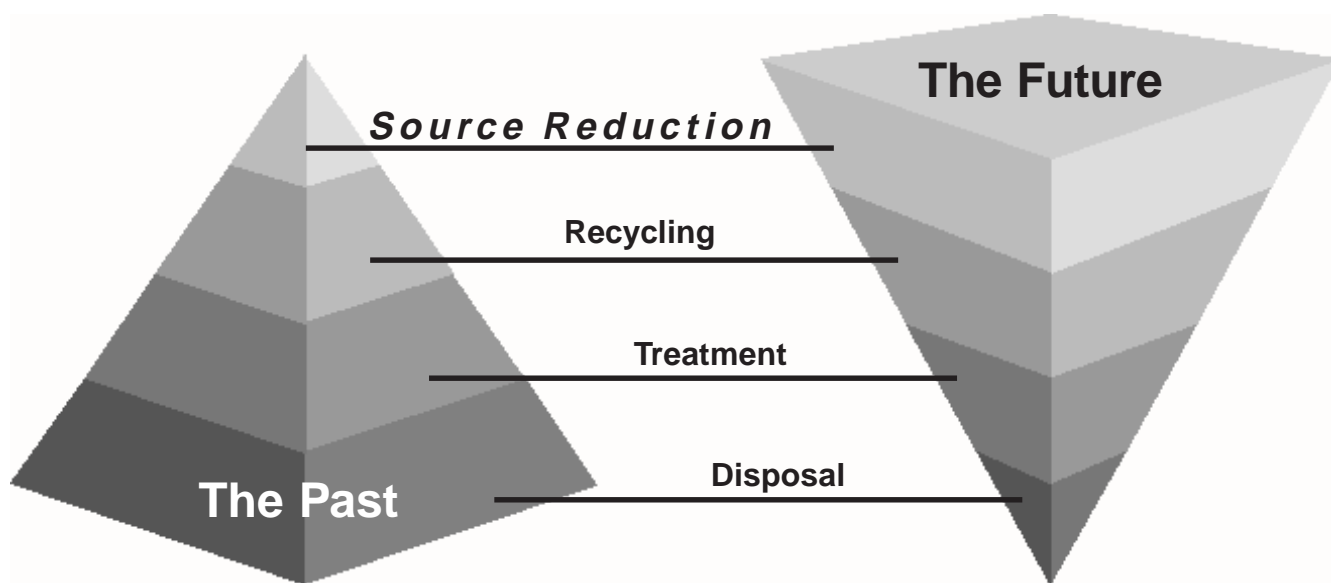


Biennial Report to the Legislature on:

Pollution Prevention Planning



Vermont Agency of Natural Resources
Department of Environmental Conservation
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POLLUTION PREVENTION PLANNING

Background

This is the Department of Environmental Conservation's fifth biennial report on pollution prevention planning to the Vermont Legislature. In 1991, Act 100 was passed which required manufacturers to plan for the reduction of toxic chemicals used in their processes and businesses (including non-manufacturers) to plan for the reduction of hazardous waste that they generate. About 22 states have adopted similar laws.

More specifically, Act 100 required businesses generating more than 2,640 pounds (1,200 kilograms) per year of hazardous waste from routine operations to develop an initial plan by July 1, 1993. It also required manufacturers using more than 1,000 pounds (454 kilograms) per year of certain toxic chemicals to develop an initial plan by July 1, 1996. Plans must be updated every three years thereafter, unless chemical use or hazardous waste generation fall below these threshold amounts. The Department's Environmental Assistance Division (EAD) provides companies with written guidance that may use to develop an approvable plan. Both hazardous waste reduction and toxics use reduction may be 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 their plan, it is reviewed for completeness at the facility. Goals established in the plan for reduction projects that are determined to be feasible may be revised over time and are not enforceable. Every year, companies must submit an *Annual Progress Report* to the Environmental Assistance Division which reports on progress made towards achieving plan goals. An annual fee accompanies this report. The fee, authorized in section 6626(j) of Act 100, is used to 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 2001 were \$64,200.

Trends in 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) ingredients. Pollution prevention gives preference to source reduction strategies over recycling activities, which in turn, are preferred over treatment and disposal controls for the management of waste. Pollution prevention also seeks to avoid the transfer of pollutants from one media to another. This is common where a treatment technology is used to control pollution. For example, wastewater treatment usually results in the generation of a sludge that often must be disposed of as a solid or a hazardous waste.

a) Hazardous Waste Generation.

There has been a distinct decline in the number of hazardous waste generators that are subject to the planning requirement. In 1992, there were 220 Vermont businesses that were either "Class A" or "Class B" generators; in 2000 there were only 94 such companies.

Part of this decrease may be explained by external factors, such as economic conditions which affect manufacturing output, the emergence of "clean" technology that is widely applicable and affordable, or changes to Vermont's Hazardous Waste Management Regulations. This

POLLUTION PREVENTION PLANNERS HAZARDOUS WASTE GENERATORS

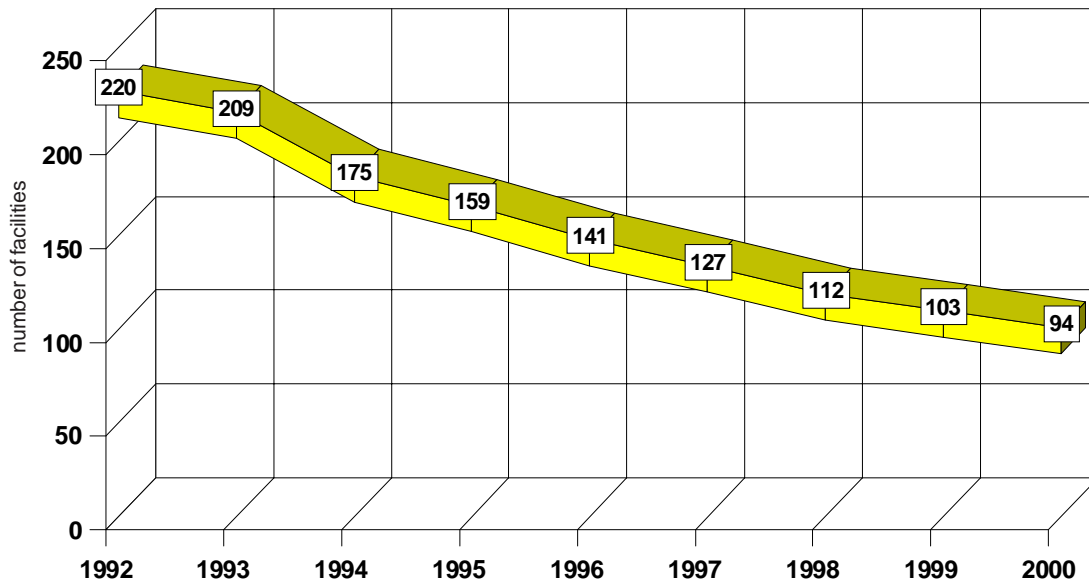


Figure 1.

last situation arose in 1998 when the Regulations were amended to clarify that companies no longer needed to manage certain waste-streams as hazardous waste. Specific examples include most 'swarf' from metal grinding operations, used oil from a variety of sources, and spent water-miscible metalworking fluids, or coolants.

However, by far the single most important reason that so many companies have been able to fall below the threshold quantity of hazardous waste is because of their own efforts to identify and successfully implement pollution prevention initiatives. Incentives are many. An overriding one is typically the company's own drive to promote efficiency and cut costs in all of its operations. While the pollution prevention benefit associated with changing a manufacturing process or investing in new equipment may not always be the primary impetus for change, it is always a factor. Improved worker health and safety, customer and public demand for "cleaner" manufacturing, and the ability to improve the company's competitive position, especially in an international market, all are powerful incentives for companies to seriously assess alternatives with pollution prevention benefits. So is the ever-increasing complexity of environmental regulations and the cost of controls necessary to achieve compliance. The planning process provides one mechanism that companies can use to systematically and periodically do this.

Figure 2 shows the total volume of hazardous waste reduced from one year to the next as reported by all planners on their Annual Progress Reports. Reductions are reported by companies as being attributable to the implementation of some pollution prevention strategy. It is interesting to note that despite the declining number of pollution prevention planners, annual reductions remain fairly constant over the last three years. Since the planning law became effective, the cumulative reduction attributable to pollution prevention is an impressive 7.2 million pounds of hazardous waste. In 2000, the reported reduction of 700,000 pounds represents a 4.5 % decrease in the total amount of hazardous waste shipped for disposal by all Vermont entities. This includes companies, individuals and waste streams not subject to the plan requirement.

HAZARDOUS WASTE REDUCTION PROGRESS BY POLLUTION PREVENTION PLANNERS

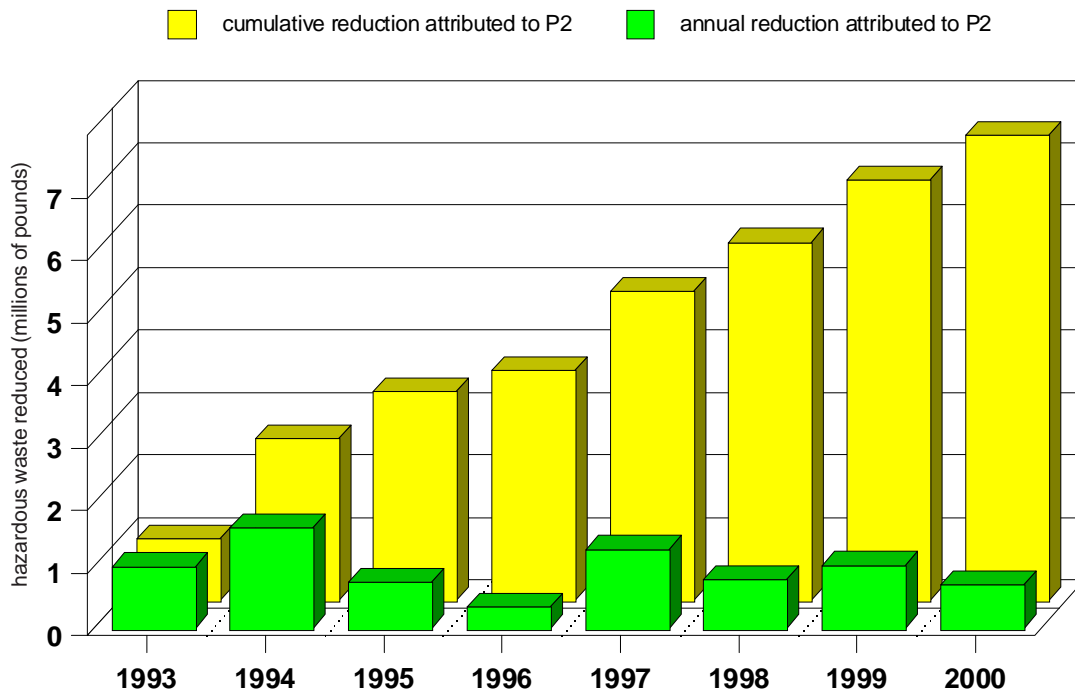


Figure 2.

Companies have typically used the planning process to first identify and provide impetus for implementation of lower cost pollution prevention opportunities. These often take the form of best management practices like improved inventory control, spill prevention controls and equipment repair and maintenance programs to name a few. For companies that will be entering their fourth three-year planning cycle in 2002, future improvements in waste reduction have become increasingly tied to projects requiring new investment in equipment. One scenario might occur, over time, across a sector where new technology is viewed as

necessary to improve a company's competitive position. An example is seen in the commercial printing sector. In today's market, printers are increasingly using computers to digitally transfer images and text direct to printing plates or in some cases, direct to the printing press. By eliminating the need for developing film, the company realizes labor savings, product enhancements, a safer workplace, and environmental benefits. Health and environmental advantages accrue since the film development process requires the use of chemicals which results in a wastewater discharge and the generation of a silver-bearing hazardous waste.



The Blodgett Oven Company in Burlington is an industry leader in the manufacture of high quality commercial ovens. Customers had the option of purchasing a painted black exterior on certain models. A solvent-based paint was spray applied in three paint booths equipped with re-circulating water curtain filtration systems. After a lengthy evaluation process, which included assessment of pollution prevention technologies such as electrostatic powder coating and spray-applied water-borne coatings, Blodgett made the decision to eliminate painting altogether. Today, Blodgett ovens are only manufactured with stainless steel exteriors. By making this change in their manufacturing, the company reduced the generation of hazardous, paint-related wastes from over 14,000 pounds per year to nothing. They also eliminated many tons of hazardous air emissions which not only benefits the environment, but makes for a much healthier workplace for employees.

b) *Toxics Use Reduction*

In 2000, there were 47 companies that met the definition of a “Large User of Toxic Substances” and required to plan for the reduction of regulated chemicals. In 1996, when the first plans were due for Large Users, there were 49 facilities. 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 toxic chemical as defined in Act 100 (SARA 313 list).

Figure 3 shows the total amount of these chemicals reported by all facilities that developed a plan, 1995-2000. There has been a gradual reduction from one year to the next, equal to 10% for the period.

**ANNUAL TOXICS USE IN VERMONT
BY LARGE USERS**

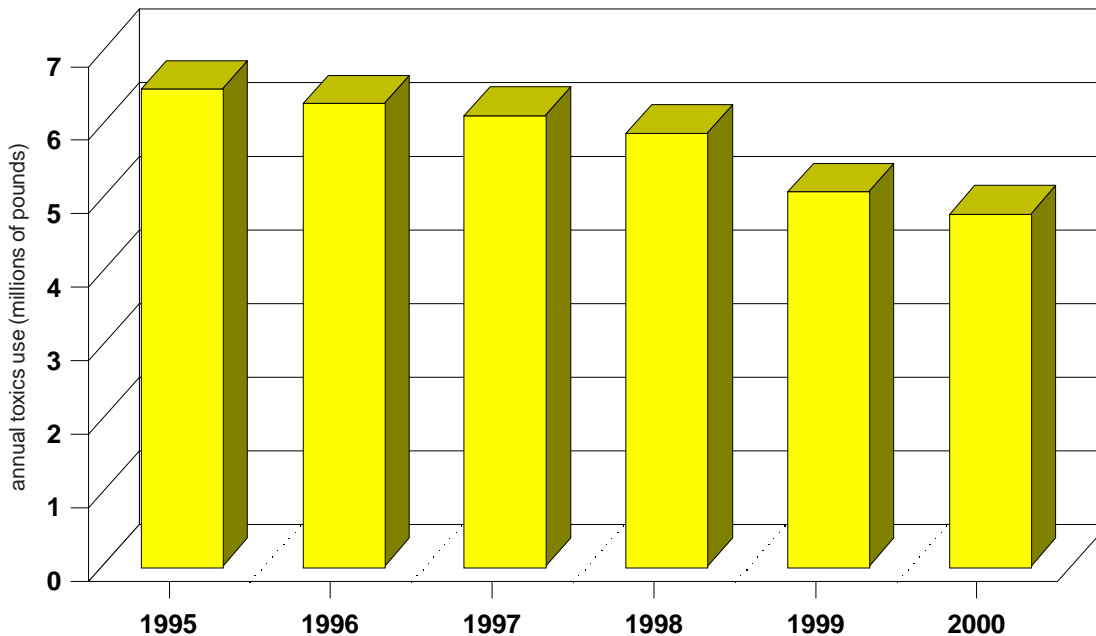


Figure 3.

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

INDUSTRIAL SECTOR	NUMBER	TYPICAL PROCESS(ES) WHERE CHEMICAL IS USED
Metal Fabrication and Finishing	10	Electroplating, Painting, Heat Treating
Wood Products	9	Finishing (stain, sealer, lacquer, clean-up)
Electronics	5	Cleaning, Plating, Polishing, Soldering
Specialty Coating/Laminating	5	Adhesives, Protective Coatings, Laminating
Aerospace	4	Plating, Anodizing, Electronics
Paper Products	4	Dyes, Coatings, Additives

INDUSTRIAL SECTOR	NUMBER	TYPICAL PROCESS(ES) WHERE CHEMICAL IS USED
Food Products	3	Cleaning (acids)
Fiberglass Products	3	Lay-up (styrene)
Battery Manufacturing	2	Cathode Mix, Degreasing
Coatings Formulator	2	Batch Formulation

All but eleven 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 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 toxic chemicals typically results in a hazardous waste by-product, by far the greatest impact on the environment is to the air. Based on the Toxics Release Inventory information maintained by the U.S. EPA, *over 90%* of toxic releases to the environment in Vermont are to the air. EPA has collected TRI information since 1987 and 37 Vermont facilities reported in 2001 for chemical use during 2000.



Vermont Tubbs Inc. in Brandon, Vermont manufactures fine hardwood bedroom and home office furniture. Finishing operations include the traditional steps of spray-applied solvent based stains, sealers and lacquers in conventional filter spray booths. In 1999, Tubbs purchased a "flatline rollcoater" to apply 100% solids ultraviolet coatings that cure upon exposure to a UV light source. This technology is exceptionally well-suited to finish parts having simple geometries. Tubbs has successfully used this pollution prevention technology to finish all of its drawer box components, thus reducing the use of toxic chemicals and emissions of volatile organic compounds (VOCs) by 10 tons per year. VOCs are an essential ingredient in the formation of ozone (smog). Generation of hazardous waste was reduced by approximately three 55-gallon drums per year in the form of dried overspray, contaminated filters, liquid solvent and rags. In addition to the environmental and worker safety benefits, Tubbs realized a big increase in productivity as labor costs to finish drawer boxes was cut by two-thirds. And finally, product quality actually improved because of the hard, very durable finish characteristic of most UV cure coatings. EAD staff provided important support throughout the assessment phase of this project during pollution prevention planning efforts and through a small grant that offset part of the \$150,000 capital cost.

BUSINESS ASSISTANCE SERVICES

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

On-site Assistance

Direct on-site assistance was provided to more than 50 companies during 2001. Half of these site visits resulted from follow-up associated with EAD's distribution of its *"Metal Fabricators Guide to Vermont's Environmental Regulations"* and the other half were the result of referrals made by other Department programs or associated with administration of pollution prevention planning requirements. A typical site visit begins by meeting with the facility contact (preferably including company management) to explain the purpose and nature of the visit and to identify any specific environmental issues that the company would like to see addressed. Next there is a facility walkthrough, lasting anywhere from an hour to half a day, that provides an opportunity for information exchange regarding the specifics of various processes, paying particular

attention to any process where waste is created. Finally, a meeting to discuss observations, ask further questions and make recommendations for the facility's consideration regarding pollution prevention and/or environmental compliance. Depending on the number and complexity of recommendations and the need for further follow-up with the facility, a written report is subsequently generated and sent to the facility.

Environmental Sector Guides

A Metal Fabricators Guide to Vermont's Environmental Regulations is the fourth in a series of sector specific environmental guides produced and disseminated by EAD. Previous *Guides* have been developed for businesses engaged in Vehicle Service and Repair, Commercial Printing and the manufacture of Wood Products. As with the others, *A Metal Fabricator's Guide...* addresses compliance issues and pollution prevention strategies specifically applicable to small and mid-size businesses in a particular sector. There are many companies in each of these sectors that may not need environmental permits and are rarely, if ever, visited by a DEC inspector. Yet such companies invariably are subject to some environmental requirements. Common issues include the use of floor drains which discharge to on-site disposal systems, underground storage of liquid petroleum, the use and disposition of hazardous materials and non-sanitary discharges of wastewater to municipal treatment plants. The Guides also provide specific suggestions for best management practices that can lessen the environmental impact associated with many business activities.

In May 2001, *A Metal Fabricators Guide...* was mailed to 105 Vermont businesses. By December, 75 of those businesses had been contacted by phone. Virtually all reported finding the Guide informative and useful. Furthermore, 25 requested an on-site visit to identify any violations and receive suggestions for possible waste reduction initiatives. More information on this successful program is available by calling EAD.

Toll-Free Hotline

EAD maintains a toll-free hotline that businesses (and others) may use to get answers to their environmental compliance and pollution prevention questions. Businesses may ask their questions anonymously. Three technical assistance personnel staff the hotline which typically rings two or three times a day with calls from businesses.

Incentive Grants

EAD administers a small incentive grant program for innovative pollution prevention projects. In each of the past three years, up to \$25,000 has been awarded to one or more small Vermont businesses. Recipients include: two drycleaners who reduced the amount of perchloroethylene they used by substituting non-toxic alternatives, a boat-building company which changed their process to minimize styrene and acetone emissions, and a furniture manufacturer who purchased equipment to allow the use of coatings that cure upon exposure to an ultraviolet light source rather than evaporate.

Vermont Business Environmental Partnership Program (VBEP)

The VBEP is a voluntary assistance and recognition program offered by EAD and the Vermont Small Business Development Center. Participating businesses agree to achieve six "core"

standards and six of twelve elective standards in order to be designated as an *Environmental Partner*. Businesses can then choose to meet additional standards to become an *Environmental Leader*. This latter designation is changed to *Green Hotel* for members of the lodging sector, which has been the focus of the VBEP for the past three years. Incentives for participation include free technical assistance and training, window emblem and program logo for use in marketing, the potential for cutting cost due to improved operating efficiency and the satisfaction generated by doing the right thing. There are over 50 participating businesses in the program.

Business Training on Environmental Management Systems (ISO 14000)

EAD has sponsored comprehensive training programs for Vermont businesses to help them meet the requirements for the international standard (ISO 14000) for environmental management systems. About 18 businesses have participated to date. Environmental management systems help businesses to implement pollution prevention and compliance improvement programs in a systematic and comprehensive manner.