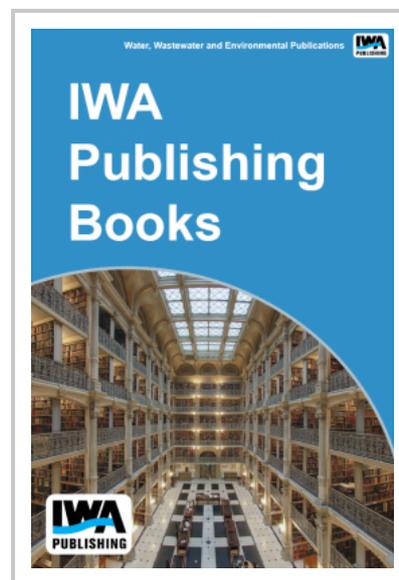


# Quantitative Tools to Determine the Expected Performance of Unit Process in Wastewater Treatment Units

Onsite wastewater treatment systems (OWTS) are an important part of water management infrastructure in the United States. Thus, proper OWTS selection, design, installation, operation and management are essential. To aid this life-cycle, a toolkit was developed to enable evaluation and design of expected STU performance. The toolkit is comprised of this Guidance Manual, a companion Toolkit User's Guide, individual tools, and supplemental information. This framework provides detailed information to less experienced users while enabling more experienced users to start directly with STUMOD or other tool implementation referring to limited sections of the Guidance Manual or User's Guide.

The toolkit was developed for a wide range of users faced with different needs of varying complexity when evaluating treatment of nitrogen, microbial pollutants (bacteria and virus), and organic wastewater contaminants (OWCs). Progressing through simple to more complex tools ultimately guides the user to the simplest tool that is appropriate, but discourages using a tool that is too simple for the decision at hand. The simplest tools include look-up tables and cumulative frequency distributions (CFDs) to direct the user to available pertinent information. Nomographs enable initial screening and quick insight into expected nitrogen removal based on the predicted output from STUMOD. Cumulative probability graphs illustrate modeling results in a risk-based framework while numerical model simulations demonstrate the usefulness of complex tools. Finally, two spreadsheet tools were developed, N-CALC and STUMOD, allowing the user to evaluate a range of STU operating conditions, soil hydraulics, and/or treatment parameters, as well as the relative influence of these factors on performance.



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