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TECHNOLOGY TRANSFER

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New Technology Transfer Publications Available

Five new Technology Transfer publications are now being distributed: (1) Handbook on Improving Publicly Owned Treatment Works (POTW) Performance Using the Composite Correction Program Approach; (2) Process Design Manual Supplement for Land Treatment of Municipal Wastewater; (3) Environmental Regulations and Technology Report on Use and Disposal of Municipal Wastewater Sludge; (4) Handbook for Septage Treatment and Disposal; and (5) Capsule Report on Benefits of Microprocessor Control of Curing Ovens for Solvent-Based Coatings.

1. The *Handbook on Improving POTW Performance Using the Composite Correction Program Approach* provides information on methods to economically improve the performance of existing POTWs. It is "how-to" oriented, and describes an approach called the Composite Correction Program (CCP) that POTW owners can use to improve treatment without making major capital expenditures. The CCP approach consists of an evaluation phase and a performance improvement phase.

The evaluation phase is a thorough review and analysis of a POTW's design capabilities and associated administration, operation, and maintenance practices. It is accomplished by assessing the capability of major unit processes and by identifying and ranking those factors that limit performance and can be corrected to improve performance. The performance improvement phase is a systematic approach to eliminating those factors that limit performance in existing POTWs. Its major benefit is that it optimizes the capability of existing facilities to perform better and/or treat more wastewater.

This Handbook focuses on POTWs treating typical municipal wastewater, compatible with common biological wastewater treatment processes. It has been written mainly for POTWs with flow up to about 40,000 m³/d (10 mgd). The Handbook further focuses on mechanical plants, using activated sludge, trickling filters and variations of these processes for secondary treatment. A series of Technology Transfer seminars on the CCP approach have been scheduled for 1985, as described below.

The order number for this publication is 6008.

2. The *Process Design Manual Supplement for Land Treatment of Municipal Wastewater* presents new information on two processes, and is intended to be an addendum to the 1981 Manual (EPA-625/1-81-013). Chapter I of the supplement covers rapid infiltration systems and Chapter II discusses overland flow systems. New information on both the systems and their performance, developed since 1981, is included. Also presented are special concerns with respect to rapid infiltration, since some of the systems constructed in recent years have experienced problems or do not satisfy all design expectations. An analysis of those experiences indicates that the majority of the problems could have been avoided. It is, therefore, the intent of Chapter I to

provide additional guidance and detail on planning, design, construction, and operation of rapid infiltration systems so that similar problems can be avoided in the future. The basic criteria in the 1981 manual are still valid and are not repeated in this text. Both documents are necessary for design of rapid infiltration and overland flow systems.

The order numbers for these publications are: Manual 1013; Supplement 1013a.

3. The report on *Environmental Regulations and Technology: Use and Disposal of Municipal Wastewater Sludge* is intended to be a guidance document, describing all available alternatives for effectively managing the ultimate use and disposal of sludge.

Sludge production is expected to about double to approximately 13 million dry metric tons (14 million dry tons) per year by the year 2000 as the population increases, as more municipalities comply with the Clean Water Act requirements, and as more sophisticated wastewater treatment systems are developed and installed. In addition, the sludges generated by more advanced treatment are more difficult to handle than the sludges produced by less advanced treatment.

When properly used, sludge can be a valuable resource as a soil conditioner and partial fertilizer and, to a certain extent, as a source of methane for producing energy. The U.S. Environmental Protection Agency (EPA), the primary federal regulatory agency responsible for sludge management, encourages the beneficial use of sludge wherever environmentally feasible.

Topics discussed in the report include land application, distribution and marketing of sludge products, land filling, incineration and ocean disposal.

The order number for this publication is 10003.

4. The *Handbook for Septage Treatment and Disposal* presents information on the receiving, treatment, and disposal of septage (the liquid and solid material pumped from a septic tank or cesspool when it is cleaned). It is designed to serve as a practical guide for planners, design engineers, state and Federal reviewers, and local government officials involved in planning, evaluating, and designing septage handling facilities. Information is provided to facilitate the design of septage receiving stations, pretreatment processes, new sewage treatment plants with provisions for receiving septage, and independent septage treatment and disposal alternatives. Individual treatment processes are discussed in detail and specific design guidance is provided. Methods for septage treatment and disposal discussed are:

1. Land treatment and disposal;
2. Co-treatment at existing wastewater treatment facilities;
3. Independent facilities for treatment and disposal.

Included in the Handbook are: technical options applicable for the management of septage; detailed discussion of septage characteristics; septage receiving station design; specific technical advice for design of land treatment, co-treatment, and

independent septage treatment facilities; facility operation and program management considerations; and fact sheets (a series of two-page capsule summaries of selected septage treatment methods) that give the generalized capital, operation, and maintenance costs of septage treatment.

The order number for this publication is 6009.

5. Benefits of Microprocessor Control of Curing Ovens for Solvent-Based Coatings—Curing ovens are a major source of VOC emissions. The organic solvents, or hydrocarbons, in the coating are evaporated in the oven at temperatures which range from 100°F to 700°F, depending upon the curing properties of the coating and the product. Because great volumes of air containing low concentrations of VOCs are involved, the fuel and investment cost of controlling these VOC emissions can be significant.

Most curing ovens operate at ventilation air flow rates far in excess of the rate required to cure the product and to maintain the solvent concentration below its lower explosive limit. This over-ventilation results in higher than necessary investment costs for

pollution control equipment and high fuel costs for both curing and incineration.

Recognizing the potential for reducing the fuel and investment costs of meeting VOC regulations, the Chemical Coaters Association, the Environmental Protection Agency, and the Department of Energy cooperatively funded a program to develop a micro-computer-based system to control curing oven ventilation by continually monitoring and controlling operating parameters (including solvent concentrations and pressure). Such a system can also monitor the efficiency of pollution control equipment.

This capsule report highlights the results of that program, the performance of a prototype system at Mack Trucks, Inc., Allentown, PA, and applications for other curing operations.

The report includes a discussion of the microprocessor concept, the performance and cost savings of the system installed on the Mack Truck curing line, and applications on other systems in the coating industry.

The order number for this publication is 2031.

Technology Transfer Seminars—Improving POTW Performance Using the Composite Correction Program Approach

A series of ten Technology Transfer seminars presenting information on utilizing the Composite Correction Program (CCP) to improve the performance of publicly owned treatment works (POTWs) will be conducted across the country beginning in January 1985.

This series will consist of ten 2-day seminars conducted in the following locations:

Tallahassee, FL	January 7-8, 1985
Charlotte, NC	January 10-11, 1985
Denver, CO	January 21-22, 1985
San Francisco, CA	January 23-24, 1985
Dallas, TX	February 11-12, 1985
Kansas City, MO	February 14-15, 1985
Chicago, IL	February 25-26, 1985

Philadelphia, PA	February 28-March 1, 1985
Albany, NY	March 11-12, 1985
Boston, MA	March 14-15, 1985

Topics to be discussed include: EPA's National Municipal Policy; Comprehensive Performance Evaluation (CPE) Methodology; Conducting CPEs; Assessing Ability to Improve POTW Performance Without Major Capital Expenditures; Prioritizing and Improving Factors Limiting POTW Performance; Evaluating CPE Results; Composite Correction Program (CCP) Methodology; and Conducting CCPs.

Two workshop sessions are included in each seminar: one on conducting CPEs, and one on conducting CCPs. Preregistration is a requirement for attendance at these seminars since the workshop sessions will be limited in size to an effective number of workshop participants.

If you are interested in receiving registration information on these seminars contact Sheri Marshall, Dynamac Corp., (301) 468-2500.

Seminar Series Protection of Public Water Supplies from Groundwater Contamination

The USEPA's Office of Drinking Water and Center for Environmental Research Information, in cooperation with regional offices, have developed a series of Technology Transfer seminars that present not only a general approach to managing contamination but also include a regional perspective of the problem. Through cooperative planning between the program and regional offices, each meeting agenda is tailored to address particular needs and issues of concern of the attending Region or state.

The purpose of the seminar is to provide information to state, local and municipal officials on the methods available for dealing with public water supplies that are threatened by ground-water contamination. Speakers during the two and one-half day meeting will discuss general principles of hydrogeology and local hydrogeologic considerations, potential sources of ground-water

contamination, approach to identifying contamination threats, management alternatives for dealing with ground-water contamination, as well as case studies of actual situations.

Efforts in the ground-water area by the Offices of Solid Waste, Drinking Water, Water Program Operations, and Research and Development will be brought together to provide the latest information available which can be used by managers in developing a practical approach to decision making.

Seminars are scheduled to be conducted in the following locations:

Pittsburgh, PA	November 14-15, 1984
Baton Rouge, LA	November 27-29, 1984
Plainview, NY	December 3-5, 1984
Boston, MA	December 10-11, 1984

Registration for these seminars is handled by Dynamac Corp., 11140 Rockville Pike, Rockville, MD 20852.

EPA Displays Exhibit at Air Pollution Control Association Meeting

The 77th Air Pollution Control Association (APCA) annual meeting and exhibition was held this summer, June 24-29, in the San Francisco Civic Center.

EPA was represented at the meeting by staff members from the Office of Research and Development (ORD) and the Office of Air Quality Planning and Standards (OAQPS) who presented papers, attended technical committee meetings and also helped plan and manage the Agency's 60-foot-long booth at the exhibition.

REQUEST FOR TECHNOLOGY TRANSFER MATERIAL

PROCESS DESIGN MANUALS

- Sulfide Control in Sanitary Sewerage Systems (Oct. 1974) 1005
- Nitrogen Control (Oct. 1975) 1007
- Wastewater Treatment Facilities for Sewered Small Communities (Oct. 1977) 1009
- Municipal Sludge Landfills (Oct. 1978) 1010
- Sludge Treatment and Disposal (Oct. 1979) 1011
- Onsite Wastewater Treatment and Disposal Systems (Oct. 1980) 1012
- Land Treatment of Municipal Wastewater (Oct. 1981) 1013
- Supplement for Land Treatment of Municipal Wastewater (Oct. 1984) 1013a
- Dewatering Municipal Wastewater Sludges (Oct. 1982) 1014
- Municipal Wastewater Stabilization Ponds (Oct. 1983) 1015
- Land Application of Municipal Sludge (Oct. 1983) 1016

TECHNICAL CAPSULE REPORTS

- First Progress Report: Wellman-Lord SO₂ Recovery Process—Flue Gas Desulfurization Plant 2011
- Double Alkali Flue Gas Desulfurization System Applied at the General Motors Parma, OH Facility 2016
- Recovery of Spent Sulfuric Acid from Steel Pickling Operations 2017
- Fourth Progress Report: Forced-Oxidation Test Results at the EPA Alkali Scrubbing Test Facility 2018
- Particulate Control by Fabric Filtration on Coal-Fired Industrial Boilers 2021
- Bahco Flue Gas Desulfurization and Particulate Removal System 2022
- First Progress Report. Physical Coal Cleaning Demonstration at Homer City, PA 2023
- Acoustic Monitoring to Determine the Integrity of Hazardous Waste Dams 2024
- Disposal of Flue Gas Desulfurization Wastes: Shawnee Field Evaluation 2028
- Adipic Acid-Enhanced Lime/Limestone Test Results at the EPA Alkali Scrubbing Facility 2029
- Environmental Controls at a Secondary Lead Smelter 2030
- Benefits of Microprocessor Control of Curing Ovens for Solvent Based Coatings 2031

SEMINAR PUBLICATIONS

- Benefit Analysis for Combined Sewer Overflow Control 4013

BROCHURES

- Environmental Pollution Control Alternatives. Municipal Wastewater 5012
- Environmental Pollution Control Alternatives: Economics of Wastewater Treatment Alternatives for the Electroplating Industry 5016

- Environmental Pollution Control Alternatives: Centralized Waste Treatment Alternatives for the Electroplating Industry 5017
- Environmental Pollution Control Alternatives: Sludge Handling, Dewatering, and Disposal Alternatives for the Metal Finishing Industry 5018

HANDBOOKS

- Industrial Guide for Air Pollution Control (June 1978) 6004
- Identification/Correction of Typical Design Deficiencies at Municipal Wastewater Treatment Facilities (Oct. 1982) 6007
- Improving Publicly Owned Treatment Works Performance Using the Composite Correction Program Approach (Oct. 1984) 6008
- Handbook for Septage Treatment and Disposal (Oct. 1984) 6009

INDUSTRIAL ENVIRONMENTAL POLLUTION CONTROL MANUALS

- Pulp and Paper Industry—Part 1/Air (Oct. 1976) 7001

SUMMARY REPORTS

- Control and Treatment Technology for the Metal Finishing Industry Series: Sulfide Precipitation 8003
- Sulfur Oxides Control Technology Series: FGD Dual Alkali Process 8004
- Sulfur Oxides Control Technology Series: FGD Magnesium Oxide Process 8005
- Sulfur Oxides Control Technology Series: FGD Lime/Limestone Processes 8006
- Control and Treatment Technology for the Metal Finishing Industry Series: Ion Exchange 8007
- Control and Treatment Technology for the Metal Finishing Industry Series: In-Plant Changes 8008
- Sulfur Oxides Control Technology Series: FGD Spray Dryer Process 8009

EXECUTIVE BRIEFINGS

- Short-Term Tests for Carcinogens, Mutagens, and Other Genotoxic Agents 9003

ENVIRONMENTAL REGULATIONS AND TECHNOLOGY PUBLICATIONS

- Environmental Regulations and Technology. Use and Disposal of Municipal Wastewater Sludge 10003

ATTENTION PUBLICATION USERS

Due to the increasing costs of printing and mailing, it has become necessary to institute positive management controls over distribution of Technology Transfer publications. Although these publications will be distributed on a no-cost basis, any request for more than five documents total, or for more than one copy of a single document must be accompanied by written justification, preferably on organization letterhead. In the event your order cannot be filled as requested, you will be contacted and so advised.

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The exhibit, one of the largest in the show, presented summaries of major programs from the ORD Laboratories and OAQPS Offices. In addition, handout material was available, describing ORD monitoring and control technology, OAQPS enforcement, clearinghouse and training activities, as well as ORD's Publications Announcement and selected Project Summaries. Exhibit preparation was a joint effort by ORD and OAQPS: production was coordinated by the Center for Environmental Research Information in cooperation with APCA.

New Operating Mode for Sludge Incinerators Saves Fuel/Costs

A cooperative research project between the Office of Research and Development and the City of Indianapolis, IN, resulted in a reduction in fuel costs to the city of close to \$1,000,000 per year by installing \$250,000 worth of instrumentation in the city's eight incinerators burning sewage sludge.

In addition, four other cities in the U.S. are now using the operating and training procedures established at Indianapolis and save over 50 percent of their fuel costs without any additional instrumentation and controls.

Equally important is the accompanying reduction in particulate emissions that occurs when the incinerators are operated in their optimum fuel consumption mode. At Indianapolis, scheduled construction of \$3,000,000 worth of air pollution control equipment was cancelled because the project brought the incinerators into compliance with air pollution requirements.

These savings are the result of a project to determine whether an existing sewage sludge incinerator could be made to operate more efficiently. At the Indianapolis Belmont Wastewater Treatment Plant, researchers demonstrated that fuel consumption can be reduced 34 to 70 percent by improving existing instrumentation and control systems, using a more fuel-efficient operational mode, and providing operator training. Indianapolis experienced a fuel savings payback period of less than three months. The other four cities adapting the fuel savings method of operation have experienced a payback period of one to three months.

One of the biggest problems facing municipalities operating sludge incinerators is the high cost of energy required both for the actual incineration process and for air pollution control. A recent survey shows that approximately 15 to 20 percent of the sludge incinerators constructed since 1970 are no longer in operation due to high energy costs. Those still in operation use about 80 gallons of fuel to burn one ton of dry sludge.

The research project involved several activities. A combustion engineering analysis was made of the multiple hearth incinerator operations, with extensive instrumentation to measure air, gas,

The booth attracted a large audience who showed particular interest in Agency programs pertaining to acid deposition, hazardous and toxic air pollutants and indoor air pollution.

Next year's meeting is scheduled to be held June 23-28, 1985, in Detroit, MI. We plan to display a similar exhibit, again planned by ORD and OAQPS, which will highlight the Agency's major air programs.

temperature, and flow rates. Tests were then conducted to determine the effect of many incinerator variables on fuel consumption. Analytical and test data were compared to determine the relationship between specific fuel consumption and key incinerator operating variables, and a model was developed to predict the lowest possible fuel consumption obtainable by optimum incinerator operation. Key factors in this model are gas temperatures, the sludge moisture to volatile ratio (MN), and the desired flow rate for sludge through the incinerator.

The test results and model were used to specify a new, more fuel-efficient operating mode. The key to operation of the incinerators in an optimum mode is to clearly define operating procedures and provide process control flexibility. To achieve this, the existing instrumentation and control systems were upgraded to allow operator remote control. New systems were designed and installed for air flow control, measurement of fuel flow and sludge cake load rate. Key features of the operating mode were developed into guidelines, techniques, and instructions and included in operator training and an operating manual for the furnace.

Since completion of the Indianapolis study, similar orders of magnitude in fuel reduction requirements and cost savings have been realized and documented at all locations. Average fuel savings of over 50 percent of that formerly used have been documented for over a year after the new method of operation was initiated. This saves \$180,000 in fuel costs per year for the average multiple hearth furnace incinerating sludge.

One plant also showed that a change in the equipment used to dewater sewage sludge further reduced fuel usage. With the installation of continuous belt press filters, in addition to incinerator operational changes and operator training, total fuel usage for incineration was reduced 83 percent during a four-year period.

To obtain more information about these projects, contact Howard O. Wall, Jr., the EPA Project Officer, at:

Municipal Environmental Research Laboratory
U.S. Environmental Protection Agency
Cincinnati, OH 45268

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