

Factors Affecting the Performance of Primary Treatment in Onsite Wastewater Systems

Approximately 23% of the estimated 115 million occupied homes in the United States are served by onsite wastewater systems, the vast majority of which include a septic tank, grease trap, or both for primary treatment. These are efficient, simple treatment units whose performance is critically important to the overall functioning of onsite wastewater systems.

Current primary unit design and operational practices tend to be driven by highly prescriptive regulations, industry standards and guidance materials which rely heavily on limited and often dated scientific information and may be incomplete in their consideration of the factors that influence primary treatment unit performance in onsite wastewater systems. As such, the development of improved practices has been somewhat limited.

The objective of this research was to take a fresh look at the existing body of work addressing the performance of primary treatment units in onsite wastewater systems, with a goal of establishing what is known, what is not known, and what future research is needed. Design, construction/installation, operation, monitoring and maintenance issues were each considered, with a focus on those factors most likely to affect primary unit treatment objectives, including influent

characteristics, sizing, hydraulic design, compartmentation, influent and effluent apertures, and seasonal effects, among others.

Relevant publications were identified, compiled, analyzed, and synthesized to support the development of several inter-related products for practitioners, researchers, policymakers, and other stakeholders. These products are available through the Water Environment Research Foundation (www.werf.org) and the National Decentralized Water Resources Capacity Development Project website (www.ndwrcdp.org).

Research Digest

Factors Affecting the Performance of Primary Treatment in Onsite Wastewater Systems, the research digest, is a synthesis of the comprehensive literature review. Two additional appendices on “Existing Tank Standards” and “History/Evolution of Primary Treatment Units in Decentralized Systems” are included in the digest. It is available as a soft-cover printed document or in PDF format.

Bibliographic Database

An interactive bibliographic database is a key element in the project. The objectives of the database are: 1) to organize and manage input on references; 2) to

BENEFITS

- Describes what is known about the performance of primary treatment in onsite wastewater treatment systems and factors affecting performance.
- Describes the landscape for primary treatment in onsite wastewater treatment systems: history, regulations, industry standards, and standard practice.
- Sets basis for future research on primary treatment in onsite wastewater systems.
- Provides bibliographic database to assist researchers and practitioners.

RELATED PRODUCTS

Long-Range Planning for Decentralized Wastewater and Stormwater Treatment Research(04DEC8W)

Promoting Equitable Consideration of Decentralized Wastewater Options (04DEC2a)

Analysis of Community-Sized Decentralized Wastewater Treatment Systems(04DEC9)

RELATED ONGOING RESEARCH

Influent Constituent Characteristics of the Modern Waste Stream from Single Sources (04DEC1)

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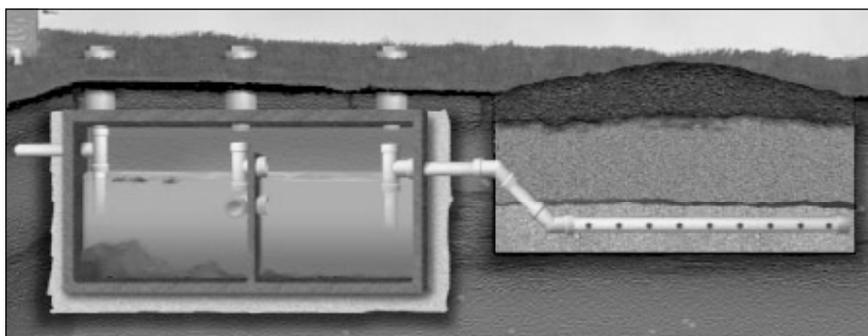
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Septic Tank and Soil Absorption Field System

allow users to find and access references of interest; and 3) to allow for continued updating. The database includes searchable fields that characterize the data references (e.g., authors, year of publication, etc.) as well as fields for characterizing the information including type of data (e.g., design, construction, or operation), keywords or topics that are addressed by the data, and quality assurance ratings, among others.

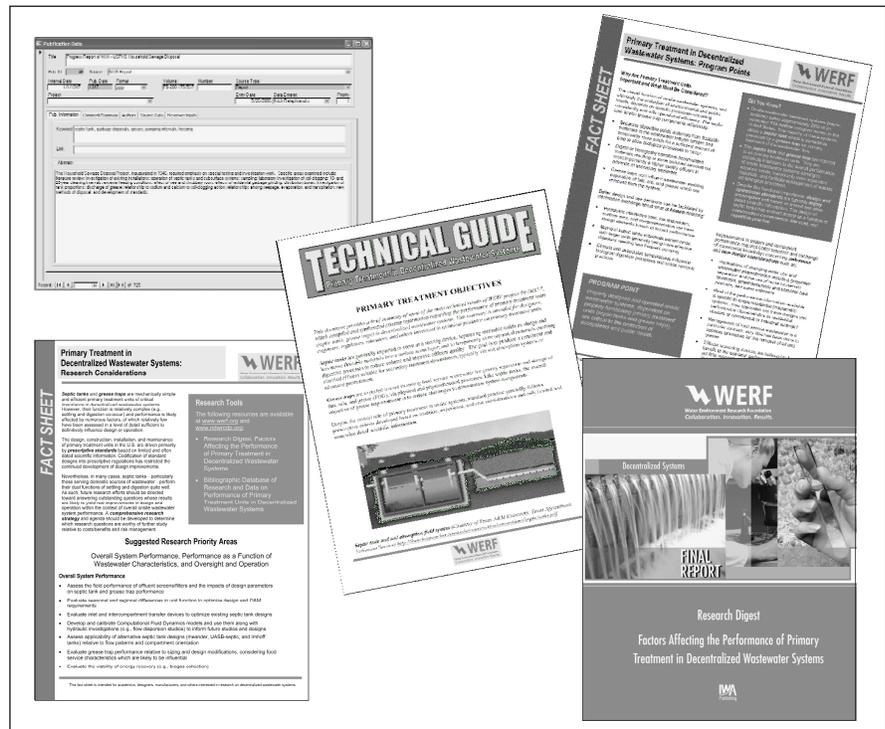
Fact Sheets and Communication Tools

In addition to the Research Digest and Bibliographic Database, three primary communications pieces ensure that the primary elements of the communications framework are concise, stakeholder-specific, and understandable to target audiences. These three pieces include:

Primary Treatment in Onsite Wastewater Systems: A Technical Guide This six-page bulletin concisely communicates the main technical findings of the project. It primarily targets designers, engineers, regulators, and educators, but other stakeholders may use the guide to further their knowledge in the subject. This piece also highlights the relevant research needs.

Primary Treatment in Onsite Wastewater Systems: Research Considerations This fact sheet is targeted primarily to the research community, including researchers themselves and those who administer research efforts. Regulators and designers may also have an interest in the issues. It summarizes the major project observations and recommendations on how research has been and should be conducted in the decentralized field. Recommendations for further research are also included.

Primary Treatment in Onsite Wastewater Systems: Policy Points This fact sheet will be useful to policymakers, as it communicates the relevance of this research project (and other decentralized research efforts) to their concerns, namely public health, environmental protection, economics, and growth and development.



This research resulted in the development of several interrelated products designed for practitioners, researchers, policymakers, and other stakeholders. They are available through the Water Environment Research Foundation (www.werf.org) and the National Decentralized Water Resources Capacity Development Project website (www.ndwrcdp.org).

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