Reduce Costs through a Pollution Prevention Process

Many techniques which make the most efficient use of resources in your production process or business activity can be classified as pollution prevention. For businesses, most pollution prevention techniques result in reduced costs and potentially, higher profits. From the Minnesota Pollution Control Agency’s (MPCA) standpoint, pollution prevention offers increased environmental protection and better long-term compliance rates.

Applying preventive techniques to your business activities reduces energy, water or other resource use. In addition, air, water and waste pollutants are minimized, reducing the capital or ongoing costs of reclamation, treatment, control and compliance with environmental regulations.

Pollution prevention requires informed choices. Either through major actions such as updating equipment or changing production inputs, or through the numerous small choices employees make every day, large amounts of waste can be prevented.

**Case Study: Concrete Maker Reduces Water Use**

**Company** Fabcon, Incorporated: Savage, MN

**Product** Precast, prestressed fabricated concrete panels

**Waste** Used 3,000,000 gallons of water monthly; discharged 2,908,000 gallons monthly; landfilled 20,000 tons of concrete waste annually

**Change** Replaced water-cooled pumps with air-cooled hydraulic pumps; recycle remaining water used; recycle waste concrete

**Cost** $11,765 for pumps; $225,000 for closed-loop water recycling system

**Savings/ benefit** $259,484 during the first year, and $191,090 annually thereafter. Kept water use at 1991 levels, avoiding a service charge of $68,394

MnTAP Source: University of Minnesota, Fall 1995

**Pollution Prevention Requirements of the 1995 Minnesota Environmental Improvement Act (Act)**

**Overview of the Act**

On August 1, 1995 a four year environmental pilot program began at the MPCA. This voluntary program encourages businesses and governments to conduct environmental audits of facilities and correct problems they may discover.

For those opting in, the pilot project requires businesses and government to report any violations they discover to the MPCA along with a plan for correcting the violations. The intent of the program is to focus on the goal of achieving measurable environmental results, not
on fines or other penalties. Except in the case of very serious or repeat violations, penalties will not be assessed.

**Pollution Prevention Requirements for Major Facilities**

The Act requires different pollution prevention activities depending on a facility’s size.

Minnesota law defines pollution prevention as the elimination or reduction of the use, generation, or release of a pollutant at the source. This contrasts with simply trying to control the pollutant at the end of a discharge pipe or stack.

Going this far back into a production or activity to eliminate waste ensures that the process becomes more efficient. Pollution prevention therefore reduces the cost of doing business while satisfying the environmental improvement mandate in the statutory definition.

The Act requires a “major” facility to develop a pollution prevention plan and submit progress reports to the MPCA. The pollution prevention plan is based largely on the process described later. The progress report encourages the facility to review their plan’s progress every year, and lets the MPCA know how the facility is doing, and where assistance can be provided.

A major facility is defined as:

◊ the largest type of industrial or municipal wastewater discharge facility;
◊ a feedlot with 1,000 or more animal units;
◊ a large quantity hazardous waste generator;
◊ a hazardous waste treatment, storage, or disposal facility;
◊ a large stationary air emission source; an air emission source that emits 50 or more tons per year of a specific air pollutant, or;
◊ an air emission source that emits 75 tons or more per year of all air pollutants regulated by the MPCA.

If you are unsure what category you are, contact the MPCA at the phone number at the end of this fact sheet.

**Case Study: Reducing Perc Use in Dry Cleaning**

**Company** Cottage Cleaners: Forest Lake, MN  
**Process** Dry cleaning  
**Chemical** Percholoroethylene (PCE or perc)  
**Process change** Replaced an old transfer dry cleaning machine with a new and more efficient dry-to-dry machine.

**Cost** $49,000 purchase cost for a new dry-to-dry machine  
**Savings/benefit** Perc use reduced from 455 gallons in 1990 to 38 gallons in 1992, saving $2,246 (1992 dollars) annually; hazardous waste reduced from 375 gallons in 1990 to 240 gallons in 1992, saving $593 (1992 dollars) annually; complied with perc regulatory requirements

MnTAP Source: University of Minnesota, Winter 1994

**Contents of Pollution Prevention Plans and Progress Reports for Major Facilities**

The Act requires major facilities to prepare formal pollution prevention plans to participate in the pilot program. The plans do not need to be submitted to the MPCA. The plans should at a minimum include the following for all facility operations:

- Identification of process(es)
- Identification of chemical(s)
- Description of current process
- Description of new process
- Savings/benefit analysis
- Compliance with all regulatory requirements
(1) a policy statement stating upper management support for eliminating or reducing the generation or release of pollutants;

(2) a description of the types, sources, and quantities of pollutants currently being generated or released, and of the processes or activities involved;

(3) a description and an evaluation of the effectiveness of current and past practices used to eliminate or reduce the generation or release of pollutants;

(4) an assessment of technically and economically feasible pollution prevention options available, including options such as changing raw materials, operating techniques, equipment and technology, personnel training, and other practices. The assessment may include a cost benefit analysis of the available options;

(5) a statement of the pollution prevention objectives developed, based on the assessment in clause (4), and a schedule for achieving those objectives;

(6) an explanation of the rationale for each pollution prevention objective established;

(7) a list of options that were considered not to be economically and technically feasible; and

(8) a legally-binding certification attesting to the accuracy of the information in the plan, signed and dated by the facility manager and an officer of the company.

Pollution Prevention Requirements for Non-Major Facilities

Minor facilities do not need to develop a pollution prevention plan or submit a progress report, but they are required to “examine” pollution prevention opportunities. Minor facilities are encouraged to undertake the program process outlined later in this fact sheet.

Specifically, if you have examined any of the following options, you are eligible to participate in the program:

(1) A change in your processes to reduce the amount of raw materials needed.

(2) A change in inventory control procedures to only purchase what is needed and usable within a short period of time.
(3) A substitution of any raw material for a less hazardous or toxic one.
(4) Institution of any housekeeping or management practices to reduce spills or wasting of raw materials.
(5) Improving or replacing machinery to make it more efficient.
(6) The formation of a source reduction team made up of representatives from various departments and organizational levels.
(7) Contacting a state or local group, such as the Minnesota Office of Environmental Assistance or the Minnesota Technical Assistance Program (MnTAP) to help you evaluate your pollution prevention opportunities.

A pollution prevention “program” will help fulfill the requirements of the Act. It can be informal or formal, detailed or general, rigorous or relaxed, depending on the size of the company and its style. In general, a pollution prevention program is an ongoing, comprehensive examination of the operations of a business or facility. The program goal is to reduce direct and hidden operating costs by minimizing all kinds of wastes associated with production or other business activity.

An effective pollution prevention program can yield cost savings that will more than offset program development and implementation costs. Savings may be immediate, appearing directly on the balance sheet, or anticipated, based on avoiding potential future costs. A company with an effective, ongoing pollution prevention program may well be the lowest-cost producer, gaining a significant competitive edge.

The following eight well-tested steps can help your organization implement an effective program. While written for larger businesses, they can easily be adapted for smaller ones. The important points to remember are top management support, employee input and education, setting reachable goals, measuring your progress and continuing the process.

1. Management declares support.

Owners or managers must understand the need to wring as much efficiency out of business activity as possible by preventing waste. Management can show support by:

- Announcing its authorization for the program.
- Developing a mission statement and goal with the staff.
- Seeing that periodic announcements and employee recognition take place.

Case Study: Reduction at an Auto Body Shop

<table>
<thead>
<tr>
<th>Company</th>
<th>Roger’s Body Shop: Bloomington, MN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>Auto body repair/maintenance</td>
</tr>
<tr>
<td>Activities</td>
<td>Distill solvents for reuse; use high-volume, low-pressure painting equipment; adopt computerized paint mixing; reuse plastic paint containers; reclaim antifreeze and refrigerants; install downdraft spray paint booths; use more energy-efficient lighting, heating and air conditioning</td>
</tr>
<tr>
<td>Savings/benefit</td>
<td>$21,850 since program began; use of thinner reduced from 100 to 3 barrels a year; paint purchases reduced 40 to 50%; reduced VOCs in shop air by 50%; 100% reduction in waste paint; 25% energy reduction</td>
</tr>
</tbody>
</table>

MOEA: 1994 Governor’s Awards for Pollution Prevention
◊ Staying concerned and involved.

By doing these things and by informing employees of cost and environmental waste issues, management communicates its concern to employees. This encourages involvement.

2. Select a reduction team.

It is important to get input from diverse interests within the business. If appropriate for the size of the business, managers may request a volunteer from departments such as purchasing, accounting, maintenance, production and environmental to form a team. The team members act as contacts for their departments. Businesses should ensure that team members represent all areas of the organization. Team members and roles are suggested in Worksheet 1 of this package.

3. Select a coordinator.

The coordinator needs strong organizational and communications skills as well as enthusiasm for the project. The coordinator collects information from outside sources, relays definitions and priorities, educates and tracks job assignments for the team.

4. Educate everyone, assess all activities.

There are four main phases to this step.

◊ First, management must be clear on waste and cost issues and program goals. The mission statement is agreed upon with the team.
◊ Second, the coordinator teaches definitions, clarifies the mission statement and identifies waste, cost and procedural issues, and develops the program outline for the team. The coordinator provides focus.
◊ Third, the team surveys all waste generated in the facility and becomes aware of its economic and environ-
mental impact. A basic process survey is provided in Worksheet 2.
◊ Fourth, the team members take what they’ve learned back to their departments or coworkers. Photographs or notes taken during the facility waste survey help educate all employees.

5. Brainstorm pollution prevention ideas.

Though many excellent ideas often come from the reduction team, many more ideas come from the entire staff. Avoid criticism of ideas in this step or ideas will not flow freely. Circulation memos or suggestion boxes work well. Worksheet 3 on pollution prevention opportunities is enclosed, as is a resource list providing company-specific information.

The following questions can be used for brainstorming:

◊ Does product design dictate the toxicity or quantity of materials used?
◊ Are raw materials delivered in just-enough, just-in-time fashion?
◊ Would upgrading machinery result in less use or greater efficiency?
◊ Do production runs and schedules optimize the use of resources?
◊ Is maintenance regular and carried out?
◊ Can single-use products be reused?
◊ Can concentrates or bulk purchases reduce our waste?
◊ Are operators trained in and using the most efficient processes?

6. Evaluate the ideas.

Prioritize the suggestions and evaluate them to determine how each suggestion affects waste and cost. Good record-keeping and a pocket calculator are usually sufficient to accomplish this. When several people cooperate with the purchasing department to research suggestions
simultaneously, this step can be accomplished quickly and decisions made on which ideas to implement first.

7. Implement the most promising ideas.

Some suggestions can be implemented immediately. Use these ideas to add momentum to your program. This helps win support for more complex ideas, those that must be phased in over time. A month after implementation, the coordinator asks for comments from the staff on how the specific actions are working. The team writes up waste and cost changes achieved so far, and distributes the information to management and employees.

8. Continue the program.

Pollution prevention is an ongoing process. Periodic announcements on bulletin boards or in newsletters about the program help create enthusiasm. Give awards for innovative ideas. Inform new employees about the program. Remind staff about the suggestion box. Make sure that all implemented ideas are widely promoted.

Conclusion

All businesses, regardless of size or activity, can pursue cost reduction and increased efficiency through a pollution prevention process. This fact sheet has presented an introduction to a process which should help businesses reach their economic goals, while also assisting them in meeting the formal pollution prevention planning and reporting requirements of the Act. You are encouraged to contact the organizations listed for further assistance or referral to information and materials specific to your business activity.

Where can you go for more help?

To receive help examining pollution prevention opportunities at your facility and preparing your plan or progress report, contact either the Minnesota Technical Assistance Program (MnTAP) at (612) 627-4646, (toll-free at 1-800-247-0015), or the Minnesota Office of Environmental Assistance at (612) 296-3417, (toll free at 1-800-657-3864). For help in determining if you are a major facility, contact the MPCA at (612) 296-6300, (toll-free at 1-800-657-3864).

About the attachments

The resource list that immediately follows is a partial inventory of free printed materials and services available in the state. The resources listed can help you with general or specific pollution prevention information if the topics are pertinent to your operation.

The worksheets provided are general and introductory in nature. They are simply templates you can use to get started. They should be adapted, altered or copied as necessary for the most beneficial use by you and your staff. Comments on their format and usefulness are welcome.

References for this fact sheet:

POLLUTION PREVENTION RESOURCE LIST
Fact Sheets, Checklists, and Manuals

(70) Reducing Solvent Emissions from Vapor Degreasers (3/93)
(16) Alternative Cleaning Technologies for Vapor Degreasing and Cold Dip Processes (2/92)
(85) Waste Reduction Alternatives for Spray Painting and Coating (10/94)
(54) Overview of Waste and Emission Reduction Alternatives for Dry Cleaners (10/95)
(47) Vehicle Maintenance and Repair Self-Assessment (6/94)
(40) Solid Waste Source Reduction Self-Assessment (5/94)
(109) Waste Reduction for Grocery Stores (9/92)
(5) Pollution Prevention Assessment for Dry Cleaners (1/94)
Source Reduction Now (manual)
(WRI 3) Waste Reduction: Equipment Cleaning (11/91)
(WRI 4) Waste Reduction: Inventory Management (4/90)
(WRI 6) Waste Reduction: Parts Cleaning (11/91)
(WRI 7) Waste Reduction: Printing Industries (11/91)

Case Studies

(93) Aluminum Foundry Replaces TCA with Water-Based Coatings (6/94)
(91) Autobody Repair Shop Waste Reduction Measures (12/93)
(94) Drill Bit Manufacturer Recycles Milling Waste (6/94)
(92) New Dry Cleaning Equipment Reduces Perc Use (12/93)
(95) Petroleum Solvents and Production Changes Replace Chlorinated Cleaning Solvents (10/94)
(90) Plastics Manufacturer Reduces Waste Through Good Housekeeping and Recycling (2/95)
(82) Pollution Prevention: One Company’s Organizational Strategy (3/91)
(87) Replacement of Vapor Degreasing Operation with Deburring Process for Cleaning Metal Parts (5/92)
(89) Reuse of Wood Finishing Overspray (1/93)
(84) Soak Step Reduces Solvent Waste from Cleaning Paint-Stripping Equipment (7/91)
(80) Solid Waste Management and Reduction in the Restaurant Industry (12/91)
(83) Spray Nozzle Selection Reduces Solvent Waste Volume When Cleaning Paint-Straining Equipment (6/91)
(105) Solid Waste Source Reduction: A Hospital Case Study
(104) Solid Waste Source Reduction: A Newspaper Publishing Case Study

Periodicals

MnTAP Source: University of Minnesota
The Quarterly Newsletter of the Minnesota Technical Assistance Program
The Resource: MN Office of Environmental Assistance
Perspectives on Minnesota Waste Issues

Intern Summaries
Identifying and Segregating Contaminated Materials Reduces Hazardous Waste (94)
Source Reduction and Recycling Opportunities for a Fiberglass Reinforced Plastics Shop (94)
Waste Reduction Measures for a Multi-tenant Commercial Building (94)
Water Conservation Opportunities for a Printed Circuit Manufacturer (94)
Aqueous Alternatives for Cleaning Measurement Instrumentation (93)
Evaluating Methods for Reducing Solvent Emissions in Painting Operations (93)
Reducing Waste in Polyurethane Manufacturing Operations (93)
Reusing Zinc Alloy Die Cast Scrap (93)
Source Recovery of Isopropyl Alcohol at an Electronic Equipment Manufacturer (93)
Waste Reduction at a Vehicle Maintenance Facility (95)
Water Conservation Opportunities for a Printed Circuit Board Manufacturer (95)
Evaluating the Use of Mercury Manometers in the Dairy Industry (95)

Equipment, Supplies and Service

(1) Aqueous Cleaning Equipment Manufacturers (4/96)
(8) Aqueous and Semi-Aqueous Cleaners for Metal Parts Degreasing (6/95)
(27) Alternative Solvent Degreasers (2/96)
(17) Pollution Prevention Consultant Referral List (7/95)
(15) Solvent Recycling Equipment (2/96)
(55) Stripping and Cleaning Chemicals: Safer Alternatives (2/96)

Resources and Referrals

Minnesota Technical Assistance Program
Industry and process-specific pollution prevention technical alternatives.
(612)627-4646
(800)247-0015

Minnesota Office of Environmental Assistance
Financial assistance and information on waste prevention.
(612)296-3417
(800)657-3843

Minnesota Technology, Inc.
Manufacturing improvements and assistance to small businesses.
(612)338-7722

These resources were developed by MnTAP, OEA and MPCA and can be obtained by contacting:
Minnesota Technical Assistance Program (MnTAP)
1313 5th Street SE, Suite 207
Minneapolis, MN  55414
(612)627-4555  (800)247-0015  (612)627-4769 fax