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InSide

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OOWA AT NOWRA

Doug Joy

The 14th annual NOWRA conference was held in Cleveland Ohio from October 9 to the 14th. A number of OOWA members (including a few OOWA board members) attended this annual event and took in a range of interesting talks, meetings and met with a large number of exhibitors. Chris Kinsley presented his work on water softeners that appeared in our last newsletter at the day-long forum on water conditioners and their affects on treatment systems.

The theme of the 2005 conference was "Removing Barriers" to Decentralized Wastewater, something that is equally important to us in Ontario as for the US. What we learned was that, while we have a lot to improve in Ontario, there are many locations that are in more difficult situations with regards to on-site as we are. Barriers exist on both sides of the border. The need for systematized operation and maintenance is as recognized in the US as we have been trying to make it here.

Some jurisdictions in the US are moving to performance-based codes (Florida and parts of Minnesota are but two) similar to what we might eventually reach when objective based-codes are introduced in Ontario. Interestingly, in these jurisdictions there is a much higher training requirement than in Ontario plus the requirement for ongoing education for someone who is to remain active.

On the other side the situation in parts of Ohio, for example, are not so good. In one county of the some 14,000 on-site systems, nearly 10,000 discharge to the surface with no more than treatment by a septic tank. Needless to say, they are moving to correct the situation with aggressive changes. Among these are required, annual inspections. A permit to have an on-site system requires the homeowner to pay an annual fee of $60 (in U.S. funds no less) to pay for the program. Although you might expect some opposition to this by the homeowner, nearly 97 percent paid in the first year without question. In addition, any replacement system must meet higher standards than had been in place before and, as a result, over 70 percent of the new systems going in are advanced treatment systems of some type. If they still surface discharge, as many must because of small lots and poor soils, they must disinfect prior to release.

There were a number of unique and interesting products being flogged in the exhibit booth. Some looked good and some looked a little more questionable. Perhaps the most interesting to me was pointed out by board member Kirk Hastings. "You gotta see the coconut treatment system," he said. This was a treatment system in which the filter media was strands of fibre from the outside of dried coconut husks. Apparently this is a waste material and not subject to the price fluctuations of the oil markets. As sceptical as I was to begin with, it turns out it has been certified by NSF and, I believe, meets the tertiary treatment requirements for Ontario!

Perhaps the best concept I heard was a suggestion for the maintenance schedule for a septic system: "Pump it out once every election year, you need to clean the crap out of the White House ever four years and you might as well do the same for your septic tank."

If you haven't been to the NOWRA conference I highly recommend it. While a lot of

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Husky Oil Truck Stop in Belmont, Ontario

Re-Use Sewage Treatment Plant

By: David Harsch, P.Eng. K.Smart Associates Limited
Iggy Ip, Craig Jowett, Kyle Straw, Heather Millar, Waterloo Biofilter Systems Inc.

Introduction

This paper profiles a sewage treatment system at a Husky Oil (www.huskyenergy.ca) truck stop on Highway 401 near London, Ontario, that uses the treated effluent immediately inside the facility for toilet and urinal flushing. The expansion of the facility included a larger restaurant and increase in design flow from 19,000 L/day to 56,000 L/day, thereby requiring decommissioning of the existing facultative lagoon and the construction of a new wastewater treatment system.

Space limitations, nitrogen loading, and lack of groundwater supplies required innovative design by K. Smart Associates www.ksmart.on.ca, which resulted in re-using treated sewage inside the new truck stop for toilet and urinal flushing.

The sewage design (Figure 1) included a Waterloo Biofilter (WBS) (www.waterloo-biofilter.com) and slow sand filtration (www.msfilter.com), which was a scaled-up version of CMHC's Toronto Healthy House, in which wastewater is re-used for showers and toilet flushing (http://www.cmhc-schl.gc.ca/popup/hhtoronto/water.htm).

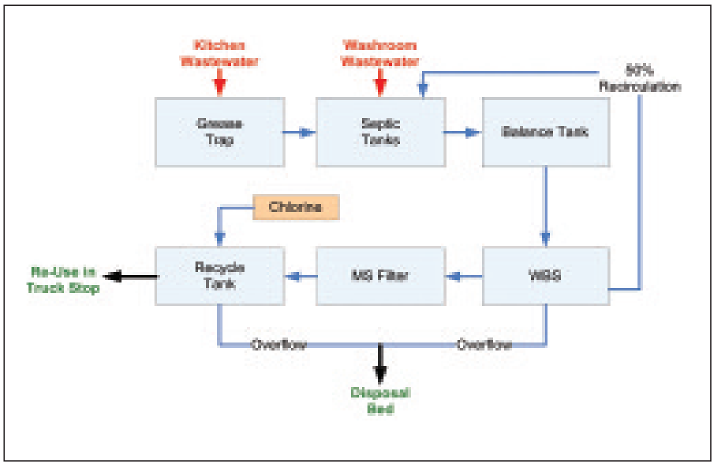

Figure 1
Husky Oil Belmont re-use system process

Grease traps intercept kitchen wastewater and prevent fats, etc. from entering the treatment system. Toilet wastewater enters the septic tanks, providing solids separation and anaerobic fermentation before exiting out into the balance tank. The balance tank is sized to store peak flows and allows the Biofilter to be dosed evenly throughout the day, providing more efficient removal of organic matter, suspended solids, and ammonium. Half of the treated Biofilter effluent is re-circulated to the septic tanks for improved treatment and denitrification.

The remaining Biofilter effluent passes through the MS Filter (ozonation, up-flow charcoal and down-flow sand filtration) located inside the treatment building and is further disinfected with chlorine before being re-used for toilet flushing inside the truck stop (Figure 2a, 2b). This polishing process removes traces of solids, disinfects, and removes the brown colour that occurs in re-used sewage due to build-up of recalcitrant lignins and tannins. To keep plumbing free from bioslime, ~0.2 ppm chlorine residual is added, and back-flow preventers are installed in the facility to operate the toilets with potable water in an emergency.

When recycled water demand is low or when the MS Filter is being overloaded, treated wastewater overflows are pumped to a disposal bed, with less water and less nitrogen than normal.

Figure 2a
Treatment plant consisting of two SC-40 Biofilter units adjacent to the building housing the MS Filter.

Figure 2b
MS Filter ozone generation unit.

Ontario Ministry of Environment Requirements

The re-use system was approved by the Ontario Ministry of the Environment (MOE), who were open to this innovative concept which alleviates several problems. It reduces the size of the in-ground disposal, reduces nitrogen loading in the ground water, and reduces the demand for potable water supply by an estimated 60-70 percent saving of water supply. A comparison of the daily mass nitrogen loading onto the environment of three systems (traditional septic system, WBS without re-use and a WBS with re-use) is shown in Figure 3.

For this toilet re-use, the MOE effluent criteria are cBOD and TSS <10 mg/L, and fecal coliforms <5 cfu/100mL. No phosphorus or nitrogen limitations are required, except to monitor the discharge to the disposal bed for nitrogen loading.

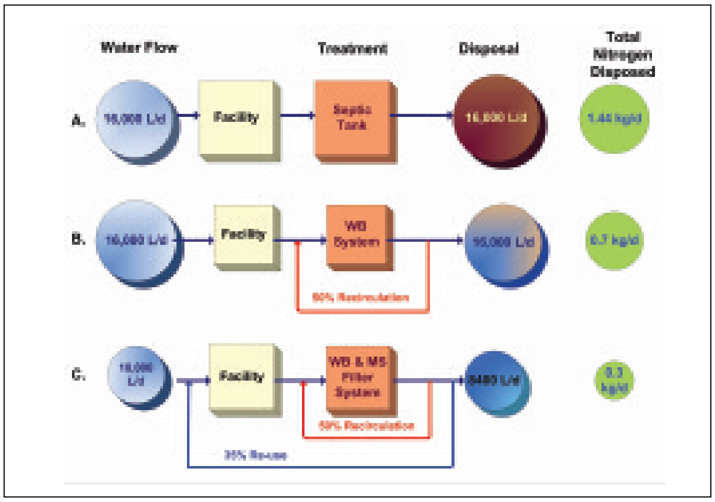

Figure 3

Re-using wastewater means that a lower volume is disposed of, lessening the mass nitrogen loading on the environment. Compared to a traditional septic system and a WBS without re-use, ~79% and ~57% less nitrogen is entering the ground, respectively.

Operations and Maintenance

Rockwood Geological Engineering operates and maintains this treatment system with regularly scheduled pump-outs of grease traps and septic tanks; inspecting system components; taking weekly samples of sewage and effluent; tracking wastewater and recycled flows; and optimizing treatment performance.

A key feature for the client is that the recycled wastewater must be aesthetically pleasing for customer satisfaction, and this in turn requires consistent treatment. This implicit safeguard increases cooperation between the owners and the operators. When owners have more at stake, they ensure that cleaning procedures and kitchen practices are optimized to minimize stress on the treatment system. This holistic approach to O+M where optimization consists not only of ‘tweaking’ the mechanical components, but also the in-house practices, ensures that the influent wastewater is easier to treat and the practice of re-use is successful.

The future of Re-Use in Canada

With proper design, O+M, and a progressive and contentious user, the Belmont Husky Oil is an example that re-use is a viable component that can be incorporated into sewage system designs for large commercial applications. The implicit nature of a re-use system not only decreases the impact on the environment but also provides safeguards ensuring that the system is thoroughly optimized to protect public health and safety, through consistent treatment performance.

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learning takes place, it’s not all work. We all managed to sample some of the nicer restaurants and pubs of downtown Cleveland in addition to talking about wastewater. Next year’s conference is booked for New Orleans (venue currently under reconsideration) so put it on your calendar.

McGuinty Government Intoduces Clean Water Act

Proposed Legislation Would Help Protect Lakes, Rivers, Groundwater

TORONTO

The McGuinty government is safeguarding the health of Ontario families and communities by introducing new legislation that would protect the natural sources of our drinking water, Environment Minister Laurel Broten announced today.

"Everyone has a right to clean water. It is a priceless resource and we all have a responsibility to protect it," said Broten. "To keep our drinking water clean, we need to keep pollution from seeping into our streams, lakes and rivers." The proposed *Clean Water Act*, to be introduced today, would establish Ontario as a leader in the delivery of safe drinking water by:

- Requiring municipalities and conservation authorities to map the sources of municipal drinking water supply, and especially the vulnerable areas that need protection, to prevent the supply from being depleted or contaminated.
- Directing local communities to monitor any activity that could potentially threaten water quality or quantity and take action to reduce or remove that threat.
- Empowering local authorities to take preventative measures before a threat to water can cause harm.

For the first time, communities would work together across watersheds in full and public consultation to develop and execute plans to protect their drinking water sources. This new and better approach is based on good science, increased vigilance and the necessary foresight to avoid potential problems, not just deal with immediate ones. To ensure that communities are able to fully complete these studies, the government recently announced an investment of $67.5 million – $51 million over five years for technical studies and $16.5 million for conservation authorities over the next year for staff and resources.

If passed, *The Clean Water Act* would help integrate water protection and growth planning and ensure that growing communities can continue to have an appropriate supply of safe, clean water. The act would better protect both the quantity and quality of the water in Ontario's aquifers, rivers and lakes, including the Great Lakes. "Our government is committed to protecting the environment and the health of all Ontarians," said Broten. "Today, and into the future, we all deserve to be fully confident that our drinking water is reliable and clean."

Installers — How this affects our industry...

103-*Building Code Act*, 1992

This section amends relevant sections of the *Building Code Act*, 1992 to allow for:

- mandatory inspection programs for existing onsite sewage systems located in a vulnerable area, by the principal authority that has jurisdiction in the area.
- discretionary inspection programs where maintenance and upgrading are required under the *Building Code*. This can be used to authorize the inspection of existing onsite sewage systems that are located outside vulnerable areas.
- cost recovery through inspection fees and adding unpaid fees to the tax roll.

In addition, this section establishes the necessary inspection and order-making authority to support such programs.

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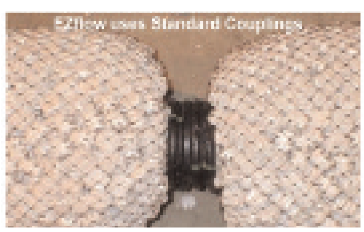

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Rob's World By Robert A. Passmore, B.Eng.

Dear Santa... All I want for Christmas are Some Answers

Given that it's nearly Christmas, it's time for some sober (well that's debatable) reflection on the past year in the on-site wastewater industry. Although there have been some bright lights and slow progress in the industry, there has been some serious disappointments. In keeping with the spirit of Christmas, it seems fitting to summarize these items in a traditional Christmas list.

Dear Santa:

I have been a reasonably good on-site wastewater advocate this year, although there are many people that would disagree with me on that. I have tried not to disagree with too many people, and I love a good argument too much to stop any time soon. So considering all of this, I'm not going to ask for much for Christmas. All I want for Christmas are some answers to the following questions:

1. Why did the Ministry of Municipal Affairs and Housing (MMAH) rolled out Bill 124, made inspectors, designers and Chief Building Officials (CBOs) scramble to take preparatory classes, write exams, obtain insurance at sometimes outrageous costs, increase the bureaucracy by at least a few orders of magnitude, all under the premise of "Building Code Reform"?

2. Why did the MMAH make the new OBC qualification requirements so confusing that virtually no one, save for CBOs, knew what exam to write (and apparently some of them didn't know what to write either)?

3. Why were the MMAH qualification examination rooms, and why weren't there more locations and times available to write the exams?

4. Why did the MMAH, after subjecting the entire Province to this mess, turn around and change the date of enforcement of the new qualifications to January while specifying that all of the other aspects of the new OBC were to be implemented on June 1, 2005?

5. Does the MMAH still think they have reformed the OBC when Regulators in some parts of the Province, who were not enforcing the OBC before Bill 124, are still not enforcing the new OBC?

6. Speaking of Regulators, why are so few of them OOWA members, especially considering the fact that specific effort is made to send the OOWA newsletter to almost every office?

7. Why haven't more Regulators voiced their opinion on the MMAH's handling of Bill 124, and why haven't they called for more education? In a past Rob's world, most of the respondents stated that lack of education was the reason that they did not interpret the OBC properly!)

8. Why are most installers in the Province not members of OOWA? A strong, united voice in Provincial Parliament is the only way to ensure the long-term sustainability of individual on-site septic systems?

9. Why are many designers not advancing their understanding of the fundamentals of wastewater treatment and embracing new technologies? (Fear of change is not a reasonable answer!)

10. Why are so many homeowners more concerned about the look of their front door than their on-site wastewater system? They can't live in the house without a sewage system, yet it is often ignored.

Well Santa, that's it for now. I wish you a Merry Christmas and good luck in your hunt for the answers to these questions. (Be careful not to get lost in all the bureaucracy and self-interest out there along the way).

Rob

P.S. I have one last question: With all the milk and cookies you eat along the way, does that sleigh have a Class 1 septic system and, if so, could you see if the MMAH can tell you if it conforms to the OBC?

2005 OOWA Board of Directors

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OOWA Member Profile:

Kirk Hastings of Onsite Septic Solutions

Occasionally we like to profile one of our OOWA members — this issue it is one of our new board members, Kirk Hastings. I had the opportunity to talk with Kirk at our December 2005 board meeting in Newmarket, where, typical of his active life, he not only attended the board meeting, he did a little business on the phone during breaks, picked up a couple of treatment units on the way home and regaled us with his great sense of humour.

Kirk is a third generation installer from Wyevale, Ontario. His grandfather started installing systems in 1945 and the family has kept at it continuously since then. He took a break from the business for a few years when he worked as a heavy equipment mechanic in Sudbury but came back in the 1990s. When asked why he left the heavy equipment business to join the family business back in Wyevale, he replied; "because it wasn't Sudbury!" Since 1998 he has been on his own as Onsite Septic Solutions.

Kirk started out focusing on traditional trench and filter bed systems. Lately he has branched out and installs treatment units and currently focuses on Waterloo Biofilter units. He installs over 100 systems a year with his crew of five and at least 10 percent of these are advanced treatment systems. Another change to his practice recently is the extensive use of chamber systems.

Nearly 70 percent of his systems now go in with chambers. He likes the convenience and speed that they can be installed and,as an added benefit, if there is a clogging problem somewhere down the road they are easy to jet out from the ends – much easier than a traditional pipe and stone system.

Not that Kirk has had a lot of failures – far from it. I've spoken to a number of people in the business in his area of practice and the universal opinion is he is someone who takes the business seriously, taking courses when possible, getting advice when required and generally working with a high degree of professionalism.

I asked what his biggest challenge was and, like others, he responded with system abuse by the owners. His most challenging installation was a communal system serving two homes designed by Barry West of Jagger Hims. This was a multi-unit Ecoflo system that required MOE approval since it was serving two lots. Although the design was excellent, the site made it particularly challenging. The site combined a high water table, timed dosing, tight locations due to the small lot sizing and poor soils — "glacial hell" in Kirk's words — that all lead to it being his most challenging system to date.

When he's not running the business, Kirk enjoys skiing and snowmobile adventures — two activities that take advantage of the seasonality of the onsite business. Look Kirk up on his website at www.onsitesepticsolutions.com.

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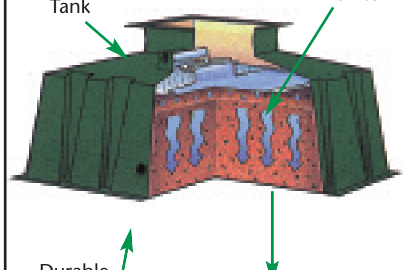

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Performance Expectations of Ontario Sand Filters & Proprietary Absorbent Filter 'Area Bed' Systems

Craig Jowett & Philippe Masuy

Introduction

Sand "Filter Beds" have been treating septic tank effluent in Ontario since their introduction by the MOE in the early 1980s, and have been transferred to the *Ontario Building Code* ('OBC') in Subsection 8.7.5. as an acceptable benchmark that is presumed safe. Sand filter beds installed under the OBC are not routinely sampled and there is no requirement for maintenance contracts. Therefore, there has been no opportunity to determine their performance under installed conditions or their impact on the groundwater resource.

In contrast, the performance of proprietary absorbent filter systems that use sphagnum peat or open-cell foam (Jowett and McMaster, 1995; Talbot *et al.*, 1998), which are maintained through on-going management contracts (e.g., Ouellet *et al.*, 2000) is better known.

The validity of "presumptive compliance" implicit in prescriptive codes like the OBC can be examined, first by summarizing the quality of effluent obtained during original testing of the under-drained sand filters by Chowdhry (1974), and second, by comparing the tested configuration with actual installed OBC filter bed systems. This way, "performance expectations" can be estimated for OBC filter bed systems and compared to performance-based proprietary systems, with a view to evaluating relative health and safety risks and to minimizing those risks.

This paper describes the scientific development and thorough testing of Filter Beds by the Ministry of the Environment ('MOE') and their subsequent adoption in prescriptive building codes. The under-drained filter beds tested provide the benchmark for presumed treatment effectiveness, especially for fecal coliform bacteria used as an indicator of human pathogens. In this paper, the tested configurations are compared to field installations of OBC Filter Beds, and to similar proprietary biological filters tested by third-party agencies. Levels of pathogens exiting the OBC filter beds may be predicted, and using OBC vertical separation distances, what is entering the groundwater resource may be estimated. Finally, we comment on whether expectations of presumed compliance are being met, and how fecal removal might be optimized.

Development of "Whitby" Sand Filter

The MOE tested filter beds from 1969 to 1973 using six different types of sand on sewage from the Whitby psychiatric hospital. Hence, this testing is referred to as the "Whitby" sand filter bed testing (Chowdhry, 1974). This research was well ahead of its time in North America, perhaps by 15-20 years. One of the sands was mixed with "red mud" for phosphorus removal. Only the other five clear sands tested at Whitby are of interest here, as they form the basis for the filter sands prescribed in OBC Sentence 8.7.5.3.(3).

The Whitby sand filter beds were constructed in boxes 3.05 m by 3.66 m in plan view and 0.76 m in depth. They were fed at rates of 24, 49, and 73 L/m^2/day by "trickle" and "time-dosed" flush flow through three 2.4-m lengths of 100 mm perforated pipes set 1.2 m apart within crushed stone. Under-drain pipes at the base of the 760-mm thick sand kept the filters free-draining, and collected the effluent for sampling before being discharged to a tile bed (Figure 1).

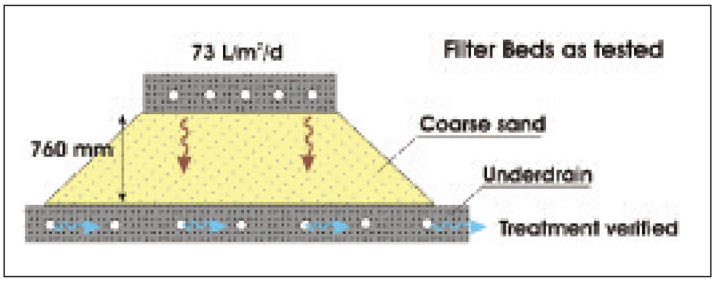

Figure 1. Schematic of Whitby Filter Beds as tested by Chowdhry (1974), with under-drain to keep the sand filter free-draining to ensure treatment.

Test Results of Free-Draining Whitby Filter Beds

Chowdhry (1974) details the extensive MOE biochemical study which shows that the sewage was filtered to a very high degree. Median BOD and SS values (carried out at MOE Laboratory and assumed standard MOE cBOD & TSS) were <10 mg/L with all sand grades, and usually <5 mg/L. Septic tank effluent was fairly weak, in part due to infiltration into the septic tank, with average medians of only 97 mg/L BOD, 61 mg/L SS, and 19 mg/L total nitrogen. No total nitrogen was removed, despite the high rate of nitrification typically evident after 11-19 months operation.

Removal of fecal coliforms is an indication of basic health and safety (Table 1). The results obtained at the Whitby sand filter bed study (carried out at Public Health Laboratory) clarify the fundamental controls necessary for lower fecal content, being: (a) lower loading rates (e.g., 49 L/m^2/d rather

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than 73 L/m²/d), especially when the sand is coarse, (b) finer grained sand, (c) biological aging or maturing of the filter, and (d) gravity trickling rather than timed (pump) dosing, especially when the sand is coarse. The finer sands 2 and 4 were shown to be capable of accepting both increased loading rate and pump-dosing with little effect on fecal removal. However, coarser sands 5 and 6 were shown to be negatively affected by increased loading rate and especially by time-dosing. Effluent fecal content does not appear to be affected by septic tank content.

Effluent Source	Sand 'k' conductivity cm/s	Sand 'T' time min/cm	Period I 49 L/m²	Period II 73 L/m² 49 L/m²	Period III 73 L/m²	Period IV 73 L/m² time-dosed
Sand 4	$2.6e^{-2}$	3	1500	290	430	1700
Sand 2*	$9.0e^{-2}$	2	10,000*	3500*	1850*	2050*
Sand 3	$3.4e^{-1}$	1	4400	6200	4400	27,100
Sand 5	$9.6e^{-1}$	0.5	7000	3000	6500	73,000
Sand 6	$4.8e^{0}$	0.1	38,000	31,000	36,000	241,000
Septic tank	-	-	800,000	2,200,000	2,600,000	1,047,000

* Note: Sands 2 and 4 are similar in grain size, so Sand 2 is omitted from calculations.

Table 1. Characteristics of sands treating septic tank effluent, and fecal coliform values (cfu/100mL) exiting the Whitby sand filter beds (Chowdhry, 1974). During Period I (and Period II in part), the sand filter beds were loaded at 49 L/m²/day and in later periods, at 73 L/m²/day. During Period IV, the sand filter beds were time-dosed to simulate siphon or pump dosing. Each sand filter was sampled ~185 times over the four Periods, and the values reported here are the medians of samples taken in each Period.

OBC Filter Bed Performance Expectations

A "best guess" fecal value exiting the typical OBC filter bed can be estimated by averaging the median values from filter sands 4, 3, 5 and 6 as tested at the Whitby test facility. Sand 2 plots very close to sand 4 on the grain size distribution graph described in OBC Sentence 8.7.5.3.(3), and because this duplication would bias a "best guess" of actual installed systems, sand 2 is excluded from these calculations.

Calculated values from the four Whitby sand filter beds are ~12,000 cfu/100mL for the seven values at 49 L/m² daily loading and ~44,000 cfu/100mL for the nine values at the higher 73 L/m² rate. An alternative method is to include all five sand types from Periods III and IV dosed at 73 L/m² to give a "best guess" of ~40,000 cfu/100mL. These values are the fecals that can be expected at 750 mm depth with an underdrain installed; the OBC requires an additional 150 mm of vertical separation between this level and water table. Figure 2 shows expected values for each of the different grain sizes tested. The finer the sand, the better the fecal removal, but the risk of hydraulic failure by anoxic biomat clogging by septic tank effluent is greater. Extrapolating the line out to T = 6-10 min/cm sand predicts the thorough removal of fecals when dosing proprietary filter-treated effluent onto finer "area bed" sand, described below.

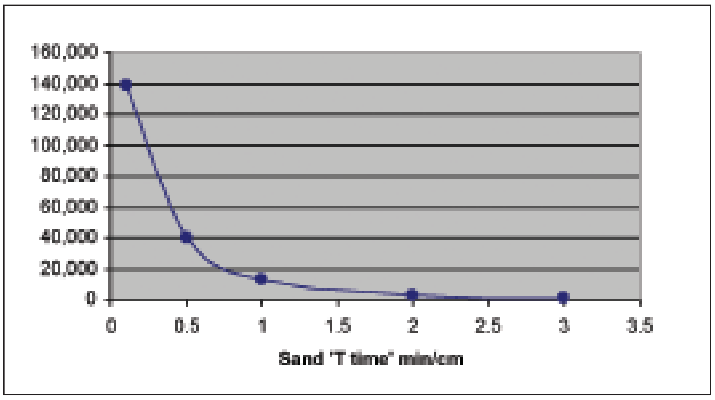

Figure 2. Average of fecal coliform median values expected at the 760 mm level of under-drained Filter Beds 6, 5, 3, 2, and 4 loaded at 73 L/m²/day (excluding all 49 L/m²/day results) with respect to percolation rates allowed in OBC Sentence 8.7.5.3.(3) (from Chowdhry, 1974). The average of Sands 6, 5, 3, and 4 that better represent the range of sands allowed in the OBC is about 44,000 cfu/100mL or ~40,000 for all five samples dosed at 73 L/m²/day in Periods III and IV (see text).

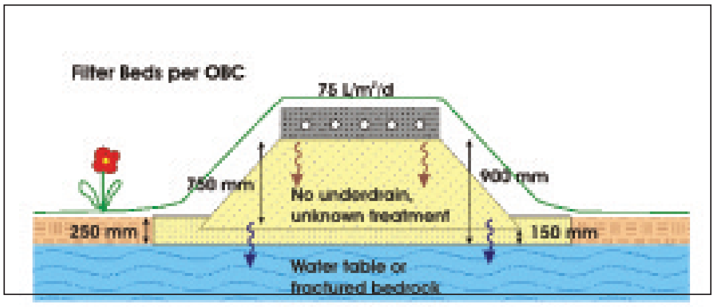

Figure 3. Raised Filter Beds are installed in high-risk areas such as high water table and fractured bedrock without under-drains. Under the OBC, only 150 mm of fast, coarse sand may separate the bottom of the sand filter bed (which yields 40,000-44,000 fecals or more) from the groundwater resource.

The entire article was too long to print in this edition. Visit www.oowa.org to view the whole article .

STEP Ban Not in Ratepayers' Interests

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Editor's Note:
In some parts of the country, developers have embraced STEP sewer systems to such a degree that regulatory agencies are seeking to slow their spread via regulatory action. This is happening in Tennessee, in Arkansas, and in Olympia, Washington, where City officials recently imposed a ban on new STEP sewers after determining that 35-40 percent *of new permit applications were requesting STEP connections. Following is Orenco Systems' response to Olympia's STEP sewer ban. This article may give you some ideas for investigating and responding to similar allegations and regulatory actions, if these kinds of issues surface in your area.*

On February 15, 2005, the Olympia, Washington City Council approved a resolution to enact a six month moratorium on new STEP Sewer Systems. On July 19, the moratorium was converted into a ban. The City Council's actions were the result of recommendations by the City's Public Works staff. In requesting the moratorium last February, Andy Haub, Olympia's Stormwater Engineering Supervisor, said (according to Council minutes) "that it was urgent that Council consider a moratorium on STEPs and noted that of the approximate 6,000 new applications for single-family homes, 35 to 40 percent were asking for STEPs instead of gravity systems."

After the Moratorium was imposed, Olympia posted a "STEP System Moratorium Fact Sheet" on its web site, claiming that the problems with STEP systems include the following:

- More costly to operate and maintain than conventional gravity systems (with sewer rate payers carrying the burden of the additional costs)
- Odor problems that are difficult and expensive to solve
- Effluent leaks and groundwater contamination

After the moratorium was imposed, Olympia commissioned Brown and Caldwell to evaluate comparative costs between STEP and gravity sewer systems. Apparently, that report was presented at a June 21 Land Use and Environment Committee meeting that was nominally attended. The June 28 City Council meeting moved closer to a STEP ban. Two representatives from Orenco were at that meeting, obtained the Brown and Caldwell report and, the next day, took issue with its accuracy. Orenco was invited to submit a written response and subsequently did extensive analysis of City documentation, then presented its own cost analyses and conclusions at the City Council meeting on July 19. Nevertheless, that evening City Councilors unanimously approved a ban on new STEP systems.

Orenco's research and analysis show that the comparative costs provided by Olympia staff and the City's consulting engineer are completely backwards. STEP sewer systems are cheaper to maintain than conventional gravity systems and pose far fewer environmental concerns. Orenco's analysis of Olympia's cost data is consistent with similar findings around the country.

So how did the City and its consulting engineer arrive at their conclusions?

- By understating gravity sewer maintenance costs in rights-of-way by 90 percent.
- By omitting high gravity sewer treatment costs.
- By omitting huge gravity sewer R&R (renewal and replacement) costs at year 20 and year 50.
- By inventing an "administrative" fee for each STEP connection that is 10 times higher than for gravity connections.

The first factual error, alone, affected Brown and Caldwell's findings so dramatically that it should have prompted Olympia to reconsider its analysis of STEP sewer costs. But there are literally dozens more errors, which explain why the consultant's report wrongly concludes that Olympia's STEP sewer systems cost more to operate than the City's gravity sewer system. When all the missing gravity sewer costs are taken into account, STEP systems are cheaper to operate and maintain.

In fact, it's likely that Olympia's STEP sewer customers are subsidizing gravity sewer customers by a factor of 2 to 1.

Other claims by City of Olympia staff are equally faulty. For example, the City claims that 90 percent of sewer utility calls are STEP-related and that one City staff person has to work full time on STEP maintenance. However, even the City's consultant noted that only 10 percent of STEP calls require any action, which equates to about one hour per week. That's probably why, as of July 2005, the voice mail for this "fulltime" City staff person states that he is also responsible for maintenance of the City's storm water system and for removing FOG (fats, oils, grease) from the

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City's gravity sewer system.

A close look at Olympia's annual financial reports provides even more evidence that STEP systems do not account for 90 percent of sewer utility calls. For a three-year period, 2000 to 2003 (the last year that complete records were kept), there were 203 emergency STEP system call-outs and 208 emergency call-outs for the City's gravity lift stations. The City has also claimed that STEP sewers create odors and environmental risks. In private meetings and in a recent public hearing, Public Works Department managers conceded that odor management is required of BOTH systems, and environmental risks are not an issue with STEP systems. Yet both claims remain on the City's Website and the STEP sewer ban continues on.

Obviously, those of us who know better are incensed. But why should Olympia's citizens be incensed too? Because they are rate payers! Since STEP systems are more economical than gravity systems, requiring all new subdivisions in Olympia to install higher-cost gravity sewers will ultimately mean higher costs — and higher wastewater rates — for everyone. The buck stops with Olympia's citizens.

Admittedly, Orenco's views are not unbiased. For 25 years, our company has advocated affordable, versatile, environmentally sound STEP sewer systems. We've published and presented extensively on the subject, we hold numerous patents, and we design and manufacture STEP sewer equipment,including the equipment used in Olympia. So of course, we have a financial interest in Olympia's STEP moratorium. But more importantly, we have a broader interest. We also have experience in the design and construction of gravity sewers, and we know that gravity sewers ARE more cost-effective in some situations (high-density, favorable terrain, no groundwater). And STEP sewers ARE more cost-effective in other situations (low density, rocky terrain, high groundwater). We believe that...

- City planners should have both options available to them.
- City planners should know the real costs of both options.
- City planners should hire independent third-party consultants to help them make good decisions.

Why do we advocate for independent third-party rate consultants? Because consulting engineers who are hired to make technology recommendations for engineering projects and then are permitted to bid on those projects face an inherent conflict of interest. Engineering firms typically charge their clients a mix of lump-sum costs and percentage fees that total about 15 percent of the project's overall cost. And 15 percent of a high-cost technology is more profitable than 15 percent of a low cost technology, like STEP.

Here at Orenco, we honestly can't figure out why the City of Olympia is continuing to pursuits ban on new STEP sewers. We've provided ample evidence that the ban is not in ratepayers'interest. And it's clearly not in the environment's interest, since Olympia's gravity sewers have spilled hundreds of thousands of gallons of raw sewage over the past few years.

We have even offered to take over the management of Olympia's STEP sewers, if the City feels, for whatever reason, it would rather not take care of them.

Maybe it's time that the City heard from its ratepayers, instead of from Orenco.

• *If you would like the complete text of Orenco's written rebuttal to the report issued by the City of Olympia's consulting engineer, go to www.orenco.com and click on "About Orenco," then "In the News," then "Manufacturer's Report States Olympia's Gravity Sewers Annually Cost Twice as Much as STEP Sewer," then select "Click for a pdf file of Orenco's report to the Olympia City Council (1.9 MB)."*

For those unlikely few in Ontario that don't know it, STEP systems are sewage collection systems that consist of a Septic Tank and Effluent Pumping systems that utilize small diameter (usually 1-3") plastic pipe. They are an onsite alternative to the big pipe or conventional gravity sewers. This story is timely in that this year our conference revolves around "Removing Barriers to the Onsite Industry." See you at the 7th annual conference in Kitchener on March 20 and the 21. Al Brown – Sand Filtration Inc.

ONTARIO ONSITE   Ontario Rural

7th Annual Ontario On-site Wastewater Conference and Exhibition

Removing Barriers to the Onsite Industry

March 20 and 21, 2006

Delta Kitchener Hotel and Conference Centre
Kitchener, Ontario

The Final Flush

The History of S.H.I.T.

In the 16th and 17th centuries, everything had to be transported by ship and it was also before commercial fertilizer's invention, so large shipments of manure were common. It was shipped dry, because in dry form it weighed a lot less than when wet, but once water (at sea) hit it, it not only became heavier, but the process of fermentation began again, of which a by-product is methane gas.

As the stuff was stored below decks in bundles you can see what could (and did) happen. Methane began to build up below decks and the first time someone came below at night with a lantern, BOOOOM! Several ships were destroyed in this manner before it was determined just what was happening.

After that, the bundles of manure were always stamped with the term "Ship High In Transit" on them which meant for the sailors to stow it high enough off the lower decks so that any water that came into the hold would not touch this volatile cargo and start the production of methane.

Thus evolved the term "S.H.I.T." (Ship High In Transit) which has come down through the centuries and is in use to this very day.

You probably did not know the true history of this word SHIT.

Well SHIT.......... Neither did I

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