

OVERALL WASTE DISPOSAL MANAGEMENT

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Abstract: There is great importance to the management and proper handling of hazardous waste for all printing companies, regardless of size. The areas of identification, handling, storage, waste reduction, disposal, training, and contingency/preparedness plans must be addressed with a sense of urgency. Those managers who choose to comply will find themselves out of the enforcement loop, while those who fail to comply subject themselves and their company to environmental enforcement.

THE HAZARDS OF HAZARDOUS WASTE AND ENVIRONMENTAL NONCOMPLIANCE

There are nearly 10,000 federal, state, and local environmental regulations. This large number, plus an ever-increasing number of new regulations, will cause printers both new and continuing problems.

As acknowledgment to the amount of emphasis that the Federal Environmental Protection Agency (EPA) places upon the generation, storage, and disposal of hazardous waste, 29 new Federal hazardous waste and land disposal regulations were made law in 1992.

Due to the implementation of the air toxics provisions to the Clean Air Act, U.S. industry's management of its hazardous waste will be greatly influenced by the Clean Air Act regulations. Because of the controls being imposed concurrent with restrictions on discharges to other media, there will be a far-reaching impact that air toxics provisions will have on plant operations.

Air toxics emissions are either discharged into the air or "put somewhere else" for disposal. But with the new limits being placed on discharges, landban provisions, and wastewater discharges, it is becoming increasingly difficult to properly dispose of wastes.

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Compliance with hazardous waste regulations can no longer be directed towards one method or one waste stream. Multi-media alternatives will now have to be researched to determine how one media will affect another.

In today's complex environmental arena with its multitude of regulations, every generator of hazardous waste is directly responsible for treating, recycling, or disposing of his hazardous waste. Choosing the wrong transporter, storage, or disposal company can result in charges being brought against corporate officials.

RESOURCE CONSERVATION AND RECOVERY ACT

This Act provides for the safe treatment and disposal of hazardous wastes and regulates hazardous waste management practices for generators. Hazardous waste regulations are found in Title 40 of the Code of Federal Regulations (CFR). Definitions for hazardous wastes are found in 40 CFR 261.3. Non-hazardous definitions are found in 40 CFR 261.4(a) & (b). Solid definitions are found in 40 CFR 261.2. A copy of Title 40 may be purchased from many companies throughout the country.

To find out if, because of the size of your company, or because of the types of materials that you use, that you should be excluded from these regulations, then you need to read 40 CFR 261.4(c)-(f) & 261.5.

No material can be classified as hazardous without first being a solid waste. The term "solid waste", as a regulatory term, does not apply to its physical characteristic. According to 40 CFR 261.4(a), unless excluded by this part of the regulation, a discarded material is one that is:

1. Disposed of, burned or incinerated, accumulated, stored or treated.
2. Recycled and considered inherently wastelike, and if it is identified as a waste from the F020, F021, F022, F023, or F026 lists.
3. Recycled.

If not excluded, a material is a solid waste if it is no longer useful for its intended purpose.

If wastes meet one or more characteristic by chemical content they are hazardous. The different characteristics are: a) ignitability, b) reactivity, c) corrosivity, or d) toxicity. They could be acutely hazardous (fatal to humans in low doses) or could be PCB's as defined in 40 CFR 761 (D). Wastes also can be listed by source on one of the many lists found in 40 CFR.

Various wastes whose toxic or hazardous constituents could leach out after disposal are banned from land disposal. Wastes must now pass the toxicity characteristic leaching procedure (TCLP) before being disposed of in a landfill. Many wastes must be treated to remove or stabilize their hazardous constituents before they can meet the TCLP standard.

There are other terms used to define hazardous wastes. These are terms used to describe contaminated media and process wastes consisting of mixtures of solid and listed wastes where the mixture is hazardous because it exhibits a characteristic of toxicity. These rules require media contaminated with hazardous waste to be managed as a hazardous waste until they no longer contain the waste, they no longer exhibit the characteristics of the waste, or the waste is delisted. Simply by mixing a hazardous waste with a non-hazardous waste will not delist the hazardous waste.

These other terms are listed and defined as follows:

Mixed with - 40 CFR 261.3(a)(2)(iv). The "mixed with" rule requires that a waste must be treated as hazardous if it is a mixture of a solid waste and one or more of the listed hazardous wastes.

Derived from - 40 CFR 261.3(c)(2)(i). The "derived from" rule provides that any solid waste generated from the treatment, storage, or disposal of a hazardous waste, including any sludge, spill residue, ash, emission control dust, or leachate (but not including precipitation run-off) is a hazardous waste.

Contained in - 40 CFR 261.3(d)(2). Hazardous wastes may be "contained in" otherwise non-hazardous material such as discarded cleaning rags or protective clothing containing a listed waste

or exhibiting a characteristic of hazardous waste (see above). To be acceptable for land disposal, hazardous material under this regulation must be treated by extraction, destruction, or immobilization to remove or immobilize hazardous constituents. These rules were vacated, then reissued on an interim basis in March 1992 until April 28, 1993, now are delayed for one to two more years.

The Resource Conservation and Recovery Act regulations prohibit the disposal of untreated wastes. Treated hazardous wastes must meet strict requirements stated by these regulations.

As outlined by Eric A. Sisco and Keith D. Grossman of Morgan, Lewis & Bockius, state and federal laws and regulations impose additional duties upon employers whose employees handle hazardous waste, including its generation (29 CFR 1910.120 & 40 CFR 260-67). Specifically, employers must, among other things, develop a safety program. This program should be in writing, and developed before any hazardous waste work or generation begins. This program should include:

1. Policy statement with regards to a line of authority and accountability for implementing the program, and the program objectives.
2. Methods for developing procedures to identify and control workplace hazards.
3. Develop plans, work rules, safety rules, and operating procedures, then communicate these to all employees.
4. Supervisor and employee health and safety training and other necessary training, such as the proper use of personal protective equipment.
5. Develop a monitoring, sampling and medical surveillance program.
6. Develop a program to handle drums and containers safely, including proper labeling procedures.
7. Develop an emergency response program to anticipate, prepare for, and respond to any emergency situation, including spill prevention and control, and decontamination procedures.
8. Confined space entry procedures if needed.

9. A follow-up and evaluation program to improve the program's effectiveness.

Each of these different elements of a hazardous waste program has specific details and formats that must be followed. Employers should consider combining as many of the elements of this program with any other program they may already have or should have, since many requirements are the same and can be used in other programs. [[1]]

Most generators of hazardous waste accumulate it on-site before it is transported for disposal or recycling. The amount of waste generated determines the accumulation time allowed before requiring a waste management permit. You must always be in compliance with the RCRA standards that apply to accumulated wastes (40 CFR 262.34).

Generators fall into three different categories. The first is Large-Quantity Generators (LQG). By definition, these are facilities that generate 1,000 kilograms (2,200 pounds) or more per month of hazardous waste. The wastes may be accumulated onsite for 90 days or less.

Satellite Storage - Up to 55 gallons of hazardous waste or one quart of acutely hazardous waste may be accumulated by LQGs in containers that are at or near any point of generation where wastes initially accumulate, without falling under the 90-day limit. There are restrictions and requirements that must be met when using satellite storage. (40 CFR 262.34(4)(c)(1))

Containers/Drums - If you accumulate wastes in containers or drums, you must comply with the container standard found in 40 CFR 265, Subpart I.

Tanks - If you accumulate wastes in tanks, you must comply with the tank standard found in 40 CFR 265, Subpart J.

The second category is Small-Quantity Generator (SQG). These are facilities who generate between 100 and 1,000 kilograms (220 to 2,200 pounds) per month of hazardous waste. These generators may accumulate hazardous waste onsite without a permit for 180 days - or 270 days if wastes are shipped to a treatment, storage, and disposal facility

that is more than 200 miles away.

SQGs must comply with the same standards as apply to LQGs, with exceptions found in 40 CFR 265.176. SQGs also must meet preparedness and prevention requirements as do LQGs, but SQGs have their own contingency plan requirements. These requirements are:

1. An "emergency coordinator" to be available or on-call at all times with certain actions to be followed.
2. Certain information is to be posted next to the telephone.
3. Workers must be trained in waste handling and emergency procedures.

The third category is Conditionally Exempt Small-Quantity Generator (CESQG). These are facilities who generate less than 100 kilograms (220 pounds) per month of hazardous waste. The CESQG can accumulate onsite up to 1,000 kilograms (2,200 pounds) of hazardous waste. However, at the time 1,000 kilograms of waste is accumulated, the CESQG will now be subject to the same regulations applicable to SQGs. The new SQG status would remain in effect until the accumulated waste falls below 1,000 kilograms and the monthly generation of waste falls below 100 kilograms.

The CESQG can either treat or dispose of his hazardous waste in an approved on-site facility, or ensure delivery to a permitted, licensed or authorized off-site treatment, storage, or disposal facility.

EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT

As as outlined by Robert L. Collings and John J. McAleese, III of Morgan, Lewis & Bockius, this is an independent, freestanding statute designed to inform the community of the hazardous chemicals and substances that are being handled in the community and to provide relevant information regarding those chemicals and substances. It will also aid local communities in planning for the accidental release of hazardous chemicals and protecting against injuries to persons and property.

There are four sets of regulated chemicals:

1. Extremely Hazardous substances (EHS), listed at 40 CFR 355.40, Appendix A.
2. OSHA MSDS "hazardous chemicals" listed at 29 CFR 1910.1200(c).
3. "Toxic chemicals" listed at 40 CFR 372.65.
4. CERCLA "hazardous substances" listed at 40 CFR 302.4.

There are five basic reporting requirements:

1. Emergency Planning -[SARA 302; 40 CFR Part 355].
2. Spill Reporting-[SARA 304; 40 CFR Part 355].
3. Material Safety Data Sheets (MSDS's) - [SARA 311; 40 CFR Part 370].
4. Annual Inventory Reports - ("Emergency and Hazardous Chemical Inventory" form "Tier I" and "Tier II") [SARA 312; 40 CFR Part 370].
5. Annual Toxic Chemical Release Reports - (Form R) [SARA 313; 40 CFR Part 372).

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HAZARDOUS WASTE DOCUMENT REVIEW

There are several documents relating to hazardous waste that must be complete, accurate, and, for your protection, kept on hand for years, forever being more appropriate. These documents are:

1. Permits and I.D. numbers.
2. Hazardous waste manifests.
3. Landban certification.
4. Biennial/annual reports.
5. Manifest exception reports.
6. Waste analysis test results.
7. Contingency plan.
8. Spill prevention plan.
9. Inspection records.
10. Training plan and records.
11. Waste minimization plan.
12. Source reduction plan.
13. Treatment/disposal permit.
14. Superfund involvement.
15. Storage area inspection results.
16. Quarterly/annual tax statements.
17. Spill response plan.
18. Preparedness and prevention plan.

19. Waste handling procedures.
20. Extremely hazardous waste disposal permit.
21. EPA Section 313 Form R (toxic chemical release report).
22. EPA Section 304 (extremely hazardous substance report).
23. EPA Section 302 (extremely hazardous substance notification).
24. Acutely hazardous materials registration.
25. Hazardous material purchasing records.
26. Spill/incident reports.
27. Storage permits.
28. Material Safety Data Sheets (MSDS's).
29. Community Right-to-Know reports and inventory.

HAZARDOUS WASTE TRANSPORTERS

Hazardous waste transporters are responsible for the safe and legal transportation of your waste. The generator has "cradle-to-grave" responsibility which cannot be assumed by a third party, no matter what the transporter or treatment, storage, and disposal facility may say. Any company using another company to transport, store, or dispose of their hazardous waste, should conduct an audit on these firms.

WASTE STREAMS METHODS OF MANAGEMENT

There are many waste streams that are produced as a result of manufacturing in any printing facility. Following is a list of the most common waste streams, and some of the current techniques available for the disposal of each.

The best method of compliance with any waste stream, is not to produce the waste. As simple as this sounds, it is often overlooked as a viable method. The Pollution Prevention Act establishes a national policy to ensure that pollution is prevented or reduced at the source, recycled or treated in an environmentally safe manner, and disposed of or released into the environment only as a last resort. It also requires a toxic chemical source reduction and recycling report to be included with the annual toxic chemical release form required under EPA Section 313 Form R.

The Pollution Prevention Act classifies four practices for pollution prevention. They are:

1. Equipment, technology, process or procedure modifications.
2. Product reformulation.
3. Raw materials substitution.
4. Improvements in housekeeping, maintenance, training, and/or inventory control.

Known by several different titles: source reduction, pollution prevention, or waste minimization, the main goal is to reduce the generation of hazardous waste at the source. This is best done through an aggressive management plan. The second part of this regulation addresses recycling either on or off site.

A pollution prevention program will have four basic elements: 1) planning, 2) assessment, 3) feasibility analysis, and 4) implementation. The opportunity should be presented to all co-workers to receive their input. Assign a team of co-workers for each waste stream that is generated to assess then suggest possible changes. The EPA has a guide on pollution prevention entitled "Facility Pollution Prevention Guide," EPA/600/R-92/088.

HAZARDOUS WASTE STREAMS

INK

There are several different methods available today to effectively dispose of waste ink. Depending upon the quantity generated, one can return the ink, under specified conditions, to the manufacturer to be "recycled" into black ink. Waste ink can also be "incinerated" - a process whereby the ink is burned inside a large furnace. The result of this process is an "aggregate". This "aggregate" is able to be used for several different applications. Incineration is also being used as a waste-to-energy system to generate steam or electricity. Waste ink also may be blended and used as a supplemental fuel. This fuel is usually sold to a cement manufacturer and burned in a kiln used to produce cement. Another method of disposal, recently introduced, is onsite recycling for both heatset and non-heatset web inks, also, sheetfed inks.

With the continuing research into the development of inks that can be cleaned without the use of traditional solvents, there is a potential to significantly reduce the emissions of VOC's, reduce health hazards to co-workers, and the reduction or even elimination of hazardous waste generation.

The same disposal methods as used for waste ink are used for waste coatings generated during manufacturing and/or clean-up. Regardless of the type of coating: aqueous, ultra violet, electron beam, water or solvent catalytic, solvent lacquer, or oleoresinous, all must be disposed of properly.

SILVER

While most printers are aware of silver recovery units on their film processors, this is an area that is often neglected. If the silver recovery units are not maintained on a regular basis, the filters may become plugged resulting in high concentrations of silver-laden wastewater being dumped into a Public Owned Treatment Works (POTW) or other wastewater disposal system. The EPA has placed a maximum concentration limit of 5 parts per million (PPM) on the wastewater discharge. Most modern silver recovery units have no problem meeting this requirement, so long as they are regularly maintained and use ion exchange in combination with an electrolytic recovery unit. There are some states that are looking at placing a 5 parts per billion (PPB) or less limit on wastewater discharge. This will be virtually impossible to meet at this time using current technology. Make sure that your wastewater discharge meets the standards set by your local municipal sewer authority's regulations.

OIL

The EPA recently announced that used oil that will be recycled or burned will not be considered a hazardous waste, unless, of course, it is a hazardous waste as defined by your State where you are located.

SOLVENT

Waste solvent is another waste stream that may be managed using several different methods. As with waste ink, it can be incinerated or used for fuel blending. Depending on the quantity generated, printers can send out their waste solvent with the dirty shop towels. Be aware though, since you are responsible for this waste from "cradle to grave", you need to know exactly what the company is doing with your waste solvent. Not to do so would be to invite a regulatory penalty. Remember, you could be held liable for the consequences if the laundry improperly handles your shop towels. Waste solvent also can be distilled and re-used on site. This may create a problem with the printer as you are now treating a hazardous waste that may require a permit.

Onsite solvent recycling can often help reduce the amount of hazardous waste you may generate. Source reduction must occur before recycling, but through onsite recycling a manufacturer may bring about source reduction in the manufacturing process. Whatever method used for onsite recycling, there are many regulations that need to be addressed before deciding that this is the method to be used. There are many companies throughout the country who will remove your waste solvent from your plant, recycle it, then offer it for sale on the market.

PLATE DEVELOPER

Due to its corrosivity, solvent plate developer falls into the category of hazardous. It may be disposed of through methods such as incineration or fuel blending, or may be recycled by the manufacturer. It may be possible to discharge your waste water into the municipal sewer system. Be sure to check with them to ensure that your discharge meets the standards set by their regulations. If you use aqueous plates, unless restricted by your local treatment plant, the processing chemicals can go down the drain.

OTHERS

Depending upon the area of the country in which the following waste streams may be generated, and upon the pending outcome of the "mixed with"

"derived from" regulations, the following may be considered as hazardous wastes:

1. Absorbents mixed with oil or other materials.
2. Ink pails, buckets or containers.
3. Containers that held hazardous materials.
4. Any media that have absorbed a hazardous material, ie: filters, water, contaminated soil.
5. Dirty shop towels.

NON-HAZARDOUS WASTE STREAMS

PAPER/BOARD

The printing industry has always been an advocate of paper recycling. During the first six months of 1992, collection of recovered paper for recycling rose to 16,324,200 tons. Most waste paper is baled and sent to a recycling company or to a mill for recycling. For label converters of pressure-sensitive materials the matrix waste can be recycled into a safe, pelletized fuel to be used by a paper manufacturer or municipal power company. The U.S. Department of Agriculture continues to find more uses for recycled paper. Some "uncommon" uses are: development of soils using newsprint, insulation, bedding for livestock, and processed newsprint used as cattle feed.

PLATES

Most printing companies have a system in place to recycle their metal printing plates. Many plates may now be processed on both sides, thus reducing waste in compliance with the Pollution Prevention Act.

OTHER TREATMENT METHODS

A federal appeals court recently ruled that federal hazardous waste regulations authorize the EPA to use dilution as a method of treatment for hazardous wastes exhibiting ignitable, corrosive, or reactive characteristics. However, unless the waste has been treated to reduce risks beyond those presented by the characteristics themselves, they must be treated as hazardous.

Another method that has the potential to treat most "organic" hazardous wastes is with a system that uses sound waves to pick up the components of contaminants and break them down to volatiles, then re-use or re-claim them. Called "sublimation", by its inventor, it does show promise in dealing with certain wastes.

THE FUTURE

There are recent innovations in the printing industry that will make meeting compliance with environmental issues easier for the printer. Waterless printing is an innovation that is seen by some as addressing a number of issues. The pressroom will be more environmentally friendly, and, due to the lack of water-related problems, production should increase. Waterless printing produces less waste by removing some of the chemicals in the conventional process.

Another innovation is the direct imaging technology. While not yet able to meet the quality needs of offset printing, it is a technology that could become a major factor. By the end of the 1990's, we will probably see the elimination of film and all of the hazardous problems that are associated with it.

While not having a crystal ball, it is safe to assume that the situation will not get any better, nor made any easier. While it is anticipated that there will not be a flurry of new environmental regulations being developed in the near future, it is predicted that there will be increasingly stepped up environmental enforcement, including use of criminal sanctions, and an ever-rising trend toward higher environmental expenditures even without new requirements.

You can not be sure to know all of the requirements of one phase of regulation (RCRA, CAA, OSHA, etc.) unless you monitor changes to all of them. With environmental concern at an all-time high, federal and state lawmakers will most certainly require you to supply even greater detail about your toxic chemical use, storage, release, and disposal. If printers do not become more environmentally aware, they may find themselves forced out of business, in legal trouble either civilly

or criminally, or loosing customers due to the compliance requirements placed by them. You can expect that more and more of your customers will require you to be familiar with all of the issues surrounding the need to produce printed products that are more environmentally friendly.

Printing managers need to assess compliance with federal, state, and local regulations, for all areas of environmental concern. They then need to determine what actions might be required to bring the facility into compliance if any noncompliance issues are identified.

Managers also need to assess the potential for future liabilities and identify and assess where regulatory trends might affect existing and future compliance. This is not an issue that you want to delegate to an employee to be done "as part of your regular job, when you find time to do it".

Following the natural course of events, printing companies that take a pro-active approach toward environmental issues will find that the time and expense necessary to meet environmental, health and safety regulations will benefit them now and in the future.

The U.S. Environmental Protection Agency, the P.I.A., and G.A.T.F. are currently working together on many projects to help the printing industry reduce its overall impact upon the total environment. Through involvement with these different organizations, the entire environmental arena can be made into something a little easier to accept, understand, and comply with.

I have tried to limit this paper to the regulations set forth by the Federal Environmental Protection Agency. You must be aware that many state and local agencies also have regulations that may be more stringent to, or in addition to the federal regulations. Before implementing any program or procedure, be sure to contact and understand any federal, state, or local regulation as it may apply to you.

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