ONSITE
WASTEWATER NEWS
ONTARIO ON-SITE WASTEWATER ASSOCIATION NEWSLETTER

InSide

- Certification & Licensing of Installers
- BMEC vs Ecoflo Ontario & Waterloo Biofilter
- Shallow Buried Trench Study
- NOWRA Conference
- Rob's World
- President's Welcome
- Alex across Africa

Volume 3
Issue 2
October 2002

OnSite is published three times a year by Ontario On-Site Wastewater Association. To submit an article or place an advertisement, contact the LandOwner Resource Centre at (613) 692-2390 ext. 137

Mailing address:
P.O. Box 599,
5524 Dickenson Street,
Manotick, Ontario
K4M 1A5

Technical Review
Terry K. Davidson

Editor
Jocelyn Chandler

Visit us at
www.cowa.org
Ontario Rural Wastewater Centre at www.orwc.uoguelph.ca

The Continuing Saga of Septic Additives

In his continuing saga about septic system additives, Al Brown submits another chapter. He writes:

Recently I found this on the internet, but if you want a real look at the whole picture go to google and type in "septic additives." There are some letters and comments from homeowners and agencies... including the following: (this article has had the names of the parties removed for this publication, however it is available in full on the internet).

STATE OF VERMONT
OFFICE OF THE ATTORNEY GENERAL
December 29, 1998 Ass't Attorney General
ATTORNEY GENERAL SETTLES CONSUMER FRAUD CLAIMS AGAINST SEPTIC PRODUCT COMPANY

Vermont Attorney General William H. Sorrell announced today that his office has settled consumer fraud claims against a seller of septic system products, under the settlement, [redacted] will pay the State of Vermont $50,000 and offer full refunds to Vermonters who purchased their product, [redacted]. Letters offering a total of over $200,000 in refunds will be mailed to approximately 2,100 Vermont consumers shortly. [redacted] has sold [the additive] over the telephone to Vermont consumers for a number of years. Three- and six-year supplies of the product, which is a powder said to contain "scientifically enhanced bacteria and enzymes" designed to be poured down the toilet, cost $109 and $149, respectively.

The Attorney General took issue with the lack of factual support for the advertising claims that [redacted] made to sell [the additive], including these statements:

– "Save hundreds of $$$."
– "Prevent pumping out your septic tank periodically..."
– "In most cases (the additive) will solve any minor problems within 2 to 6 weeks."
– "In just 3 or 4 months ... (the additive) will help to open these (septic system) lines to their original size."
– "(It costs only $2.00 per month) to guarantee in writing
– "Greatly reduce that risk (of digging up your drain field)."
– "Those (customers) with a problem should start to see an improvement within 30 days."

The Attorney General alleged that it is difficult, if not impossible, to predict whether [redacted] products will, or are even likely to, work for any specific consumer, given the variability in septic system design, environmental conditions, and composition of waste going into the system, as well as the absence of any definitive research on the effectiveness of biological additives to septic systems.

In an Assurance of Discontinuance filed last week with the Washington Superior Court, [redacted] without admitting liability, agreed to refrain from marketing or selling its products to Vermont consumers unless it has prior factual support for all claims made. They will also mail to 2,089 Vermonters who first bought (the additive) after 1994 a notice that they have three business days in which to submit a written request for a full refund from the company.

In addition, [redacted] will place advertisements in all of the daily newspapers in Vermont

continued on page 2

Letter to the Editor

Conventional septic systems (leaching beds) have been installed in tens of thousands of rural households since the 50's and beyond. Are these systems still treating wastewater as they were intended? We have moved in the past two decades to treatment rather than disposal. It's time we raised the bar to incorporate testing of on-site conventional leaching beds. A new bed should be equipped with some type of access port (in a representative location) to provide a point for sampling of the treated effluent. This type of device could be installed during the installation phase.

Parameters for treated effluent quality would need to be established for testing purposes. On-site sewage systems could be sampled and analyzed to provide data on their continued ability to treat domestic sewage. A current example of this practice is the "Clean Air" program which checks vehicle exhaust emissions. Similarly sewage systems could be monitored and required to meet certain standards to prevent groundwater contamination. Compliance permits could then be issued for these systems. This would help lessen the concerns over present and future groundwater quality issues.

David Cooke, C.P.H.I.(C)
Coordinator Sewage Systems Program

The Continuing Saga of Septic Additives

continued from page 1

informing all other purchasers of (the additive) that they have 60 days in which to submit a written request for refund. If the company does not have a record that a consumer bought (the additive), the consumer will have to provide reasonable proof of purchase.

Finally, [redacted] has agreed to pay the State $50,000 as costs. Under the settlement, the president, and Vice-president, are personally liable for ensuring that the company pays the State and Vermont consumers.

Commenting on the settlement, Attorney General Sorrell stressed the importance of having a factual basis for advertising claims before those claims are made to the public. "For a company to say that its product will achieve a certain result without having the research to back that up is deceptive to consumers and violates our laws," he said.

Waterloo Biofilter® Septic System

Residential & Communal Sewage Treatment Systems

- above or below ground units
- seasonal or year-round cottages & resorts
- 99% fecal coliform removal
- small disposal area, easy maintenance

A Better Choice for Difficult Sites
bedrock, clay, high water table, small lot

143 Dennis St., Rockwood, ON N0B 2K0
Ph: 519-856-0757 Fax: 519-856-0759
www.waterloo-biofilter.com

Better Water FAST®

FAST® wastewater treatment systems help you build environmentally advanced yet simple and affordable projects. Ideally suited for use in single family dwellings, clustered residential developments and subdivisions, restaurants or other high strength commercial applications, a versatile FAST system is ready to serve your needs. FAST can even be used to retrofit a failed conventional septic system, giving home owners and small communities the innovative solutions they seek.

Dependable, affordable...FAST.

Nitrogen Reduction
Unsurpassed treatment in a single tank

Fixed film aerobic treatment
Proven, safe and reliable...a cut above

Repairs failed septic systems
Simple repair with minimal disruption

Flexible design
Many sizes and affordable options

BIO-MICROBICS® INCORPORATED

FAST® wastewater treatment systems

8450 Cole Parkway, Shawnee, KS 66227 ▪ **800-753-FAST(3278)**
Fax: 913-422-0808 ▪ www.biomicrobics.com ▪ onsite@biomicrobics.com

Infiltrator Equalizer Chambers

Contributor; Gary Sharp of Infiltrator Systems Inc.

Infiltrator Equalizer Chambers are an alternative option for installing tile runs in septic beds. Approved as a substitute for the gravel and piping component by the B.M.E.C., under the OBC, the number and length of infiltrator runs is calculated in the same manner as for conventional septic design. The EQ 24 model is commonly used for this purpose. The following guidelines for installing septic equalizer chambers are provided by Gary Sharp, Field Sales Representative in Kanata, Ontario for Infiltrator Systems Inc.

Description

Each section of infiltrator chamber is 8 feet 4 inches long and 12 inches high, and has an inlet and outlet end, so that they can be easily latched together to achieve the desired length of run. Six sections create a 50 foot long run. An end cap with a hole for the inlet connection is attached to the header end of each run. Likewise, a solid end plate is attached to the end of each run.

Site Preparation:

1) Stake out the location of the bed and runs, allowing for a 1.6 metre separation between the centres of each run.

SFI
SAND FILTRATION INC.
35-A Shirk Place
Kitchener. Ontario, CANADA
N2K 1R3
Tel. (519)743-1780
Fax. (519)743-1781
Email: albrown@limnoterragroup.com
an Orenco Systems
Incorporated Distributor

. Advanced Tertiary On-Site Sewage Technology
. Single Home, Communal, Commercial and Institutional Applications
. Installer and Designer Training And Development Available
. Small Bore Sewer Technology
. Septic Tank Effluent Pumping Systems (STEP)
. Septic Tank Effluent Gravity Systems (STEG)
. Orenco Certified Design, Operation, Maintenance and Inspection
. Approved For Use In Ontario

Effluent Filters & Carbon Filters
Call for pricing today!

Wastewater Products Distributor and Engineering Design Assistance

2) Determine the desired tank, pipe and trench bottom elevation. Like conventional runs, the bottom of a trench must be at least 90 cm above clay/bedrock or water.
3) Excavate each trench level, using an 18" – 24" bucket and roughly 2 feet deep. This allows a shovel with a laser to easily excavate the trenches without changing grade.
4) Remove large stones and rake the bottom and sides if the soil is smeared.
5) Verify the trench elevation.

Installation:

6) Level the header pipe at the appropriate height to meet the chamber inlet connections.
7) Lay the first chamber in the trench at the header and make the inlet pipe connection.
8) Check the chamber for level and then secure the inlet connection to the chamber with a screw.
9) Connect the remaining sections of chamber to create a run of the desired length, finishing with an endplate.

Backfilling:

10) Beginning with the interlocking joints, fill in the space around the sidewall area, leaving the tops uncovered.
11) Pack down the fill by walking the edges of the trenches and chambers. (do not do this if soil is wet or clayey).
12) Once the system is inspected by your regulatory agency, the tops can be covered by pushing the fill material overtop to a depth of at least 1 foot, but not over 2 feet. This can be done using a small bulldozer since the chambers can withstand 16,000 lb axle loads with 1 foot of cover. The final grading should be designed to shed water and be seeded or sodded to establish vegetation.

For specific information, Infiltrator has a toll free number 1-800-221-4436.

BMEC vs Ecoflo Ontario & Waterloo Biofilter

DECISION OF DIVISIONAL COURT RESPECTING JURISDICTION OF THE BUILDING MATERIALS EVALUATION COMMISSION ("BMEC")

In March, 2002 Ecoflo Ontario and Waterloo Biofilter System Inc. filed an application to Divisional Court challenging the resolutions enacted by the BMEC on February 28, 2002, which had the proposed effect of amending our existing Authorizations.

Our challenge was advanced on two principal grounds: (1) that BMEC did not have authority to amend the Authorisations for just any reason or at any time that it cared to do so, and (2) that whenever BMEC decided to deal with an Authorisation there was a right way and a wrong way to do it. Our overriding position was that the BMEC was not merely an administrative policy arm that could act without review, but rather that it was an adjudicative body that was subject to the review of the courts and that therefore it had to follow certain rules of substance and procedure in what it did.

In proceeding we were looking to quash the resolutions and therefore the amendments to the Authorisations. We were also looking to establish for the future the ground rules that govern how BMEC conducts its business, in order to contribute more certainty and a better understanding to the industry.

The BMEC as you know disagreed with these principles and on the basis of that disagreement disputed the application and defended it in Court.

The application was heard in Toronto on April 18 and 19, 2002. Pending the hearing, we obtained a stay order from the Divisional Court, which had the effect of stopping any progress of the proposed amendments until the matter was resolved. Virtually all Health Districts and Building Officials were put on notice of the stay and were advised that the amendments had no effect.

Yesterday the Divisional Court released its Reasons. We have a copy of these. What follows is the view and comment of our lawyer, Scott McLean on the Reasons as received.

"Your application was successful. In short, the resolutions and therefore the proposed amendments are quashed. This means that they do not exist because they were not justified by BMEC and were not handled properly by BMEC. You succeeded in the attack on the BMEC exercise and in the Reasons the Court has indicated that you had 'every reason' to take the steps that you did and to express the concerns that you had, in the manner that you expressed them."

The Reasons contain a number of points that I consider important to you and to the industry in going forward. I will outline a few of these.

BMEC has taken the position in the past that it was a policy making/legislative tribunal exercising powers as a surrogate for the Minister and therefore like the Minister it alone determined what it could do and how it could it. BMEC had a broad understanding therefore of what its powers were. Clarification of this understanding was in our view important to you and to the industry. The Court rejected the BMEC position on this point and therefore the characterisation of BMEC is now better understood. The Court states that BMEC is an adjudicative body. As noted above, this is very important to understanding BMEC better. This means that BMEC must be respectful of the rights of stakeholders (more on this below) and must understand that what it does is subject to control by the Courts.

In this context, the Court has stated clearly that there is nothing in any legislation that allows BMEC to do whatever it wants, whenever it wants to, respecting an issued Authorisation.

In the same context, the Court has stated that when BMEC issues an Authorisation, it can only reconsider that Authorisation where it has made findings on any of the conditions contained in the Authorisation and where those findings are warranted, or, where it can demonstrate that "public health and safety issues warrant."

The Court stated that in your cases BMEC failed on both grounds.

The Court has confirmed that the Authorisations, which you hold, are "valuable". They can only be reviewed by BMEC, the Court has stated, where "new information raises concerns about potential health and safety issues." These concerns must be in relation to your product as authorised.

Because your Authorisations are valuable in the eyes of the Court, the Court has stated that you are entitled to a significant degree of procedural fairness with respect to any decision of BMEC to alter the terms and conditions of them. With respect to any such change, the Court has stated that you must have a meaningful opportunity to make written or oral submissions, because any such change means that your rights and privileges are being seriously affected.

This language is chosen carefully by the Court and is very important. It means that what BMEC has given you cannot easily be interfered with or taken away. This establishes important standards in the industry as to the clear restraints, which exist on the conduct of BMEC, and on the importance of the Authorizations, which you hold.

The Court, in summary, has stated in this context that BMEC acted improperly throughout its involvement with you, that you had acted properly throughout your involvement with BMEC, and that in conducting its business with you in the manner that it had, BMEC's actions amounted to a denial of procedural fairness.

continued on page 9

Feature Installation

A large four bedroom house was proposed on a beautiful hertitage lot. The lot contained an abundance of old growth deciduous trees (oak and maple) and numerous fruit trees. The soil covering the entire property was predominantly a moderately compacted silty clay.

A conventional system was originally proposed for this site; a septic tank and a fully raised leaching bed were specified. The owner's, realizing that over a dozen old growth and fruit trees would need to be removed to accomodate the leaching bed, looked to tertiary treatment systems to potentially reduce the tree loss.

It was decided that a tertiary treatment system, in this case the Clearstream 750N model, discharging to an area bed would best suit the site conditions. The installation proceeded and resulted in the loss of only one fruit tree and at nearly the same price as the conventional system.

This example underlines the importance of listening to the clients wishes when designing the sewage system and understanding the benefits that tertiary treatment can provide.

FYI **The 4th Annual Ontario On-Site Wastewater Conference and Exhibition in Mississauga will take place March 24, 25 and 26, 2002**

Shallow Buried Trench Study

submitted by: Hal Lewis

The Ministry of Municipal Affairs and Housing (MMAH) initiated a study to assess the use of shallow buried trench disposal systems in the Province of Ontario. The objective of the study was to evaluate the effectiveness of the systems, identify deficiencies with the systems, and to provide recommendations for optimizing the design and construction requirements for the use and operation of shallow buried trench technology. Stantec Consulting Ltd. was awarded the project in February 2001.

The study included an initial questionnaire investigation to determine the use of shallow buried trenches (SBTs) throughout the Province. Upon evaluation of the questionnaire responses, thirty (30) SBT system owners were asked to participate in a field investigation portion of the study.

Three separate field investigations were completed. The first round of investigations was completed near the end of the Summer 2001 to obtain data during a dry season. The second round was completed during January / February 2002 to obtain data during a cold season, and the third round was completed during April / May 2002 to obtain data for a wet season. Sewage effluent samples were also collected and submitted to a laboratory for anlayses of Biological Oxygen Demand (BOD5), Carbonaceous Biological Oxygen Demand (CBOD5), and Total Suspended Solids (TSS).

The site investigations included review of the following:

- length of trench;
- separation distance between trenches;
- soil conditions;
- area saturation; and,
- water movement through the area.

Data was collected and recorded during each of the three site visits to the individual systems.

A final report summarizing the questionnaire responses and the findings of the three rounds of field investigation was prepared and submitted to the MMAH. The report included recommendations for the design, construction, and maintenance of SBT systems.

Installers Comment

Stu Sunderland of SUNDEX asks why the Ministry of the Environment, who are responsible for approving septic systems over 10,000 L per day design flow, does not require installation to be performed by licensed contracting companies. In competing for contracts to install these systems, contractors with licensed supervisors have no advantage over inexperienced contractors, despite their certification as septic installers. When the Ministry of the Environment was the regulatory agency for all septic systems (before the less than 10,000 L per day design flow were moved under the Ontario Building Code and transferred to the Ministry of Municipal Affairs and Housing), they did require that sewage systems be installed by registered installers. This approach did not require installers to pass an exam to show their competency but was simply a registration system, so that installers were on record. When the Ministry of Municipal Affairs and Housing took over the approval program for sewage systems under 10,000 L design flow, they required contractors to write the exam on Part 8 of the Ontario Building Code in order to receive their license. The Ministry of the Environment abandoned the practice of demanding any registration of installers for the larger systems, and instead required that they be designed and construction supervised by professional engineers. At present, the exam and supervisors license is overseen and issued by the Ministry of Municipal Affairs and Housing, and not the Ministry of the Environment. Does the Ministry of the Environment not recognize the validity of licenses issued by other ministries in the same provincial government? Perhaps this is something that should be considered as OOWA prepares its position statement on Installer Certification.

BMEC vs Ecoflo Ontario & Waterloo Biofilter

continued from page 5

The manner in which BMEC exercises its jurisdiction, subject to any appeal, which BMEC may consider, will be required to change as a result of this ruling. At the same time, the Court recognised, as you did throughout this exercise, that BMEC has a jurisdiction to exercise. The point is however that BMEC must condition its exercise of that jurisdiction with greater respect for what you hold, for what it means to your businesses, and for your rights.

Editors note: In connection with the publication of this article, persons interested in reading the Divisional Court's judgement in this matter (it is not lengthy – only 41 paragraphs) can review the reasoning and the actual disposition of the application by the Court on-line at http://obc.mah.gov.on.ca. click on BMEC and then scroll down to 99-07-235 and 99-08-236.

We're Not in Kansas (City) Anymore Toto!

By Robert A. Passsmore, B.Eng.

The National Onsite Wastewater and Recycling Association (NOWRA) conference was held September 18 through 21, 2002 in Kansas City, Missouri. The location for this event was the Crown Centre Exhibition Hall located inside the picturesque Hyatt Regency Hotel.

The Hyatt Regency Hotel greets each visitor with stunning artwork and the Kansas City skyline of the downtown core is unique onto itself.

The conference was well attended, with over 600 people registered for various workshops, learning seminars and strategy meetings. There was a great diversity of attendees from all aspects of the onsite industry; there were academics, installers, service providers and even regulators! There was even a showing from some of our OOWA members, namely Dr. Doug Joy, P.Eng. (President), Terry K. Davidson, P.Eng. (Manager of the Ottawa Septic System Office), Bill Seabrook and Kaleb Lakew of Green Valley Environmental, Rob King of Eparco, and Craig Jowett of Waterloo Biofilter.

Again this year, there was a significant showing by many of the industry leaders in tertiary treatment units, filters, tanks and software. Each exhibitor provided ample product literature and sound advice on proper installation of many pieces of equipment.

As always, the conference was informative and well worth the trip. We urge all members of OOWA to experience these conferences and use the information gained. It may be timely to remind everyone that each OOWA member is also automatically recorded as a NOWRA member, and as such, gain the membership discounts to all NOWRA events.

Doug Joy Presenting at NOWRA (his presentation was well attended and informative)

Alex Across Africa in 2003

In January 2003 a group of intrepid adventures will gather at the Great Pyramid of Giza in Cairo Egypt. Their mission is to be the first to cross the continent of Africa by bicycle and the finish line in Capetown, South Africa. Crazy? Maybe. Exciting? Definitely. Dangerous? Possibly. Who would do such a thing? Alex Campbell of RJ Burnside, one of OOWA's Directors. Alex is an On-site Waste Management Specialist (septic guru, king of pooh and many other acronyms). Alex will be taking a leave of absence between January and July 2003 and sent us this contribution.

The Tour D'Afrique is the world's longest endurance bicycle race at 10,500 kms from Cairo, Egypt to Capetown, South Africa over 120 days. The race covers 11 countries, countless terrain types and runs from sea level to over 15,000 feet in elevation. The accommodation along the way is camping. Food is a combination of freeze dried food, energy bars, sport drinks, with a smattering of fresh fruit from local markets. Water is bottled or filtered. As for vaccines I have had more shots for more diseases than I care to think about. All in the name of a challenge.

I have wanted to do this ever since I was a kid. I will be away for a total of 6 months including acclimatization time prior to the race and relaxation at the end of the race. What about the strife, turmoil and danger of Africa? Yes it is there but it is not enough to stay away and in or me.

For the techno-fans out there here are the stats on what it takes to do this:

- Mountain Bike (modified) "The Stuff" by Kona
- Disc Brakes added
- Front Shocks deepened
- Clipless Pedals added
- Street tires (slicks)
- Tires are Kevlar reinforced
  (yes that is what they make bulletproof vests from)
- Anatomically correct gel seat
- Soft grips
- Addition Chain ring added for increased gear ratios
  (16 speed to 24 speed)
- Pannier modified to carry 4 litres of water

Training

- Daily rides of not less than 30 kms with rides of 70 kms/day at least 3 times per week
- Rides to be done as fast as possible over as many different terrains as possible
- Weight training of 50 reps of 10 exercises in 3 cycles (a total of 1500 reps per session) 3 times per week for endurance (low weight but lots of reps)

The Tour d'Afrique Website

(www.tourdafrique.com) will have progress reports and updates, including pictures. The map shows the route we will follow. The Race will be filmed for a documentary film and by the Outdoor Life Network for an upcoming show.

See everyone when I get back, *Alex*

Membership News

In a drive to continue our membership growth into 2003, we are offering an introductory rate of $50 dollars to all new members for the remainder of 2002. This will allow them to receive the newsletter and create a NOWRA membership for them as well. Hopefully this will encourage them to renew in 2003 for the full membership cost. Pleases circulate this information to anyone who may be interested and contact OOWA if you would like a membership package sent out to interested parties.

@(613)692-3571 x137

S-Files

Unexplainable or inexplicable septic sightings

Is this decorative landscaping OR a Clearstream Unit with a raised bed?
Answer: both. But does it meet OBC standards?

R. J. Burnside & Associates Limited
Engineers • Hydrogeologists • Environmental Consultants
BURNSIDE *Offices Located Throughout Ontario*

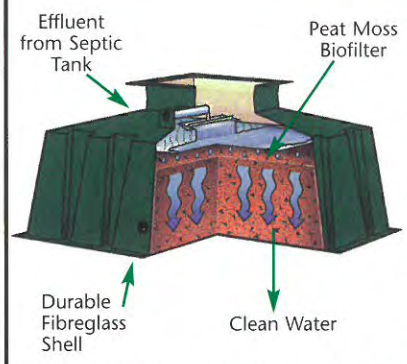
Sewage Project Backed Up?
Our On-Site System Specialists can assist you with:

- Approvals and Development
- Design and Operations
- Maintenance and Monitoring
- Sewage Systems Investigation
- Septage Disposal Facilities
- Innovative Technological Solutions

Contact: Alex Campbell, M. Sc.
15 Townline, Orangeville, ON L9W 3R4
Toll Free: 1 800-265-9662
Tel: 519-941-5331 Fax: 519-941-8120
Email: acampbell@rjburnside.com Website: www.rjrburnside.com

Septic Problems?

The new Ecoflo® Biofiltration System uses peat moss technology to treat your domestic wastewater.



- ✓ Small Lots
- ✓ Difficult Soils
- ✓ Compact Size
- ✓ Ideal for Cottages
- ✓ 8 Year Annual Maintenance Included
- ✓ No Electrical Parts
- ✓ Excellent Reliability
- ✓ Environmentally Friendly

Ecoflo®

Call ECOFLO-ONTARIO
for Free Information
Toll Free: 1-877-738-2991
(613) 738-2991
e-mail: ecoflont@istar.ca
web page: ecofloontario.com

Frequently Asked Questions

Reviewed by Ahmed Sharaf, P.Eng. Building Code Advisor, MMAH

Q If an existing house had a holding tank without any records to verify its approval, and the owner would like to add an additional bedroom onto the house, would this be allowed if there was room on the property for a Class 4 system?

A No. The addition will increase the wastewater design flow from the building code (O.B.C 8.8.1.2 (1)(b)(i)). The addition would be permitted with the installation of a Class 4 system.(OBC 8.8.1.2(1)(d))

Q A property close to a watercourse, where the development is not being permitted due to the quantity of fill required to construct a Class 4 Septic System in a wetland, should a holding tank be allowed instead of a fill based Class 4 Septic System?

A No. The proposed development does not meet the requirements under OBC 8.8.1.2 for an acceptable Class 5 installation.

Q If a Class 5 Holding Tank is approved in a regulated flood plain, and the 1:100 year flood elevation is 1 metre above existing grade, should sealed access hatches be install to this elevation?

A No. The vent should extend to an elevation above the flood elevation. (OBC 8.8.2.1(3))

Q Where a holding tank had been permitted under a previous regulating authority, in contradiction to the regulations at the time of the permit issuance, can the present regulating authority force the removal of said holding tank?

A Yes. Permits issued in error may be revoked. (BCA 8-10(d))

From the Editor

This month Dave Cooke and Hal Lewis will each receive ONSITE t-shirts for their contributions to the newsletter. Remember, your contributions are welcome. Letters to the editor, feature installation, installer's corner, photos for our gallery etc. are all welcomed and encouraged. Contributors names will be placed in a draw. Every issue, we will pull a name (or two) and send an ONSITE hat or T-shirt.