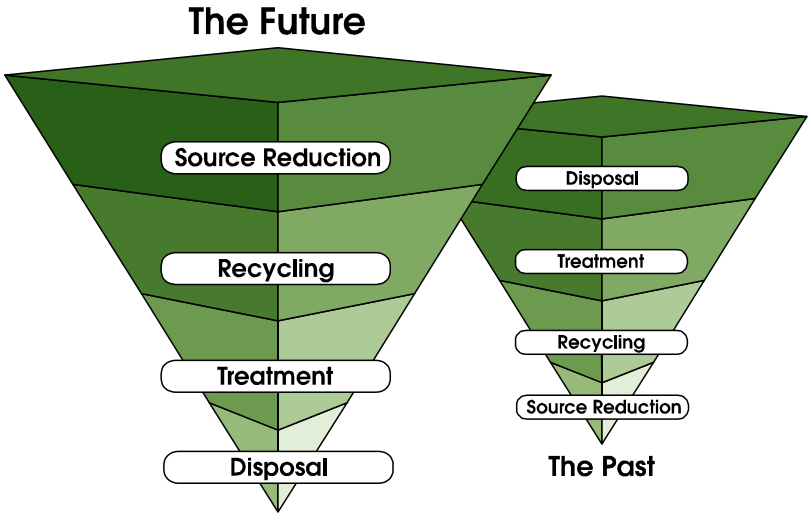
Biennial Report to the Legislature on:

Pollution Prevention Planning



VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Environmental Assistance Division
January 2004

Pollution Prevention Planning

Background

This is the Department of Environmental Conservation's sixth biennial report on Pollution Prevention Planning to the Vermont Legislature. 10 V.S.A. Chapter 159 section 1925, adopted in 1991, requires manufacturers to develop a Plan where the facility uses more than 1,000 pounds per year of a listed (SARA 313) toxic chemical(s). The law also requires any business that routinely generates more than 2,640 pounds per year of hazardous waste to develop a Plan. About 22 states have passed similar laws.

Pollution Prevention Plans must be updated every three years, unless chemical use and/or hazardous waste generation falls below threshold quantities. The Department's Environmental Assistance Division (EAD) provides companies with guidance and worksheets to help with developing a Plan. Where applicable, both hazardous waste and toxics use reduction are addressed in the same plan.

Plans are confidential and do not have to be submitted to the Environmental Assistance Division for review. Where a company chooses not to submit its plan, it is reviewed for completeness at the facility site. Performance goals established in the plan for reduction projects that are determined to be feasible may be revised over time and are not enforceable. Each year, companies must submit an *Annual Progress Report* to the Environmental Assistance Division which reports on progress made toward achieving these goals. An annual fee accompanies this report. The fee, authorized in 10 V.S.A. section 6626(j), is used to partially offset the cost of administering the plan requirement and the cost of technical assistance services provided to businesses by EAD staff. Total fees collected in 2003 were $49,500.

What Is Pollution Prevention?
Generally, pollution prevention is any strategy that results in the avoidance of waste generation or that results in the use of non-toxic, or less toxic raw materials in a manufacturing process. Such strategies are often referred to as source reduction measures. In pollution prevention planning, source reduction measures are given preference over recycling activities, which in turn, are preferred over waste treatment technologies and lastly, disposal, for the management of waste. Another characteristic of successful pollution prevention measures is that they avoid the transfer of pollutants from one media to another. For example, in wastewater treatment, contaminants that are removed from the wastewater stream are often landfilled, sometimes as a hazardous waste. Disposal in a landfill represents a transfer of the pollutants to the landfill. Although not always feasible, recycling or in some way reusing the separated "pollutants" could avoid this media transfer.

Trends in Pollution Prevention

Hazardous Waste Generation
The significant decline in the number of companies subject to the planning requirement because of their hazardous waste generation has leveled off in recent years. In 1992, the first year of the planning requirement, there were 220 Vermont businesses classified either as a "Class A" or "Class B" generator of hazardous waste; in 2002 there were 94 such companies. The increase to 101 companies in 2001 can be attributed to the identification of new planners from a review of hazardous waste manifest records maintained by the DEC's Waste Management Division. Thirteen new Class B generator facilities were identified during that review.

From 1992 through 1998, the number of planners decreased by almost half as companies implemented many of the cost-effective, easily identifiable waste reduction measures. Important external factors included the changing economy which caused many Vermont manufacturers to close their doors and regulatory changes which gave companies more flexibility in managing certain wastes as non-hazardous.

POLLUTION PREVENTION PLANNERS
HAZARDOUS WASTE GENERATORS

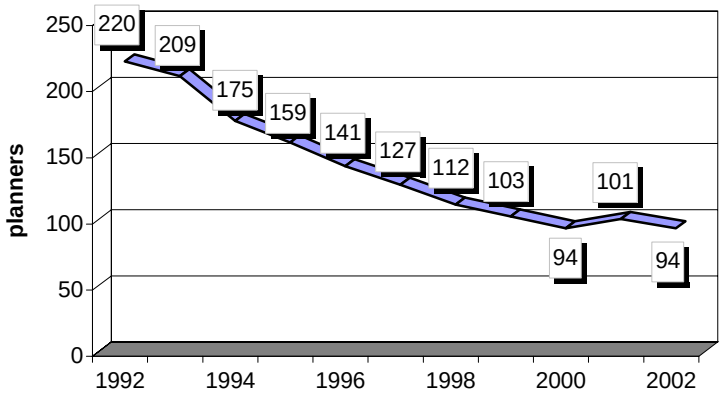


Figure 1

Although *Figure 1* shows the number of companies has stabilized since 1999, the primary incentives leading to improvements in waste reduction still apply. An obvious one is every company's drive to promote efficiency and cut costs in all of its operations. Another is the desire to enhance competitive position. Many of the new technologies that companies invest in to improve their product bring important environmental and worker health and safety benefits. An excellent example affecting many business sectors is photoprocessing. Chemicals have traditionally been used to develop film. Today, electronics are used to create digital images for a variety of applications, including the commercial printing industry, health care and semi-conductor manufacturing. These technologies produce superior quality and require much less time and labor. The cumulative waste reduction impact is huge. Finally, the ever-increasing complexity of environmental regulations and the cost of controls necessary to achieve compliance can be important incentives for companies to make investments in pollution prevention. The planning process continues to be a credible mechanism that companies can use to help with assessing the environmental and health and safety impacts associated with alternatives.

Figure 2 shows the total amount of hazardous waste reduced from one year to the next for the period 1993 through 2002. This information is taken from the Annual Progress Reports filed by planners every year by the end of March. Reporting forms ask planners to show only those reductions, in pounds, that

HAZARDOUS WASTE REDUCTION PROGRESS
BY POLLUTION PREVENTION PLANNERS

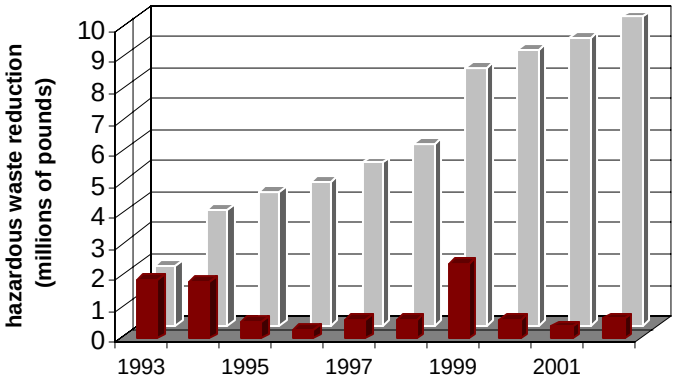


Figure 2

are attributable to implementation of a pollution prevention strategy during the preceding year. Total hazardous waste reduced in 2001 was about 400,000 pounds; in 2002, the reduction was about 660,000 pounds. Since 1993, the cumulative reduction attributable to pollution prevention is an impressive 9.9 million pounds of hazardous waste.

YORK CAPACITOR

York Capacitor Corporation in Winooski, Vermont, manufactures capacitors used in conjunction with electric motors found in air conditioners and other appliances. Over the years, York has implemented several pollution prevention strategies as part of a broader initiative to enhance their position in an increasingly competitive global market. There are many different types of capacitors but essentially, a capacitor is a device to filter and store electricity. In very basic terms, York's capacitor uses an assembled component (the electrode) inserted into a metal can, where it is immersed in a non-conductive (dielectric) fluid. York has worked with suppliers and customers to achieve cost savings. On the supplier side, York finally was able to purchase oil-free steel and aluminum cans and covers in order to eliminate a cleaning step, and subsequent hazardous waste generation, at the start of its own manufacturing process. On the customer side, York was able to convince many of its customers to move away from painted capacitors. Some of this was achieved through the use of aluminum vs. steel, and in some cases York showed customers that painting steel cans was beyond what was needed for the applicable environment in which the capacitors were used. The result was that hazardous waste from painting operations was reduced by more than 80%. In 2001, York invested heavily in three automated filling machines. With these machines, cans are automatically filled with di-electric fluid through a small hole in the cover. Fluid does not come in contact with the outside of the can so no cleaning is required, again eliminating a hazardous waste. Before 2001, cans were filled by immersion in a large tank and then transported to work stations for sealing, cleaning and marking. Drips of oil on the floor and around work stations were common (hazardous waste). Also in 2001, a new zinc-deposition process for the ends of the assembled component allowed excess zinc to be captured by banks of air filters where it can be easily recovered and sent off-site for reclamation. Prior to this, water was used to scrub zinc-laden air, which created a wastewater stream that had to be managed - a transfer of pollutants from one media (air) to another (water). Then, in 2003, York successfully substituted a non-toxic di-electric fluid for the one commonly used by the industry which contains di(2-ethylhexyl)phthalate, a SARA listed toxic substance. Due to this substitution, York is no longer a Large User of Toxic Substances and is now exempt from the pollution prevention planning requirement. While none of these changes was easy to implement, and some required a significant investment, York has demonstrated that environmental and worker health and safety benefits can be an important part of making process improvements.

Toxics Use Reduction

In 2002, there were 38 companies that met the definition of a "Large User of Toxic Substances" and were required to plan for the reduction of regulated chemicals. There were 47 such companies in 2000. The drop by 9 facilities is due to plant closings or a shift in operations where the process(es) using toxic substances are no longer performed at the facility. Four new "large user" companies were added in 2001, and a new initiative based on review of records maintained by the DEC's Air Pollution Control Division will add several more facilities to the pollution prevention planning database in late 2003.

Many companies that are Large Users are also subject to planning requirements as generators of hazardous waste. Essentially, a Large User is defined as any manufacturer, (SIC code 20-39) *using* more than 1,000 pounds per year of a regulated chemical. **Figure 3** shows the total amount of these chemicals reported by all facilities that developed a plan, 1995-2002.

Despite the decrease in the number of companies reporting, total chemical use increased from 4.7 million pounds in 2000 to 5.0 million pounds in 2002. One facility reported an increase of 800,000 pounds in 2002. However, this was not due to increased usage of any toxic substance from prior years, but rather the result of a changed interpretation by the federal EPA and the facility regarding the applicability of the federal Toxics Release Inventory (TRI), and consequently, Vermont's Pollution Prevention Planning requirements. This situation involved the use of chrome as a constituent in the processing of stainless steel as a final product.

Facilities reporting as “Large Users” can be grouped as follows:

SECTOR	NUMBER	TYPICAL PROCESS(ES) WHERE CHEMICAL IS USED
Metal Fabrication and Finishing	9	Electroplating, Painting, Heat Treating
Wood Products	8	Finishing (stain, sealer, lacquer, clean-up)
Electronics	5	Cleaning, Plating, Polishing, Soldering
Specialty Coating/Laminating	4	Adhesives, Protective Coatings, Laminating
Aerospace	3	Plating, Anodizing, Electronics
Paper Products	2	Dyes, Coatings, Additives
Food Products	2	Cleaning (acids)
Fiberglass Products	2	Lay-up (styrene)
Battery Manufacture	2	Cathode mix, Degreasing
Coatings Formulator	1	Solvents mix

All but six of these companies must also address hazardous waste generation in their pollution prevention plan. This is not surprising as it is often the use of these very chemicals, usually as constituents in raw materials, that results in a solid or liquid by-product that must be managed as hazardous waste. What may be surprising is that even though the use of products containing toxic substances often results in a generation of a hazardous waste, by far the greatest environmental impact is to the air. Based on the Toxics Release Inventory (TRI) information collected annually by the federal EPA, *over 90 %* of toxic releases to the environment in Vermont are to the air. EPA has collected TRI information since 1987 and 47 Vermont facilities reported in 2003 for chemicals used during 2002.

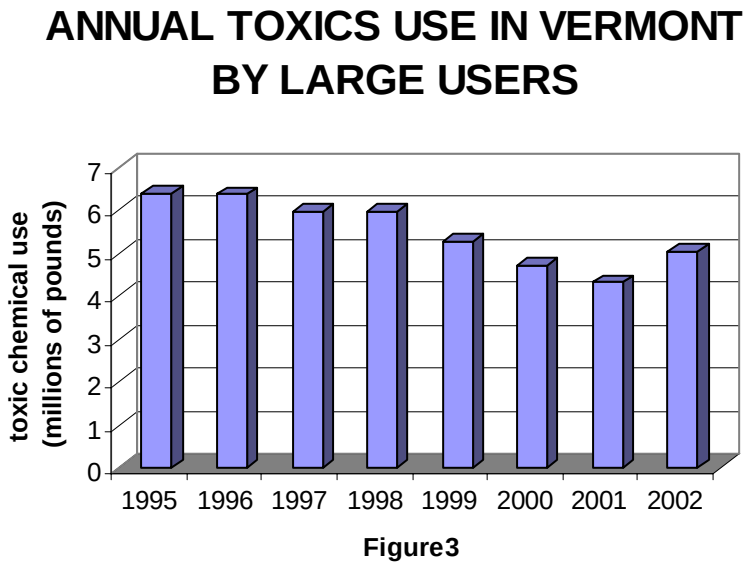


Figure3

Compliance

Of the 100 Vermont companies required to develop a Plan, all but three are in compliance. Of the 97 plans that are completed, EAD has reviewed and approved 89 of them. The remaining 8 have made timely submissions of their Plan Summary, and the complete Plan is maintained at the facility where it will be reviewed by EAD sometime during the next six months. Only two companies failed to submit their 2002 Annual Progress Report and fee. These companies will be brought into compliance as well. Overall, the program administered by EAD has achieved a high rate of compliance and staff will continue to assist facilities in order to bring them into compliance.

Business Assistance Services

The Environmental Assistance Division administers several programs that provide pollution prevention technical assistance and compliance assistance to businesses.

On-Site Assistance

Direct on-site assistance is provided to about 35 companies per year. On-site assistance begins with a meeting with facility personnel, a walkthrough lasting an hour to half a day, and an exit meeting to further discuss issues, make recommendations and plan next steps. Depending on the number and complexity of recommendations and the need for further follow-up, a written report may be prepared and sent to the facility. The facility often determines the focus of the on-site visit - whether emphasis is placed on a particular process or a broader assessment of all plant operations. While EAD's goal in performing an on-site is to suggest pollution prevention strategies for consideration, many times it is environmental compliance questions that spark discussion. Talking about compliance often leads to a discussion about waste reduction/pollution prevention opportunities. Occasionally on-site visits develop into an ongoing dialogue with the facility where staff are able to provide in-depth assistance regarding a particular project that the company is interested in.

Toll-Free Hotline

EAD maintains a toll-free hotline that businesses (and others) may use to get answers to their pollution prevention and compliance questions. About 400 calls per year are received from businesses.

Vermont Business Environmental Partnership (BEP)

The BEP is a voluntary assistance and recognition program offered by EAD and the Vermont Small Business Development Center. Participating businesses agree to achieve a set of diverse pollution prevention standards including, energy and water conservation, solid and hazardous waste reduction and adoption of a company environmental policy statement. The BEP Program currently has over 50 *Environmental Partners*, and is being revised to include a separate and new compliance assistance component that will hopefully include as an incentive for participation, a limited waiver from certain DEC inspection programs.

Sector Guides

Over the years, EAD has found that a very effective way of delivering information to businesses is via sector-specific outreach. So, for example, only relevant compliance and pollution prevention information for garages is included in *"A Vehicle Service & Repair Technician's Guide to Vermont's Environmental Regulations"*. This particular Guide has been very well received and distributed to over 1,500 businesses. Other guides have been developed for the Commercial Printing, Wood Products Finishing, Metal Fabricating and Auto Body Repair sectors. All of the guides are targeted for mid-size and especially small businesses that do not typically need DEC-issued permits to operate and that are seldom visited by a DEC inspector. Yet these companies are still subject to environmental requirements affecting things like floor drains, used oil, and hazardous waste generation to name some common issues.

The Metal Fabrication Initiative

"A Metal Fabricator's Guide to Vermont's Environmental Regulations" was mailed to 106 manufacturers in May 2001. During the period September 2001 through April 2002, 35 of these companies accepted EAD's offer of a confidential on-site environmental compliance and pollution prevention assessment. Violations were identified and recommendations made to address those violations, and in applicable cases, for best management practices or other pollution prevention strategies. Companies were not required to implement recommendations and there were no situations where current operations posed an imminent threat to health or the environment. In fact, many companies that were visited demonstrated a high standard of environmental awareness and many were already implementing best management

practices. Some of the noteworthy accomplishments that were observed included: a manufacturer of brass nuts that uses only hot water to remove lubricants from finished parts; several companies that were implementing sophisticated coolant management programs to maximize the time before coolant had to be replaced; and several who had worked with either suppliers or customers to minimize the use of oil on incoming parts or finished product (for corrosion protection) to minimize or eliminate a cleaning step. The metal fabrication on-site initiative was a successful outreach effort that provided tangible environmental results and established a positive relationship with many small businesses.

Auto Body Outreach

Following-up on the success of the metal fabrication initiative, EAD developed *"An Auto Body Repair Technician's Guide to Vermont's Environmental Regulations"* and with help from the Vermont Auto Body Association (VABA), mailed the Guide to 225 businesses in the summer of 2002. Since that time, 25 on-site visits have been made to shops around the state. Visits were made to the "larger" shops, typically those employing two to four technicians. Anecdotal evidence suggests there are many more 'home-based' body shops that are not easily identified through conventional sources. Of these "larger" shops, the visits revealed some important trends relating to coatings and application systems that are mitigating environmental impacts associated with refinishing. Partly because coatings are so expensive, most shops mix their own paint in precise amounts so as to minimize leftover paint (waste). In part because of federal requirements, coating formulators have significantly reduced the amount of volatile organic compounds (VOC) in paint and eliminated most of the heavy metals. Equipment manufacturers have developed paint delivery systems that provide higher transfer efficiencies, require less solvent for cleanup and are more flexible for operators to use. Many of the shop owners noted that it is imperative for them to stay abreast of changing technology to remain competitive, reduce workplace exposures for employees and minimize their liability (environmental and otherwise) caused by the use of products containing hazardous materials. The VABA has been exploring the concept of a self-certification program for members that would include an environmental/health and safety component. The Guide represents a useful tool for development of such a program, and EAD will provide additional support to VABA as needed.