time: Registration opens at 12:00 PM;
Shotgun start at 1:00 PM

Registration Includes: 18 holes of golf with a power cart, dinner, contests, prizes, giveaways, and invaluable networking opportunities with industry peers. (Lunch will be available for purchase at the course.)

* This is an open tournament, so whether you're an OOWA member or not, we encourage you to bring a friend, colleague, or your spouse for a fantastic day out. If you're new to OOWA, this is a perfect chance to meet seasoned professionals. Let us know if you'd like to be matched with an experienced member!

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Showcase your commitment to education and the future of our industry by becoming a sponsor. We still have many great opportunities available! Please contact Krista at op-coordinator@oowa.org to learn more.

ONTARIO ONSITE WASTEWATER ASSOCIATION GOLF TOURNAMENT

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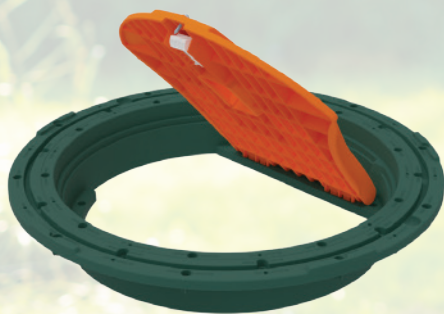
Registration deadline: September 14

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- **Percentage of proceeds go to our scholarship fund**
- **Register online at oowa.org/events**
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For more information or sponsorship opportunities,
please contact Krista at op-coordinator@oowa.org

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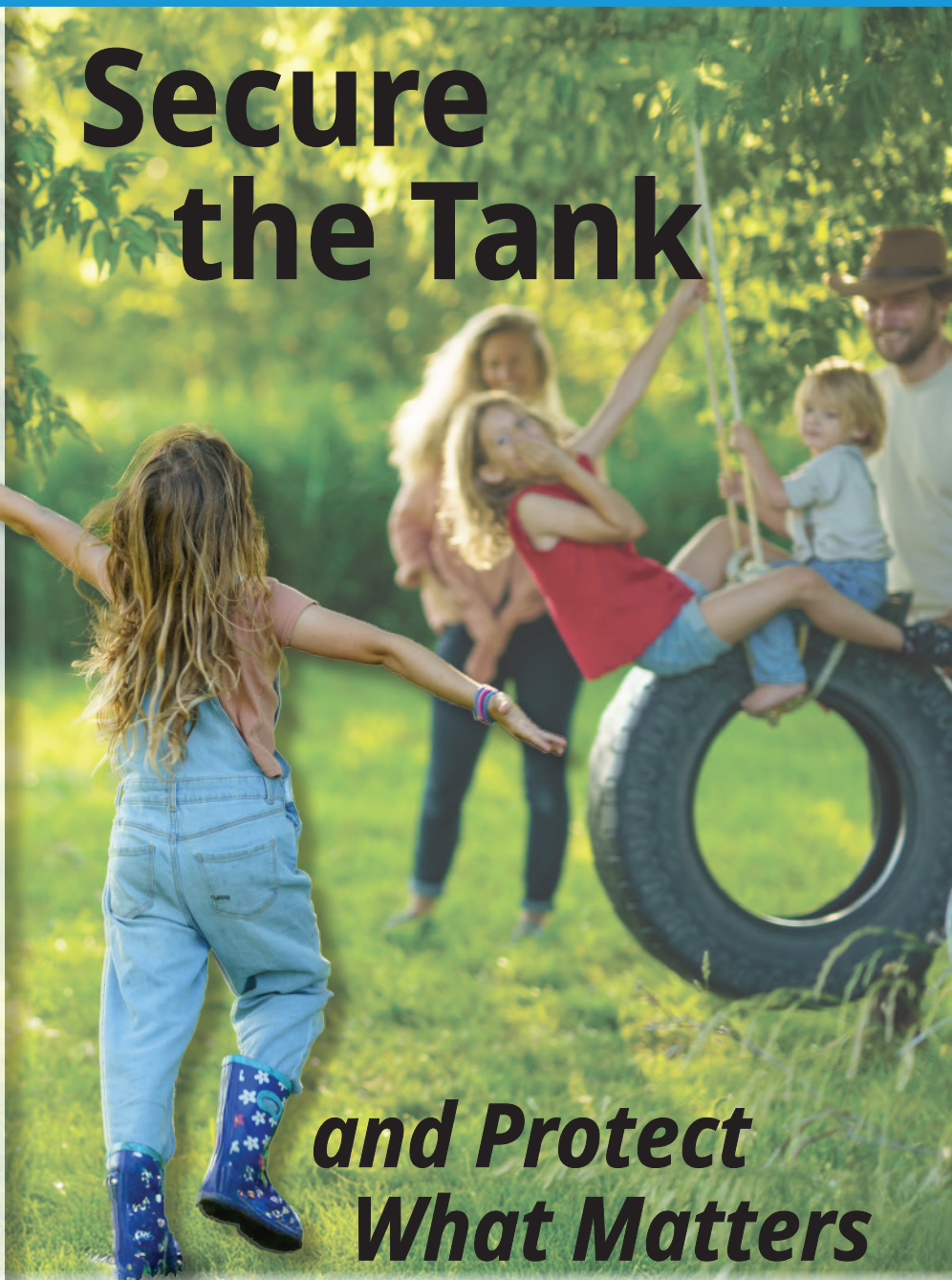
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