

2-1-2006

Building an Onsite Wastewater Treatment System Management Database for Your Municipality

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Recommended Citation

Obropta, C. C., & Buckley, K. A. (2006). Building an Onsite Wastewater Treatment System Management Database for Your Municipality. *The Journal of Extension*, 44(1), Article 21.
<https://tigerprints.clemson.edu/joe/vol44/iss1/21>

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Building an Onsite Wastewater Treatment System Management Database for Your Municipality

Abstract

In an attempt to protect groundwater and surface water quality in the face of rapid residential development, a New Jersey municipality established an "Onsite Wastewater Disposal Management District." After 15 years of having the program in place, the municipality asked Rutgers Cooperative Research & Extension to update the management program database. The newly developed database is automated to generate form letters, invoices, late notices, and license renewals, and it is linked to the municipality's geographic information system. The database has increased productivity, improved tracking abilities, and has resulted in faster identification of systems needing inspection for the municipality.

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Introduction

Onsite wastewater treatment systems (OWTS) or septic systems are essential to wastewater planning in many communities. In New Jersey, approximately 1.2 million people rely on onsite wastewater treatment for their wastewater needs (ANJEC, 2002). This is more than one-tenth of the growing New Jersey population.

In many instances, onsite wastewater treatment systems are neglected as part of the wastewater management plan for a municipality. In New Jersey, only eight of the 566 municipalities have OWTS ordinances (ANJEC, 2003) that require residents to maintain and inspect their systems. Lack of regular inspection and maintenance of OWTS may result in nitrate and bacteria contamination of surface water and groundwater, which are potential threats to public health and aquatic life. Furthermore, if the septic tanks are not inspected and pumped regularly, the leaching field can clog, resulting in system failure.

Developing the Database

The local health departments within a municipality typically track the operation, installation, and maintenance of systems within their municipality. Montgomery Township in Mercer County, New Jersey recognized in 1990 that the soil conditions and seasonal high water table within the Township were marginal for the use of OWTS and that failing OWTS within the municipality could potentially threaten groundwater, potable water supplies, and overall public health. The municipality, by township ordinance, charged the Board of Health to establish an "Onsite Wastewater Disposal Management District" that has the following functions:

- Issue three-year operating licenses to OWTS owners in the program;
- Oversee maintenance issues during the three-year license;

- Inspect the system prior to re-issue of license and possibly on an annual basis if certain site conditions exist;
- Inspect the drainage fields semi-annually for systems meeting specified criteria (Township of Montgomery, 1999).

Of the approximately 2,500 OWTS in the township, more than 1,450 are enrolled in the management program at this time.

To manage the newly created OWTS management program in 1990, the Township created a database to store the licensing information using a Lotus software application. In 2004, the Township asked Rutgers Cooperative Research & Extension's Water Resources Program to help them convert their existing database into one that would better satisfy the needs of their growing program. The Water Resources Program chose to reconstruct the database in Microsoft Access®. Microsoft Access is a relational data management system capable of storing and retrieving structured information electronically. Microsoft Access is a robust database software package that allows the user to easily complete database queries and incorporate database information into reports and forms.

The Water Resources Program worked closely with the Township to determine their data needs and the information that should be incorporated into the new database. The newly created database includes the homeowner's name, address, emergency contact information, the number of bedrooms to estimate the number of residents, the size of the septic tank, and the location of the tank and leaching field. Additionally, the database includes information pertaining to why the system is in the program (i.e., new system, repaired system, replaced system, or other).

Because Montgomery Township did not require all homeowners with OWTS to participate in the program, the "why" information is important to help identify areas of the Township where future OWTS problems can be expected. For example, if a particular neighborhood in the Township has 10 homes and five are in the program because their systems have failed and needed to be replaced, it is likely that the other five systems are marginal systems. Now the Township can monitor the area for future failing systems.

Results of the RCRE OWTS Database

After being tailored to meet the community's needs, the Montgomery Township OWTS Management Database was installed at the Board of Health in September of 2004 for evaluation by the Board of Health staff. The OWTS Management Database, benefiting from the query and programming functions available in Access, was automated to generate form letters, invoices, late notices, and license renewal letters. The ability to quickly query the database and generate form letters and invoices has greatly increased the efficiency of the clerical staff. In addition, the database has the capability of linking OWTS to the municipality's Geographic Information System (GIS) by parcel data. The full extension of this GIS capability may include:

- Linking failing systems to surface water and groundwater quality problems;
- Identifying areas of past system failures within the Township;
- Linking past system failures to physical features contained in the GIS databases, such as soils, proximity to surface water, and high groundwater table;
- Grouping Township inspections so that inspectors are not crisscrossing back and forth across the Township;
- Developing the ability to use handheld devices such as Arc Pad® to enter inspection data in the field that can be uploaded to the database back in the office.

The database is used by the Health Officer, inspectors, and clerical staff who print invoices, update information, track late payments, and manage the program overall. When users of the system were asked how and if the OWTS Management Database has aided the Board of Health, responses included increased productivity, improved tracking abilities, and faster identification of systems needing inspection. The single recommendation received was the request for RCRE to work with other municipalities in tracking and managing OWTS.

More information on OWTS operation, maintenance, and management can be found at <www.rcre.rutgers.edu> and at <www.water.rutgers.edu>.

Acknowledgements

The RCRE Water Resources Program would like to thank the Township of Montgomery and the Board of Health for their input. Additionally, the RCRE Water Resources Program would like to thank Dr. Sajan Thomas for his work on the OWTS Management Database.

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