

# **A New Era for the Onsite Wastewater Industry**

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“We can't solve problems by using the same kind of thinking we used when we created them.”

Albert Einstein

“Never doubt that a small group of thoughtful committed citizens can change the world. Indeed it is the only thing that ever has.”

Anonymous

## CHAPTER 1

### The Way We Are

The handling or management of sewage has over the past two centuries evolved into a science with technologies and techniques greatly advanced over the days of tossing the “night soil” out into the centre of the street or holding it in basements to be removed occasionally by the “night soil men”.

As cities around the world grew larger and population sizes increased in density, the management of sewage evolved into a system of collection, treatment and disposal. In the countryside, the sewage was, for generations, spread on the land as fertilizer for agricultural crop production.

As society came to recognize the increasing levels of harm to public health, aquifers, surface lakes, rivers and streams that was occurring, systems for holding, treatment and disposal developed. This ended the practice of using human waste for fertilizing farm land.

Wastewater was increasing in quantity and potency, since the mid-1800s as well as man-made chemicals and pharmaceuticals being placed directly into wastewater and thereby into the environment.

Since the early 1900s, cities developed systems that are, today, referred to as a city sewer system or a central sewage system and in the countryside and the developing urban fringe to cities, sewage that was generated on these properties was managed using an onsite septic treatment system. These onsite septic system collected the sewage on the private property, treated it to certain acceptable levels and dispersed the effluent into the same private property’s soil.

Today, there are two basic sewage management systems. One is where the city accepts the ownership of sewage once the sewage leaves the property and enters the city sewer collection system. The other is where the property owner maintains ownership of the sewage and must treat the sewage on the same parcel of land where the sewage was generated.

Both of these systems create a material referred to as “biosolids”. These biosolids are often referred to as sewage scum, sludge or septage and will contain organic material, non-organic material and chemicals that will need to be treated in a variety of ways and means for final disposal. As these biosolids are generated from sewage owned by the city or a local regional authority, the city/local authority is responsible for the final disposition of its biosolids. As the city/local authority collects property taxes from land owners that are using an onsite sewage system, the city/local authority typically receives the “septage” and takes ownership of the septage for final disposition of the biosolids.

The sewage that is owned by the city/local authority is managed by the human and fiscal resources of that local authority and paid for by the taxpayer. Federal, state or provincial funding or grants for the city/local authority infrastructure causes taxpayers outside the local authority to contribute towards the capital costs of this infrastructure. Taxpayers within the local authority pay the capital costs and the operation and maintenance of the central sewer system and potentially any fines that are levied by senior levels of government against a city for not meeting treatment and disposal objectives.

To support the local authority’s central sewer system, the design, installation, operation and maintenance is overseen or directed by professional engineering firms readily available to the local authority.

To support the privately owned sewer system on a parcel of land, there is an industry called the Onsite Wastewater Treatment and Dispersal Industry. This industry consists of manufacturers of septic tanks, aerobic treatment units, pumps and controls, and individuals who are specialists in site and soil assessment, designing, engineering, installation, and maintenance.

The local authority's sewer systems are further challenged with needed repair or replacement due to the age of the collection system or due to increasingly larger than planned for daily sewage flow rates. The pipes under ground and roadways are being challenged by the larger flows and by the constituents in today's complex sewage flows. Additionally, the local authority's sewer systems have to meet new and current effluent qualities that are more stringent than before.

The public cost for the upgrade and repair or replacement of all or part of the central sewer system is estimated to be in the hundreds of billions of dollars, and the upgrade is needed now.

Non-point source pollution studies of aquifers, lakes, rivers and streams indicate that one of the potential contributors of contamination could be the onsite wastewater system. Older onsite wastewater systems on private land that were permitted to be installed and operated by the authority having jurisdiction are being reviewed through the lens of today's science and understanding. Despite being permitted by government officials, onsite wastewater systems of a certain age may need to be upgraded.

Federal, state and provincial governments mostly encourage the use of central sewer collection, treatment and disposal systems through the use of grant money to support local governments' growth and expansion. This current policy is mainly due to the perception that the central sewer system infrastructure can be managed better to protect public health and the environment, and that all costs for operation, maintenance and penalties will be covered by the levies or taxes that the local government can impose as and when needed.

Many times the public reads or hears about another fine or penalty being levied by a senior level of government on a local government's sewage treatment plant for failing to comply with federal requirements. Often these public utilities are fined for spilling sewage (raw or partially treated) into lakes, oceans or rivers. In some cases, penalties are levied for inappropriate (or illegal) dumping of biosolids into the environment at the wrong time of the year.

These fines and penalties are passed on to the local taxpayers and become accepted as the cost of operating a central sewer system.

This is the normal manner in which cities, counties, towns and villages operate their central sewer systems and infrastructure throughout North America.

The central wastewater treatment services, provided by a system of funding and taxation, allowed for the growth and development of cities. This in turn has allowed density to be increased significantly while protecting public health and the environment.

The areas where the city sewer cannot be brought to in order to collect the sewage are serviced by onsite wastewater systems. These systems are typically referred to by the general public as a "septic system".

It is important to note is that septic systems do offer some extremely valuable lessons that can be applied to central sewer systems that will save taxpayers' dollars, protect public health, reduce costs for infrastructure upgrades, and provide a truly economical, sustainable, safe system of sewage treatment and dispersal.

Regulatory frameworks for the management of sewage owned either by a local authority or by a private citizen need to consider the economic and environmental impacts, and then to source solutions in the current global economic condition.

## CHAPTER 2

### Integrated Wastewater Management Structure

Typically, federal, state and provincial governments have taken the policy position that to achieve sustainability in the protection of watersheds, public health and the environment, onsite wastewater systems should be the last choice of local governments for land use planning and development.

This government policy ignores the benefits of onsite sewage wastewater treatment systems that can exist when an onsite wastewater system maintenance and management policy is in place. Onsite wastewater systems provide sustainable protection at extremely low cost to the taxpayer compared to that of a central sewer system.

The general public pays the following costs for a central sewer system:

- Capital cost recovery
- Financing fees
- Administration and staffing
- Upgrades due to increased demand
- Maintenance of the collection system, treatment plant and the dispersal environment
- Any costs associated with senior government imposing fines for treatment non-compliance
- Cost of the environmental clean-up resulting from spills of contaminated sewage wastewater

These costs do not exist when using onsite wastewater treatment and dispersal systems with an appropriate maintenance monitoring program.

Strangely, it is the same senior levels of government that produce regulations, standards of practice, and codes for the onsite wastewater industry to comply with, and typically require local authorities to administer and enforce them.

Existing policies and directives by senior governments place on the local authorities the need for them to consider their resources, fiscal and human, and set internal policies and directives for the administration and enforcement of regulations, requirements and policies. The burden of resources by the local authorities is substantial and may not be sustainable to the taxpayer/voter.

Creating an integrated harmonized wastewater management structure embracing the two types of systems is somehow overlooked when senior governments develop wastewater policies and directions.

To create the integrated wastewater management structure, it will be necessary to identify the issues that need to be resolved and then bring forward the methods and solutions to address these issues. An integrated wastewater management structure will have the general public better served with sustainable systems and meet the objective of protection of watersheds, public health and the environment at an appropriate cost.

The onsite wastewater industry is able to organize itself in order to bring to the senior and local governments the methods and solutions needed to address the identified issues that are discussed in the chapters ahead.

## CHAPTER 3

### Land Use Planning & Development Opportunities

Local authorities are a key body in the formulation of overall community planning. The local authorities may be unable to move forward with their land use planning and development objectives due to the costs associated with centralized sewage collection, treatment and disposal of treated wastewater back into the environment.

Onsite wastewater systems offer a tool to local authorities that allows for land development without the financial burden typically associated with the “sewage problem”. The onsite wastewater treatment systems are purchased, installed and maintained directly by the user. There are almost no costs carried by taxpayers, either local or provincial, when using onsite wastewater treatment systems.

The development of municipal sewer infrastructure is very time consuming, often taking many years to develop to the functional stage. Onsite wastewater infrastructure is installed “on demand” and for the specific use, virtually eliminating wait time for infrastructure application.

As a result land use planning and land development can be streamlined substantially, reducing the timeframe from development proposal to marketable land.

The benefits of onsite infrastructure for local authority sewer management planning are:

- Virtually no taxpayer costs
- Complete control of the land use development process at the local level
- “On demand” infrastructure availability
- Low-cost management
- Low requirement for local authority resource allocation
- Eliminates catastrophic failure inherent to large municipal systems

The other frontier for the use of onsite wastewater technologies is to provide solutions to the urban density planning and development that is stalled due to existing sewer system infrastructure limitations.

Central sewer collection pipe and lift stations are designed to handle raw sewage flow. The volume of raw sewage and its mass loading often limit the population density that would be serviced by the central system. Applying the onsite wastewater industry’s goods and services at the source of the raw sewage would result in already have treated effluent being discharged into the central collection pipe.

The central sewer collection pipes would then be able to handle a greater quantity of wastewater due to the much reduced mass loading. This could allow the urban planners and developers to increase density in the urban areas and have the costs of treatment carried by the wastewater producers.

Sending treated wastewater into the sewer collection pipe system would also assist in the “cleaning” of the sewer pipe system and may mitigate the costs of increasing or replacing sewer pipes.

The downstream centralized sewage treatment system may then be able to handle an increased flow with little or no upgrades. In addition, there is the likelihood of less spillage or discharge of non-compliant effluent, thus reducing or eliminating penalties or fines.

To apply the onsite wastewater technologies to achieve these benefits would mean that in the basement of a high-rise building or under the roadways adjacent to high-rise or commercial buildings,



there would be an onsite treatment device that is owned and operated by the owners of the building generating the sewage.

The biosolids management of the onsite sewer treatment technologies from these privately held and operated systems could be addressed through existing central management structures.

There are significant benefits to local governments by reducing sewer system operating and maintenance budgets. This in turn relieves cost burdens being carried by the general taxpayer.

These concepts are not new as they have been effectively practiced in many Asian countries for years.

The current global economic conditions may provide the conditions needed for these concepts and opportunities to be actively considered by all levels of government. Land use planning and development would be able to be maintained and sustainable and financially viable growth can occur.

## CHAPTER 4

### Issues, Solutions, Barriers & Opportunities

To be able to effectively utilize and experience the benefits of the onsite wastewater technologies, there are several issues/barriers to the authorities accepting them as another form of infrastructure. It is important to address the issues/barriers and identify the solutions. In no particular order of priority the barriers are:

#### Issue/Barrier - Lack of Onsite System Maintenance

Public and government opinion is that onsite wastewater systems contribute to non-point source pollution of aquifers and watersheds that deteriorate the fresh water resources. This opinion is based in the observation and assumption that onsite systems are not performing as intended. The non-performance is viewed by the public and authorities as a normal condition due mainly to the lack of maintenance and servicing of onsite systems on private property.

#### *Solution/Opportunity:*

*The Onsite Wastewater Industry is able to provide the ongoing maintenance and servicing of all privately owned onsite wastewater treatment systems to ensure that systems meet the intended performance desired by government and the public. To carry out an effective maintenance program there needs to be in place a lawful method requiring the property owner to have the maintenance conducted.*

#### Issue/Barrier - Lack of Confidence in the Onsite Wastewater Industry

Industry participants have been historically viewed by the authorities as being “bad actors” with insufficient training and accountability.

The same authorities have addressed, in recent years, this issue with the requirement for licensing practitioners based on passing an exam to demonstrate a level of knowledge that is intended to indicate competency to practice or at least an understanding of how to comply with the applicable regulation, code or bylaw on a site-by-site basis.

Accountability of the practitioner is held by the license issuer and through, in some jurisdictions, a re-licensing program based on payment for renewal and review of public complaints. In addition, the local authorities issue the permit to construct and operate an onsite treatment system to ensure compliance to the applicable regulation, code or bylaw.

Opportunities may exist within the licensing program to demand increased educational requirements.

#### *Solution/Opportunity:*

*The Onsite Wastewater Industry is able to provide advanced education and training opportunities with practicum and experiential requirements, as well as follow up with an accountability structure through a code of ethics. In addition, the Onsite Wastewater Industry wants to encourage the authorities to require advanced education and upgrade of education.*

### Issue/Barrier – Lack of Industry Accountability

The permit process removes the accountability of the practitioner and transfers it to the permit issuer. The permit issuer is the entity that has the lawful duty of care to ensure compliance to any regulations, codes or bylaws. The local authorities may recognize that they could be legally liable in perpetuity for permits that they issue for private property owners to use an onsite wastewater system.

The authorities' licensing process may provide official permission to the practitioner to work within the onsite industry based on the successful completion of the examination of the practitioners' understanding of the applicable regulation, code or bylaw. The authorities administer the licensing program, determine who is licensed, how licensing will be determined and administers complaint processes against licensees.

#### *Solution/Opportunity:*

*The Onsite Wastewater Industry is able to partner with authorities to provide an accountability model that has industry involved in sharing some of the responsibility as outlined.*

### Issue/Barrier - Lack of System Performance

The general opinion of the authorities is that onsite wastewater treatment and dispersal systems are either going to malfunction over time or are failing and contributing to contamination of water resources. This opinion is generally held due to the lack of maintenance of the system by the owner or due to the misuse and behaviour by the owner of the system. The solution/opportunity above provides the remedy to lack of maintenance.

To mitigate these conditions, the authorities set installation requirements that require an appropriate amount of land area and soil depth for the drain field. The authorities then have the view that a septic tank based system is less of a problem due to their operational and non-mechanical simplicity. Septic tank based systems are also viewed by the authorities as being the "safer" method due to the volume of soil required by regulation, which is intended to provide natural treatment and dispersal of the effluent thereby protecting public health and the environment.

Treatment units are viewed as being not as "safe" because they are typically mechanical and require ongoing maintenance. In addition, treatment units have a smaller volume of soil than that of a septic tank based system. It is viewed by the authorities that the small volume of soil is not "safe" when the treatment unit is not monitored and maintained. It is viewed that when not maintained, the treatment unit based systems fail rapidly.

#### *Solution/Opportunity:*

*The Onsite Wastewater Industry is able to be proactive in monitoring and tracking all onsite sewer systems in a timely manner to ensure that the system is performing in accordance with the permit as issued by the authorities, and, take corrective measures when the system is found to be mal-functioning.*

The Onsite Wastewater Industry, through its various national, state and provincial associations is capable of meeting the challenges to overcome the issue/barrier listed above by working with the authorities to create policies and directives to give effect to the opportunities detailed. The Onsite Wastewater Industry is not seeking taxpayer money to meet these challenges, but it is seeking revised government policies.

## CHAPTER 5

### Resources

In the current global economic climate, the Onsite Wastewater Industry recognizes the difficulties that local authorities may have in managing their human and fiscal resources related to the administration and enforcement of regulations or codes.

Local authorities may have land use planning and development opportunities that the Onsite Wastewater Industry may have a role of resolving. The Onsite Wastewater Industry wants to assist local government and communities, as this could open up new consumer purchasing and buyers for its goods and services.

Both the local authorities and the Onsite Wastewater Industry have underlying drivers to encourage working together to resolve the issues that each party has.

The local authorities set their policies and procedures, and it is through these that the Onsite Wastewater Industry would like to provide the outcomes sought by the authorities, namely, maintenance, sustainability and the protection of the watersheds, public health and the environment.

Local authorities have the lawful duty to manage their budgets and human resources to meet the demands of the taxpayer. The taxpayer is also the voter, and it is the voter that the local authorities answer to and act on behalf of.

The Onsite Wastewater Industry offers the local authorities the benefit of growing its community without huge capital costs for typical sewer infrastructure, which consists of a sewage collection system, centralized treatment plant and the central final treated effluent disposal to the environment.

Onsite wastewater treatment and dispersal systems do not cost the local government's taxpayer and voter base significant resources. The local authorities' resources of administering and enforcing the applicable regulation is a minor cost annually compared to the annual costs to pay for a central sewer's infrastructure, financing, operation and maintenance costs.

The Onsite Wastewater Industry is able to assist local authorities to develop wastewater policies and procedures that are fiscally beneficial to the local authorities.

## CHAPTER 6

### Solutions

This chapter outlines solutions/opportunities to administratively manage the issues/barriers outlined above. This would require cooperative engagement of local authorities with the Onsite Wastewater Industry and the appropriate senior authorities.

#### Onsite Wastewater Management Process

The onsite wastewater management process is to take into consideration a full life cycle analysis of the system. All components of the system must work in harmony to maintain the intended outcome of sustainable protection of watersheds, public health and the environment.

Life cycle analyses of system management include all aspects of the processes involved in the development of an onsite system.

This starts with the regulatory and standards framework in which the Onsite Wastewater Industry stakeholders work and the competencies required to do the work.

Life cycle analysis is to include the quality assurance required for the equipment used within the system, the record processes used (data set) to identify what was used, where it was used and what is required for its maintenance. Finally, proper management of onsite wastewater systems requires a coordinated understanding of all of the roles and responsibilities of stakeholders within the process.

The development of a comprehensive onsite wastewater management process requires identifying roadblocks and opportunities within the components of life cycle analyses. In summary and in general these components are:

- Regulation and standards framework (the code)
- Stakeholder (practitioner) competencies
- Equipment quality standards
- Records collection and management (permit data sets)
- Coordinated understanding and obligations

#### Regulation and Standards Framework

Typical regulatory frameworks provide for the command and control of the Onsite Wastewater Industry in all aspects of the onsite industry including the design, installation, practitioners' competency, equipment standards, and records management. The interpretation and management of the regulatory processes should be reviewed to ensure that they are sufficiently supported to facilitate life cycle system analysis, especially regarding the following sections:

- Licensing requirements
- Records collection and management
- System design and installation standards related to maintenance
- Regulated maintenance requirements.

The Onsite Wastewater Industry supports and will participate with the authorities in a review of the appropriate regulations to develop opportunities to improve the regulatory framework in support of system maintenance

The Onsite Wastewater Industry will assist the authorities in developing interpretation guidelines and policies in support of system life cycle analysis.

### Stakeholder Competencies

Several jurisdictions require that practitioners conducting site and soil assessment, design, installation and maintenance of an onsite wastewater system must hold a license issued by the authorities.

Typically, successful completion of a course or examination as required or endorsed by the authorities is required to be issued a license.

There are other jurisdictions where there are no requirements for a government issued license.

The Onsite Wastewater Industry would like to ensure that the current training levels are sufficient for the application of onsite wastewater systems and encourages a program of continuing education within the Onsite Wastewater Industry.

Licensed practitioners are not the only stakeholders within the life cycle analysis of the onsite system. Product suppliers, regulators and owners are intrinsically involved in system design, installation, maintenance and operation.

Regulators require a level of education and professional development that will ensure they are up-to-date with current onsite techniques and are able to interpret applicable regulations including environmental regulations and local by-laws. Professional development should be encouraged and implemented by the appropriate authority.

Product suppliers do not typically require formal training in the industry to sell or promote their product. Although there is a broad range of products and application, each product must be used correctly and maintained to ensure long-term function of the system.

Product suppliers who work in the Onsite Wastewater Industry should have a basic knowledge of the use and application of their product and a broad understanding of the industry as a whole to support life cycle analysis of the system. The Onsite Wastewater Industry should focus attention on these stakeholders and ensure educational resources are available to improve competency.

Owners of onsite wastewater systems are critical stakeholders within the industry. They are required on a regular basis to assess the operation of their system, ensure it is utilized according to its design and initiate maintenance during the system's life cycle.

The system owner is the least educated stakeholder within the life cycle analysis of the system. The Onsite Wastewater Industry and authorities should dedicate some resources to ensure owners are educated on the use and maintenance of their system.

The Onsite Wastewater Industry should ensure all stakeholders, designers, installers, regulators and product suppliers provide timely, accurate and understandable information to owners to ensure that they have the competencies to operate their system.

The Onsite Wastewater Industry supports the authorities in placing continuing education requirements for the relicensing of practitioners.

The Onsite Wastewater Industry supports increased training and professional development of regulators to ensure regulators remain current on changes in onsite wastewater techniques and technologies, and to attain system life cycle analyses for system operation and maintenance.

The Onsite Wastewater Industry recommends to the authorities that all purveyors and suppliers of onsite system components be required to be registered and that as part of the registration a minimum competency and understanding of the industry is required to be examined.

The Onsite Wastewater Industry supports the inclusion of home owner education within the competencies of all stakeholders. Additionally, the Onsite Wastewater Industry supports the broad dissemination of educational material through the regulators.

### Treatment Equipment and Technology Standards

The Onsite Wastewater Industry recommends to the authorities that they require that all equipment meet a recognized standard where such a standard exists, and the equipment is to be included in any ongoing certification program. The following standards are used or available:

#### USA

- NSF International, Standard 40, Class One, Standard 245, Standard 350
- ASTM
- IAPMO
- NPCA Septic tank manufacturing
- ETL or UL

#### Canada

- CSA B66 – Septic, Sewage Holding and Effluent Dosing Tanks
- CSA B65 – Installation Code for Decentralized Wastewater Systems
- Treatment Units; NSF Standard 40, CAN/BNQ 3680-600
- Pumps Pipes and Fittings; These types of products have a range of available standards
- CSA, cUL (electrical safety standards)
- CE

The use of “standardized” and “certified” products offers assurance of the products viability for the selected use.

Within the system life cycle analysis, the viability of the product indicates system lifespan and maintenance requirements. “Standardized” and “certified” production quality assurance supports an integrated management strategy for onsite systems.

The Onsite Wastewater Industry will encourage authorities to utilize current American National Standards Institute or Standards Council of Canada accreditations to regulate components used in the industry and in setting requirements for the provision of technical installation and maintenance documents by manufacturers.

The Onsite Wastewater Industry encourages the development of policies that will ensure that the suppliers provide clear and concise installation and maintenance information for use by maintenance providers, designers and installers.

## Records Collection and Management

The collection and management of records is a key component to the development of the onsite wastewater system's life cycle analysis. Records are used to identify the location of the system, its owner, its intended function and its system components. A proper records collection system provides the basis of the ongoing data sets needed to ensure the system function from a macro to micro level, capturing information valuable to all stakeholders from the authorities to the installer and owner.

The use of paper records collection and inconsistency of records management systems is a major roadblock to the development of a comprehensive life cycle analysis for onsite sewage wastewater systems.

Enabling records to be managed in a comprehensive manner will allow for accessibility, ease of record updating and the ability to mine comprehensive data information.

The Onsite Wastewater Industry wants to work with the authorities to develop a comprehensive electronic records collection and data management system that will provide an integrated and accessible onsite system database.

## Coordinated Understanding and Obligations

Stakeholders within the onsite industry often work independently and without a clear understanding of each other's roles, responsibilities and goals. Understanding the obligation of each stakeholder and their goals and objectives as they relate to the onsite system will ensure a coordinated approach to life cycle analysis. Education programs designed specifically for the industry and inclusive of all roles will assist in the development of a coordinated approach. Additionally, data dissemination and accessible record data sets will also allow stakeholders to interact in a coordinated manner.

The stakeholder's ability to work in a coordinated fashion within the overarching goal of system life cycle analysis is a critical feature of proper system management. The coordinated approach will allow for a reduction in costs and resources applied to protection of watersheds, public health and the environment.

The Onsite Wastewater Industry wishes to engage stakeholders and the authorities in discussions to develop integrated and coordinated processes that will facilitate system management, including the implementation of system life cycle analysis approach.

## Accountability Models for Industry

Professional engineers have an organization that they are members of and the engineers' association typically has a code of ethics that the professional engineer is to uphold. The engineers' association holds their members to account through a variety of penalties including loss of license to practice when they have breached the code of ethics or conduct.

Where the authorities issue licenses to other professionals, the authorities hold to account these professionals through continuing education requirements for relicensing and the public complaint process.

The equipment certification agencies hold tank and treatment unit manufacturers to account on the manufacturing, supply and performance of the treatment unit. Accountability is reinforced through penalties including decertification of the tank or treatment unit.



The permit issuer provides in-field inspectors to ensure compliance with the appropriate regulations, codes or bylaws during the design, permit application phase and the installation phase.

Combined, these accountability models should allow the Onsite Wastewater Industry to provide safety to the public, providing that all of these models are in place.

The accountability models appear great on paper, but in practice they are not consistent and uniformly applied.

The Onsite Wastewater Industry would like to work with the permit issuer to create the conditions where the accountability models function and operate as intended. This may require the authorities to review their policies and directives within the scope of the resources that the authorities and the Onsite Wastewater Industry can bring together.

## CHAPTER 7

### The New Era for the Onsite Wastewater Industry

Onsite wastewater systems provide wastewater infrastructure for over a third of all households and businesses across North America. There are no second choices for the provision of this infrastructure available for many of these homes and businesses. In some cases, there is a potential to provide municipal sewer systems to some of these homes and businesses; however, the monetary resources are unavailable as the municipal sewer system is just too costly an option.

Managing infrastructure properly is paramount to the protection of watershed, public health and the environment. The management of municipal sewer systems is supported through user fees and municipal tax structures with management carried out by municipal workers or contractors on behalf of the community. Regulation of the infrastructure is managed by senior levels of government through renewable permit processes.

Onsite wastewater system infrastructure management is left to the owner of the system. Requirement of the maintenance may or may not exist in a regulation. There is no support for managing onsite infrastructure through user fees or taxation. Owners with little knowledge and no access to proper data or system records are expected to obtain services through private providers.

Onsite wastewater system infrastructure, once it is installed, is not supported by local governments that rely on these cost effective systems within their wastewater strategies. Additionally, properly supporting onsite infrastructure requires proper data sets and records collection, which is currently not available or resource heavy. The ability for local government to provide system life cycle analysis is restricted structurally and financially.

The Onsite Wastewater Industry needs to explore options with the local authorities for funding of the programs that include new approaches and transparency to the consumer/taxpayer for systems that are owned and operated privately.

The new era for the Onsite Wastewater Industry starts with the industry entering into discussions with the authorities to create a framework for working together in addressing the issues common to the industry and the authorities, as brought forward in the chapters here.

The current global economics offer an opportunity for the new era because the Onsite Wastewater Industry provides the best affordable method for land use planning and development. The Onsite Wastewater Industry wishes to grow its business activities, and it needs to work with the local authorities to meet industry and local authority issues as discussed herein.

It is appropriate for businesses to grow and be financially viable once the primary obligations of water resource management and the protection of watershed, public health and environment are met.

The Onsite Wastewater Industry offers the opportunity to prove the value of the onsite wastewater systems and start a new era for the authorities and the industry in meeting society's need for economic and environmental sustainability.

Whether you, the reader, is active in the onsite industry, a government or an association related to the onsite industry, the era can begin in your community by you taking action to implement the principles and concepts, in whole or in part, outlined in this commentary.

## About the Author

Frank Hay is currently the:

- President of Pinnacle Environmental Technologies Inc. (sewage treatment equipment designing, fabricating and supply – [www.pinnacleenvironmental.com](http://www.pinnacleenvironmental.com))
- President of NOMADIC Systems Inc. a division of Pinnacle Environmental Technologies Inc. ([www.nomadicsystems.com](http://www.nomadicsystems.com))
- Past President of the BC Onsite Sewage Association ([www.bcossa.com](http://www.bcossa.com) )
- Associate Member of the Canadian Standards Association Committee (B65 Committee) for a national standard for decentralized (onsite/septic systems) wastewater design, installation and maintenance.
- Director of the Canadian Onsite Wastewater Institute Inc. (writing, designing and publishing technical textbooks, manuals and teaching aids – [www.canowi.com](http://www.canowi.com) )
- Director of Community Infrastructure Management Corp. (internet based online wastewater systems monitoring, tracking, record keeping and notification system)
- Member of the Ontario Onsite Wastewater Association's Professional Development Committee.

Previously Mr. Hay has served as:

- President of the BC Onsite Sewage Association from 1999–2010
- Inaugural Chairman of the Applied Science Technologists and Technicians of BC (ASTTBC) Onsite Wastewater Registration Board from (2004–2009).
- Member of the Provincial Government's 6 person Sewerage System Leadership Council (2005–2010)
- Vice-Chairman Royal Roads University Advisory Board for Onsite Wastewater Management (1998–2006)
- Instructor at the Westcoast Onsite Wastewater Training Centre
- Chairperson of the BCOSSA Education & Training Committee

Mr. Hay has been involved in the sewage wastewater treatment industry since 1980 and has manufactured and serviced sewage treatment plants of different types such as suspended growth, extended aeration, activated sludge return, fixed film attached growth media, sequencing batch reactors, rotating biological contactors and membrane biological reactors.

Mr. Hay is the designer and developer of the NOMADIC™ mobile wastewater treatment systems and is the author of several publications for wastewater treatment technical manuals, maintenance and monitoring manuals, and trade articles.

Mr. Hay is one of the leaders in the development of the Registered Practitioner Program implemented in BC. Mr. Hay has been a guest speaker at various conferences and seminars in Canada and the USA, and has published:

- Wastewater treatment plant technical manuals for engineers
- Maintenance and monitoring manuals for onsite wastewater systems
- Various technical and related articles for trade newsletters

Mr. Hay is a Registered Onsite Wastewater Practitioner and an Onsite Wastewater Professional Technician.