

**Municipal Wastewater
Treatment Technology
Recent Developments**

U.S. Environmental Protection Agency

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MUNICIPAL WASTEWATER TREATMENT TECHNOLOGY

Recent Developments

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Foreword

This book presents recent developments in municipal wastewater treatment technology, based on a forum sponsored by the USEPA in 1991. The 25 presentations included cover the areas of land treatment, sand and gravel filters, operation and maintenance, biological nutrient removal, sludge, stormwater, disinfection, constructed wetlands, and municipal water use efficiency.

Several recent and/or upcoming changes in Federal regulations will affect all of those involved in wastewater technology development and transfer. These include impending sludge and stormwater regulations and the reauthorization of the Clean Water Act. Because of technology transfer implications, the information presented here will be beneficial to those engineers, managers, and coordinators involved in treating municipal wastewaters.

The appendices to the book contain a listing of Regional and State wastewater coordinators' addresses, and a summary of innovative and alternative technology projects by state.

The information in the book is from *Proceedings of the U.S. EPA Municipal Wastewater Treatment Technology Forum—1991* (June 5–7, 1991, Portland, Oregon), prepared for the U.S. Environmental Protection Agency, issued September 1991.

The table of contents is organized in such a way as to serve as a subject index and provides easy access to the information contained in the book.

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All information pertaining to law and regulations is provided for background only. The reader must contact the appropriate legal sources and regulatory authorities for up-to-date regulatory requirements, and their interpretation and implementation.

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INTRODUCTION

Update on EPA's Sludge Policy and New Sewage Sludge Regulations

Robert Bastian

U.S. Environmental Protection Agency
Washington, DC

The initial round of comprehensive sewage sludge technical regulations required by Section 405 of the Clean Water Act (CWA) were published on February 6, 1989, in the Federal Register (Vol. 54, No. 23: 5746-5902) as "Proposed Standards for the Disposal of Sewage Sludge" for public comment. The new proposed technical regulations (to be issued as 40 CFR Part 503) cover the final use and disposal of sewage sludge when incinerated, applied to the land, distributed and marketed, placed in sludge-only landfills (monofills), or on surface disposal sites. Co-landfilling of sewage sludge with municipal solid waste will be covered under the new 40 CFR Part 258 Municipal Solid Waste Landfill regulations (proposed on August 30, 1988 [53 FR 3314] and expected to be issued in final form early in 1991). Ocean dumping is to be phased out by the end of 1991 under the provisions of the Ocean Dumping Ban Act of 1988 (PL 100-68) signed into law on November 18, 1988.

The proposed Part 503 rule contains standards for each end use and disposal method consisting of limits for 28 pollutants in the form of sludge concentration limits or pollutant loading limits, as well as management practices and other requirements such as treatment works management controls over users and contractors, and monitoring, record keeping, and reporting requirements. As proposed, the requirements would apply to the final use and disposal of sludges produced by both publicly owned treatment works (POTWs), and privately owned treatment works that treat domestic wastewater and septage, but would not apply to sludges produced by privately owned industrial facilities that treat domestic sewage along with industrial waste.

Over 650 parties submitted more than 5,500 comments identifying some 250 issues in response to the Proposed Part 503 regulations. Formal comments on the proposed regulations were received from 30 states and four environmental groups, as well as many POTWs, consultants, equipment vendors, etc. During the 180-day comment period provided on the proposal (which ended August 7, 1989), experts from both inside and outside EPA were

involved in thoroughly reviewing the technical basis of the proposal. The review involved experts from the Agency's Science Advisory Board, environmental groups, academia, and various scientific bodies with expertise in areas covered by the proposed rule. The majority of commenters indicated that the proposed rules were overly stringent, used unrealistic conservative assumptions, and at a minimum, will discourage beneficial use of sludge. Others raised questions about how to better define the sludge use and disposal categories, terms such as *de minimus* and "clean" sludge, and which models, risk assessment methodologies, and data to use for determining the proposed numeric limitations.

The Agency also conducted a National Sewage Sludge Survey (NSSS) to obtain better information on current sludge quality, use, and disposal practices. The survey collected information from 479 POTWs on sludge use and disposal practices and costs, and analyzed sludges from 181 POTWs for 419 analytes—all the metals and inorganics (including pesticides, dibenzofurans, dioxins, and PCBs) for which gas chromatography/mass spectroscopy (GC/MS) standards exist. These data are being used in developing regulatory impact analysis and aggregate risk analysis of human health, environmental, and economic impacts and benefits of sludge use and disposal practices to help refine the Part 503 regulations, and to help identify which additional pollutants in sewage sludge should be regulated in the future. As a result of settlement of litigation in Oregon concerning the failure of EPA to issue the new regulations by the dates specified in the Water Quality Act Amendments of 1987, EPA will identify additional pollutants and a schedule for a second round of sewage sludge rulemaking in June 1992.

The Agency published its analysis of the new NSSS data in the November 9, 1990, Federal Register Notice (55 FR 47210) for public comment. In addition, the Notice requests comments on alternative approaches that EPA is considering for various sections of the Part 503 regulations. These approaches are based on comments received on the proposed Part 503 regulations and information received since the proposal. These include:

- Revised approaches for regulating 1) land application of septage, 2) organic pollutants in emissions from sewage sludge incinerators, 3) the application of sewage sludge to non-agricultural land, and 4) the disposal of sewage sludge on a surface disposal site

- Potential changes to the input parameters for the models used to develop pollutant limits for sewage sludge applied to agricultural land or distributed and marketed
- Alternative pollutant limits (i.e., "clean sludge concept" for sewage sludge applied to the land or distributed and marketed)
- The eligibility of a pollutant for a removal credit with respect to the use and disposal of sewage sludge

The public comment period on the notice closed on January 8, 1991. EPA is utilizing the comments received on the notice, the February 6, 1989, proposal and the recommendations of the peer review panels to craft the final rule. A number of the external scientists involved in the peer review effort continue to be involved in assisting the Agency in developing scientifically defensible pollutant limits and in addressing key technical issues raised in public comments. It is anticipated that the proposed pollutant limits and management practices included in the proposed regulations, and even some of the basic approaches for regulating sewage sludge taken in the proposal, will change significantly. Current plans call for promulgation of the final Part 503 regulations in January 1992, as a result of the Oregon court-imposed schedule.

Meanwhile, the Part 122-124 and 501 regulations, which will require the new Part 503 technical regulations (once issued in final form) to be imposed through an NPDES or state permit (issued under an approved state program), were issued on May 2, 1989, in the Federal Register (Vol. 54, No. 83: 18716-18796) as "NPDES Sewage Sludge Permit Regulations; State Sludge Management Program Requirements." A "Sewage Sludge Interim Permitting Strategy" was issued in September 1989, describing the Agency's strategy for carrying out the new Section 405 CWA requirements to impose controls on sewage sludge use and disposal practices in NPDES permits issued to POTWs until the new Part 503 technical regulations become effective. Pursuant to the "Interim Strategy," EPA or the states may issue sludge permits as agreed to by the state/EPA agreements. POTWs should consult their NPDES authorities as to the appropriate procedures and requirements. The final version of the "POTW Sludge Sampling and Analysis Guidance Document" was issued in August 1989 to provide technical guidance on the sampling and analysis of municipal sewage sludge. "Guidance for Writing Case-by-Case Permit Requirements for Municipal Sewage Sludge" was issued in final form in December 1989.

Copies of these documents are available from the Permits Division in EPA's Office of Wastewater Enforcement and Compliance.

Finally, a number of issues concerning some programmatic and technical considerations needed to implement sewage sludge beneficial use programs on federal lands have arisen among federal agencies. To remedy this, EPA is working closely with the Office of Management and Budget, the Bureau of Land Management, the U.S. Forest Service, the U.S. Fish and Wildlife Service, the Department of Defense, the Department of Energy, TVA, FDA, and other federal agencies that generate or use/dispose of sewage sludge on federal lands to establish a unified federal policy on beneficial use of sludge and to prepare guidelines that federal agency land managers can use in determining the appropriateness of land application of sewage sludge for their facilities. A Federal Register notice containing the new "Interagency Sludge Policy on Beneficial Use of Municipal Sewage Sludge on Federal Land" that has been designed to supplement the existing 1984 EPA policy promoting beneficial use of sludge and the 1981 EPA/USDA/FDA policy and guidance document should be issued by early summer 1991.