Environment

INFORMATION FROM KODAK

J-410 $8.00

An Introduction to Waste Management Options for Photographic Processing Facilities

Waste reduction measures and recycling measures can be practiced by any business. Photographic processing facilities should assess potential opportunities for pollution prevention.

WHY MANAGE WASTE?

Processing photographic films and papers for any application, regardless of how big or small your operation, generates solid waste. Fortunately, more businesses now recognize that it is wise to investigate waste management options for materials associated with photographic processing activity. In fact, here are five key reasons why you should consider alternative waste management practices before you make disposal decisions for your facility:

- Save money, potentially, through reuse and recycling.
- Increase efficiency in your operation.
- Maintain compliance with government regulations.
- Gain a competitive marketing advantage.
- Be environmentally responsible.

This environmentally focused series of publications is designed for owners and operators of facilities in the U.S. who use photographic products. The information is beneficial not just for large photographic processing facilities but also for medical or veterinary clinics; schools; studios and labs; microfilm, dental and printing businesses; government facilities and other businesses with in-house processing operations.

Kodak Environmental Services

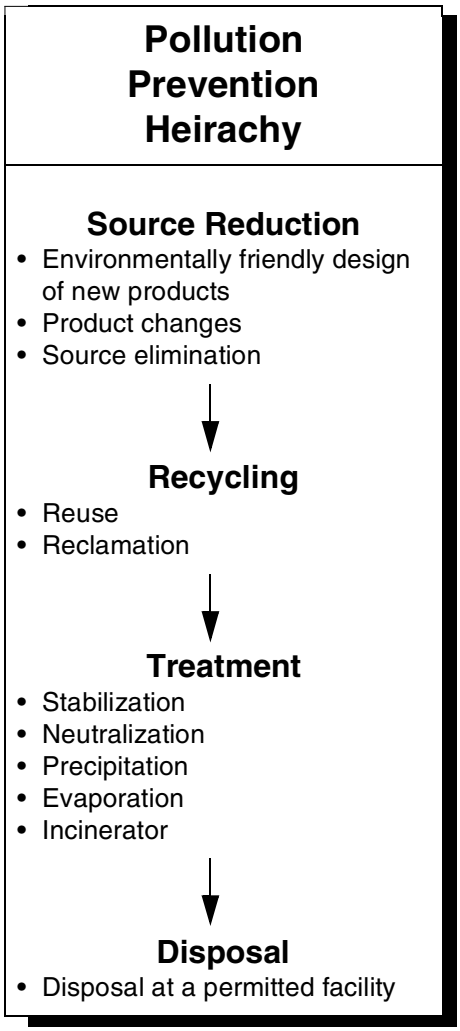
The *Waste Management Series* will help you find solutions that benefit your financial bottom line and the environment. Each publication offers valuable advice on how to run your operation more efficiently, conserve important resources, reduce waste disposal costs, and avoid potential environmental fines and penalties. They offer useful guidance on how to categorize the solid waste created at a facility and identify opportunities to prevent waste. In addition, the publication series includes:

- General guidelines for managing and reducing solid waste.
- Information to help identify and handle your facility's hazardous wastes.
- Tools for conducting a waste management assessment of your facility.
- Details on Kodak and other recycling programs.
- Recommendations for proper disposal of wastes that can't be reused or recycled.
- Tips on translating your environmental commitment to your marketing messages.
- Key definitions and an overview of applicable federal regulations.

Kodak has drawn upon its substantial solid waste management expertise in developing this informational series. We operate photographic product manufacturing facilities, which produce 1,000 varieties of film and nearly 300 kinds of photographic paper.

The identification of new or expanded recycling opportunities for company and customer facilities is an ongoing priority at Kodak. For instance, we expanded our internal x-ray film recycling program and now accept scrap film directly from healthcare providers and film collection companies. The scrap film received in this program is converted to new x-ray film product or even motion-picture film. A variety of other film products are also manufactured from this recycled material.

Waste reduction measures and waste material recycling options are important elements in all manufacturing processes. We suggest that all photographic processing facilities assess potential opportunities for pollution prevention for their operations.



PUBLICATIONS IN THIS SERIES

The U.S. Environmental Protection Agency (EPA) defines solid waste as garbage, refuse, sludge, or other discarded material. Such waste can consist of solids, semi-solids, liquids, and contained gaseous materials. Solid wastes can be described, in general terms, as either hazardous or non-hazardous. The following publications provide information regarding options available for managing all types of solid wastes associated with photographic processing and will help you improve your existing hazardous waste compliance program.

,J-410, An Introduction to Waste Management Options for Photographic Processing Facilities. On the following pages of this publication find out about essential first steps to taking a better approach to waste management, and overview the EPA's recommendations on preventing pollution. This publication also explains why recovering silver from photographic processing solutions merits special attention, lists the recycling programs available through Kodak, and describes the many advantages of linking an environment commitment to marketing messages. Three appendices provide a waste assessment checklist useful for any photographic processing facility, a summary of key federal environmental laws, and terms and acronyms.

J-411, Dealing with Hazardous Waste and Processing Effluents at Photographic Processing Facilities. This publication walks you through the process of how to determine if your facility's waste stream may be considered hazardous or not. It focuses on the various regulations that impact photographic processors, explaining everything from how to obtain an EPA identification number, hazardous waste accumulation limits, and shipping and reporting requirements. It also discusses the impact of local sewer use codes on your operation, and gives valuable advice on effective ways to treat the effluent discharged to the municipal sewer. J-411 will help you assess whether to use on-site or off-site waste management systems for your operation's hazardous waste and processing effluents.

J-412, Waste Prevention and Recycling for Photographic Processing Facilities. The final publication in the series describes numerous opportunities for recycling your non-hazardous solid wastes and the many recycling and reuse programs Kodak offers. Options for the proper disposal of non-hazardous wastes that cannot be recycled or have reached the end of their useful life are also discussed. In addition, methods to minimize the wastes you generate (e.g., inventory control, sorting, compacting) and off-site management options (e.g., contracting with transportation and disposal sites directly) are identified.

Check for programs in your community for recycling or managing bottles, cans, paper, corrugated cardboard, and other recycled material.

GETTING STARTED

The first step in managing solid waste more effectively is to take a close look at the wastes your operation is generating. In most companies, someone at the managerial level will take the initiative to set up a pollution prevention program.

This information gathering process, or waste management assessment, provides the baseline information needed to establish waste reduction and recycling goals and to monitor progress for continuous improvement.

See Appendix A for a "Facility Waste Management Assessment Tool." It is a checklist designed to help you conduct your own assessment and determine the types and quantities of wastes your facility generates. Using this tool will also help identify waste management opportunities involving recycling and reuse programs, including Kodak programs that address solid waste management issues. Also listed are Kodak publications that provide additional useful information.

Facility Waste Management Assessment Tool

Category	Type of Solid Waste	Quantity Generated at Your Facility (Example: pounds per month)	Disposal Costs Before Waste Reduction Efforts	Disposal Costs After Waste Reduction Efforts	Type of Waste Reduction Effort Used (Reduce, reuse or recycled)	KODAK Recycling Program Available ✓	Other KODAK Publications Available (in addition to this series)
BATTERIES	Alkaline-Manganese						
	Small Sealed Lead-acid						
	Mercuric oxide						
	Nickel-Cadmium					✓	
	Nickel Metal Hydride						
	Silver oxide						
	Lithium						
CHEMICALS	Discontinued						
	Unused (virgin)						
	Expired						
	Processed (contaminated/used)						
EFFLUENTS	Silver bearing					✓	CIS-57, CIS-147, J-212, J-215
	Non-silver bearing					✓	CIS-57, CIS-147
EQUIPMENT	Processors, monitors, scanners						
	Miscellaneous electronics						
	Cameras						

The checklist can be used for any photographic processing facility, regardless of type or size. Before you conduct an assessment, determine which individual(s) in your organization should conduct the walk-through.

Adopting a waste management plan for an operation is much the same as planning for other aspects of a business. Elements include building support for the plan, organizing the program, setting goals and objectives, performing an assessment of waste management opportunities, and identifying potential solutions.

Efforts to improve waste management strategies will be most effective if management support is obtained early in the process. It is also critical to get creative input from employees, for ultimately they will be the program's most important advocates. Depending on the size of the operation, your facility may need a team of people from different areas of your organization to plan and implement the program. The team members (or coordinator) must be enthusiastic and willing to work with individuals responsible for facilities management, materials handling, transportation and procurement, as well as with vendors, contractors, employees and the public.

You'll need to collect data on waste collection and disposal procedures and on the types and amounts of waste created.

GENERAL GUIDELINES FOR POLLUTION PREVENTION

Pollution prevention (P2) is the national environmental policy for the U.S. since the passage of the Pollution Prevention Act of 1990. Today, more businesses are realizing the advantages of *not* creating waste rather than trying to manage waste after it has been generated.

The EPA hierarchy of goals identifies source reduction (also referred to as waste prevention or minimization) as the most desirable means of pollution prevention, followed in order by reuse/recycle, treatment, and disposal options. Source reduction simply means preventing or reducing waste where it originates—at the source—including practices that conserve natural resources by reducing or eliminating pollutants through the more efficient use of raw materials, energy, water and land.

Some ways photographic processing facilities can take advantage of P2 opportunities include:

- Installing wash water control devices to limit water use when processing is not underway.
- Managing inventory levels carefully, thereby reducing the potential for processing chemicals to expire before use.
- Checking replenishment rates (i.e., avoid over-replenishment by following manufacturers' recommendations).

These and other waste minimization activities designed to reduce the quantity or toxicity of discarded products before the products are purchased, used or discarded are outlined in the other publications in this series.

RECOVERING SILVER

Whatever the size of your operation, if you are removing silver from effluent using on-site recovery equipment, or just collecting silver-bearing fixer for off-site treatment, the information in this series serves as a guide through the maze of environmental regulations (See Appendix B for key regulation summaries). It outlines the many solid waste management elements required by EPA and provides specific information of interest to your business. Another Kodak publication series, entitled *The Silver Management Series*, offers extensive information on managing silver-bearing waste. (See KODAK Publication No. J-208, *Introducing the "Silver Management" Series*).

A silver-rich solution is generated whenever photographic films or papers are processed. Silver-rich solutions include used fixer and bleach-fix solutions, low replenished (low-flow) washes following a fixer or bleach-fix solution, and stabilizers for washless minilab film and paper processes.

The used solutions still have value because they contain enough silver to make it cost-effective to recover the precious metal either on or off-site. Developing and implementing a plan to manage and recover silver is good business practice because more money can be put back into your operation. In addition, recovering silver is an important environmental responsibility because the metal is a non-renewable resource.

The *Waste Management Series* discusses various issues related to silver-bearing wastes and their waste status under current federal regulations. For example, effluents discharged from photographic processing operations and associated silver recovery equipment are considered to be a solid waste by the EPA, and therefore could be subject to regulation under the Resource Conservation and Recovery Act (RCRA). While silver flake and silver sludge collected in recovery units are eligible for specific exemptions from RCRA, the effluent—even after the majority of the silver is removed—may still contain enough of the metal to be considered a hazardous waste. Properly characterizing silver-bearing wastes merits special attention for these and other reasons.

In addition to federal solid waste regulations, local wastewater authorities can place additional restrictions on your ability to discharge silver-bearing wastes to the municipal sewer. The implementation of the federal Clean Water Act led to the development of such local restrictions.

Today, in fact, most municipal sewer authorities limit the amount or concentration of silver in wastewater. You may be required to recover the silver from your processing effluent in order to meet sewer code limitations.

Kodak recycles many materials, including drums, film containers, roll paper fiber cores, and one-time-use cameras.

KODAK RECYCLING AND REUSE PROGRAMS

Recycling and reuse programs utilize recovered or used materials as a substitute for virgin feedstocks, eliminating the environmental impact associated with extracting and harvesting additional raw materials. Recycling and reuse also help extend the life of the limited number of landfills in this country.

Kodak offers numerous recycling programs to customers, and suggests reuse when appropriate (e.g., the Returnable Drum Program; reuse of filtered washwaters, fixers and developers as described in KODAK Publication J-412.)

To explore whether a Kodak recycling program is right for your business, contact your Kodak representative or distributor. Or call the Kodak Information Center or the Kodak Environmental Services (www.kodak.com/go/kes).

KODAK Recycling & Reuse Programs[1]

- Roll Paper Fiber Core Recycling Program
- Returnable Drum Program
- One-Time-Use Camera Recycling Program
- Dental Film Lead Recycling Program
- Film Recycling Program for X-ray Film
- Wood Pallet Recycling Program

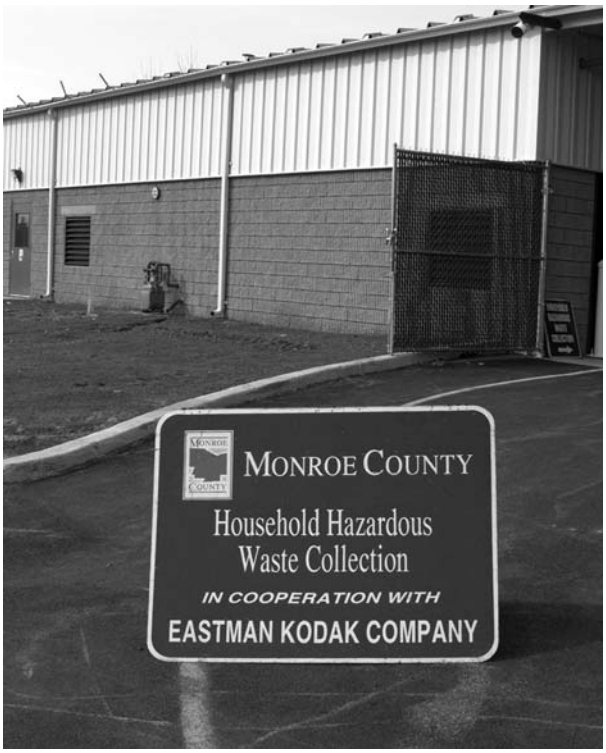
Kodak Also Accepts for Recycling

- Silver flake from electrolytic recovery units
- Silver-rich sludges
- Many other silver-bearing materials
- Metallic replacement cartridges
- Scrap photographic film
- Most polyester film
  - X-ray film (medical and industrial)
  - Silver-halide graphic arts film
  - Long-roll professional imaging products
  - Aerial films
  - Copier transparencies

Other Offerings

- Programs for Graphic Artists
  - Contact (toll free) 1-877-KP GRAPHICS ext. 5 or pep@kodak.com

1. Note: Some programs limited to Kodak products. Program details vary. For more details, see KODAK Publication No. J-412.



Contact the solid waste management department of your municipality to see if its household hazardous waste facility is available to small businesses.

OTHER P2 OPTIONS

Many facilities are already recycling or managing bottles, cans, paper, corrugated cardboard and other recycled materials through municipal or private programs in their areas. Investigate the programs available in your community. Check the phone book yellow pages to locate companies that collect / haul waste chemicals / effluents. Find out if your municipality makes its household hazardous waste facility available to small businesses, for free or for a small charge. Often the best way to obtain information from a municipality is to contact the solid waste management department.

TIE MARKETING MESSAGES TO THE ENVIRONMENT

Companies that only react to environmental issues often end up dealing with negative attention from special interest groups, non-compliance orders, or other potential problems. Companies that take a proactive approach to the environment are often viewed favorably by the community, by industry peers and by the regulatory authorities.

It makes good business sense to communicate your commitment to the environment and your participation in Kodak recycling programs. Many consumers today are willing to pay more for products that contain recyclable materials. A very high percentage also participate in voluntary recycling programs.

Some suggested ways to tie your marketing message to your environmental efforts are:

- Display key collateral (e.g., exhibition kits, coupons, information sheets) that showcases your business' role as an environmental advocate.
- Assess opportunities for media coverage that highlight a "reuse" activity adopted by your business.
- Include a statement about your environmental commitment in all direct mail promotions.
- Describe your environmental accomplishments on your company's website.
- Stress in advertising that your focus goes beyond providing customer service to include protecting the environment.

Make your environmental commitment an integral part of your company's message about how you conduct business.

APPENDIX A

Facility Waste Management Assessment Tool

Category	Type of Solid Waste	Quantity Generated at Your Facility (Example: pounds per month)	Disposal Costs Before Waste Reduction Efforts	Disposal Costs After Waste Reduction Efforts	Type of Waste Reduction Effort Used (Reduce, reuse or recycled)	KODAK Recycling Program Available ✓	Other KODAK Publications Available (in addition to this series)
BATTERIES	Alkaline-Manganese						
	Small Sealed Lead-acid						
	Mercuric oxide						
	Nickel-Cadmium					✓*	
	Nickel Metal Hydride						
	Silver oxide						
	Lithium						
CHEMICALS	Discontinued						
	Unused (virgin)						
	Expired						
	Processed (contaminated/used)						
EFFLUENTS	Silver bearing					✓	CIS-57, CIS-147, J-212, J-215
	Non-silver bearing					✓	CIS-57, CIS-147
EQUIPMENT	Processors, monitors, scanners						
	Miscellaneous electronics						
	Cameras						

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FILM	Exposed acetate/PEN						
	Unexposed/Exposed PET					✓	M3-494, CIS-164
	Motion picture nitrate based						H-182
	Unexposed acetate/PEN					✓	J-210
	Print film/PET (Motion picture)					✓	FPC Brochure *We're Saving Mega Bucks*
	Tri-acetate (120, 135, motion picture)					✓	FPC Brochure *We're Saving Mega Bucks*
GLASS	Containers, clear and colored						
METAL	Lead foil from dental interoral packs					✓	N-417, D3-65, D3-66
	Lead shield from X-ray film cassettes						
	Silver flake					✓	CIS-164, J-213,
	Silver sludge					✓	
	Other silver-rich materials					✓	
	Motion picture steel cans					✓	FPC Brochure *We're Saving Mega Bucks*
	Steel 135 film magazines					✓	
MIXED	Laminated prints from proofing						
	Photographic paper bag						

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PAPER	Corrugate						
	Fiber paper cores					✓	PF3-561
	Paperboard						
	Photographic paper						
PLASTICS	Chemical containers/drums					✓	CIS-139, CIS-148, CIS-183, AE-116
	Core plugs					✓	AE-117
	Donor rolls						
	Film canisters from 135 film						
	Film cartridges and spools						
	Filters from processors						
	Inkjet cartridges						
	Leader/leader cards						
	Motion picture film containers					✓	
	Photo CDs						
	Photo CD jewel box					✓	
	Photographic film*					✓	M3-494
	Single-use cameras					✓	A7-340

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PACKAGING	Foam pads from graphic arts paper					✓	AE-117, AE-118
	Shrink and stretch wrap						
WOOD	Pallets					✓	

* Kodak contracts with the Rechargeable Battery Recycling Corporation (RBRC) to recycle used NiCd bateries.

Publication Key

A7-340, *Recycling Program for One-Time-Use Cameras*
CIS-57, *Effluent Characteristics of KODAK Photographic Processing Chemicals*
CIS-139, *KODAK Returnable Drum Program*
CIS-148, *Recycling KODAK Photochemical Containers*
CIS-164, *Silver Refining at Kodak*
CIS-183, *Recycling KODAK SM Processing Units*
D3-65, *Instructions for Using KODAK Dental Film Lead Recycling Program*
D3-66, *KODAK Dental Film Lead Recycling Program*
J-210, *Sources of Silver in Photographic Processing Facilities*
J-212, *The Technology of Silver Recovery for Photographic Processing Facilities*
J-213, *Refining Silver Recovered from Photographic Processing Facilities*
J-215, *Recovering Silver from Photographic Processing Facilities*
M3-494, *KODAK Film Recycling Program for X-ray Film*
N-417, *Photographic Wastes in the Dentist's Office*
PF3-561, *Roll Paper Fiber Core Recycling Program*

APPENDIX B

A SUMMARY OF KEY FEDERAL ENVIRONMENTAL LAWS

Clean Water Act (CWA). In 1972, the U.S. Congress enacted the first comprehensive national clean water legislation in response to growing public concern for serious and widespread water pollution. Many of the nation's rivers were little more than open sewers and fish kills were common. The CWA is the primary federal law that protects the nation's waters, including lakes, rivers, aquifers and coastal areas. It focuses on improving the quality of the nation's waters and provides a framework of standards to achieve two national goals:

- eliminate the discharge of pollutants into the nation's waters, and
- achieve water quality levels that are fishable and swimmable.

One element of the Clean Water Act is the wastewater discharge permit program entitled the National Pollutant Discharge Elimination System (NPDES). It is a system of requirements to obtain authorization to discharge pollutants to surface waters. Municipalities that operate waste water treatment plants must obtain such a permit to legally discharge their treated waste to adjacent water bodies. The pollutant discharge limits outlined in a NPDES permit will directly impact the amount of pollutants photographic processing facilities and other businesses are allowed to release to the local sewer system for treatment at the Publicly Owned Treatment Works (POTW).

Resource Conservation and Recovery Act (RCRA). In 1976, U.S. Congress passed the most innovative and protective regulatory program for the management of hazardous waste of any country in the world. This national program mandates that hazardous waste be treated, stored and disposed of so as to minimize the present and future threat to human health and the environment. The RCRA standards are designed to provide cradle-to-grave control of hazardous waste by imposing upon generators, transporters and treatment, storage and disposal facilities special management requirements.

Under RCRA, a waste may be considered hazardous if it is ignitable, corrosive, reactive or toxic, or appears on a list of about 100 industrial process waste streams and more than 500 discarded commercial products and chemicals. Waste may also be considered hazardous if it contains certain amounts of toxic chemicals. Hazardous waste takes on many different forms and may be solid, semi-solid, contained gaseous or even liquid.

Pollution Prevention (P2). The Pollution Prevention Act of 1990 made P2 national policy for the United States. Pollution prevention means source reduction—preventing or reducing waste where it originates—at the source. The EPA definition of P2 does include the practice of conserving natural resources by reducing or eliminating pollutants through the increased efficiency in the use of raw materials, energy, water and land. Owners and operators of a facility who are required to file annual toxic chemical release forms to the EPA must include a source reduction and recycling report for the same year.

The environmental hierarchy described in the Act favors source reduction over recycling, treatment and disposal whenever feasible.

APPENDIX C

TERMS AND ACRONYMS

AA/AE SPECTROSCOPY
Atomic Absorption or Atomic Emission. Spectrophotometers which measure the absorption or emission of specific metallic elements at specific wavelengths. This equipment is commonly used to quantify the levels of metals and metal compounds in waste water effluents.

Ag
Silver. Silver compounds are the basic light-sensitive material used in most of today's photographic films and papers. Processing solutions contain silver because it is dissolved by solutions such as fixers or bleach-fixes, or because it leaches from the film during processing. After silver is removed from the film or paper during fixing or bleach-fixing, it is carried out in the solution and wash overflows, usually in the form of a silver thiosulfate complex. Unlike free silver ion (Ag+), which is toxic to microorganisms, silver thiosulfate complex is relatively nontoxic and is not detrimental to a secondary waste-treatment plant. When this complex reaches a treatment plant, chemical or biological action converts it to insoluble silver sulfide (Ag_2S) and it is collected as a solid sludge.

BMP
Best Management Practices. Schedules of activities, prohibition of practices, maintenance procedures and other management practices to prevent or reduce the pollution of waters. BMPs also include treatment requirements, operating procedures and practices to control chemical spillage and leaks or drainage from raw material storage.

BOD
Biochemical Oxygen Demand. The BOD test measures the amount of oxygen that a chemical solution, or effluent consumes over a five-day period through biological degradation. Knowing the oxygen demand of a discharged waste is important because strong oxygen-demanding wastes can overload the aeration capacity of a secondary treatment plant. Discharging improperly treated wastes can deplete the amount of dissolved oxygen in a receiving body of water. The BOD analysis attempts to duplicate in the laboratory the environmental condition in a receiving body of water and to measure the oxygen demand that the chemical or effluent exerts on it. A BOD of 400 mg/L for an effluent means that one litre of the waste would consume 400 milligrams of oxygen in 5 days in a natural stream. As the biochemical oxygen demand increases, more dissolved oxygen is removed from the stream, leaving less for fish and other aquatic life.

CAS
Chemical Abstract Service. A service of the American Chemical Society that assigns identification numbers to chemicals. The CAS number is the most common reference for chemicals.

CERCLA
Comprehensive Environmental Response, Compensation and Liability Act. The purpose of CERCLA is to provide authorities with the ability to respond to uncontrolled releases of hazardous substances from inactive hazardous waste sites that endanger public health and the environment. CERCLA established prohibition and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at such sites, and established a trust fund to provide for cleanup when no responsible party could be identified.

CFR
Code of Federal Regulations. The codified regulations of all U.S. regulatory agencies; usually cited by volume number, title number, and sections. It is revised and issued annually by the Government Printing Office.

Chain of Custody
A document designed to trace the custody of a sample(s) from the point of origin to final disposition with the intent of legally proving that custody remained intact and that tampering or substitution were precluded.

Characteristic Waste
According to the EPA, a solid waste not otherwise excluded from the definition of a hazardous waste is a hazardous waste if it exhibits one or more of the following four characteristics: 1) ignitability, 2) corrosivity, 3) reactivity or 4) toxicity. The primary responsibility for determining whether a waste exhibits a characteristic rests with the waste generator.

Cl_2 Demand
Chlorine Demand. Chlorine demand is the amount of chlorine needed to reduce the microorganism level in treated effluent to a level safe for discharge to a receiving body of water. More specifically, it is the amount of chlorine needed to provide a certain residual chlorine content (usually 0.5 mg/L) after a specific time (usually 15 minutes). The chlorine-demand test is an old method that depends heavily on test conditions, such as temperature, exposure time, etc. However, it is commonly regulated by sewer codes.

COD
Chemical Oxygen Demand. A means of measuring the pollution strength of domestic and industrial wastes based upon the fact that all organic compounds (with few exceptions) can be oxidized by the action of strong oxidizing agents, under acid conditions, to carbon dioxide and water. COD and BOD analyses do not completely correlate on all samples of photographic effluent because the two methods do not measure the same oxygen-demanding chemicals, but the COD is usually a larger number than the BOD. The COD test is more reproducible than the BOD test.

Composite Sampling. Composite sampling consists of taking a number of small samples over a period of time and combining them into one sample. This is a good method for determining average effluent characteristics. These samples can be collected manually and mixed together or can be collected by automatic sampling equipment. The sample can be fixed-volume or a flow-proportional composite type.

Cr
Chromium. Hexavalent chromium (chromium with a valence of 6) is harmful. Some local sewer codes limit the discharge of hexavalent chromium to 0.1 parts per million. When a dichromate bleach is mixed with other processing solutions that are alkaline and with solutions that contain reducing agents, such as thiosulfate, the chromium is precipitated as trivalent chromium hydroxide. The trivalent form is removed at the treatment plant in the primary and secondary sludge.

Dilution
Most sewer codes regulate chemical discharges according to their concentration. Although diluting photographic waste reduces the concentration, most sewer codes specifically prohibit dilution of the waste for the sole purpose of meeting the code limits.

DO
Dissolved Oxygen. Biological decomposition of organic matter uses dissolved oxygen. Since fish and most aquatic life are stifled by lack of oxygen, dissolved oxygen determination is a principal measurement in pollution surveys. The DO analysis is part of the BOD test procedure.

DOT
Department of Transportation. DOT oversees and regulates the transportation of hazardous materials. "Hazardous" materials, by DOT definition, are those materials that are capable of posing an unreasonable risk to health, safety and property when transported in commerce. Specific rules apply for proper identification, labeling, shipping papers, packaging and method of transportation.

Effluent Sampling
Sampling and flow-measurement methods designed to provide processing laboratories and treatment authorities with samples that accurately represent the composition of effluents. Sampling programs may be initiated by treatment authorities to: 1. determine whether or not effluents comply with sewer code restrictions, 2. evaluate conditions for a discharge permit, 3. establish treatment charges.

Fe
Iron. Iron concentration in effluent is commonly regulated because it affects the appearance and taste of water and because it readily oxidizes to the ferric (Fe^{+3}) form, which precipitates and causes rust stains. The iron in photographic effluent is not generally a problem because it is usually present only in the form of stable iron complexes.

FID
Flame Ionization Detector. A gas chromatography detector in which the column effluent gas is mixed with hydrogen and burned in air or oxygen. The ions and electrons produced in the flame produce an electric current proportional to the amount of material in the detector. The FID responds to nearly all organic compounds, but it does not respond to air and water, making it exceptionally suited to environmental analysis.

FR
Federal Register. The daily publication of the federal government's regulatory activities, such as proposed or final regulations, executive orders, settlement of federal lawsuits, etc. Publication of a notice in the Federal Register is legally considered to be notice to all the world.

GC
Gas Chromatography. A chromatographic separation technique in which the substance (or mixture) to be analyzed is vaporized and diffused along with a carrier gas through a liquid or solid for differential adsorption.

GC/MS
Gas Chromatography/Mass Spectrometry. An analytical technique, especially useful for organic analysis, in which the effluent from gas chromatographic column is introduced into the ion source of a mass spectrometer. The organic compounds are ionized and the ions are separated by their mass/charge ratio in a mass analyzer and detected in characteristic ion fragmentation patterns (mass spectra).

Grab Sample
A grab sample is sometimes called an individual or discrete sample and will only represent conditions at the exact moment it is collected. A grab sample can indicate what is in a batch dump, and a series of grab samples can show the changes that occur in an effluent over a period of time. A grab sample may spot an extreme condition that may be masked by another method.

Hardness
The total concentration of the calcium and magnesium ions in water expressed as calcium carbonate (mg/$CaCO_3$/litre). Hard waters from both underground and surface water supplies are most common in areas having extensive geological formations of limestone.

Heavy Metals
Materials classed as heavy metals are commonly regulated by local sewer codes. They are defined as metals with a specific gravity greater than 5.0. This includes metals such as cadmium, chromium, cobalt, copper, gold, iron, lead, manganese, mercury, molybdenum, nickel, silver, and zinc.

Holding Time
The storage time allowed between sample collection and sample analysis when the designated preservation and storage techniques are employed.

ICP
Inductively Coupled Argon Plasma. An instrument used for metal analysis because the temperature of the plasma is considerably higher (10,000 K) than the temperature of a flame atomic absorption spectrophotometer. It is also capable of doing multi-element analysis.

Indirect Discharger
This is an industrial user or other non-domestic user that discharges wastewater (pollutants) into a publicly owned treatment works.

LEPC
Local Emergency Planning Committee. A committee required by SARA Title III; the local group responsible for developing and implementing response plans to chemical emergencies.

MSDS
Material Safety Data Sheet. Hazard and toxicological information required by OSHA's Hazard Communication Standard (29 CFR 1910.1200) to be provided by the manufacturer or distributor for all potentially hazardous substances. It must be made available to employees.

MDL
Method Detection Limit. The minimum concentration of a compound that can be measured and reported with 99 percent confidence that the value is above zero.

N
Nitrogen. Common forms of nitorgen are: organic, ammonia, nitrite and nitrate. Nitrogen in wastewater can promote the growth of algae.

NOV
Notice of Violation. A document issued by the pollution control authority that provides notice that the facility / process is (or was) in violation of its pollutant discharge permit. The NOV will typically outline the steps the owner / operator must take to respond and address the noncompliance situation.

NPDES
National Pollution Discharge Elimination System. In the Clean Water Act, this is the national permitting process for point-source discharges of pollutants into waters of the United States.

O & G
Oil and Grease. A variety of organic substances including hydrocarbons, fats, oils, waxes and high molecular weight fatty acids are collectively referred to as oil and grease. Because of low solubility, these substances separate from water and adhere to the interior of pipes and tank walls, reduce the biological treatablilty of waste and produce greasy sludge solids that are difficult to process.

Pb
Lead. Lead is naturally occurring and has no characteristic taste or smell. Lead in water will combine with different chemicals depending on the acidity and temperature of the water.

pH
pH indicates how acidic or alkaline (basic) a solution is. It is a measurement of hydrogen-ion concentration and is expressed as the negative logarithm of the hydrogen-ion concentration. pH values run from 0 to 14. The lower numbers indicate acid solution, higher numbers indicate basic solutions, and 7 represents neutral solutions.

Point Source
In the Clean Water Act, it is any discernible, confined, discrete conveyance from which pollutants are or may be discharged.

P2
Pollution Prevention. Identifying areas, processes and activities that create excessive waste products or pollutants in order to reduce or prevent them through, alteration or eliminating a process. Such activities and consistent programs can involve cooperative efforts with such agencies as the Departments of Agriculture and Energy.

POTW
Publicly Owned Treatment Works. POTW is any device or system used in the treatment (including recycling and reclamation) of municipal sewage or liquid industrial wastes that is owned by a state or municipality.

PPB / PPM
Parts Per Billion / Parts Per Million. Units commonly used to express low concentrations of contaminants. For example, one ounce of trichloroethylene (TCE) in one million fluidounces of water is one ppm; one fluidounce of TCE in one billion fluidounces of water is one ppb. If one drop of TCE is mixed in a competition-size swimming pool, the water will contain about one ppb of TCE.

Preservative
Either a chemical or reagent added to a sample to prevent or slow decomposition or degradation of a target analyte or a physical process (such as cooling) used for the same purpose. Both physical and chemical preservation may be used in tandem to prevent sample deterioration.

Recycle/Reuse
Minimizing waste generation by recovering and reprocessing usable products that might otherwise become waste (i.e., recycling of aluminum cans, paper and bottles, etc.).

SARA
Superfund Amendments and Reauthorization Act of 1986. One portion of the SARA Regulation is Title III, which established requirements for federal, state and local governments and industry regarding emergency planning and community right-to-know reporting on hazardous chemicals. This law increases public access to information about hazardous chemicals in communities and the release of these chemicals into the environment.

Settleable Solids
A term to describe solids in suspension that will settle because of the influence of gravity. Only the coarser suspended solids with a specific gravity greater than that of water will settle.

SIU
Significant Industrial User. Any industrial user that: discharges an average of 25,000 GPD or more of process wastewater to a POTW; contributes a process waste stream that makes up 5% or more of the average dry weather hydraulic or organic capacity of the POTW; is designated as such by the Regulatory Authority on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard; or is subject to federal pretreatment standards under 40 CFR.

Source Reduction
Reducing the amount of materials entering the waste stream from a specific source by redesigning products or patterns of production or consumption (e.g., using returnable beverage containers). Synonymous with waste reduction.

SPDES
State Pollutant Discharge Elimination System. A state water quality agency can obtain approval from EPA to have NPDES Permit-Issuing Authority" for their state. Just like a NPDES permit, a SPDES permit poses restrictions upon the pollutants found in a permitee's discharge.

TCLP
Toxicity Characteristic Leaching Procedure. The EPA method for determining the amount of toxicity characteristic substances in a waste. A representative sample of waste is subjected to an acidic solution. After 24 hours, the resulting extract is then tested to determine if it contains contamination levels of regulatory concerns. The TCLP is designed to identify wastes that are likely to leach hazardous constituents into groundwater under improper management conditions. EPA has made the assumption that industrial waste would be disposed of with non-industrial waste in an actively decomposing municipal landfill situated over an aquifer.

TDS
Total Dissolved Solids. In potable waters, most matter is in the dissolved form and consists mainly of inorganic salts, small amounts of organic matter, and dissolved gases. As waters become polluted, the amount of undissolved and suspended solids increase, and the dissolved fraction is usually not considered an important effluent parameter.

TOD
Total Oxygen Demand. A measurement of the extent to which a chemical can be oxidized by laboratory incineration. TOD is a larger number than BOD or COD. It is being used with increasing frequency because results can be obtained quickly in the laboratory.

TOC
Total Organic Carbon. The organic carbon in wastewater is composed of a variety of organic compounds in various oxidation states. The TOC is a more convenient and direct expression of total organic content than either the BOD or COD, but does not provide the same information. TOC measurement does not replace BOD and COD testing.

TC
Toxicity Characteristic. The EPA term for some substances, including heavy metals, a number of pesticides, barium, arsenic and vinyl chloride, that can pollute groundwater by seeping out of landfills. A waste exhibits the characteristic of toxicity if it contains more than a specified level of the listed substances as demonstrated by the TCLP. They are regulated under the authority of the Resource Conservation and Recovery Act.

TPQ
Threshold Planning Quantity. The amount of a hazardous substance on hand at a facility that triggers emergency planning and community right-to-know under SARA Title III.

TSCA
Toxic Substances and Control Act. This act allows the Environmental Protection Agency to evaluate the toxicity and environmental impact of chemical products being manufactured and sold.

TSS
Total Suspended Solids. Suspended solids are undissolved matter in effluent. A parameter to evaluate the strength of wastewaters. It is used to determine the efficiency of effluent treatment units. The TSS fraction includes the settleable solids component.

Turbidity
A measure of the light-transmitting properties of water used to indicate the quality of waters with respect to colloidal matter. Colloidal matter will scatter or absorb light and thus prevent its transmission.

Waste Minimization
Measures or techniques that reduce the amount of wastes generated during industrial production processes; term is also applied to recycling and other efforts to reduce the amount of waste going into the waste stream.

WL
Waste Load. A measurement of the characteristics of an effluent received by a body of water or a treatment plant. Usually expressed in terms of volume and concentration of oxygen demand, chlorine demand, nutrients, specific chemical compounds and suspended solids. These values can be related to the capacity of the receiver to handle the load.

WQS
Water-Quality Standards. Concentration limits for bodies of water established by federal and state authorities. These are limits for overall characteristics and individual components of water based on the proposed use of the water.

Zn
Zinc. Zinc is seldom found in public water supplies at concentrations over 1 ppm. Because it tends to impact water taste, its concentration in effluents is usually limited to 5 ppm by local sewer authorities.

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