ONSITE
WASTEWATER NEWS
ONTARIO ON-SITE WASTEWATER ASSOCIATION NEWSLETTER

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Technical Review
Alex Campbell

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Ontario On-site Wastewater Association — Membership on the Rise!

The first meeting of the Interim Board of Directors was held on December 7, 1999. The Board discussed the structure and future direction of the Association. It was decided that there will be a 15 member Board of Directors. A request is being made to the members of the Ontario On-Site Wastewater Association (OOWA) for an additional 4 members to join the interim board for the year 2000. If you are interested in becoming a Director, please contact Terry Davidson in writing by March 1, 2000. If the Association receives more than 4 applications, a balloting system will take place and the results will be in place for the first annual meeting to be held at the On-Site Conference. The conference is being organized by the Ontario Rural Wastewater Centre March 27 & 28, 2000 in Mississauga. Register now for the conference and receive a discount as an OOWA member!

The 2000 "Membership Directory — Who's Who in the Ontario On-Site Industry", will be published early in March, so members will have the benefit of referring to it as soon as possible.
If you're a manufacturer or designer, here's an opportunity for your company to benefit from additional recognition!

For those interested in joining the Association this year, your membership fee includes your membership in the National Onsite Wastewater Recycling Association (NOWRA). NOWRA is the association devoted to the art and science of on-site and decentralized wastewater management. For those already belonging to the Association, please be advised that your membership in NOWRA has been processed, and you should start to receive the "Onsite Insight" newsletter.

The on-site industry is composed of a diverse group of professionals including: installers, haulers, engineers, manufacturers, regulators, and researchers. If you know someone that works in this industry, please encourage them to join the Ontario On-Site Wastewater Association. The on-site industry is at the front line of environmental protection. Only as a team can we build the profile and recognition throughout Ontario that this industry deserves.

If you have any questions, please contact:
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Ontario On-Site Wastewater Association
Interim Board of Directors

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Al Brown
- Sand Filtration Inc.

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- Green Valley Environmental

Ahmed Sharaf
- MMAH

Recirculating Sand Filters —
A Technology Evaluation/Demonstration Project

Based on article by Mr. Tony Ho, O.M.O.E. Standards Branch

Approximately 20% of Ontario's population live in small rural communities and rely on private septic tanks and adsorption beds to treat and dispose of their sewage. Unfortunately, many communities have reported that aging septic systems are failing. In some cases these systems can be replaced, but many times they cannot due to poor local soil conditions or insufficient lot sizes. Traditionally, the alternative to septic systems are either sanitary sewers and a new treatment plant or a sewer trunk line to an existing treatment plant. These alternatives are often exceedingly expensive, and with diminishing government support, are not within the financial reach of small communities. As a result, new cost effective solutions are required.

To address this need, the Water and Environment Association of Ontario (WEAO) formed a partnership with Environment Canada's Great Lakes 2000 Cleanup Fund, Ontario Ministry of Environment (MOE), Sand Filtration Inc., Wilkinson Heavy Precast Ltd., and McMaster University to evaluate & demonstrate a promising solution — recirculating sand filters. The study objectives are to evaluate the performance, design, operating conditions and costs of using septic tanks plus a recirculating sand filter to treat municipal sewage for small communities. The study results will also be used to evaluate the existing design and operation of intermittent sand filters currently being used to polish sewage lagoon effluent from several Ontario towns.

A 1997 study conducted by McMaster University reported that septic tanks followed by a recirculating sand filter would be a cost effective technology. This technology has been successfully operated year-round in a number of communities in Wisconsin, and produced tertiary effluent quality. Pumps and timers are the only mechanical parts, making the technology easy to operate and maintain. Observations made in Wisconsin indicated that to prevent freezing and

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"Recirculating sand filters are cost effective technology."

photo courtesy Sand Filtration Inc.

Recirculating Sand Filter Research and Demonstration Facility — Clifford, Ontario

photo courtesy Sand Filtration Inc.

Close-up of four sand filters — Clifford, Ontario.

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Ontario Rural Wastewater Centre — Update

by Shelly Bonte-Gelok, ORWC

We Have Buildings!

The first demonstration building, a 60 foot by 100 foot fabric Calhoun structure, was put up at the Baxter site (near Ottawa) in early December. Radiant heaters have already been installed and some demonstration units have also arrived on site. Terry Davidson worked hard to have the building up and ready before our very first course. A 40 foot by 50 foot structure at the Alfred site and a 60 foot by 120 foot structure at the Guelph site have been completed, and the electrical and heating work should be done before the end of February. The Ontario Rural Wastewater Centre (ORWC) would like to thank all of the people that have generously donated their products and time.

Inside and out — the new Ottawa Training Centre and Demonstration Site.

Successful First Course!

Terry K. Davidson shows a plastic septic tank at the first ORWC course for real estate agents.

On December 14th the ORWC offered its first course to real estate agents at the Baxter Conservation Area. The course was very well received by the 15 attendees and the evaluations were very positive. This course will be offered again in the spring and fall.

We are also working on courses dealing with alternative systems, system inspection, troubleshooting and remediation, swine manure odour control, water and wastewater recycling for agricultural uses, nutrient management and constructed wetlands design. All are expected to be ready for delivery in the spring or fall.

Research Update!

The ORWC has received funding for a new research project, $30,000 to look at the various techniques used in the remediation of adsorption beds.

The Centre continues its work in phosphorus removal from septic and agricultural wastewaters, design and monitoring of constructed wetlands, evaluation of new septic technologies, manure application and groundwater contamination, and the treatment and recycling of liquid manure in barns.

Proposals are currently being written in the areas of greenhouse gas emissions from wetlands, vegetable washwater recycling, odour control and treatment of swine manure, and fermentation of whey wastewater to produce ethanol.

Spring Conference!

Over the past three months we have been busy organizing the first annual Ontario On-Site Wastewater Conference. The theme of the conference is On-Site Wastewater Systems: Protecting the Environment into the Next

continued on next page

Millennium. One of the mandates of the ORWC is to sponsor a conference for all members of the on-site industry including: installers, inspectors, haulers, designers and educators. To ensure that the conference is of interest to everyone we have established a conference organization team. The members of the team are: Doug Joy & Shelly Bonte-Gelok of the ORWC, Alex Campbell of R.J. Burnside, Terry Davidson of RVCA, Paulette Haché and Al Brown of Sand Filtration, Mike Newark of Gamsby & Mannerow, Ahmed Sharaf of Ministry of Municipal Affairs and Housing (MMAH), Robert Stone of OMAFRA, Marianne Willson of Waterloo Biofilter, and Remo Petrongolo of the Office of Open Learning, University of Guelph.

The objectives of the conference are to provide a forum to discuss current issues associated with on-site systems and to launch the new Ontario On-Site Wastewater Association. On the first day there will be a general meeting to introduce association members to their board of directors, including the four newly elected executive members.

The conference will be held March 27th and 28th in Mississauga at the Delta Meadowvale hotel. There will be one large room for speaker presentations, as well as an open area for exhibitors. A pre-conference tour of the ORWC's Guelph demonstration facility, as well as visits to some local alternative on-site installations, will be organized. A one day post-conference workshop will be held on Wednesday March 29th and will focus on system inspection and troubleshooting, and remediation techniques. We hope to see you all at the conference!

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Ontario Rural Wastewater Centre Team

- Claude Weil, M.Eng., P.Eng., General Manager
- Doug Joy, Ph.D., P.Eng., Manager

Coordinators

- Chris Kinsley, M.Eng., Eastern and Northern Ontario
- Shelly Bonte-Gelok, B.Sc. (Eng.), Central and Southern Ontario
- Terry Davidson, P.Eng., Ottawa Training and Demonstration Site
- Nick Goursky, Training

Researchers

- Jean-Luc Galand, M.A.Sc., P.Eng., Environmental Engineering
- Anna Crolla, M.A.Sc., Environmental Engineering
- Pierre-Alain Blais, M.Sc., Plant Sciences
- Denis Caron, B.Sc. (Agr.), Animal Sciences

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Frequently Asked Questions — About Sewage Systems and the Building Code

Q► Does the OBC require that a "qualified supervisor" be on site for the entire installation of the septic system?

A► Clause 2.12.4.6.(1)(a) stipulates that supervision is required for the installation of a sewage system.

The intent is that, the qualified supervisor be on site to provide direction to other staff at critical points in the installation and to meet with the inspector to ensure that the project is progressing as planned. As with any other type of construction project, he/she does not have to be on site throughout the project.

Q► Section 8.7.3.3.(2) OBC requires that the stone covering the distribution pipe be covered with untreated building paper or a permeable geotextile fabric. Which one is better?

A► The purpose of this separator is to prevent soil or leaching bed fill from entering the stone during backfill. Thus, neither is actually better than the other for this purpose. However, the untreated building paper may decompose within a few months compared to the geotextile which will last the life of the tile bed.

Q► I am a licenced septic Installer starting to construct a septic system. After starting site preparations I realize the plans that were provided will not work on this lot. What are my responsibilities?

A► It is the Installer's responsibility to make sure that the constructed tile bed meets the OBC requirements. Therefore, the Installer must contact the designer and the regulator before making any changes or alterations to the approved plans and specifications. Any changes made to the design after a permit has been issued must be approved by the Regulator before implementing the changes.

Further information on septics can be obtained by visiting the Housing Development and Buildings Branch's home page at http://obc.mmah.gov.on.ca.

Household Products and the Health of Septic Systems — Experiences with Septic Tanks and Waterloo Biofilter Systems

by C. Jowett, Waterloo Biofilter Systems Inc.

We have seen problems with the health of septic tanks we've sampled over the years. These problems usually result from abnormal use of disinfectants, toilet pucks, anti-biotic shampoos or medication. Septic tanks operate by fermenting raw sewage to a state that can be treated by a tile bed or a treatment unit, like making wine or beer, and a healthy biota is important. A new septic tank will reach prime operation in a year's time, but this can be achieved in less time by seeding the new tank with a little septage. A tank can be killed for a few days by cleaning paint brushes, or heavy use of bleach-type cleaners.

The good news is that the tank can recover by itself within a week if not poisoned further. An

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These toxic substances should never be put into a septic system:

- Caustic drain and toilet bowl cleaners
- Bleach
- Varnishes, paints and solvents
- Gasoline, antifreeze
- Photographic solutions
- Nail polish remover

Source:
A Guide to Operating & Maintaining Your Septic System, Government of Ontario

to reduce filter plugging, septic tank effluent should be applied to the sand filter at least hourly, and coarser media (2 to 5 mm) should be used for the sand filter. Some filters in Wisconsin were operated continuously for six months or longer without resting, which is consistent with observations of sand filters in other areas that have been operated for many years without resting.

A similar technology the "single pass or intermittent sand filter" is being used in Ontario to polish and/or provide nitrification for sewage lagoon effluent. The "intermittent sand filters" in Ontario use fine media (0.2 to 0.5 mm), and the lagoon effluent is usually applied to the filter once or twice per day to build a head of 15 to 20 cm above the filter at the beginning of each application cycle. As a result, Ontario intermittent sand filters have become plugged after 15 to 30 days of operation, and require 15 days or longer of rest to restore their performance.

In 1998 it was agreed that a pilot plant demonstration study was necessary to demonstrate the design and operation of the septic tank and recirculating sand filter technology in Ontario. The pilot plant was completed in July 1999 at the Village of Clifford's sewage treatment plant, near Walkerton. The Ontario Clean Water Agency, which operates the Clifford treatment plant, is assisting in the study. The pilot plant consists of four parallel trains. Experimental studies will be conducted over the next two years to determine the effects of media size, dosing frequency, recycle ratio, and mass/hydraulic-loading rates on effluent quality in order to assist in regulatory guideline development and reviews. The effect of chemical addition for phosphorus removal on sludge generation and septage haulage will also be monitored.

Updates on the progress and results of the study will be published in future issues of *Onsite Wastewater News*. Both the one year interim report and the final report will be made available to the public. Site tours, process control and technology demonstrations are available by calling Sand Filtration Inc. at (519)743-1780.

Interesting Web Sites

Alternative Septic System Info Centre
- http://www.capecod.net/alternativeseptic

Canadian On-Site Wastewater Disposal Individuals and Organizations
- http://www.tuns.ca/~mooersjd/canlist.html

National Small Flows Clearinghouse
- http://names.nsfc.wvu.edu/nsfc

National Onsite Wastewater Recycling Association
- http://www.nowra.org

Ontario Building Officials Association
- http://www.oboa.on.ca

Ontario Ministry of Municipal Housing and Affairs
- http://www.mmah.gov.on.ca

Ontario Water and Wastewater Association
- http://www.oww.org

On-site Wastewater Training, Management, Demonstration and Research at Vernon James Centre, North Carolina
- http://plymouth.ces.state.nc.us/septic/jmscntr.html

University of Rhode Island On-Site Wastewater Training Centre
- http://www.edc.uri.edu/cewq

Water Environment Association of Ontario
- http://www.weao.org

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example that illustrates the effects of bleach on a system is an office/lab/daycare site monitored in 1994. After a single bleaching event for iron bacteria, this site showed a BOD rise from 85 to 326 mg/L in the septic tank and Biofilter effluent rise from 5 to 56 mg/L. High phosphorus, iron, dissolved oxygen, low coliform bacteria, and unusually bad odour, was coincident with this poisoning. The following week the BODs in the septic tank and Biofilter were back to normal at 83 and 9 mg/L respectively, as were the other parameters.

However, persistent use of disinfectant cleaners, detergent with bleach, or chemotherapy will keep a septic tank unhealthy over a period of time and will eventually cause failure of the tile bed or treatment unit. This happened to the tank discussed previously. The BOD jumped to 123–133 mg/L in July, then down to 11 mg/L in early August, and up again to 174–239 mg/L throughout August-September when sampling stopped. Biofilter effluent had risen from 5–10 mg/L to 20 mg/L during this time, which is normally not a cause for concern except in this case it was known that it would only get worse if the poisoning continued. By October, the tank was not bubbling at all and had an unusual green-white colour. Although the cause was not certain, the failure of the septic tank coincided with a new cleaning person who was very thorough and used a lot of disinfectant.

"... persistent use of disinfectant cleaners, detergent with bleach, or chemotherapy will keep a septic tank unhealthy over a period of time and will eventually cause failure of the tile bed or treatment unit."

Bleach is not the only killer of septic tank biota that we have seen. Other sites have been poisoned by a peppermint oil-based disinfectant that was described as "natural, biodegradable" (purchased from a health food store!), and especially 'detergent with bleach' designed to sanitize your laundry. In these cases the Waterloo Biofilter cleans itself within 2–3 months after the offending disinfectant is removed from the house, but avoidance is better than unnecessary maintenance.

Remember, treatment rather than disposal is the coming thing in Ontario, and micro-biological treatment systems are as sensitive as we are to pollutants. Recommend to your clients that they use vinegar instead of chemical fabric softeners, and moderate use bleach or bleach alternatives. A diet free from toxins will keep septic systems healthy and avoid costly failures and groundwater contamination.

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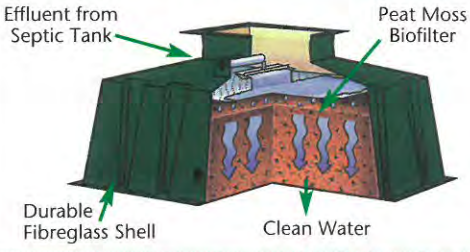

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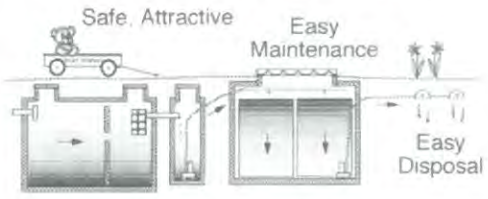

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On-Site Wastewater Systems:
Protecting the Environment into the Next Millennium

This inaugural conference of the Ontario Rural Wastewater Centre will provide an opportunity for members of the on-site sewage industry to meet with and learn from leading researchers and practitioners in the field. The program is designed to benefit installers, inspectors, haulers, designers and educators. The two-day event will feature well-known keynote speakers followed by morning and afternoon presentations focusing on key issues in today's industry. As well, an exhibition hall will highlight organizations promoting products and services that will be of interest to conference attendees.

CONFERENCE TOPICS

NEW TECHNOLOGIES: approved, under development, improved, nutrient removal

EDUCATING THE PUBLIC: changing attitudes of industry and regulatory agencies; systems maintenance

PERFORMANCE VERSUS PRESCRIPTIVE APPROACHES TO REGULATION

CASE STUDIES OF DIFFICULT SITES: failures, small lots, high groundwater table, nearby surface water

AGRICULTURAL WASTEWATER: dealing with milkhouse wastes; washwater from fruits and vegetables

NON-DOMESTIC WASTEWATER SOURCES: high fat content; high oils and grease; landfill leachate; slaughterhouses

WASTEWATER RE-USE AND RECYCLING: irrigation, aquifer recharge, fertilization, biosolids management, natural sources

CONFERENCE PLANNING COMMITTEE

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