OhioEPA

Office of Pollution Prevention

March 2000
Number 79

Governor's Pollution Prevention Award, 1999 Recipient

The Hoover Company

The Governor's Awards for Outstanding Achievement in Pollution Prevention have been presented since 1986. The Hoover Company was one of nine recipients to receive the award in 1999. These awards recognize outstanding commitments to improve Ohio's environment through pollution prevention. Evaluation criteria for the awards include: the reduction of waste at the source, recycling or recovery of materials, cost-effectiveness, ability of the program to serve as a model for others, and effectiveness in promoting pollution prevention as the preferred long-term approach for environmental management.

The Hoover Company is recognized for:

- **reducing air, waste and water emissions by more than 90 percent since the mid-1980s;**
- **reducing water consumption by nearly 900,000 gallons per day;**
- **eliminating the use of solvents in its paint line; and**
- **saving more than $100,000 annually.**

The Hoover Company

The Hoover Company is a manufacturer of vacuum cleaners located in North Canton. The Hoover Company operates two large integrated manufacturing facilities in the North Canton area with more than 1.2 million square feet of manufacturing space. Operations include primary parts production through final assembly, packaging and distribution of its products. Another 600,000 square feet is devoted to support services including accounting, distribution, engineering, quality control and sales. The Hoover Company has more than 2,500 employees in Ohio.

Summary

Through a continued review of its manufacturing operations, The Hoover Company (Hoover) has reduced hazardous waste generation regulatory status at its two North Canton facilities from large quantity to small quantity and conditionally exempt small quantity generator status in 1997 and 1998, respectively. Total hazardous waste generation has been reduced 97 percent from nearly 500,000 pounds in 1987 to less than 12,000 pounds in 1998.

During the same period, the total toxic releases under the Toxic Release Inventory (TRI) emissions program fell 97 percent from a high of slightly more than 500,000 pounds in 1989 to approximately 12,000 pounds in 1998.

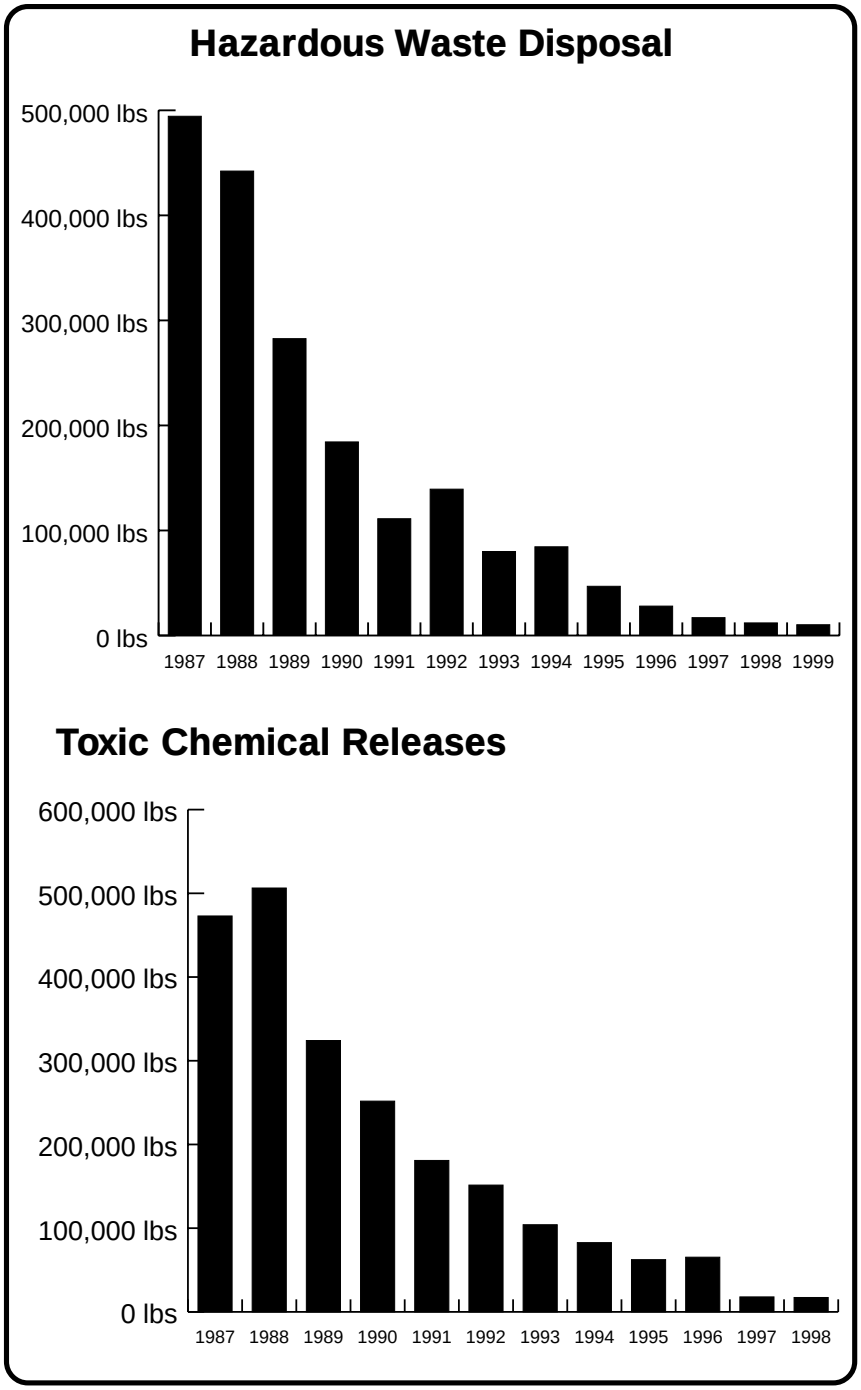
Hoover's reduction and minimization efforts were cost effective. Savings from raw material, waste-disposal and factory floor space costs more than offset the money invested on equipment modifications.

Pollution Prevention Program

During the 1970s and 1980s, metal-forming and finishing operations were Hoover's primary parts manufacturing operations. Hoover used chlorinated solvents for degreasing, operated two solvent-based painting systems and had various metal-plating operations.

After environmental regulations were enacted in the late 1970s, Hoover's management formed an Environmental Task Group to review the regulations and the resulting impact on its processes. Hoover's committee, comprised of personnel from production, engineering, maintenance and environmental departments, is still a working group today.

Some of Hoover's waste minimization and pollution prevention projects are reviewed in the following.



Production Process Redesign

Water-Use Reduction Project

Hoover reduced water use initially with the installation of flow-control devices on rinse tanks. As new equipment was purchased for replacing various plating and phosphating operations in the early 1980s, counter-flow rinse tanks and solution conductivity meters were added to further control and reduce water use.

The latest equipment purchased for cleaning/washing operations included oil-and-solids removal equipment that cleans and reuses some of the solutions. The additional cost of the flow-control equipment was minimal since Hoover was updating its equipment at the time. These process modifications and changes reduced water consumption by nearly 900,000 gallons per day (gpd) to less than 100,000 gpd from 1984 to 1998. This yielded a total water savings of nearly 1 million gpd.

Through reduced water consumption, Hoover was able to further control processes, thereby more easily removing contaminants. The use of water-saving techniques prevented the tanks from overflowing. This, in turn, eliminated wet, slippery floor conditions for employees. Additionally, the dry floors promoted other improvement in housekeeping such as improved parts and material storage. These changes created a safer and more pleasant work environment resulting in boosted employee morale.

At the time of implementation, Hoover's water-cost savings was slightly more than $100,000 annually. Hoover's savings was greater than the cost of implementing the water-use reduction project.

This project was instrumental in informing Hoover management of the many benefits that pollution prevention projects could bring to the company. As a result, Hoover formed a waste minimization team in 1990 to identify and evaluate other opportunities for waste minimization.

Paint Line Solvents Elimination

Hoover has been able to eliminate its painting operations because of improvements in the technology of plastics. In the 1970s, when plastics began to improve in strength, color consistency and availability, Hoover began to use more in its operations. Plastic parts didn't have to be painted, and they were more cost effective to make than metal parts. In addition, any plastic waste could be reground and used again. By eliminating the painting operations, and its reduced need for metal parts, Hoover reduced hazardous waste disposal costs from spent solvents and paint-related wastes. Furthermore, by eliminating its painting operations, Hoover freed up 100,000 square feet of manufacturing space for other uses, further reducing production costs.

Facility changes necessary for this project required the total commitment of Hoover management - not only in manufacturing philosophy, but in the commitment of financial resources well into the millions of dollars. While savings in waste disposal costs were nearly $100,000 annually, the real savings were generated by efficient material usage. Rejects were reduced to less than one percent, and the majority of those plastic rejects were reused. The total costs for this type of project have to be based on long-term commitments in order to provide the necessary funding.

Removal of the paint lines at the Hoover facilities, coupled with the additional usage of plastics, had the net effect of eliminating more than 30 tons of volatile organic compounds (VOCs). Correspondingly, another 40,000 pounds of hazardous waste was eliminated from Hoover's waste streams.

Product Redesign

Historically, Hoover used a bright nickel plating on visible metal parts of its products. Through product redesign, the need for the visible plated parts was drastically reduced and the nickel plating process operations were eliminated by 1997. This product redesign eliminated 25,000 pounds of hazardous waste annually. Alternative protective coatings included both zinc plating or zinc phosphating. The elimination of the nickel plating in 1996 eliminated the F-006 - hazardous waste classification of the plating sludge.

In addition, this project also provided the environmental management benefits associated with a change in facility regulatory status from a large quantity generator to a small quantity generator of hazardous waste status, thereby reducing regulatory requirements and oversight. Also, potential chemical exposure to several employees was eliminated.

The removal of 16 tons of plating sludge from the hazardous waste stream saved just less than $10,000 annually. In addition, Hoover minimized long-term potential liabilities associated with the generation and management of hazardous waste.

Degreasing Change

Hoover changed from solvent degreasing to a new aqueous cleaning process including steam degreasing from 1988 - 1993, which eliminated more than 300,000 pounds of perchloroethylene and 1,1,1-trichloroethane emissions.

Hoover previously used perchloroethylene and 1,1,1-trichloroethane as the cleaning medium in several vapor degreasers. A review of both the type of parts and the quantities required indicated that these units could be consolidated; first one unit for each of the two North Canton plants, and then eventually to only one unit. During this time, Hoover began the successful transition to aqueous cleaning processes to completely eliminate the remaining vapor degreaser.

The environmental benefits derived from this project were many: First, potentially carcinogenic materials were removed from the workers' environment. Second, air emissions harmful to the earth's ozone layer were eliminated. Finally, a source of hazardous waste was eliminated.

Hoover estimates $500,000 savings to date from the degreasing changes. This savings offset the nearly $500,000 invested in capital improvements relating to the degreasing changes.

Other

Management commitment to waste reduction not only included the waste minimization team, but extended to the "employees" cost savings program. Through the paint line solvents elimination program, many employees are rewarded for company implementation of cost savings ideas.

When Hoover began molding plastic materials in the early '60s, the practice of regrinding scrap was implemented at the molding machines. This location saved time and reduced the potential for color and material contamination. The practice continues today. In addition, Hoover collects and sells nearly all other scrap-plastic purgings and obsolete materials to various venders for reuse.

For more information

The Hoover Company
101 East Maple Street
North Canton, Ohio 44720

Anthony R. Casasanta
Environmental Engineer
(330) 499-9200, Ext. 2230

www.epa.state.oh.us/opp

The Office of Pollution Prevention was created to encourage multi-media pollution prevention activities in Ohio to reduce risk to public health, safety, welfare and the environment. Pollution prevention stresses source reduction and, as a second choice, environmentally sound recycling, while avoiding cross media transfers. The Office develops information related to pollution prevention, increases awareness of pollution prevention opportunities, and can offer technical assistance to business, government, and the public.

Printed on recycled and recyclable paper with soy-based inks