



Pollution Prevention Handbook

Sewage and Wastewater Treatment Plants

No. 13 in a Series of Fact Sheets.



Department of
the Interior
Office of
Environmental
Affairs (OEA)

Pollution prevention is the use of materials, processes, or practices that reduce or eliminate the quantity and/or toxicity of wastes at the source of generation. Pollution prevention is a multimedia approach that minimizes or eliminates waste released to land, air, and/or water without simply shifting pollutants from one media to another. The pollution prevention concept is catching on. The Pollution Prevention Act of 1990 makes pollution prevention a national policy for environmental management. Further, the Department of the Interior (DOI) considers source reduction to be the most preferred environmental management technique for dealing with waste generation. In addition, promoting pollution prevention is often the most cost-effective means to reduce environmental and health risks associated with waste. Pollution prevention is often cost effective because it may reduce raw material losses; reduce reliance on expensive "end-of-pipe" treatment technologies and disposal practices; conserve energy, water, and raw materials; and reduce the potential liability associated with waste generation.

For wastes that cannot be reduced at the source, DOI recommends that generators consider recycling as the next best option. Wastes that cannot be reduced at the source or recycled should be stored, treated, and/or disposed in accordance with all applicable waste management regulations. Wastes that must be disposed should be disposed safely to minimize adverse impacts on the environment.

PURPOSE OF THIS FACT SHEET

This fact sheet provides information to wastewater treatment facility operators about source reduction and recycling programs that can help wastewater dischargers to eliminate, reduce, or recycle wastes. Wastewater treatment facility personnel are in a unique position to promote pollution prevention. The staff at your facility probably have a good understanding of industrial processes - a key ele-

ment in identifying pollution prevention opportunities. They can help dischargers (such as laboratories, photoprocessors, and metal working facilities) understand how pollution prevention can reduce the quantity and toxicity of wastewater and make operations more cost efficient.

The first step is to educate your inspectors about pollution prevention and secure their support in promoting the pollution prevention concepts. The next step is to work with the industrial dischargers so they may better understand and take actions to reduce the quantity and toxicity of wastewater they generate. You play an important role in making dischargers aware of the environmental harm their operations may cause. You can encourage dischargers to make a commitment to reduce waste through pollution prevention.

If you are interested in obtaining additional reference information about developing and implementing a pollution prevention program at your facility, contact EPA's Pollution Prevention Information Clearinghouse (PPIC) at (703) 821-4800. PPIC is a free service that provides the public with technical, programmatic, and policy references about source reduction and recycling.

We recommend the following documents that discuss pollution prevention program options and waste assessments in greater detail. They are available from PPIC free of charge:

Waste Minimization Opportunities Assessment Manual, U.S. EPA, Hazardous Waste Engineering Laboratory (EPA/625/7-88/003). July 1988. Request PPIC document # WAM-3.

Profiting From Waste Reduction in Your Small Business, Alaska Health Project, 1988. Request PPIC document # WAM-2.

DEFINITIONS:

Source Reduction:
Reducing or eliminating the quantity and/or toxicity of a waste before it is generated (i.e., at the source).

Recycling:
Recovering a waste from one process and reusing it in the same process or in another process in an environmentally safe manner.



EMPLOYEE EDUCATION AT YOUR SEWAGE TREATMENT FACILITY

Encourage your inspectors' understanding of pollution prevention. Be sure that they understand that pollution prevention not only improves worker health and safety, it can also benefit plant operations and maintenance. Stress the positive and beneficial effects that pollution prevention can have upon the environment.

Improved Worker Health and Safety

- Achieve a safer working environment. Reducing the toxicity of pollutants discharged at your facility can prevent the release of noxious gases that can pose a health hazard to plant workers.

Improved Plant Operation/Maintenance

- Reduce your regulatory burden. In the next few years, sewage treatment facilities will be subject to increasingly stringent state and Federal regulatory requirements. Pollution prevention can help you meet these requirements by reducing the volume and toxicity of industrial pollutants discharged to your plant.
- Decrease the demand for sewage treatment. Pollution prevention is an economical way for your facility to respond to increased demand for sewage treatment. Source reduction can reduce the amount of wastewater discharged to, and treated by, your facility. It can also help your facility to reduce sludge disposal costs.
- Decrease system damage. Reducing the concentration and volume of pollutants in the facility's wastewater decreases the probability of plant upsets and damage to plant equipment and the conveyance system.

Types of Pollution Prevention Techniques and Options

Production Planning and Sequencing - Plan and sequence production to maximize raw materials.

Process or Equipment Modification - Change the process, parameters or equipment used in that process to reduce the amount of waste generated.

Raw Material Substitution or Elimination - Replace existing raw materials with other materials that produce less waste, or a non-toxic waste.

Loss Prevention and Housekeeping - Perform preventive maintenance and manage equipment and materials to minimize opportunities for leaks, spills, evaporative losses and other releases of potentially toxic chemicals.

Improved Environmental Quality

- Improve effluent quality. Eliminating toxic pollutants from the facility's influent can improve the quality of the effluent discharged to the environment.

POLLUTION PREVENTION FOR WASTEWATER DISCHARGERS

Once you secure staff commitment to achieve pollution prevention goals, the next step is to pass your staff's expertise along to the wastewater dischargers. Your facility can direct dischargers toward information about pollution prevention techniques and strategies. Such information should demonstrate that effective pollution prevention programs can be integrated into the discharger's daily operations to reduce environmental impacts and economic costs.

Studies have shown that industrial wastewater dischargers who aggressively pursue pollution prevention receive significant benefits. An effective pollution prevention program can increase the productivity of an operation while decreasing hazardous waste management and treatment costs, long-term liability, and chemical feedstock costs. Explain to the discharging facilities that a well-planned and implemented pollution prevention effort can result in direct and indirect cost savings. Some potential benefits for dischargers include:

- Savings from reduced raw material use.
- Decreased industrial wastewater discharges to the sewage treatment facility.
- Reduced need for costly on-site pretreatment systems.
- Increased ability to meet designated pretreatment discharge limits.

Waste segregation and Separation - Avoid mixing different types of wastes. This makes the recovery of wastes easier by minimizing the number of different constituents in any given waste stream.

Closed-Loop Recycling - Use or reuse Waste as an ingredient or feedstock in the production process on site. Recycling in which a waste is recovered and reused in the same production process on site as an input is a form of pollution prevention.

Training and Supervision - Provide employees with the information and the incentive to minimize waste generation in their daily duties. Train employees to practice proper and efficient use of tools and supplies, and to understand and support the company's pollution prevention goals.



Potential Benefits of Pollution Prevention

To the individual:

- *Eliminating or reducing toxic or hazardous chemicals in the workplace provides a safe, healthy work environment for all employees*

Waste reduction can:

- *Help your facility to achieve regulatory compliance.*
- *Reduce operating cost by limiting the amount of raw materials, energy, and water use your facility.*
- *Minimize waste, transportation, storage, and disposal fees.*
- *Reduce liability associated with waste handling, storage, and transportation.*
- *Demonstrate DOI's concern about the environment.*

To the Environment:

- *Reducing pollution improves the quality of the environment for everyone.*

- Decreased quantity and toxicity of sludge produced by on-site pretreatment systems, and reduced costs associated with off-site sludge disposal.
- Increased environmental awareness at the facility.
- Reduced environmental compliance costs.

██████████ POLLUTION PREVENTION TIPS FOR INDUSTRIAL WASTEWATER DISCHARGERS

There are many pollution prevention techniques available to reduce the volume and toxicity of industrial Wastewater. Pollution prevention activities range from easy-to-implement options to more comprehensive approaches to reducing wastes. These activities can be applied across a range of different industrial processes and to both hazardous and non-hazardous wastes. The suggestions listed below are examples of pollution prevention options available to facilities generating industrial wastewater:

- Segregate wastewater streams to allow for re-use and recycling. Segregate according to the level of contamination and the potential for recovery of oil, heavy metals, and other materials.
- Prevent accidental discharges into wastewater handling systems by constructing curb and floor sumps in production and material handling areas.
- Prevent industrial pollutants from contaminating stormwater runoff through the use of diversion systems to prevent stormwater from contacting their contaminants.
- Inspect equipment to ensure that process fluids are not leaking into cooling water systems.
- Reuse process water to the greatest extent possible.
- Use a cooling tower or re-use cooling water to decrease the amount of non-contact water contributing to the wastewater stream.
- When possible, use process solvents to clean equipment, then recycle them back into the process stream.
- Use treatment technologies that do not generate heavy metal sludges; use precipitating agents that minimize the volume of sludge generated.

A list of EPA technical documents for industry-specific pollution prevention techniques is provided on the final page of this fact sheet. These documents contain detailed information on pollution pre-

vention techniques, cost information, and implementation considerations.

██████████ WHAT CAN YOUR FACILITY DO?

Wastewater treatment facility staff can encourage industrial wastewater dischargers to think about ways to reduce their waste. A pollution prevention program can involve your extensive participation or basic support for incorporating pollution prevention concepts into the discharger's daily operation. Your facility can most effectively promote pollution prevention to dischargers through a combination of these program options:

- Technical assistance programs
- Educational programs
- Voluntary resolutions.

Technical assistance programs

Technical assistance programs conducted by trained staff can help dischargers to identify and evaluate opportunities through site-specific pollution prevention assessments. Conducting a pollution prevention assessment involves collecting process information, setting pollution prevention targets, and developing, screening, and selecting pollution prevention options for further study. Pollution prevention assessments can be extensive process examinations using scientific methodology or less formal evaluations of waste generation and management practices.

There are two different ways that wastewater treatment facility staff can conduct on-site technical assistance programs:

- Incorporate pollution prevention tips into ongoing industrial pretreatment inspections.
- Conduct special on-site training in addition to regular compliance inspections.
- Co-sponsor local household hazardous waste collection days to encourage bureau housing units to segregate their hazardous wastes.

A list of pollution prevention assistance program contacts is provided on page 4 of this fact sheet.

Educational programs

Educational programs inform dischargers about steps they can take to reduce the volume and toxicity of wastewater through pollution prevention practices and technologies. To design a low-cost and successful educational program, keep these three concepts in mind:



OEA would like to thank the following for their document! that were used to develop this fact sheet:

USEPA Region III - "Pollution Prevention Opportunities in Wastewater Treatment"

Local Government Commission, Sacramento, CA - "Reducing Industrial Toxic Wastes and Discharges: The Role of POTWs"

- Establish clear pollution prevention priorities.
- Pollution prevention concepts should be readily incorporated into the daily routines of the discharging facility. Programs should use existing staff and require no special training.
- The program should be designed to encourage actions that have a significant impact on the volume and toxicity of hazardous waste generated and subsequently discharged to the sewers.

Voluntary resolutions

Along with dischargers and your facility's management, develop a voluntary resolution calling for the development of a joint pollution prevention program. The resolution can:

- Identify specific operations and/or pollutants for priority attention. If the discharging facility staff is faced with limited time and financial support, the program should address those operations contributing the largest quantities and/or most troublesome pollutants to the sewer system.
- Set voluntary reduction goals for water-borne pollutants. This can provide a benchmark for your facility and dischargers to evaluate the effectiveness of the pollution prevention effort.
- Enlist the assistance of state and local environmental health departments, air pollution agencies, pollution prevention agencies, and other departments responsible for hazardous materials issues in achieving pollution prevention goals.

EMPLOYEE PARTICIPATION

Discuss pollution prevention concepts with staff from your sewage treatment facility and wastewater dischargers. The key to any pollution prevention effort is employee participation. Employees directly involved with processes and activities that generate wastewater should have an understanding of why and how wastes are generated, how they are managed, and the costs and liabilities incurred by your company in generating hazardous wastes. Public recognition, awards programs, and a suggestion box can also encourage their participation.

STATE CONTACTS

ALABAMA

Alabama Waste Reduction and Technology Transfer (WRATT) Program
Daniel E. Cooper 205-271-7939

ALASKA

Pollution Prevention Office
David Wigglesworth 907-465-5275
Waste Reduction Assistance Program (WRAP)
Kristine Benson 907-276-2864
Small Business Hazardous Material Management Project
Kristine Benson 907-276-2864

ARIZONA

Arizona Waste Minimization Program
Stephanie Wilson 602-257-2318
Dr. J. Andy Soesilo 602-257-6995

ARKANSAS

Arkansas Pollution Prevention Program
Robert J. Finn 501-570-2861
Biomass Resource Recovery Program
Ed Davis 501-682-7322

CALIFORNIA

Department of Toxic Substances Control
Mr. Kim Wilhelm 916-324-1807
Tony Eulo 916-448-1198

COLORADO

Pollution Prevention and Waste Reduction Program
Neil Kolwey 303-331-4830
Michael Nemecek 303-355-1861

CONNECTICUT

Connecticut Technical Assistance Program (CONNTAP)
Rita Lomasney 203-241-0777
Connecticut Dept. of Environmental Protection
Mr. Carmine Di Battista 203-566-3437
Elizabeth Flores 203-566-8843

DELAWARE

Delaware Pollution Prevention Program
Philip J. Cherry 302-739-5071/3822
Herb Allen 302-451-8522/8449

DISTRICT OF COLUMBIA

Office of Recycling
Hampton Cross 202-939-7116

FLORIDA

Waste Reduction Assistance Program (WRAP)
Janet A. Campbell 904-448-0300

GEORGIA

Georgia Multimedia Source Reduction and Recycling Program
Susan Hendricks 404-656-2833

HAWAII

Hazardous Waste Minimization Program
Jane Dewell 808-586-4226

IDAHO

Division of Environmental Quality
Joy Palmer 208-334-5879



*From the White House
(October 31, 1991)*

Federal agencies and facilities must initiate program to promote best effective waste reduction and recycling reusable materials.

Agencies that generate energy from fossil fuel systems must, whenever possible begin to use energy of fuels derive from solid waste as the primary or secondary energy source.

Agencies are required to adopt "environmentally-affirmative procurement programs will enhance Federal procurement of products made from recycled and recyclable materials.

In addition to require standards, agencies a encouraged to participate in the developme of voluntary, environmentally sound and economically efficient waste reduction, recycling, and procureme standards.



ILLINOIS

Illinois Hazardous Waste Research and
Information Center (HWRIC)
Dr. David Thomas 217-333-8940
Office of Pollution Prevention
Mike Hayes 217-785-0533
Michael Nechvatel 217-785-8604

INDIANA

Office of Pollution Prevention and Technical
Assistance
Joanne Joice 317-232-8172
Indiana Pollution Prevention Program
Rick Bossingham/Jeff Burbrink
Purdue University
West Lafayette, Indiana 47907-1284

IOWA

Iowa Waste Reduction Center (IWRC)
John Konefes 319-273-2079
Waste Management Authority Division
Tom Blewett 515-281-8941

KANSAS

State Technical Action Plan (STAP)
Tom Gross 913-296-1603
Kansas State University RITTA Program
Lani Himegamer 913-532-6026

KENTUCKY

Kentucky Partners - State Waste Reduction
Center
Joyce St. Clair 502-588-7260

LOUISIANA

Louisiana Department of Environmental Quality
Gary Johnson 504-765-0720

MAINE

Bureau of Oil and Hazardous Materials Control
Scott Whittier 207-289-2651

MARYLAND

Office of Waste Minimization and Recycling
Harry Benson 301-631-3315
Maryland Environmental Services
George G. Perdikakis 301-974-7281
Technical Extension Service
Travis Walton 301-454-1941

MASSACHUSETTS

Office of Technical Assistance for Toxics Use
Reduction
Barbara Kelley 617-727-3260
Toxics Use Reduction Institute
Jack Luskin 508-934-3275

MICHIGAN

Office of Waste Reduction Services
Larry E. Hartwig 517-335-1178

MINNESOTA

Minnesota Pollution Control Agency (MPCA)
Eric Kilberg 612-296-8643
Minnesota Technical Assistance Program
(MNTAP)
Cindy McComas 612-296-4646

MISSISSIPPI

Mississippi Technical Assistance Program
(MISSTAP) and Mississippi Solid Waste
Reduction Assistance Program (MISSWRAP)
Dr. Caroline Hill 601-335-8454
Thomas E. Whitten 601-961-5171

MISSOURI

Waste Management Program (WMP)
Becky Shannon 314-751-3176
Environmental Improvement and Energy
Resources Authority (EIERA)
Steve Mahfood/Tom Welch 314-751-4919

MONTANA

Solid and Hazardous Waste Bureau
Bill Potts 406-444-2821

NEBRASKA

Hazardous Waste Section
Ten Swarts 402-471-4217

NEVADA

Business Environmental Program
Kevin Dick 702-784-1717
Nevada Energy Conservation Program
Curtis Frame 702-885-4420

NEW HAMPSHIRE

New Hampshire Pollution Prevention Program
Vincent R. Perelli 603-271-2902

NEW JERSEY

New Jersey Office of Pollution Prevention
Jean Herb 609-777-0518
New Jersey Technical Assistance Program
(NJTAP)
Kevin Gashlin

NEW MEXICO

Municipal Water Pollution Prevention Program
Alex Puglisi 505-827-2804

NEW YORK

John Lannotti 518-457-7276
New York State Environmental Facilities
Corporation
Harold Snow 518-457-4138
Erie County Office of Pollution Prevention
(ECOPP)
Thomas Hersey 716-858-6231

NORTH CAROLINA

Pollution Prevention Program
Gary Hunt 919-571-4100



EPA Research Center for Waste Minimization
Dr. Michael Vercash 919-515-2325

NORTH DAKOTA
No formal State program to date
Neil Knatterud 703-221-5166

OHIO
Ohio Technology Transfer Organization (OTTO)
Jeff Shick/Jackie Rudolf 614-644-4286

Thomas Edison Program
Dan Berglund 614-466-3887

Ohio Environmental Protection Agency
Roger Hannahs/Michael W. Kelley 614-644-3969

Ohio Department of Natural Resources
Helen L. Hurlburt 614-265-6333

OKLAHOMA
Environmental Quality Council
Ellen Bussert/Mary Jane Calvey

Pollution Prevention Technical Assistance
Program
Chris Varga 405-271-7047

OREGON
Waste Reduction Assistance Program (WRAP)
Roy W. Brower/David Rozell/Phil Berry
..... 503-229-6585

WRAP Collaboration with Oregon State
University
Dr. Ken Williamson 503-754-2751

PENNSYLVANIA
Department of Environmental Resources
Keith Kerns 717-772-2724

Center for Hazardous Materials Research
Roger Price 1-800-334-CHMR

Pennsylvania Technical Assistance Program
(PENNTAP)
Jack Guido 814-865-1914

National Technology Applications Corporation
(NETAC)
Devon Streit 412-826-5511

RHODE ISLAND
Hazardous Waste Reduction Program
Victor Bell 401-277-3434
Richard Enander 401-277-3434

SOUTH CAROLINA
Hazardous Waste Management Research Fund
Eric Snider 803-656-3308

Center for Waste Minimization
Jeffrey DeBossonet 802-734-4715

SOUTH DAKOTA
Waste Management Program
Vonnie Kallmeyn/Steve Pimer . 605-773-3153

TENNESSEE
Department of Health and Environment
James Ault 615-742-6547

Waste Reduction Assessment and Technology
Transfer Training Program (WRATT)
George Smelcer 615-242-2456
Carol Dugan/Steve Hillenbrand . 615-751-4574

TEXAS
Texas Water Commission
Priscilla Seymour, Ph.D. 512-463-7761

Center for Hazardous and Toxic Waste Studies
John R. Bradford 806-742-1413

UTAH
Department of Environmental Quality
Rusty Lundberg 801-538-6170
JoAnn S. Lighty 801-581-5763
Nancy Fox 801-750-2752

VERMONT
Waste Minimization Program
Gary Gulka 802-244-8702
Paul Maskowitz 802-244-7831

VIRGINIA
Waste Minimization Program
Sharon Kenneally-Baxter 804-371-8716

University Center for Environmental and
Hazardous Materials Studies
Virginia Polytechnic Institute and State
University 703-231-7508

WASHINGTON
Waste Reduction, Recycling, and Litter Control
Program
Stan Springer/Joy St. Germain/Peggy Morgan
..... 206-438-7541

WEST VIRGINIA
Pollution Prevention and Open Dump Program
(PPOD)
Michael Dorsey 304-348-5989

Generator Assistance Program
Randy Huffman 304-348-4000

WISCONSIN
Hazardous Pollution Prevention Audit Grant
Program
Phil Albert 608-266-3075

Department of Natural Resources
Lynn Persson 608-267-3763

WYOMING
Department of Environmental Quality
David Finley 307-777-7753