

CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE



**GUIDANCE FOR DESIGN
OF
LARGE-SCALE
ON-SITE WASTEWATER RENOVATION SYSTEMS**

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DEDICATION

Randall “Randy” May, Principal Sanitary Engineer, Connecticut Department of Environmental Protection, co-author of “Seepage and Pollutant Renovation Analysis for Land Treatment, Sewage Disposal Systems” (Healy and May, 1982), was a strong advocate for the preparation of this document.

Randy passed away in 2000, while still in the prime years of his life. He made numerous friends throughout the state, nation and beyond. He was not only very active in the field of on-site wastewater systems but also participated in development of many Department policies and procedures on other environmental matters as a senior staff member of the Department’s Planning and Standards section. Randy also wrote and presented many technical papers and was a featured speaker at professional seminars and symposiums concerned with on-site wastewater treatment. His advice was sought and appreciated by many persons and he was always ready with a humorous anecdote, many times using one to illustrate a point he was making.

Randy was a mentor to many of us who practice in the field of environmental engineering and his advice and good-natured critical commentary are sorely missed. Those of us who were fortunate to know Randy and have him as a friend are much richer for having had that opportunity. He lives on in our memories.

All of us who participated in the preparation of this document are saddened that Randy did not live to critique it and see to its completion. It is to Randy that our efforts, as represented in this document, are dedicated.

ACKNOWLEDGEMENTS

Nathan L. Jacobson, P.E. was the principal researcher and writer of this document. Other members of the consulting engineering firm of Nathan L. Jacobson & Associates, Inc. who assisted in the development of this document were Brian C. Curtis, P.E., Vice President, Wade M. Thomas, M.S., Associate, Hydrogeologist, David P. Campbell, Environmental Analyst; Ms. Tracy Bloch, Technician (CAD); and Ms. Mary Carroll, Administrative Assistant.

Dr. Kent A. Healy, P.E., made a major contribution in preparing Sections II and III of this document and providing valuable guidance on several other sections.

At the Connecticut Department of Environmental Protection, a very significant contribution was made by Warren Herzig, Supervising Sanitary Engineer of the Connecticut Department of Environmental Protection Bureau of Water Management, Land Disposal Section, who administered the preparation of this document and provided a valuable critique of each section. Members of his staff, including Joseph Wettemann, Jennifer Perry Zmijewski, Sarah Overton, William Coleman, Joseph Faryniarz, Robert Lorentson, and Antoanela Daha also made significant contributions by reviewing most sections of this document and participating in a number of meetings at which the various sections were critically reviewed. Jennifer Perry Zmijewski also provided valuable assistance in coordinating the final revisions based on review comments by Department staff.

The assistance of Dr. Gary Robbins of the University of Connecticut Department of Geology & Geophysics and the UCONN Environmental Engineering Program with the analysis of plume development in the ground water down-gradient of a subsurface wastewater renovation system was very helpful and is greatly appreciated.

PREFACE

Twenty four years ago, the Connecticut Department of Environmental Protection issued a landmark publication, “Seepage and Pollutant Renovation Analysis for Land Treatment, Sewage Disposal Systems” (Healy and May, 1982), that provided guidance for meeting the Department’s permitting requirements for on-site discharge of domestic wastewater to the subsurface. That document was, at that time, quite different from those issued by many other state and local regulatory agencies for on-site systems. It stressed an approach to design of such systems that utilized the basic physical, chemical and biological principles that govern the flow and renovation of wastewater that is discharged to the ground water, rather than using prescribed “standards”.

The following document is both an update and expansion of the 1982 publication. In the years that followed the issuance of that document, much additional information has become available regarding the subject matter contained in that document and the Department also gained considerable experience utilizing the concepts set forth in that publication in administering the permitting requirements for on-site wastewater renovation systems. Accordingly, the Department in issuing this new guidance document is building upon the success of the previous publication. This document contains much of the information included in the 1982 publication, as it is timeless. In some cases, however, newer information has replaced older information and in other cases older information has been updated. It also includes subject matter not included in the 1982 publication.

The authors of “Seepage and Pollutant Renovation Analysis for Land Treatment, Sewage Disposal Systems” were Dr. Kent A. Healy, Professor of Civil Engineering, University of Connecticut and Randall “Randy” May, Principal Sanitary Engineer, Connecticut Department of Environmental Protection. In writing that publication, the authors made use of research conducted by Dr. Healy and his associates at the University of Connecticut (UCONN) and research conducted by staff of the Connecticut Agricultural Experimental Station, as well as research conducted by others and published in various professional and scientific publications. The 1982 publication benefited greatly from the keen insight of Kent Healy and Randy May regarding the physical, chemical and biological processes that govern wastewater renovation in the subsurface soil-ground water regime. Likewise, their desire to encourage the use of basic scientific and engineering principles and sound engineering judgment in developing solutions for on-site wastewater renovation contributed greatly to the enlightenment of those persons in the private or public sector who are responsible for designing or permitting of on-site wastewater renovation systems.

Dr. Healy was a well-respected member of the UCONN faculty and is still fondly remembered by many of his former students. He has since retired from UCONN and taken up residence on Martha’s Vineyard, MA, where he is in active practice as a professional engineer. He has actively participated in the writing and critiquing of portions of this new guidance document and his efforts are greatly appreciated. Randy May passed away in 2000.