

# Alternative Onsite Wastewater Treatment Training

## Onsite Wastewater Options for Small Rural Communities in the Adirondacks

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### Overview

Twenty years ago, the Adirondack Research Consortium was founded on the premise that good science and information should be the basis for sound decisions. Through the years, the Consortium has fulfilled this vision by holding the Annual Conference on the Adirondacks each May, by publishing the *Adirondack Journal of Environmental Studies* (AJES), and by hosting specialty workshops and seminars focused on specific issues. Topics explored at these workshops are chosen from current issues and problems facing policy makers and industry where new research can foster solutions to complex problems.

Managing onsite wastewater treatment systems is an ongoing problem in the Adirondacks. Typical treatment systems consist of a septic tank and soil absorption field. Contaminated water, aging septic systems in need of replacement, limited regional infrastructure, and site restraints, such as steep slopes and poor soils, are some of the challenges that make installing a typical treatment system prohibitive. These challenges are why residential and municipal users are considering alternative systems that can provide cost-effective solutions that also improve water quality, reduce water use, and provide better wastewater treatment.

There are many benefits of alternative wastewater treatment technologies especially for small towns and rural areas in the Adirondacks. These technologies have been available for some time but

have not become widely utilized for a number of reasons including the lack of public awareness and restrictive government regulations. The purpose of this training was to promote awareness and provide information on alternative wastewater technologies, explore opportunities, and to discuss issues and problems in utilizing them. Over 20 people attended the workshop, half of whom earned continuing education credits.

### Defining the Problem

Eric Murdock from Onsite Engineering presented an introduction describing the many designs for septic systems



*Eric Murdock, P.E., Onsite Engineering, Syracuse, NY, explaining alternative wastewater treatment options for individual property owners at View in Old Forge, NY.*

ranging from conventional to alternative that must take into consideration such resource limitations and factors such as soil type, slope, and depth to bedrock. Many traditional residential septic systems fail due to poor design and site limitations. Alternative technologies present viable options.

Faced with the rising cost of building traditional treatment facilities, many municipalities are exploring and implementing alternative community onsite technologies which meet treatment standards and are less expensive to build and operate. One example is the “cluster system” approach, which is a decentralized system employing aerobic tanks, sand filters, and constructed wetlands. The Environmental Protection Agency (EPA) has many useful online resources including a handbook for onsite and clustered treatment systems (see EPA, 2005).

An aerobic treatment option exists for residential use. It requires oxygen and bacteria that thrive in the oxygen-rich environment and break down and digest the wastewater inside the unit as they are suspended in the liquid. Applied information on this technology can be also be found in online case studies (see EPA, 2012).

### Biological Options

Mark Noga of Knight Treatment Systems discussed the biological aspects of treatment. In the biological treatment approach, aerobic bacteria breakdown the waste entering the tank which results in an effluent that is cleaner and enriched with oxygen and bacteria that are beneficial to the leech field. Facultative ponds are also an alternative in the final stages of treatment.

In deciding upon appropriate treatment, one must consider the varying characteristics of wastewater. Residential wastewater may include household

chemicals, pharmaceuticals, paints and varnishes, flushable additives and cleaners, garbage disposal wastes, water softeners, and salt which kill microbes necessary to treat wastewater. Commercial, institutional, and industrial high-strength waste requires special treatment considerations that vary from dairies to restaurants.

Biosolids or sludge can also be difficult to manage because of the complexities of the waste stream. There are alternatives to managing the sludge, such as the "Nowa One" process. Sewage sludge is typically either burned or spread on farm fields. In contrast, the Nowa One approach uses the energy within the sludge to run the process of transforming the sludge into useful products, which results in cleaner air and farmland.

**Regulatory Framework**

Andrew Getty, the Codes Enforcement Officer for the Town of Webb, discussed the regulatory framework of wastewater treatment. The Hollywood Hills development in the Town of Webb was used as an example of an unregulated development built in the early 1900's. It included a motel and subdivision with many undersized lots with steep slopes, poor soils, and no setbacks from water. In the 1950's and 1960's resource problems, including contaminated drinking water, began to develop because of the sewage plume. There was a clear need for action, but the Town had no way to resolve these problems at the time.

The Town of Webb has taken responsibility for code administration and enforcement procedures in the community as provided in New York State law. In 1973, Adirondack Park Agency regulatory oversight and permitting authority

took effect and the Town of Webb adopted a parallel authority through its code enforcement office. With this framework in place, the Town had a system to manage new development and pre-existing problems such as non-conforming septic malfunction along the waterfront. The introduction of alternative wastewater treatment systems in this location have proven very effective in replacing older systems installed without regulation, especially for

excellent example of these issues as it is surrounded by homes and communities and is the drinking supply for the City of Syracuse.

An alternative to consider in this situation is the fusion treatment system, a Japanese product in widespread use since 1911. The unit is energy efficient and is easy to install, operate, and maintain. The system involves both aerobic and anaerobic sections to provide biodegradation. Estimated costs associated with it are significantly less than those of a traditional system.

**A Commercial Alternative**

Mark Noga of Knight Treatment Systems presented a commercial system known as the White Knight Microbial Inoculator Generator. He noted that scientific advances in microbiology have made possible the technology that utilizes a patented bacterial process to introduce, cultivate, and release a select group of microorganisms. This technique transforms the septic tank into an active biological breeding reactor that makes use of the influent's organic waste content and is suitable for year-round use.

The Glen Haven Restaurant in Skaneateles, NY was used as an example where a White Knight Microbial Inoculator Generator was installed. This restaurant needed to upgrade its treatment system but had severe site limitations that prevented the installation of a traditional replacement system. The White Knight was selected above a variety of other available technologies to economically treat the high-strength wastewater generated by the restaurant, saving the property owner over \$50,000. More information on this system can be found on the



*Mark Noga of Knight Treatment Systems demonstrates to workshop participants a commercial alternative onsite treatment system in Long Lake, NY.*

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shoreline properties that do not have the area or space required for conventional absorption fields.

**Onsite Options**

Eric Murdock, P.E., Onsite Engineering, discussed onsite options for individual lots. Some of the challenges for lots include poor soils for biological treatment, removing dry wells that are too close to a waterbody, and shallow depth to groundwater or bedrock. Skaneateles Lake in the Finger Lakes Region is an

Knight Treatment Systems' website: [www.knighttreatmentsystems.com/](http://www.knighttreatmentsystems.com/).

### Community Systems

Bob Eichinger of Onsite Engineering discussed alternative community systems. The EPA supports community decentralized wastewater systems (DWWS). DWWS consist of a variety of approaches for collection, treatment, and dispersal/reuse of wastewater for individual dwellings, industrial or institutional facilities, clusters of homes or businesses, and entire communities. These systems are effective and less expensive for small communities.

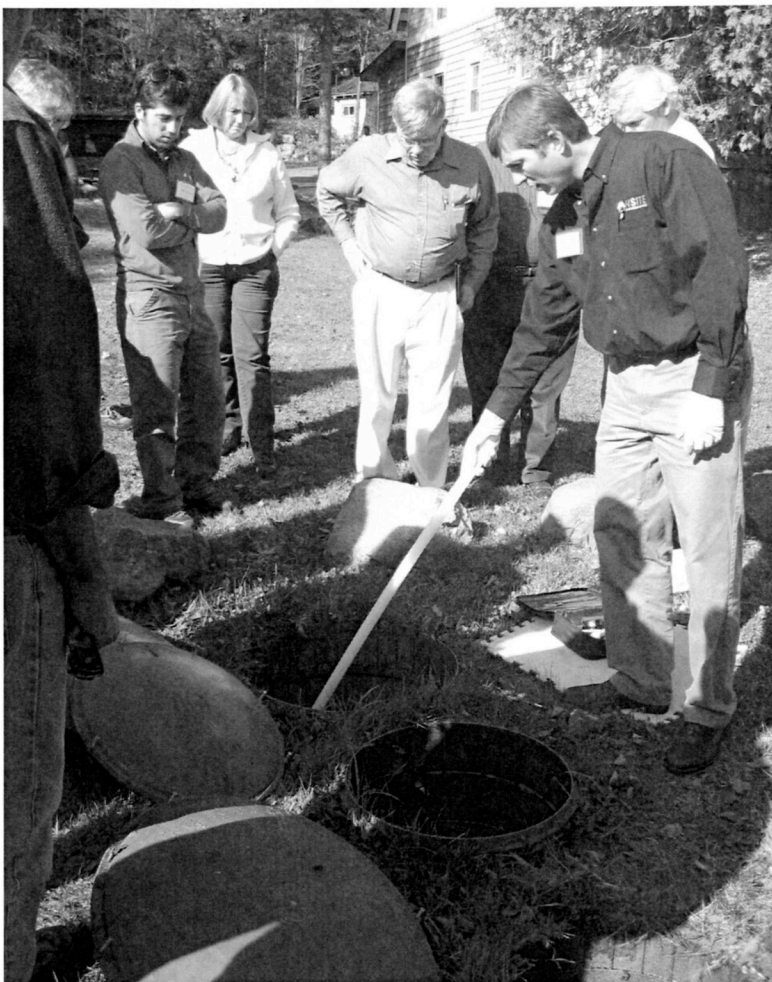
There are community DWWS in New York which are less expensive to build than traditional systems and yield better treatment results. The system in Hillsdale, NY is the most visual example. Amenia in Dutchess County and Suffolk County on Long Island are also exploring this option. More detailed information on decentralized systems can be found on the EPA's website (<http://water.epa.gov/infrastructure/septic/>).

### Fieldtrip

The training concluded with a field trip to visit four alternative systems installed in the area. The goal was to visit both commercial and residential installations of alternative systems to directly inform participants with field installation, process, and application. Participants benefited by seeing first-hand how these systems operate and by speaking with experts about the concepts explored in the classroom portion of the training.

### Additional Resources

The New York Onsite Wastewater Treatment Training Network (OTN) was established to provide wastewater treatment training events across the state that share knowledge and expertise with local



*Eric Murdock from Onsite Engineering explains how an alternative onsite treatment system operates at a lake-side residence in Old Forge, NY.*

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officials, building inspectors, and professional engineering firms. More information can be found by visiting [http://www.usawaterquality.org/nesci/Focus\\_Areas/wastewater/default.html](http://www.usawaterquality.org/nesci/Focus_Areas/wastewater/default.html)

The EPA's Environmental Technology Verification Program is a public-private partnership between the EPA and non-profit testing and evaluation organizations that has verified the successful performance of innovative technologies. It is a good reference for alternative technology information and can be found at [www.epa.gov/etv/](http://www.epa.gov/etv/).

### Acknowledgments

The Adirondack Research Consortium would like to thank the speakers and participants for making this training a success. Board Member Tom Burkley chaired the program for the Consortium and worked closely with Andy Getty and Eric Murdock on developing the program and organizing the field trips. We are grateful to Bob Eichinger and Mark Noga for freely sharing their knowledge and insights on these technologies. The recently opened View in Old Forge was the perfect facility to hold the event and the staff was hospitable and welcoming to our program participants. It is our hope that this training will serve as a launching point for those interested in exploring information about alternative wastewater technologies.

### References

- Environmental Protection Agency. December 2005. Handbook for managing onsite and clustered (decentralized) wastewater treatment systems: An introduction to management tools and information for implementing EPA's management guidelines. Retrieved from [http://water.epa.gov/infrastructure/septic/upload/onsite\\_handbook.pdf](http://water.epa.gov/infrastructure/septic/upload/onsite_handbook.pdf).
- Environmental Protection Agency. June 2012. Case studies of individual and clustered (decentralized) wastewater management programs: State and community management approaches. Retrieved from: <http://water.epa.gov/infrastructure/septic/upload/Decentralized-Case-Studies-2012.pdf>.