



# Pollution Prevention Handbook

## Automotive Maintenance

No. 6 in a Series of Fact Sheets.

Although you may not realize it, many of the activities that take place at your facility may pollute the environment and waste money. A facility such as yours can become more environmentally friendly and cost efficient by reducing the amount of waste generated. Everyone is interested in doing his/her part to protect the environment, and simple steps such as recycling paper products and used oil properly can help. Growing numbers of facilities are becoming aware of the environmental harm their operations may cause and are making a commitment to reduce waste through a series of steps commonly known as pollution prevention.

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 Department of the Interior (DOI) considers source reduction to be the most preferred environmental management technique for dealing with a waste generation problem. In addition, 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. The Pollution Prevention Act of 1990 makes pollution prevention a national policy for environmental management.

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 ap-

plicable waste management regulations. Wastes should be disposed safely to minimize adverse impacts on the environment.

### BENEFITS OF POLLUTION PREVENTION & RECYCLING

Establishing a pollution prevention/recycling program at your facility has many potential benefits for you, your facility, and the environment. Some of these benefits are direct (e.g., cost savings from reduced raw material use), while others are indirect (e.g., avoided waste disposal fees).

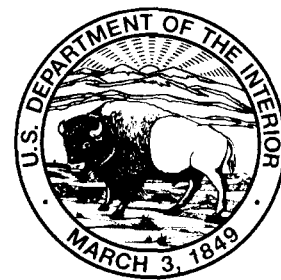
### PURPOSE OF THIS FACT SHEET

This fact sheet introduces source reduction and recycling options that can start you on the road to eliminating, reducing, or recycling wastes. This fact sheet describes many pollution prevention options that you, as the manager of your facility, may adopt to reduce wastes. The last page of this fact sheet is a list of specific practices and techniques that employees at your facility can take to help implement your pollution prevention/recycling program. The list of pollution prevention tips can be posted in your work area to encourage employees to use environmentally-safe practices.

### DEVELOPING A POLLUTION PREVENTION/RECYCLING PROGRAM

#### Recognizing the Need for a Pollution Prevention/Recycling Program

The first step is to recognize the need for waste reduction at your facility and secure staff commitment to achieve source reduction and recycling goals. Once you have convinced your staff of the benefits of a pollution prevention/recycling program, use the steps outlined below to help begin designing your program. Each step can be as basic



Department of the Interior

Office of Environmental Affairs (OEA)

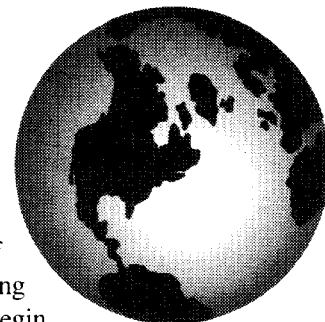
#### DEFINITIONS:

##### 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.*



or complex as you feel is necessary to meet the environmental goals that you set for your facility.

### Planning and Organizing

The next step is to plan and organize your pollution prevention program. This involves establishing program goals and objectives, as well as staffing a task force to conduct a pollution prevention "assessment" of the facility.

### Conducting a Pollution Prevention Assessment

The goal of a pollution prevention assessment is to identify opportunities at your facility where you can reduce waste generation, emissions, and environmental damage. The assessment can involve collecting process-specific 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 they can be less formal evaluations of waste generation and management practices.

### Evaluating Pollution Prevention Options

Once pollution prevention options are identified, evaluate the technical and economic feasibility of each option. These evaluations can help determine which pollution prevention options are most suitable for implementation at your facility. Pollution prevention options range from simple and easy-to-implement techniques to detailed engineering or design changes. The options you choose will depend on your facility's operations, needs, and environmental goals.

## 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.

## Implementing Your Pollution Prevention Program

The final steps in the process are implementation of the pollution prevention program and evaluation of its success. After the program is implemented, an evaluation can increase the overall success of the pollution prevention program by identifying deficiencies that remain. Specifically, the evaluation may identify new assessment targets and additional pollution prevention program options for investigation.



**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.

**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 of a 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 costs by limiting the amount of raw materials, energy, and water used at 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.*



# Pollution Prevention/Recycling Checklist

## Automotive Maintenance



*This checklist is designed to encourage thought on ways to reduce waste in your shop. By answering the following questions, you may identify some easy-to-implement pollution prevention and recycling options as well as more comprehensive approaches to reducing wastes.*

### GENERAL PRACTICES

#### **Q Is your facility in compliance with environmental regulations?**

Pollution prevention can help keep your facility in compliance with environmental regulations by reducing the amount of hazardous waste generation, storage, treatment, and disposal at your facility. If you are uncertain of whether your facility generates hazardous waste, contact your state's hazardous waste management agency.

#### **Q Have you conducted a pollution prevention assessment?**

A pollution prevention assessment is a procedure to help identify waste sources, and identify, evaluate, and implement options to reduce or eliminate wastes. EPA has developed a rigorous waste assessment methodology for waste generators. This process is described in the *Waste Minimization Opportunity Assessment Manual*, available from EPA's PPIC. Once a pollution prevention assessment is complete, it should be reviewed periodically to determine if operations or opportunities have changed.

#### **Q Are employees trained in the proper use, recycling, and/or disposal of hazardous materials?**

Properly trained employees can help to ensure that the right chemical is used for the right job, and that chemicals are safely and properly handled and disposed.

#### **Q Do you have inventory procedures for raw materials?**

Strict inventory control is the most effective and cost-efficient way to prevent needless waste. Improperly stored, labeled, or expired material can become hazardous waste. Routinely check the date of materials to prevent them from outlasting their shelf life. Practice "first-in, first-out" inventory control — use older supplies before new materials.

#### **Q Is access to hazardous material supplies limited?**

When possible, assign control over hazardous material supplies to limited numbers of people who are trained to handle hazardous materials and who understand the "first-in, first-out" inventory policy. Give one person the responsibility of maintaining the storage area. Limiting access to supplies prompts employees to conserve raw materials.

#### **Q Is the hazardous material storage area routinely checked for leaks?**

The cheapest way to reduce pollution is to prevent it from reaching the environment in the first place. Conduct routine, documented inspections and identify and fix leaking containers to stop unnecessary waste generation and spills.

#### **Q Are empty hazardous material containers and expired hazardous materials returned to the supplier?**

Empty containers may contain residues that must be treated as a hazardous waste. Return empty containers to the supplier for proper reuse or recycling. Rather than disposing of expired material, return it to the supplier for recycling. Some suppliers provide credit toward your next purchase.

#### **Q Are shop wastes segregated?**

Mixing wastes may increase treatment cost and often makes recycling more difficult. In particular, keep hazardous and non-hazardous wastes separate. *Do not* mix used oil and solvents. Keep chlorinated solvents (such as 1,1,1-trichloroethane and methylene chloride) separate from non-chlorinated solvents.

### GOOD HOUSEKEEPING

#### **Q Are lids kept closed and bungholes tightly plugged on drums or containers of paint, paint thinner, degreasers, and other materials containing organic solvents?**

Keeping lids closed and bungholes tightly plugged prevent the evaporation of solvents, reduce spill incidents, limit contamination from dirt and moisture, and minimize health hazards and air pollution. Trash can lids should also be tightly closed.

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

*California DHS - "Hazardous Waste Reduction Assessment Handbook: Automotive Repair Shops" and "Waste Audit Study: Automotive Paint Shops"*

*Alaska Health Project - "Waste Reduction Assistance Program: On-Site Consultation Audit Report: Automobile Body Repair and Paint Shop"*

**Q Is equipment routinely checked for leaks?**

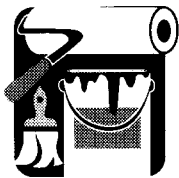
Small leaks can cause big problems. Routinely inspect all equipment for leaks and perform regular equipment maintenance.

**Q Are spills of materials common?**

Spills may be common, but preventable, sources of pollution. Avoid potential spills by keeping a clean and orderly shop. Reduce the likelihood of spills by using a gravity spigot or pump to dispense bulk liquid. Always use a spout and funnel when transferring liquid from a large container to a smaller one. When possible, scrape up spilled material rather than using absorbent material, water, or solvents. Avoid washing material spills down floor drains. Depending on the substance spilled, this practice can harm the environment and may be illegal. Train personnel in spill management and have proper spill containment equipment available on site.

## PAINTING OPERATIONS

**Q Does your facility generate waste paint, paint thinner, used filters, rags soiled with paint, or spent halogenated and non-halogenated solvents?**



Many of these spent materials are considered hazardous wastes. Answering the following questions may reduce the amount of these wastes that your facility generates.

**Q Is solvent use minimized when cleaning painting equipment?**

Cleaning painting equipment is the biggest source of spent solvents in painting operations. Steps to reduce the amount of cleanup waste generated include:

- Training employees to use only small amounts of solvent to clean equipment.
- Reusing spent solvents — rinse spray guns and equipment first with used solvent, followed by a small amount of virgin solvent for final cleaning.
- When possible, schedule painting of light colored vehicles followed by painting of darker colored vehicles to eliminate cleanup between color changes.
- Be sure to keep contaminated cloth rags in covered waste receptacles.

**Q Is paint use kept to a minimum?**

Limiting the amount of paint used per job reduces excess paint disposal. It also reduces the amount of solvent needed for equipment cleanup. Steps you can take to reduce paint use include the following:

- Mix only as much paint as needed for a job. Train employees to carefully estimate paint amounts and to mix paints correctly.
- Use a smaller paint cup than the standard (one quart) size for small touch-up jobs.
- Save off-color paint for other jobs.
- Apply extra coats to use up excess paint.
- Avoid repainting by first inspecting the area to be painted to ensure it is dry, clean, and rust-free.

**Q Are employees trained to correctly use spray equipment?**

Operator training can reduce overspray and minimize the amount of paint needed per job.

**Q Have you considered using equipment that generates less waste?**

As little as 30% of the paint reaches the target from airless spray guns. Alternatives with higher transfer efficiency include: electrostatic spray equipment, air-atomized spray guns, high volume low pressure spray guns, and gravity-feed guns.

**Q Have you investigated substituting water-based paints for solvent-based paints?**

Many industries can reduce their solvent waste by switching to water-based paints with no or low-mercury content. Water-based paints are formulated with considerably less solvent; can be cleaned with water; and do not require the use of special safety equipment (such as respirators) or require new application equipment.

## VEHICLE MAINTENANCE

**Q Does your shop generate any used oil, antifreeze, carburetor cleaner, degreasing solvent, or spent hot dip tank solution?**



Many of these wastes are considered hazardous. Answering the following questions may help you reduce generation of these wastes.

**Q Are incoming vehicles checked for leaking oil and fluids?**

Put pans under leaks to collect fluids for proper recycling or disposal. Keeping leaks off the floor reduces clean up time and costs.



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

*Federal agencies and facilities must initiate programs to promote cost-effective waste reduction and recycling of reusable materials.*

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

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

*In addition to required standards, agencies are encouraged to participate in the development of voluntary, environmentally sound, and economically efficient waste reduction, recycling, and procurement standards.*

**Q Have you considered using new equipment or processes that result in less hazardous waste?**

- Use a two stage water-based cleaning system with a hot tank for engine parts instead of parts washers that use solvents.
- Use a solvent sink instead of dunk buckets.
- Install lids on parts washers and carburetor-cleaning equipment to reduce solvent evaporation.
- Extend the life of washing solvents by regularly removing tank sludge.

**Q Does your facility experience drag-out and material loss of degreasing or wash solutions?**

- Increase the freeboard of the parts washer (degreasing unit) to avoid evaporation and spills.
- Install drain boards or drip racks so drag-out solutions can drip back into the wash tank.
- Remove pieces slowly from the parts washer.
- Arrange the workpiece in the wash rack to limit the retention of solution on the workpiece.

**Q Have you considered using different raw materials that may result in the generation of less toxic and smaller quantities of hazardous wastes?**

It may be possible to eliminate or reduce hazardous waste by substituting non-hazardous or less hazardous materials for hazardous materials.

- Use detergent-based or water-based cleaners in place of solvent degreasers.
- Replace chlorinated organic solvents for non-chlorinated solvents. Non-chlorinated solvents are less toxic and less expensive to dispose of.
- Substitute non-asbestos brake linings for asbestos brake linings.

## RECYCLING

**Q Do you recycle shop wastes?**



Spent solvents, paint thinner, degreasers, used oil, antifreeze, and cleaning solutions can be recycled either on-site or off-site.

- **Least Effort:** Contract with a commercial recycling contractor to pick up spent solvents on a regular basis and replace them with clean solvents. A recycling facility can typically regenerate 70-80% of spent solvents and can sell the regenerated solvents to you at a lower price than new solvents. When possible, reduce the

numbers of different organic solvents used. This makes recycling easier and reduces hazardous waste management costs.

- **Moderate Effort:** Used oil, antifreeze, and cleaning solutions can be recycled on-site using a filtration system.
- **Most Effort:** Install an on-site solvent recovery unit. If your facility generates large volumes of spent solvents, consider purchasing or leasing a still to recover spent solvents for reuse on-site. Contact your state's hazardous waste management agency for additional information about on-site recycling of spent solvents.

## CLOSING THE LOOP

**Q Have you researched potential markets for recyclable materials?**

Contact potential recycling markets to determine prices and available services. Learn about restrictions on contaminants and establish an acceptable schedule for pickup. Seek outside technical assistance from consultants, waste haulers, local and state government, and local recycling businesses to help you with terminology, markets, and pricing.

**Q Does your facility purchase recycled materials?**

When practical and cost effective, procure recycled and recyclable products. Consider energy and resource issues associated with the manufacturing, use, and disposal of the product. To determine the availability of recycled and reusable products, examine the following:

- GSA's introductory new product schedules.
- GSA publication "Market Tips," which presents information on initiatives of the Federal Supply Service.
- GSA Federal Supply Service contracts, some of which may include listings of recycled products.
- Vendor catalogs, which may provide the most current information available.

Further, consider establishing procurement contracts that require vendors to supply recycled products such as tires, batteries, and petroleum products (e.g., oil, transmission fluid, and hydraulic fluid). You might also establish contracts that require vendors to purchase back spent packaging materials and containers (wood pallets, empty drums, cardboard boxes, crates, etc.).



## Make It Work!

*Motivating employees to reduce waste generation is the key to a successful pollution prevention/recycling program. Training and educational programs can inform employees about pollution prevention concepts. The last page of this fact sheet contains easy-to-follow pollution prevention techniques that may be implemented today. It is designed to be removed from this booklet and posted where employees can see it. By discussing pollution prevention with your employees, you may be happily surprised with their suggestions and enthusiasm for reducing hazardous wastes.*





# STOP POLLUTION!

*Pollution Prevention Tips for Automotive Maintenance*



- **Keep your shop clean and orderly** to eliminate spills and leaks.
- **Use a “first-in, first-out” inventory policy** for raw materials to prevent them from exceeding their shelf life prior to use.
- **Use drip pans or trays** when changing fluids or working on damaged vehicles.
- **Remove parts slowly** from solvent solutions to prevent spills.
- **Put a lid on it!** Make sure container and trash can lids are sealed to prevent evaporation, contamination, and spills.
- **Stop spills!** Don't pour materials directly from drums to smaller containers. Use spigots, pumps, and funnels when pouring materials from one container to another.
- **Use different labeled funnels** for used oil and solvents to reduce cross-contamination.
- **Check the shop regularly** for improper labeling of materials, leaky containers, dripped materials, and aged materials.
- **Collect and recycle** used oil, fluids, and solvents. Don't pour these materials down the drain.
- **Drain oil filters** into the used oil container before throwing them away or storing them prior to recycling.
- **Never mix different wastes.** Keep used solvents separate from used oil.
- **Talk to your manager** about new ideas for pollution prevention and waste reduction.

