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**NEW STATE AND LOCAL APPROACHES TO  
ENVIRONMENTAL PROTECTION**

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**AN ENVIRONMENTAL LAW INSTITUTE REPORT  
TO THE OFFICE OF TECHNOLOGY ASSESSMENT**

**August 1993**

### **NOTICE**

This study was performed under Contract No. I3-6205.0 with the Office of Technology Assessment. Environmental Law Institute staff contributing to the report included Theodore Endreny and James McElfish. The findings and conclusions are those of the Environmental Law Institute and its staff and may not necessarily reflect those of the Office of Technology Assessment.

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# NEW STATE AND LOCAL APPROACHES TO ENVIRONMENTAL PROTECTION

## INTRODUCTION

Many environmental laws and programs originate with state and local governments. These include innovative approaches to environmental regulation as well as other approaches used in lieu of, or as supplements to, regulatory mechanisms. The Office of Technology Assessment (OTA) is examining nontraditional and experimental approaches to environmental protection that may be adaptable for federal support or enactment.

The Environmental Law Institute (ELI) devotes a substantial portion of its U.S. research program to state and local laws, programs, and institutions. In this study, ELI selected 36 state and local programs that use one or more of the following nontraditional approaches to environmental protection: controlled trading, pollution charges, information programs, enhanced monitoring and enforcement, streamlined permitting, liability provisions, voluntary programs, and grants and subsidies. The programs were selected to provide geographic representation, examples of each type of mechanism, and coverage of the following environmental media or pollution types: air pollution programs, water pollution programs, solid waste programs, hazardous waste programs, and multimedia pollution programs. A draft report was prepared and each state or local program provided comments used in preparing this final report.

The 36 programs profiled are found in 18 states. (Eight additional states are included in the profile on 16 state "NEPA" programs.) The states in which individual programs are profiled are shown on the map (Figure 1). These states are by no means the only ones with new or innovative programs. Rather, they represent the kinds of programs occurring in virtually every state. Other state and local programs are cross-referenced in many of the profiles.

The study achieved reasonable coverage of all of the program mechanisms of interest. Including some dual approach programs, it examined 6 controlled trading programs, 13 pollution charge programs (including fees, deposit-rebate schemes, and various types of taxes), 4 information programs, 5 enhanced monitoring and enforcement programs, 2 streamlined permitting programs, 2 liability programs, 4 voluntary programs, and 2 subsidy/grant programs.

This scoping study is intended to serve as a basis for further analysis and comparison by OTA and others interested in alternative approaches to environmental protection. Each program is described in sufficient detail to provide a basis for understanding its operation and to suggest possible avenues for further research.

The study also discusses possible bases for evaluating the programs' performance. The criteria developed by OTA were:

- cost effectiveness;
- incentives for technology innovation;
- robustness to less-than-perfect implementation;
- administrative burden to the agency;
- difficulty for the industry;
- integration with existing regulatory programs;
- ability to set and achieve goals;
- distributional implications;
- predictability of environmental results and costs; and
- flexibility and appropriateness for meeting goals.

Information relevant to these evaluation criteria is provided where available. The level of detail of the evaluation discussion varies among the programs profiled. The air programs in California, in general, have generated more data than those of the other states and also more than the other media programs. Hence, the evaluation of these programs is generally lengthier. Some programs are too new to have any track record. Where possible, ELI has identified likely outcomes and projected difficulties for these programs.

A few programs that have been in operation for several years cannot be evaluated with confidence because the state or locality in question has not collected data on their performance. Frequently, states and localities have adopted innovative programs in order to save money and/or to reduce staff sizes. Where this is the case, they have seldom spent money on data collection or program evaluation.

Finally, in a few cases, it is impossible to assess cost effectiveness or apply other criteria because there is no obvious baseline for comparison. For example, an environmental "bounty hunter" provision may generate enforcement cases identical to or different from those that a government agency might have identified and brought on its own. If it generates different kinds of cases, how should the environmental benefits be valued? If it generates the same cases, should the bounty be compared to the costs of hiring more civil servants? In a similar instance, a "public intervenor," such as that provided for in Wisconsin, may give the public a greater confidence that its environmental interests are



being protected. It may also result in industries making undisclosed decisions they would not otherwise have made -- for example, to redesign or forgo projects before making them public. One cannot readily assess (1) benefits that are received that are not publicly known, (2) the social costs to the state in terms of private decisions that are affected, and (3) the value the public places on having its interests represented.

Voluntary programs are also quite difficult to assess. Are they best compared to "no program" or to a full regulatory program designed to accomplish the same ends? Their "robustness" to less-than-perfect implementation may not matter if the basis for comparison is the former; it may matter considerably if the existence of the voluntary program is the basis for forgoing regulation.

While controlled trading and pollution charge schemes are somewhat easier to evaluate -- because the assumed comparison is command-and-control regulation imposing end-of-pipe discharge controls -- even this is not simple. The decisions of facilities are often based upon their projections about regulatory continuity, their need for certainty in planning, and the nature of their business (cyclical or steady). Attempts to use nonregulatory mechanisms can produce market distortions on a scale as large or larger than traditional regulation. Pollution charges that are not properly designed, or "pollution credit markets" that do not function, may impose charges (and administrative costs) with no corresponding benefit or with a misallocation of benefits.

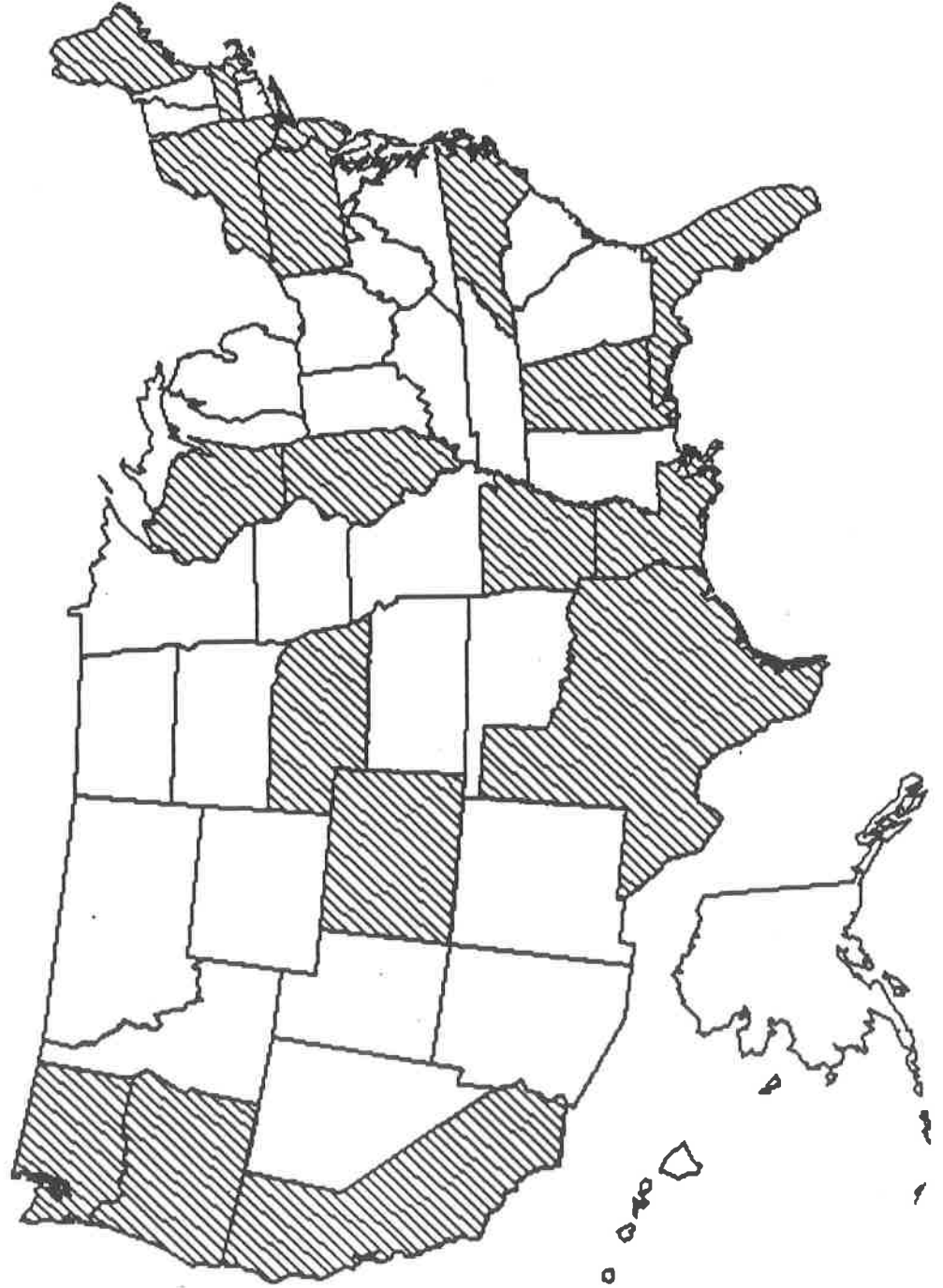
All of the nontraditional tools examined in this study have great promise. There are several important things to consider in evaluating the appropriateness of any tool:

- (1) The tool should be tailored to a problem and a market that is well-understood (e.g., a particular watershed with known dischargers, or a well-understood set of transactions like the purchase and replacement of automobile batteries by consumers).
- (2) It may be quite costly to obtain hard data concerning the cost-effectiveness of the tool, and even more costly to generate meaningful comparisons with regulatory "roads not taken."
- (3) Uncertainty is not necessarily a bad thing. Provided that there is sufficient public understanding of a proposed innovative program, and that some effort is made to monitor environmental results (often overlooked in regulatory as well as nonregulatory programs), innovative programs can be adjusted, abandoned, or expanded.

The study is divided into five chapters, organized by environmental medium/pollution type. Each chapter contains a brief introduction, followed by the profiles of the selected state and local programs. Additional information, references, and contacts are provided in the endnotes.



# New State and Local Approaches to Environmental Protection



## Legend

 Case Studies



**CHAPTER ONE:**  
**AIR POLLUTION PROGRAMS**



## CHAPTER ONE: AIR POLLUTION PROGRAMS

This chapter examines eight air pollution control programs. Five of these are in California, which continues to lead other states in innovation in this area; of the California programs discussed, four are programs of the regional air quality management districts, while one is a statewide pollution charge system.

The eight programs analyzed include pollution charge systems tied to permitting, pollution charge systems designed to encourage fuel switching, controlled emissions trading, enhanced monitoring through citizen action, and enhanced monitoring through a controlled self-audit program.

Controlled trading is encouraged by the recent amendments to the Clean Air Act, as is a system of state permit fees that may be tied to reductions in the amount of air pollution discharged. A number of these systems have been pioneered in the states, and California in particular has experimented with weighting permit fees by evaluating the toxic effects of air pollutants. Approaches such as allowing the scrapping of older automobiles as a temporary offset for industrial emissions have also been tried.

Analysis of the Clean Air Act suggests that there are ample opportunities for other types of incentive and nontraditional mechanisms within the context of state implementation plan (SIP) revisions and state permit programs contemplated by the federal Clean Air Act.





# AIR POLLUTION CONTROLLED TRADING

## PENNSYLVANIA - EMISSION REDUCTION CREDITS

### PROGRAM DESCRIPTION

A proposed Pennsylvania pollution control program will improve air quality through the use of emission reduction credits. Under the proposed amendments to the Pennsylvania Air Pollution Control Act (Act) the Environmental Quality Board (Board) will adopt new source review (NSR) provisions in conformance with the requirements of the federal Clean Air Act Amendments. The proposed amendments to the Act will require a permitting process for sources of ozone contributing gasses (volatile organic compounds (VOCs) and nitrogen oxides (NOx)).

Regulations mandate that the lowest achievable emission rate (LAER) be implemented in any modified or constructed new stationary sources and that emission reduction credits (ERCs) be obtained to offset any increased emissions through the transfer of ERCs from existing sources to new or modified sources.<sup>1</sup> The administering agency for this program is the Division of Air Resource Management, Bureau of Air Quality Control of the Department of Environmental Resources (Department).

The reason for these proposed LAER and ERC provisions originates with the Department's need to comply with the federal Clean Air Act Amendments. State implementation plans (SIPs) must be revised to address new NSR requirements that will ultimately assist states in their attainment of national ambient air quality standards (NAAQS) within federally mandated time frames. Some elements of Pennsylvania's SIP revisions for earlier CAA requirements were found deficient by the federal EPA.<sup>2</sup>

The state studied the EPA's 1986 emissions trading policy statement and then redesigned the NSR program to include LAER and ERC provisions. The goal of the revised SIP is to provide VOC and NOx reductions of at least 15% from 1990 baseline emissions by 1996 for moderate emissions areas and 20% for severe emissions areas.

ERCs are generated by a facility that reduces its baseline emissions. It may do this by: (1) adding new emission controls or (2) shutting down or curtailing production. The facility must be registered with the Department run statewide clearinghouse to receive ERCs for facility emissions reductions. ERCs may then be used for: (1) internal offsets to offset that facility's own proposed emission increases, or (2) trading the ERCs to other registered sources with proposed emissions increases.

ERC transfers must meet the following requirements. (Requirements are in the process of being revised prior to final rulemaking.)<sup>3</sup>

1. ERCs must be transferred through the state registry system.

2. Facilities trading or using ERCs must be in permit compliance.
3. ERC transfers must be in increments of greater than 1 ton/year.
4. Transferred ERCs can not result in greater ambient air impact or emissions.
5. Transferred ERCs can only be used for offsetting the same pollutant.
6. Interstate trading of ERCs requires both Pennsylvania's and the other state's approval.
7. ERC generators must have Department-certified emission reductions operating within 1 year of new permit issuance.
8. ERCs resulting from source shutdown expire in 10 years. Other ERCs do not expire.

Offset ratios on registered ERCs for internal offsetting or trading will result in emissions reductions. The following table demonstrates:<sup>4</sup>

Source	Flue Emissions	Fugitive Emissions
Particulate Matter and SO <sub>2</sub> Primary Nonattainment Areas	1.3:1	5:1
Particulate Matter and SO <sub>2</sub> Secondary Nonattainment Areas	1.1:1	3:1
Volatile Organic Compounds and NO <sub>x</sub> in Severe Areas	1.3:1	1.3:1
Volatile Organic Compounds and NO <sub>x</sub> in Transport Regions	1.5:1	1.3:1
Carbon Monoxide	1.1:1	1.1:1
Lead	1.1:1	1.1:1

The implementation of this NSR plan will result in additional environmental protection. Emissions reductions in ozone and other air pollutants are required by federal standards, particularly NO<sub>x</sub> and VOCs which exceed current standards.

There will be additional costs to industry to meet new offset ratios. The state will also incur additional costs related to the administration of this program's review and

approval process. State and local government-owned facilities which generate regulated emissions will also incur costs for emissions assessment, and LAER or ERC assisted reductions.

## EVALUATION CRITERIA

Because the basis of offsets is to achieve the same results at greater efficiency, the program has the potential for cost-effective reductions in pollution. The incentives provided by the transferability of offsets provide an economic boost to potential technology innovations. With the increased availability of offsets, nonattainment areas can admit new, more efficient industries and will increase offset trading activity which due to the ratio requirements will achieve more rapid progress toward attainment.

The program is somewhat robust to less-than-perfect implementation, but ultimately depends upon the reliability of monitoring and oversight of self-monitoring. Both the generation of the offsets and their use require a reliable understanding of the quantities of pollutants being emitted. Thus, investment in monitoring and oversight is essential to assure that the program operates as intended and that neither cheating nor inadvertent violation undermines the integrity of the offset market.

The program is not particularly difficult for industry, and provides advantages to industry by allowing the use of offsets rather than implementation of potentially cumbersome or expensive control measures in certain industries.

The system can be well integrated with the existing regulatory framework and is consistent with the ability of the legislature to set and achieve air quality goals. Distributional implications are not significant, as all trades are among emitters. Further experience with the program will be necessary to determine if there are any particular market outcomes that raise distributional concerns. Results are fairly predictable, and the mechanism provides flexibility in meeting new air emissions standards.

## AIR POLLUTION CONTROLLED TRADING

### CALIFORNIA - SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT - AUTO SCRAPPING

#### PROGRAM DESCRIPTION

A South Coast Air Quality Management District (SCAQMD) pollution prevention program uses controlled trading to manage its air pollution and to reduce industries' costs to comply with existing regulations. Rule 1610, effective January 1993, is known as Old-Vehicle Scrapping (OVS). OVS permits regulated stationary sources to use potentially more cost-effective mobile source emission reductions as an alternative method of compliance with current state emission regulations.<sup>5</sup> The OVS rule provides for reactive organic compound (ROC) and oxides of nitrogen (NOx) mobile-source emission reduction credits (MSERCs) when pre-1982 model year passenger cars and light-duty trucks are scrapped.

A reason for the adoption of these controlled trading programs is the need to find an effective fix for the SCAQMD's air pollution. The Basin exceeds federal ozone standards 91 days/year and state standards 148 days/year, more than any other area in the U.S.<sup>6</sup> Based on an estimated annual scrapping of 30,000 vehicles (10,000 vehicles in each of three year class categories as explained below), projected emission reductions range from 390 to 1,370 tons of ROC and 230 to 290 tons of NOx. Environmental benefits are greatest when the replacement vehicles for the scrapped vehicles are newer, less-polluting and more fuel-efficient.

The SCAQM Board, the administering agency, allows any vehicle owner to sell the vehicle voluntarily for scrapping as long as the vehicle is registered, insured, and operating. Proof of vehicle registration is designed to prevent an influx of old vehicles into the SCAQMD to take advantage of the program.<sup>7</sup> The vehicle's engine, transmission, emission control system and frame must be destroyed during the scrapping. MSERCs received for scrapping have a lifetime of three years and are issued at 1/3 their value each year. This requires that companies develop credit utilization plans and must bring their stationary source into compliance or renew their scrapping plan at the end of the three year limit.<sup>8</sup>

The following two programs were studied by the SCAQMD while designing the OVS rule. An earlier District Rule 1124 allowed aerospace assembly and component manufacturing operations to substitute emissions reductions they obtained from retiring old cars for reductions they would otherwise have had to make in their own operations. Companies gained volatile organic compound credits for scrapping vehicles in the pre-1979 in-use fleet. Only 130 vehicles were scrapped under this program with a cost of \$100 per vehicle for SCAQMD processing paperwork.<sup>9</sup> Under a separate program in 1990, Unocal Corporation purchased and scrapped 8,376 pre-1971 vehicles at \$700 for each vehicle.<sup>10</sup>

A 1993 vehicle emits 1.5 grams/mile of ROCs and 0.99 grams/mile of NOx as compared to a pre-1981 vehicle emission of 3.7-12.3 grams/mile of ROCs and 2.3-3.0 grams/mile of NOx. In order to streamline the guidelines for participation in the OVS program, the SCAQMD has calculated the following pre-determined ROC and NOx MSERC values for pre-1982 vehicles:<sup>11</sup>

Year	ROCs	NOx
1981-1975	26 lbs/year	16 lbs/year
1974-1972	72 lbs/year	19 lbs/year
Pre 1972	91 lbs/year	17 lbs/year

In designing the scrapping plan, the SCAQMD considered two other project alternatives: Alternative A would have required that the whole vehicle be destroyed, that the vehicles all be pre-1972, and that stricter registration and insurance regulations be enforced. The results were projected to generate more emissions reductions but to disqualify many owners considering retiring their older vehicles because of the tougher requirements and their inability to meet them. Alternative B would have required that only the engine be scrapped, that the vehicle be pre-1985, and that easier registration and insurance requirements be enforced. The results would qualify more potential program participants (number of participants dependent only on scrapper need) but also would have allowed higher air pollutant emissions.

The SCAQMD licenses polluting facilities, requiring them to be responsible for the operation of their OVS programs. These licensed auto scrappers, who may contract with commercial scrappers, must submit a compliance report every six months documenting vehicles scrapped in order to receive the MSERCs.

The air pollutants generated by the vehicle scrapping process are referred to as secondary emission air pollutants. These are projected to consist of, on average: 80 lbs CO, 27 lbs ROC, 40 lbs NOx, 15 lbs Freon, 24 lbs particulate matter. Approximately 20% of the scrapped vehicle is sold to recyclers, totaling 9,000 tons/year for 30,000 vehicles. The remaining 36,000 tons is sold as scrap or landfilled.

#### **EVALUATION CRITERIA:**

SCAQMD has calculated cost effectiveness by dividing the cost of implementing the control measure by the emission reduction. A cost of \$800/vehicle is assumed, including administrative costs. The table below provides the analysis:<sup>12</sup>

	1981-1975	1974-1972	pre-1972
Cost Per Vehicle (\$)	800	800	800
Total Program Cost (\$)	8,000,000	8,000,000	8,000,000
ROC Emission Reductions Over 3 Year Period (Tons)	390	1,070	1,370
NOx Emission Reduction Over 3 Year Period (Tons)	230	290	250
Cost Effectiveness ROC Only (\$/Ton)	21,000	7,500	5,800
Cost Effectiveness NOx Only (\$/Ton)	35,000	28,000	32,000
Cost Effectiveness (NOx & ROC) (\$/Ton)	12,900	5,900	4,900

Cost effectiveness is calculated separately for ROCs or NOx in order to accommodate companies that need only those reduction credits. SCAQMD calculated costs for traditional emission-reductions methods at \$10,000 to \$20,000 per ton.<sup>13</sup> The above table shows that the cost effectiveness of obtaining ROC credits is lower than that of NOx for each vehicle year scrapping plan.

The SCAQMD cost effectiveness calculations for the scrapping program are higher than the Office of Technology Assessment (OTA) figures.<sup>14</sup> According to a 1992 OTA vehicle scrapping study, which examined the UNOCAL program, among others, facilities can achieve required air pollutant control with vehicle scrapping programs at "costs equal to or lower than those of [traditional] emissions-reduction options", when the additional benefits of gasoline savings are calculated into auto scrapping savings.<sup>15</sup> OTA also found that: (1) programs that targeted pre-1971 cars as opposed to pre-1980 cars are significantly more cost-effective and (2) programs implemented before the emission-reduction plans (such as the burning of cleaner fuels) of the federal Clean Air Act would have more of a cost savings benefit.

There exist some incentives for technology innovation within the scrapping process. Because of excess secondary emissions from scrapping old vehicles, one SCAQMD licensed scrapper is limited to 115 vehicles/day. (However, this limit still allows the facility to scrap over 30,000 vehicles per year). Improving upon the process would allow this operator to scrap more vehicles and therefore earn more dollars.

On the other hand, the availability and cost-effectiveness of the auto scrapping program may discourage industry from developing new emission-reduction technologies for their primary processes. Essentially it may serve as an interim strategy at most.

The scrapping program protects against fraudulent participation by including registration, insurance, and vehicle operability requirements. The emission-reduction credits are inherently conservative because they last three years and assumes that a pre-1982 vehicle would be driven only three more years.

The SCAQMD is burdened with the administrative responsibility of reviewing each company's program design and set up procedures. However, its paper work costs will be reimbursed with the processing fees paid by the participating companies with the submittal of their vehicle scrapping plan applications.

Difficulties faced by the participating industries are uncertain at this time. Issues to consider include the burden of procuring older vehicles and difficulty of projecting emission-reduction credit needs for plant operations three years into the future.

SCAQMD restructuring of programs to allow for the generation and trading of emission-reduction credits (i.e., RECLAIM) provides a good environment for the integration of the auto scrapping program. The UNOCAL experience shows that the scrapping program can function within the existing system structure. The ability of Congress to set and insure the implementation of similar project goals is more difficult. There are no existing national trading structures from which to work and indeed, such a national program would require additional monitoring to ensure both the facility and the scrapper are in compliance with the scrapping rules. A program should focus on non-attainment areas for ozone (since the cost-benefit ratio is better for ROCs).

Regional socioeconomic impacts might include an increase in costs for older vehicle parts, as supply will diminish earlier with scrapping. This could cause hardships for car owners in lower socioeconomic groups. However, at the same time money will flow from local industry toward the owners of older vehicles who are in lower socioeconomic groups.

With only the history of the UNOCAL experience to work from, the predictability of the program's success is limited. Some questions to consider are the diminishing number of pre-1982 automobiles and the effectiveness of a purchase that scraps a low use vehicle. Indeed, the predictability for environmental quality improvements is lower than that of installing control technology. Nonetheless, auto scrapping costs are for the most part predictable, assuming that as the older fleet diminishes in size the cars will demand the same market value.

The concept of emissions credits or offsets has great flexibility. The program can be adapted to many different types of emissions systems as an aid for compliance.

## AIR POLLUTION CONTROLLED TRADING

### TEXAS -- POLLUTION TRADES

#### PROGRAM DESCRIPTION

A Texas pollution prevention program uses controlled trading to control air pollution. A rule was adopted in March 15, 1993, establishing the Texas Air Control Board (TACB) emission reduction credit bank. Under the program, Texas industries gain emission reduction credits for voluntarily decreasing their emissions beyond the state's required reductions.<sup>16</sup> By registering these credits in a state "clearing house" the industries can then bank for future use or trade to other industries. Targeted emissions include volatile organic compounds and nitrogen oxides, two chief contributors to ground-level ozone problems. Banking of credits, with a built-in requirement for a reduction in pollutants, will allow for new growth and job development in nonattainment areas while simultaneously cleaning the air.<sup>17</sup> The administering agency is the Texas Air Control Board.

The reason for TACB's adoption of the emission reduction credit program is to address one of the 1990 Federal Clean Air Act's (CAA) new requirements. Under the CAA new source review (NSR) permit requirements, effective November 15, 1992, any new emissions from a proposed facility or facility modification must be offset by a greater than 1 to 1 ratio before the new operation can be built. Areas with high emission levels are required to meet higher tons per year offset requirements.<sup>18</sup> For example, in Houston/Galveston, an area labeled "severe," the ratio of exchange will be 1.30 to 1, a ratio which will provide an effective net reduction in emissions of 30 percent. In Beaumont/Port Arthur and in El Paso, both designated as "serious," the ratio is set at 1.20 to 1. And in Dallas/Fort Worth, labeled "moderate," the ratio is 1.15 to 1.

The regulation would set up a mechanism to allow industries to bank emission reductions they have made voluntarily beyond those reductions required by the TACB permit. Nonattainment areas could allow for industrial growth by trading emission credits with the emission reduction credit system. Sources that would benefit by the regulation include stationary, area and mobile sources in the Houston-Galveston, Beaumont-Port Arthur, Dallas-Fort Worth, and El Paso nonattainment areas.<sup>19</sup> New or expanding industries that otherwise would not be allowed to operate as new sources of pollution could purchase and take advantage of these voluntarily banked emissions in their own operations.

In May of 1993, the Texas State Legislature passed the Community Banking Bill, which allows for the creation of Area Emissions Reduction Credit Organizations (AERCO) in each of the state's nonattainment areas. The Council of Governments in each nonattainment area would petition the TACB to create an AERCO. AERCO's major function would be to "identify and promote potential projects and strategies to generate" bankable emission reduction credits. The regional AERCO would have accounts at the TACB Emission Reduction Credit Bank. Funding for the AERCO operation costs could come from: (1) its local governments; (2) from the state; and (3) through grants and donations and (4) from the sale of ERC's.<sup>20</sup> The AERCO is also permitted to enter into contracts.



In order to ensure improvement in air quality, TACB has included a depreciation factor in the emission reduction credit system. Emission credits placed in the bank depreciate at the rate of 3 percent per year, and at the end of five years, the emissions credits are eliminated and are no longer available for trading. This assures a continual decrease in harmful emissions. These offsetting emission reductions cannot be from controls or other process changes that the TACB has required in the company's permit or through other rules. Instead, the reductions must have been made voluntarily and must be in excess of the requirement. Credits can be withdrawn only for use within the same ozone nonattainment area.<sup>21</sup>

Texas' Air Quality Planning calculates that the proposed emissions banking program will cost \$15,000 for the state to implement and then \$45,000 annually to administer the program. This cost is based on an anticipated 100 banking applications verified and processed per year and an estimated average of ten hours per application for verifying and documenting the banked emissions reduction credit.<sup>22</sup> The minor cost to industry and small business for record keeping will be offset by the increased potential for expansion in a nonattainment area. It is a TACB goal to establish a computer data base which will allow the public to review the amount of registered or banked reductions in each designated ozone nonattainment area.

Studies by the TACB Marketable Permits Advisory Committee are supportive of the benefits gained from the emission reduction credit program. The Committee suggests that trading of NOx emission reduction credits could be used in place of the Federal Clean Air Act option of reasonably available control technology (RACT) compliance measures.<sup>23</sup> Although trading is not currently allowed, industry could trade credits as a cost-effective way to achieve compliance with NOx RACT requirements.<sup>24</sup> These trades would only be allowed in the case of shut downs, with the banked credits going to new sources or expanded sources. Furthermore, the option to buy credits allows firms the flexibility to commit to long-term maintenance schedules. This removes the facilities' need to apply for extensions to deadlines in RACT installation.

## EVALUATION CRITERIA

The opportunity to trade emissions credits can reduce control costs by allowing the reductions to be made by those industries that can do so most efficiently. This provides incentives for technology innovation. The depreciating character of the emissions credits also assures the existence of continuing incentives for further innovation.

The program appears to be reasonably robust, but will rely heavily upon accurate monitoring and reporting by the participating industries. Texas' Air Quality Planning calculates that the proposed emissions banking program will cost \$15,000 for the state to implement and then \$45,000 annually to administer the program.

The system is designed to be integrated with the underlying regulatory framework and to allow the achievement of legislatively established goals. Distributional impacts are uncertain at this time. The program is predicted to allow the meeting of air quality goals at lower costs; flexibility is one of the primary goals of the program.

## AIR POLLUTION ENHANCED MONITORING AND ENFORCEMENT

### CALIFORNIA -- BAY AREA SMOKING VEHICLES

#### PROGRAM DESCRIPTION

Part of the San Francisco Bay Area Air Quality Management District's (BAAQMD) pollution prevention program is a Smoking Vehicle Program. This program uses public complaints and voluntary remediation. It is based on the fact that, on average, smoking vehicles emit more air pollutants than well-tuned vehicles and are responsible for a disproportionate share of particulate and smog-forming pollutants. In the nine county San Francisco Bay Area, automobiles are responsible for 80% of the carbon monoxide emissions and 50% of the reactive hydrocarbon emissions that lead to ground level ozone formation.

This control measure reduces Reactive Hydrogen Compound (RHC) and Nitrogen Oxide (NOx) emissions from on-road vehicles by establishing a citizen complaint program for smoking vehicles.<sup>25</sup> There is no immediate punitive result for smoking vehicle owners, however. Instead, vehicle owners that are spotted and turned in are reminded that under the California Motor Vehicle Code smoking vehicles seen by the California Highway Patrol or other law enforcement agency could receive a citation.<sup>26</sup> Prior to this current citizen-based program for reporting smoking vehicles, the BAAQMD had operated a vehicle patrol system, which was deactivated due to budget cutbacks in the late 1970s. Under the former program, uniformed BAAQMD staff would pull over vehicles and cite violators for excessive emissions under the California Vehicle Code.

Bay Area residents can report smoking automobiles, trucks and buses to a 1-800-EXHAUST line. By working with the Department of Motor Vehicle database the vehicle's owner is identified. The BAAQMD then sends a letter informing the registered owner that the vehicle has been seen emitting excessive smoke and the BAAQMD requests that the vehicle be repaired. Owners will also receive information that explains the consequences of air pollution. A compliance form must be completed and submitted to the BAAQMD in a prepaid envelope. Compliance is voluntary.

An advisory has been sent to the California Highway Patrol and other law enforcement agencies informing them of the program and asking for their support. All Bay Area transit agencies have also been informed so that they may be prepared should they receive letters about their vehicles. The California Trucking Association has been likewise notified. The BAAQMD Public Information Division has an information program to advise Bay Area residents of the smoking vehicle program.<sup>27</sup>

Tailpipe emissions are, of course, subject to regulatory control. There are federal and California standards to limit pollution from new motor vehicle certification standards. In addition to the new vehicle certification standards, vehicles are subject to the California

Smog Check Program -- a biennial inspection and maintenance program. The BAAQMD estimated that two percent of the vehicles might be subject to control through this program. The projected RHC and NOx emissions (subject to control) are given below in tons per day (TPD):<sup>28</sup>

Year	RHC (TPD)	NOx (TPD)
1994	2.4	4.9
1997	2.0	4.4
2000	1.6	4.0

With the addition of the Bay Area Smoking Vehicle reporting and voluntary maintenance program, RHC and NOx emissions from affected vehicles are expected to decrease by an average of 3 to 6 percent, depending on vehicle type. Estimated achievable emission reductions projected from this program are shown below:

Year	RHC (decrease TPD)	NOx (decrease TPD)
1994	(.08)	(.20)
1997	(.07)	(.18)
2000	(.06)	(.17)

The costs of this control measure would largely be related to the costs of repairing smoking vehicles. It is expected that older vehicles will be the most common offenders. The program also requires four additional BAAQMD staff.

Other impacts include a possible improvement in fuel economy for affected vehicles that are repaired to operate properly, leading to an overall reduction in the use of gasoline. Exposure of motorists to noxious fumes from smoking vehicles would be reduced.<sup>29</sup>

### EVALUATION CRITERIA

This program has the potential to be fairly cost-effective, at least initially, if (a) the cause of the smoking can be remedied by a minor repair or adjustment, and (b) the costs are averaged over several pollutants: RHC, Nox, carbon monoxide, and particulate matter. The enlistment of citizen-spotters and the automation of the contacts should produce voluntary emissions reductions that might not otherwise be achieved. Moreover, the reductions should be achieved at times other than the vehicles' particular inspection cycles, so incremental temporal environmental gains are possible. Cost effectiveness may decline over the longer term, not because of increased program costs, but because results are less

certain. Without follow-up enforcement (which costs money) vehicle owners that are less responsive to voluntary measures are not likely to be affected by the program.

There are no incentives for technology innovation provided by this program. The program is not robust to less-than-perfect implementation because it relies on uncontrolled citizen reports and voluntary compliance.

There is some burden to the regulatory agency, but minimal in comparison with projected initial improvements in air quality.

The program is not difficult for the targeted pollution emitters. However, it may produce adverse citizen reaction if unwarranted complaints occur frequently. Given the lack of any controls on citizen reports, this is a possible side effect of the program that may undermine its effectiveness.

Overall, however, the program has value as an education and public relations tool. During the spring of 1993, 7,000 citizen calls were coming into the 1-800-EXHAUST line per month.

The program can be reasonably well integrated with the underlying regulatory system; however, its ability to achieve goals and the predictability of results are uncertain. There are likely to be distributional effects from the program. The program is likely to target more low-income citizens, as these are the most likely to operate older cars and to be unable to keep them in good repair and tune. However, because the compliance is not backed up by enforcement but rather is expected to result from moral suasion and the "official" look of the citations, compliance is more likely to come from persons with sufficient funds to make the repairs; the poorest would simply not make the requested repairs. Thus, the financial impact of the program is likely to be greatest on the lower middle class (or the upper end of the working poor). The effectiveness of the program (and its distributional effects) could possibly be improved if some subsidy were provided to induce compliance by all recipients of the citations.

## AIR POLLUTION ENHANCED MONITORING AND ENFORCEMENT

### CALIFORNIA -- SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT -- COMPLIANCE REPORTING

#### PROGRAM DESCRIPTION

A South Coast California Air Quality Management District (District) pollution control program uses an enhanced monitoring and enforcement technique to reduce air pollutants in the region. Compliance Reporting is a program that divides the task of improving air quality management between the District and certain regulated industries with organic liquids storage tanks. Refiners of petroleum products and petroleum storage facilities are the two categories of industry under regulation. The original experimental contract, a one year Memorandum of Understanding entered into in 1989, committed 13 pilot companies (with one company represented in two separate divisions) to conduct and document emission sources inspections of their own operations.<sup>30</sup> The pilot self-inspection program showed increased compliance rates. District rules and regulations extending the program to a larger universe of facilities are expected by late summer of 1993.<sup>31</sup>

The compliance auditing program allows industry to compare source inspection results with the established audit criteria. Reason for the program includes the need for a stimulus for industry to consider air quality during planning and decision-making process. With this program industry could take a pro-active role in reducing air pollution.

District Rule 463, Storage of Organic Liquids, was chosen as the medium for this Compliance Reporting program because:<sup>32</sup> (1) the floating roof tank population is small and easily identified; (2) the equipment compliance requirements are well defined; (3) there was an existing inspection program in place and (4) industry is familiar with the procedures and equipment necessary for compliance. Companies conduct inspection at a minimum of double the state's annual inspections.

Goals for the program are to: improve and better maintain compliance, conserve inspection resources of the agency, and reduce hydrocarbon emissions from floating roof tanks. More specifically, an emissions limit must be met on volatile organic compounds (VOCs) from liquid storage tanks with a capacity greater than 19,815 gallons and of specified vapor pressures. The facilities are expected to limit emissions by the use of sealing devices on floating roof tanks and vapor recovery systems on roof tanks. Training of industry inspectors is an important part of the program success. Training concentrates on providing a clear, mutual understanding of Rule 463 and of the actual inspection techniques required to meet the Rule.<sup>33</sup>

Selection of the participating dozen companies was based on responses to the District invitation. During an initial stage, the interested companies identified problems with the

program, which were; the complexity of the four page descriptive data reporting form, that had previously been a simple "tank sheet"; the 72 hour reporting and repairing requirement on tanks found in violation; the increased penalties for program violations and the uncertain ramifications of signing the violation report. Some companies withdrew from the selection process because of these problems and because the program was "not cost-effective" for them.

Since the pilot program, the District has used existing regulations to allow companies with 60% of the total population of 950 petroleum storage tanks to voluntarily join the District program. With the passage of the new rules and regulations the remaining 40% of industry will need to come into compliance.<sup>34</sup>

An analysis of program benefits has focused on the joint training workshop for industry and District inspectors. The effective training achieved a common understanding of the Rule, effectively closing and correcting the gaps in inspector knowledge of the Rule and the necessary field interpretations. The two-day training program has certified over 300 company inspectors. Program evaluations indicate that the inspectors consider the skills very transferable to other job related tasks. Training was subsidized by the District for the first three years of the program. Now industry may pay the bill of approximately \$75 per inspector trained. Certification is good for one year before inspectors must get re-certified.<sup>35</sup>

Of the 1333 District and industry inspections made, only 25 tanks' seals were found defective - for a compliance rate of 98%. This rate is expected to fluctuate around 95% for future compliance due to the degree of tank usage over time. Of the 25 actual defects discovered there was a potential discharge of 167 lbs/day. If these had not been identified and corrected by the facility then 55,301 lbs of VOCs would have been emitted before the next District inspection 11 months later. In addition to these better air quality management savings, prompt repairs were made to 104 tanks by industry, combined with 113 (11% of all inspections) preventive maintenance repairs. This has clearly resulted in larger cumulative emissions reductions.<sup>36</sup> District audits have confirmed the accuracy of industry reports of compliance achieved.

Evaluation of the program shows great success for the effectiveness of preventive maintenance, with 11% of the tanks inspected needing and receiving repair. This is also the case for the effectiveness of achieving continual levels of compliance, with a 95% level expected. District resources are freed of time-consuming inspection work, allowing personnel numbers to drop from 5 to 2. In the same time required to inspect one tank in the field, a certified District inspector can "review, determine compliance, and enter the report data for 15 industry-conducted tank inspections."<sup>37</sup> Inspectors can review overall facility compliance with the computer-based data management system and then prioritize future audit inspections.

Industry commented on the pilot program and focused on four elements: the training program facilitated cooperation; mutual understanding of techniques between the District and industry; improved preventive maintenance; and resulting emission reductions. In final recommendations the District concluded that compliance reporting programs should be developed for other regulated industrial sources. With facilities utilizing their trained inspectors in other regulated areas the results are a maximum utilization of inspection resources "while ensuring or expanding the emissions reductions gained through source compliance."

Prior to the program the District employed 5 people to perform the inspections on the petroleum tank community. Currently the District only requires 2 inspectors for the program. To facilitate the training program the first team compiled an instruction/lessons booklet that has received positive reviews from later participants.

### **EVALUATION CRITERIA**

The program appears to be cost effective. Greater inspection frequency and detail is achieved at less cost to the government.

The program also provides incentives for technology innovation. The self-inspection provides greater opportunity to develop plans for meeting standards in alternative ways, offering industry more flexibility. The program is somewhat robust, but requires meaningful oversight to assure that the inspections are conducted honestly and that there is no "capture" of the certified inspectors being employed. The program results in a decreased administrative burden to the regulatory agency. The system is well integrated with the existing regulatory program.

Costs to the regulatory industry are increased, but this is offset to some extent by the facilities' greater autonomy and by the increased predictability of expenses.

The program appears to offer the possibility of setting and insuring the implementation of goals; it increases the predictability of environmental results and costs, and it offers flexibility beyond that of the ordinary system while providing a more frequent level of oversight.



# AIR POLLUTION POLLUTION CHARGES/INFORMATION PROGRAM

## CALIFORNIA - HOT SPOTS

### PROGRAM DESCRIPTION

A California program uses information disclosure financed by a system of pollution charges to address toxic air contaminants. California's AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987, requires that certain health and safety information concerning a facility's air emissions of toxics be made available to the public; the cost of doing so must be paid for by the facilities subject to the Hot Spots Act. The 1990 amendments created a system of fee regulations to cover state and district costs for implementation of the Hot Spots program.<sup>38</sup> The program is administered by the California Air Resources Board (ARB).

The Hot Spots Act was enacted to provide government and the public with more information about the emissions of air toxics in California. The Legislature acknowledged that facilities that manufacture or use hazardous substances may expose area residents to toxic air contaminants. It found that then-regulated emission information was not sufficient to allow an assessment of the potential health impacts of the exposure.<sup>39</sup> The goals of the original Hot Spots Act are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, and to notify nearby residents of significant risks. In September 1992, Senate Bill 1731 amended the Hot Spots Act to require that owners of significant risk facilities reduce risk below the level of significance.<sup>40</sup>

Under the Act the ARB is required to recover state program implementation costs. State costs include those incurred by the state's Office of Environmental Health and Hazard (OEHHA) and the ARB. The Hot Spots Act also sets each Air Pollution Control District's share of state costs, which is reviewed and updated annually to reflect changes in the facilities subject to the program. Districts may either adopt a fee schedule which recovers their costs, or request that the ARB adopt a fee schedule for them. The Air Pollution Control Districts are responsible for collecting the fees from the facilities to defray state and district costs.

The ARB's 1992 amendments to the state fee regulation:

1. Updated the fee schedules to reflect changes in facility emissions and state and district program costs;
2. Revised "district-specified" fees for facilities emitting 10-25 tons per year and < 10 tons per year of criteria pollutants;

3. Deleted annual fee requirements for facilities which emit less than 10 tons per year of criteria pollutants upon two conditions:
  - a. that the facility is required to submit only a one-time toxic substances production or use survey under the Emission Inventory Criteria and Guidelines Regulation, and
  - b. that the local district does not incur significant additional expense in implementing "Hot Spots" Act requirements with respect to the facility;
4. Revised the list of districts for which the ARB will establish fee schedules as part of the Fee Regulation (other districts must adopt district "Hot Spots" fee rules); and
5. Updated the list of district air toxics inventories, reports, or surveys.

The table below presents the range of proposed facility fees for fiscal year 1992-1993 based on tons per year (TPY) of criteria pollutants emitted. Graduated fees, per ton, and flat fees are fees which are calculated by the ARB, while specified fees are calculated by the districts (see endnote for definitions).<sup>41</sup>

Source Category	Fee Type	Existing Fees	Proposed Fees
Over 25 TPY	Graduated - Per Ton -	\$168-\$102,875 \$6.23-\$20.50	\$292-\$1,774* \$9.13-\$43.82
10-25 TPY	Flat - Per Ton - Specified -	\$112-\$367 \$6.23-\$16.29 \$450-\$2,000	\$170 \$14.28-\$28.44 \$286-\$450
Less than 10 TPY	Specified -	\$40-\$1,000	\$25-\$450
All Facilities Toxics Emissions	Specified -	\$100-\$1,000	\$100-\$450

[\* this reduction is due to substantial emissions reductions by one facility that had been responsible for the highest graduated fee payment]

The state ARB set fees based on criteria pollutant emissions, because the Hot Spots Act-specific air toxics inventories were incomplete. However, the air toxics inventory is now more complete. Consequently, Senate Bill 1378 of 1992 requires that future fees must be based on toxic emissions and facility risk priority to the extent possible. The fiscal year 1993-94 proposed fee regulation will be the first step in the transition from a criteria pollutants fee basis to a toxic emissions related fee basis.<sup>42</sup>

The fiscal year 1990-91 Fee Regulation contained state fee schedules for 13 districts; the remaining 21 districts were required to adopt their own fee rules to recover their costs for implementing the program. In fiscal year 1992-93, 10 air pollution control districts are recovering their costs through the state fee schedules; 24 districts must adopt district rules to recover both district costs and the district's share of state costs.<sup>43</sup>

Materials listed as "toxic" under the Hot Spots Act were compiled by the California Air Resources Board. In order to charge the facilities that are emitting pollutants, each district not relying on state fee schedules must first determine the costs to implement both state and district-required information program activities and then calculate the total fees needed to cover these costs.<sup>44</sup>

## EVALUATION CRITERIA

As an information program, the program is potentially a cost effective approach to pollution control. Its effectiveness based on the incentive effective of the fees alone is unknown. Particularly because the fees have been tied to criteria pollutants, it is not clear whether there are sufficient financial incentives in the state rules to make meaningful reductions, or to affect toxic air pollutants. (Compare discussion of the Bay Area fee program, *infra*). The disclosure aspect of the program is believed to act as a cost-effective incentive for reductions.

The program potentially provides incentives for technology innovation by encouraging incremental reductions in amounts of pollutants emitted. The information disclosure appears to be a robust tool. The robustness of the fee aspect of the program depends substantially upon the fees being well-set to affect behavior -- not something that can be assessed thus far.

There is a potentially significant burden to the administering agency, which is defrayed by the fees collected. The program poses some difficulties for regulated industry, but is incremental to existing reporting burdens.

The program is integrated with the existing regulatory system.

The program offers a reasonable ability to set goals and some opportunity to predict results; however, it is limited in the respect that the total charges cannot exceed the allowable district and state program costs.

The distributional effects of the program are that it "privatizes" the regulatory costs of disclosure and oversight. The industry pays the bill for its regulation; costs are then passed on to the industries' customers rather than shared by all taxpayers.

The program offers some flexibility and adaptability in that the charge calculations can be adjusted as needed over time to meet different goals.

**AIR POLLUTION  
POLLUTION CHARGES/INFORMATION PROGRAM**

**CALIFORNIA - BAY AREA "HOT SPOTS"**

**PROGRAM DESCRIPTION**

A Bay Area, California program uses information disclosure financed by pollution charges to address emissions of toxic air contaminants. California's AB 2588, Air Toxics "Hot Spots" Information and Assessment Act of 1987 requires that certain health and safety information concerning a facility's air emissions of toxics be made available to the public. A 1990 amendment stipulates that Districts must collect fees to cover state and District AB 2588 program costs. The Bay Area Air Quality Management District's (BAAQMD) new formula by which fees are calculated places a higher burden of the Act's cost on industry generating the greater percentage of the toxics and the higher health risks.<sup>45</sup>

The Bay Area Air Quality Management District has assessed fees since 1988, initially using an "arbitrary weighting factor for charging each industry for toxic emissions" that was not reflective of the actual levels of toxicity discharged into the air. Under the newer 1992 fee structure, the BAAQMD uses Unit Risk Values (Urbs) for carcinogen emissions and Acceptable Exposure Limits (AELs) for non-carcinogen emissions to calculate each industry's fees. Under the new fee formula some industries will pay a significant increase in fees while certain facilities with low toxic emissions will not pay anything.<sup>46</sup>

Materials listed as "toxic" under AB 2588 were compiled into a list by the California Air Resources Board. To charge toxic user facilities, the BAAQMD must first determine the costs to implement both state and BAAQMD required information program activities and then calculate the total fees needed to cover these costs. For each stationary source emitting listed toxic substances, the BAAQMD fee is assessed based on the weighted emissions (weighting is described below) of the facility as follows:<sup>47</sup>

<b>Facilities with weighted emissions between:</b>	<b>Toxics fee:</b>
150,000 and greater	\$50,000
100,000 and 150,000	\$40,000
60,000 and 100,000	\$30,000
40,000 and 60,000	\$25,000
20,000 and 40,000	\$20,000
15,000 and 20,000	\$15,000
10,000 and 15,000	\$10,000

Facilities with weighted emissions between:	Toxics fee:
4,000 and 10,000	\$5,000
2,000 and 4,000	\$2,000
1,000 and 2,000	\$1,000
500 and 1,000	\$500
200 and 500	\$200
50 and 100	\$100
less than 50	\$0

The weighted emission for each facility is calculated by multiplying the quantity of each toxic pollutant by either (1) the Unit Risk Value for the substance times one hundred thousand (in cubic meters/microgram) if the emitted substance is a carcinogen, or by (2) the reciprocal of the acceptable exposure level (AEL) for the substance (in cubic meters/microgram) if the emission is not a carcinogen; and then summing all of the results to reflect the aggregate emissions. The formula follows.

$$\text{Weighted Emission} = \sum E_i Q_i$$

Where

- $E_i$  = amount of substance  $i$  emitted by facility in lbs./year
- $Q_i$  = Unit Risk Value times  $10^5$  if  $i$  is a carcinogen; or
- $Q_i$  = [Acceptable Exposure Level]<sup>-1</sup> if  $i$  is not a carcinogen.

Late payment fees and possible permit revocation proceedings apply to facilities not in compliance with the fee payments.<sup>48</sup>

Since the fee is directly related to the toxicity of the facilities emissions there is an incentive to minimize those toxic emissions. The BAAQMD has seen an overall reduction in toxic air emissions. The toxic based AB 2588 fees have contributed to this reduction of toxic air contaminants. The state program was amended in 1992 to allow Districts to require risk reduction measures, including additional abatement equipment or substitutions of materials. Most firms in the district apparently agree that relating fees to a firm's toxic emissions is reasonable.

Hospitals and small metal plating facilities are impacted the hardest under the new fee formula. Ethylene oxide and hexavalent chromium have high URVs, and hospitals and plating facilities did have greater fees in 1991-92 and 1993: In the past, these toxins' fees were not set at levels commensurate with their risk to the public. Most hospitals and the chrome plating plants installed Best Available Control Technology (BACT) to control

emissions.<sup>49</sup> Therefore, these facilities will realize benefits of reduced emissions in fiscal year 1992-93. In order to protect small businesses from economic ruin because of the new fee structure, a \$5,000 cap was created for small business. Small business is defined as no more than 50 employees and \$5,000,000 in annual receipts.

The fee structure impacts a wide variety of private industrial business and local and federal governmental services and facilities. Many of these businesses experienced no change or a decrease in fees. The \$1.16 million collected for 1992 came from 1,200 facilities, down from the 1,850 facilities that paid in 1991. As the above table shows, the highest fee for a facility is \$50,000, while the lowest is \$100. Some firms, however, experienced a doubling or tripling of fees over the FY 1990-91 levels.

## **EVALUATION CRITERIA**

The program is potentially a cost effective approach to pollution control. It provides incentives for technology innovation by encouraging incremental reductions in both amounts and toxicity of pollutants emitted. The program appears to be fairly robust as the emitted substances are known from regulatory reporting requirements.

There is a potentially significant burden to the administering agency, which is defrayed by the fees collected. The program poses some difficulties for regulated industry, but is generally overlaid on existing reporting burdens. It is, consequently, integrated with the existing regulatory system.

The program offers a reasonable ability to set goals and some opportunity to predict results; however, it is limited in the respect that the total charges cannot exceed the allowable district and state program costs. The program offers some flexibility and adaptability in that the charge calculations can be adjusted as needed over time to meet different program costs.

## AIR POLLUTION POLLUTION CHARGES

### TEXAS - TAX ON INDUSTRIAL BOILER OIL

#### PROGRAM DESCRIPTION

A Texas pollution prevention program uses pollution charges to reduce the generation of air contaminants in the state. In 1989, Senate Bill 769 amended the Texas Clean Air Act to encourage the use of natural gas and other alternative fuels. More specifically, the Texas Air Control Board (TACB) is required to levy a 20 cent per MMBtu clean-fuel incentive surcharge on fuel oil used in all industrial and utility boilers capable of using natural gas. The surcharge only affects those boilers in use between April 15 and October 15 of each year and located in ozone non-attainment areas with populations of 350,000 or more.<sup>50</sup>

The 20 cent per MMBtu clean-fuel incentive comes as part of a wider program to provide incentives for industry and transportation to burn natural gas. In addition to the industrial boiler surcharge, the Senate Bill 769 requires transit authorities operating vehicle fleets in federal non-attainment areas to have 90% of their vehicles with the capacity of running on compressed natural gas or other alternative fuel.<sup>51</sup> All revenues from the 20 cent surcharge are deposited to the General Revenue Fund of the State of Texas.

Certain exemptions are written into the law that exclude some industrial and utility boilers from the surcharge. Provided that the facility has approval from the TACB, Texas Water Commission, or the United States Environmental Protection Agency the burning of waste oils, used oils, and hazardous waste-derived fuels for purposes of energy recovery or disposal is exempt. If there is a failure to deliver sufficient quantities of natural gas to satisfy the facility's contract or the facility is using fuel oil for equipment testing or personnel training for less than an aggregate of 48 hours then there is no clean fuel incentive surcharge. Also excluded from the surcharge are facilities with fixed price contracts to public works agencies where the contracts pre-date the amendments.<sup>52</sup>

Texas has the largest natural gas reserves in the Lower 48 states. Natural gas burns clean and machinery that runs on it requires less maintenance.

#### EVALUATION CRITERIA

There are insufficient data to ascertain the cost-effectiveness of the program. Moreover, it is uncertain how much fuel switching might have occurred absent the tax.

The program contains some incentives for technology innovation to convert boilers to more efficient use of natural gas; but no incentives to retrofit boilers that cannot now use natural gas since the tax does not apply to them.

The program appears somewhat robust, but is subject to technology limitations and to fluctuations in market prices and to demand.

There is little administrative burden to the regulatory agency. Costs conceivably could be high for the regulated industry, particularly where conversion remains uneconomic; essentially raising the costs of production with no necessary environmental benefit.

The program integrates reasonably well with existing regulatory programs, provides some basis for goal setting and predictability. The distributional implications of the program are to favor natural gas producers over their competitors in fuel oil production.

The program has little flexibility, but the tool itself (taxes to encourage fuel switching) potentially has a considerable range of potential applications.



**CHAPTER TWO:**  
**WATER POLLUTION PROGRAMS**



## CHAPTER TWO: WATER POLLUTION PROGRAMS

This chapter examines four water pollution control programs: three are controlled trading programs. (These are the only controlled trading programs with any operating experience). The fourth is a system of enhanced monitoring for groundwater in areas of particular vulnerability.

There are a few other water pollution control programs with the potential for controlled pollutant trading, but where there has been no experience or where managers believe the possibility of trading is unlikely (e.g., Cherry Creek, Colorado). Recent amendments to the federal Coastal Zone Management Act also authorize some pollutant trading in marine and estuarine waters, but programs are not yet in operation.

Several states have adopted systems of differential permit fees based on volumes of water pollution discharges. New Jersey, for example, has a sliding scale of discharge fees, as does California. However, the fees appear not to operate as an incentive to reduce pollution. They are charged not on individual pollution increments -- where they might have such an effect; nor on toxicity -- where they might produce product reformulation or other forms of pollution prevention. Rather they place facilities in various fee "brackets" based on their discharge volumes. Such systems may, however, provide the basis for future fee-based programs more closely targeted at pollution prevention.

A number of programs discussed in the multi-media chapter of this study also have some bearing on water pollution. A number of the toxic substances affected by toxics use reduction programs, for example, typically find their way into regulated discharges to surface waters. Similarly, solid waste and hazardous waste rebate programs affect a number of items that may otherwise pollute groundwater or surface water -- lead-acid batteries, pesticide containers.

Identification of state and local alternative approaches to water pollution is not simple, in part because the federal Clean Water Act scheme (at least as to surface waters) is pervasive. The Act requires all point sources to have NPDES permits and to meet both technology based and water quality based standards. There is less leeway for state experimentation. (For example, there is no equivalent of the state implementation plan that is a central feature of the Clean Air Act). Such requirements as nondegradation and anti-backsliding also reduce the flexibility of state regulatory agencies. Nevertheless, it is possible to overlay programs upon the NPDES permit scheme. Pollution charges, voluntary programs, liability provisions, information programs, and other schemes can lead to further reductions in some instances. States have been reluctant to do so, however, probably because of the scale of the task of implementing the NPDES program as it stands. (Unlike most of the other delegated federal environmental programs, the Clean Water Act has a significant number of states that have declined to seek federal authorization and instead relied on the EPA for permitting and enforcement).

With respect to nonpoint pollution, there is more state and local flexibility. In general, permits have not been required, although this is changing to some extent with regulation of stormwater. (Some of those permits will be permits-by-rule, however). Apart from state promotion of agricultural "best management practices" (BMPs) through various technical assistance and subsidy schemes, however, little has been done in this area. The Tar-Pamlico program discussed in this chapter is one in which a controlled trading program has been integrated with a more typical state agricultural BMP approach.

In the area of groundwater, in the absence of any comprehensive federal regulatory effort, there has been substantial state experimentation. Most of these experiments have been regulatory in character (e.g., Wisconsin's pioneering "action levels" concept, Arizona's aquifer protection permit program). Nevertheless, there is a great deal of regulatory space for alternative program approaches. The limiting factor, apart from political concerns, appears to be the lack of federal grant funding to supplement limited state budgets. The Nebraska program discussed in this chapter offers one approach that is designed to be sensitive to agricultural interests, and that basically taxes all types of enterprises in a given area of concern in order to monitor and correct groundwater pollution which most likely has been caused by agriculture.

# WATER POLLUTION CONTROLLED TRADING

## COLORADO - DILLON RESERVOIR

### PROGRAM DESCRIPTION

A Colorado pollution prevention program uses controlled trading to reduce facility phosphorus discharges and control water pollution. In May, 1984 the Colorado Water Quality Control Commission (CWQCC) adopted State regulations for the control of water quality in Dillon Reservoir. These regulations allow for tradeoffs between nonpoint source and point source discharges of phosphorus. Through the control of nonpoint discharges the Dillon area facilities can gain discharge credits for point sources. For every pound of nonpoint source phosphorus that is controlled, one-half pound of point source phosphorus may be discharged or allocated.<sup>53</sup> Dillon Reservoir is located in Summit County.

The Dillon Reservoir controlled trading program was designed to assist the CWQCC improve the water quality of Dillon Reservoir while avoiding a "sewer tap moratorium". A 1983 EPA study reported that Dillon Reservoir was borderline eutrophic and would become eutrophic when 1982 levels of phosphorus loading were exceeded. By allowing for trading, the CWQCC intended to promote competition, protect the environment and ease the regulatory burden of water treatment facilities.<sup>54</sup> To date, one trade has been completed.

Dillon Reservoir receives phosphorus from municipal treatment plants, smaller private treatment plants, and non-point septic systems and urban runoff sources. According to the 1984 plan, point sources are required to treat discharges and all newly constructed non-point sources must install control systems. Trading allows for the discharge of phosphorus contaminated wastewater. A point source can acquire extra discharge rights from trades with other point or non-point sources in existence prior to 1984. Point sources trade at a ratio of 1:1 while point to non-point trade at 2:1, "requiring a point source to acquire two pounds of trading rights from a non-point source for every pound in excess of the point source's waste load allocation....This higher ratio is attributable to the increased difficulty of quantifying and identifying non-point source discharge."<sup>55</sup>

Dillon Reservoir is assigned a 10,162 lb phosphorus loading limit for total phosphorus discharges permitted. This figure is based upon a water quality model that predicted the total annual phosphorus load which could be allowed to the reservoir while maintaining an in-lake phosphorus concentration of .0074 mg/l or lower during the summer season. (The adopted water quality standard for the reservoir is .0074 mg/l total phosphorus as a growing season average for the months of July, August, and September). Provided that the phosphorus standards for Dillon are not being exceeded, then credits may be generated. When any nonpoint source phosphorus loading is lowered beyond regulated limits, then credits will be granted to discharge permit holders. Triennial reports on the levels of phosphorus in the Dillon Reservoir must be submitted to the CWQCC.<sup>56</sup> The regulations

prohibit any new or existing wastewater treatment plant treating more than 2,000 gallons per day from discharging effluent with a total phosphorus concentration greater than 0.5 mg/l total phosphorus as a daily maximum.<sup>57</sup>

CWQCC is the authorized agency to register the generation of discharge credits for Dillon Reservoir. Credits are then issued within the point source discharge permits, which incorporate the watershed's point source - nonpoint source tradeoffs.

To receive such a credit, a point source discharger must apply to the Division with the following information demonstrating compliance with the following guidelines: design specifications for the nonpoint source controls for which credit is sought; the amount of total phosphorus which will be controlled; proposed construction requirements; proposed operation and maintenance requirements to assure continuous control; and proposed monitoring and reporting requirements.<sup>58</sup> Any non-point loading from construction activity around Dillon Reservoir is subject to regulations developed by the County. This increased awareness of phosphorus loading from construction sites resulted in a reduction in construction-related spikes of phosphorus into the reservoir.<sup>59</sup>

When compliance is determined, then the Division will issue a permit that will specify the following conditions at a minimum the amount of point source credit; construction requirements; monitoring and reporting requirements; and operation and maintenance requirements.

Transactions may occur among the following entities:<sup>60</sup>

1. A wastewater treatment plant permit holder may apply for credits based on a project built under the direction and control of the permittee.
2. The Summit Water Quality Committee may apply for credits based on a project built under the direction and control of the Committee.
3. Individuals or non-committee members may apply for credits by getting the permit holder for their drainage basin to sponsor their application.
4. Permit holders may trade directly with each other by contract with approval of the State.
5. Several parties may propose a combination of the above to effect a trade, or phosphorus credit.

Any Summit Water Quality Committee member may submit a proposed tradeoff project to the Committee for review. The Summit Water Quality Committee reviews and comments on proposed trades or requests for phosphorus credits. In developing its recommendations, the Committee must consider the following guidelines.<sup>61</sup>

1. The amount of nonpoint source phosphorus removed by a phosphorus control project.
2. Phosphorus credits should ultimately benefit the agency that constructs and maintains control of the project.
3. Monitoring requirements for nonpoint source control projects shall be consistent with Water Quality Control Commission regulations.
4. The Committee should find that the project life will be at least twenty years with maintenance.

If approved, the proposed trade will be transmitted to the CWQCC with a request for approval. The CWQCC will review the proposed project and will issue a letter indicating that the project meets state regulations and procedures. If disapproved, the proposal may be reworked until acceptable. The permit to trade will clearly state the responsibility of point sources to monitor and control the non-point sources from which they acquire discharge credits. The proponent will build the proposed project and monitor its performance for one year. In addition, the Committee may construct tradeoff projects on its own initiative and with its own funds. In such cases the phosphorus credits are held by the Committee until an assignment is agreed upon by another entity.

Before the 10,162 lb total phosphorus loading limit was assigned, treatment plant operators had used state wasteload allocation numbers for discharges of phosphorus. The state's numbers were well above actual discharges. For example, the state regulation for phosphorus controls in the Dillon Basin allows a total point source load of 1,578 lbs. per year. Despite a 50% population increase, 1991 point source loading was only 238 lbs. due to the high level of phosphorus removal provided by the wastewater treatment plants. Through more efficient use of plant facilities, the operators in effect "bought extra time" to develop additional ways of reducing non-point loading.

Only a few applications have been submitted for trading and only one has been completed. However, an increased interest in trading is expected because the current waste load allocations for point sources are insufficient for future growth.<sup>62</sup> In order for the community to continue to expand, trading must occur between point and non-point sources.

Continuous monitoring conducted throughout the watershed since 1981 indicates that even though point source phosphorus loading is much less than allowed by regulations (1984) and nonpoint source loads were reduced in the mid 1980's from levels prior to the control regulation, the basin is within 1500-2000 lbs. per year of the allowable load of 10,162 lbs. The "buffer" or "reserve" is slowly being used up due to land development which increases nonpoint source loading, even with the best management practices being used. Summit County has been considering new land use regulations which would in effect require "no net increase" in phosphorus loads. If new development causes increased phosphorus

from construction and stormwater runoff, then phosphorus loading must be reduced elsewhere by an equal amount so that there is "no net increase." While the concept of "no net increase" has been more or less accepted by policy makers, the issue of creating new zoning and special use permit regulations is very controversial and new regulations have not yet been adopted.<sup>63</sup>

Dillon Reservoir's trading program has the potential for significant cost savings. A waste water treatment plant pays \$860 per pound for the removal of phosphorus from a point source. Removal of phosphorus at a non-point source costs \$119. Based on these costs, it is estimated that trading between point and non-point sources could save \$773,000. The 2:1 trading ratio between point and non-point sources adds to the environmental and cost effectiveness of the program.<sup>64</sup> Costs for the implementation of the program are difficult to estimate, but they are expected to be minor administrative costs for the agency.

## EVALUATION CRITERIA

The controlled trading program has the potential for cost-effective means to control pollution and provides some incentive for technology innovation.

The program may be robust, but has not been effective to date because traditional regulation plus advances in technology have obviated the need for trades; essentially controls by traditional means have been sufficient for point source discharges to meet targets. However, the overall water quality is now chiefly threatened by non-point discharges.

The program imposes some administrative burdens on the regulatory agency. It also imposes costs upon the participating pollution dischargers, in the sense that they may need to design projects and assure the availability of credits. But potentially this may be less expensive than other approaches at the point at which trading becomes viable.

The program is integrated with the regulatory system and allows the setting and achievement of environmental goals (although the initial goal-setting turned out to be based on faulty projections). There are potential distributional implications, but these have been unrealized to date. Performance has not been predictable, yet the program offers flexibility and may be quite appropriate if total loading limits are approached under standard regulation.



## WATER POLLUTION CONTROLLED TRADING

### NORTH CAROLINA - TAR-PAMLICO

#### PROGRAM DESCRIPTION

A North Carolina controlled trading program for water pollution control seeks to reduce nitrogen and phosphorus loading in the Tar-Pamlico Basin (the Basin). The North Carolina Environmental Management Commission identified these rivers as Nutrient Sensitive Waters (NSW) and set up a nutrient-reduction trading program to reduce nutrient loading from a coalition of 12 Publicly Owned Treatment Works (POTWs) and one industrial discharger, known as the Tar-Pamlico Basin Association (the Association).<sup>65</sup>

Tar-Pamlico's NSW Strategy stems from a 1989 study's conclusion that the Basin's waters were exhibiting signs of eutrophication. Listing of the Tar-Pamlico River Basin as Nutrient Sensitive Waters forced the state to develop a nutrient discharge control program. Preliminary research indicated the contribution of both non-point and point source discharges into the Basin. As a result, the trading of water pollution credits between non-point and point sources was suggested. The theory is that non-point sources might install nutrient discharge controls that are equally effective and less costly than those of point sources.

The nonpoint source trading allows the Association either to treat their effluent to remove phosphorus and nitrogen or remove an equivalent level of nutrients from agricultural runoff through contributions to the on-going North Carolina Agricultural Cost Share Program (ACSP), which pays 75% of the farmer's cost of installing Best Management Practices (BMPs), such as grassed waterways or animal waste treatment lagoons. Member farmers of the ACSP must enter into a contract to ensure that BMP improvements meet requirements. The ACSP program is administered by the North Carolina Department of Environmental Health and Natural Resources' Division of Soil and Water Conservation (DSWC).<sup>66</sup>

During 1990 the POTWs worked with the Division of Environmental Management (DEM) to record on-site point source discharge levels and perform engineering evaluations at their plants to identify operational capital improvements that bring discharge closer to nutrient limits. After an Association member has met all feasible point source reductions and is still above its nutrient reduction goal, it can participate in the ACSP to remove the balance.

The Association's projected effluent flows and nutrient loading for 1994 were projected to reach approximately 625,000 kg/yr based on 1989 effluent concentrations. The schedule of Allowable Nutrient Loading outlined for Association members (excluding National Spinning) will limit nutrient loading to 425,000 kg/yr in 1994. The Association may

reach this goal either by making improvements at their plants or by funding the installation of agricultural BMPs, whichever is more cost-effective for the Association. The provisions further allow for a predicted expansion of three POTWs over the course of the NSW Strategy (through 1995). Any new facilities joining the Association (required by municipalities expanding to greater than 50,000 gpd) could require the Association to purchase additional BMPs. The cost to reduce nutrients through agricultural BMPs is \$56/kg/yr. This cost will be paid by Association members unable to meet allotted nutrient reduction goals at the plant.<sup>67</sup>

The Division of Soil and Water Conservation (DSWC) of the Department of Environment, Health, and Natural Resources will manage the nutrient-reduction trading program funds received for agricultural BMPs. DSWC will use the ACSP to set priorities and direct the funding within the Tar-Pamlico basin toward the BMPs that have the "highest potential and efficiency for nutrient removal." The Association has also provided \$150,000 to the DSWC to pay for administering the BMP program. Another component of the nutrient trading agreement requires the Association to fund approximately \$400,000 for the development of a Tar-Pamlico Basin nutrient computer model.<sup>68</sup>

Relevant parties in the program include the authors of the NSW Strategy, the Environmental Management Commission, and the Division of Soil and Water Conservation (DSWC). NSW Strategy authors are: the Division of Environmental Management (DEM); the North Carolina Environmental Defense Fund (NCEDF); the Pamlico-Tar River Foundation (PTRF); and the Association. Members of the Tar-Pamlico Basin Association include: Belhaven, Bunn, Enfield, Franklin Water and Sewer Authority, Greenville, Louisburg, Oxford, Pine Tops, Rocky Mount, Spring Hope, Warrenton, and Washington. Association membership is closed to nonmember dischargers until the beginning of Phase II of the NSW Strategy in 1995. At that time, the NSW strategy will be evaluated and amended as necessary.

## EVALUATION CRITERIA

The program is potentially cost effective in this river basin. The pollutants of concern are common to point sources and nonpoint sources, and control costs for nonpoint sources are likely to be lower. There are incentives for technology innovation, but the greater incentives are for applications of known non-point source technologies and methods on a wider scale.

The program appears to be robust to less-than-perfect implementation. The limited number of point source dischargers makes the monitoring simple on the demand side. The opportunities for supply of pollution credits are substantial; monitoring here will be more difficult, but can generally be assessed based on design parameters (as supplemented by general river monitoring to assure the overall attainment of environmental goals). If in-stream monitoring shows higher nutrient levels than projected, then greater scrutiny can be given to projects that may not be performing as well as projected.

There is a significant administrative burden, but the costs are all borne by the members, and the non-point source control costs (and administration) are piggy-backed on an existing agricultural assistance program.

The program appears to be not unduly difficult for the regulated industry.

The program is well integrated both with environmental regulatory programs and with existing agricultural assistance programs. The program has the potential to carry out identified goals, and to achieve predicted results.

The distributional effects of the program, provided that transactions occur, is to subsidize agriculture and prevention of agricultural pollution at the expense of users of publicly owned treatment works -- primarily urban and industrial users.

The program appears to have substantial flexibility.

## WATER POLLUTION CONTROLLED TRADING

### WISCONSIN - WATER POLLUTION ALLOCATIONS

#### PROGRAM DESCRIPTION

A Wisconsin pollution control program uses controlled trading to improve water quality standards. Transferable Discharge Allocations (TDAs) allow for trading of the allocation to discharge wastes that increase biological oxygen demand in a water body. Traded allocations are effective for a one year minimum and maximum of five years, the length of sellers' discharge permits. All trades are external because the facility permit is allocated for the total waste discharges within the plant.<sup>69</sup> Unlike the Colorado and North Carolina programs, there are no provisions for the trading of non-point sources in Wisconsin.<sup>70</sup> The Wisconsin Department of Natural Resources administers the program.

The reason for implementation of this program came from a need to control the discharge of high biological oxygen demand (BOD) waste water. Loading of BOD approached 300,000 lbs per day on the Lower Fox River which was anaerobic over much of its length during parts of the year. When the DNR began developing wasteload allocations for the Fox and Wisconsin Rivers the idea of trading discharge allocations was presented by economists studying cost effective methods for controlling discharges.<sup>71</sup> Dischargers that can treat wastewater for the least cost could trade BOD allocations into the market and minimize overall treatment costs.<sup>72</sup>

The DNR must review the total maximum load allowed for stream segments at least once every five years. Baseline loading limits are reviewed once every five years and revised when the DNR deems it necessary.<sup>73</sup> DNR considers population projections, plant expansions or other issues when determining whether a modification of baseline limits is needed. The discharger applying to receive a transfer of BOD allocations must secure a legally binding agreement by the DNR.

The plant acquires the allocations to trade by demonstrating that it is unable to meet the permitted discharge limits while operating at optimal levels or if it is new or expanding.<sup>74</sup> The plants that are trading must be within the same impact zone. Modeling identified 21 dischargers on the Lower Fox River, located in three impact zones of seven facilities each. These three groupings presented two barriers to trading. First, the small number of plants makes for a limited market place. And second, all the non municipal dischargers are in the same industrial sector, the paper industry, and are direct competitors with little incentive to trade.<sup>75</sup>

Another substantial barrier to trading comes in the regulation that trades be implemented through the permit process. Buyers of BOD allocations can only purchase the allocations for a minimum of one year and maximum of the time the seller has left on their discharge permit. The five year length of discharge permits is viewed as "relatively

permanent" by facilities that would trade BOD allocations and might need to expand within that time span. On the other hand, the facilities that would receive the BOD discharge allocations view the five years as "temporary and not reliable enough" for any major plant expansions. Growth was expected by most dischargers so they never traded away their potential future discharge needs.<sup>76</sup> The requirement that trades be for a minimum of one year precludes short-term trading that would accommodate temporary facility needs.<sup>77</sup>

Furthermore, regulations in the Federal Clean Water Act (anti-backsliding) and in Wisconsin's pollution codes (anti-degradation) may prohibit the type of trading that the program was designed to foster.<sup>78</sup> According to anti-backsliding provisions, dischargers are required to demonstrate a need before the issuance of any increased discharge permit, a provision which essentially removes DNR's legal authority to use trading mechanisms in water pollution abatement programs subject to the federal Clean Water Act.<sup>79</sup> Anti-degradation requires that an alternative control be considered and analyzed before allowing any discharge increase that would lower water quality.

The trading of marketable discharge allocations was expected to bring abatement cost savings of \$7 million annually. Actual cost savings for dischargers "have been insignificant."<sup>80</sup>

## EVALUATION CRITERIA

While the program was projected to be potentially cost effective, it has not been successful because of defects in the market. The number of potential market participants is small and the pollution units have significant limitations. Moreover, there is no banking function; all trades must be separately negotiated.<sup>81</sup> While there are theoretically incentives for technology innovation, these are limited because of the market size and the short duration of allocations. The program is not robust to less-than-perfect implementation.

The defects in the market may be based upon necessary limitations given the nature of the resource. Trades along rivers and stream reaches are not the functional equivalent of discharges into airsheds or general nutrient levels in reservoirs. The importance of local effects necessarily constrains the market.

There is an administrative burden associated with the program. Difficulty for the regulated industry is unknown.

The system is not well integrated with the regulatory system. There are particular concerns with antibacksliding and antidegradation provisions of the Clean Water Act, the lack of authority for point-source exchanges in the Clean Water Act also undermines the potential value of the pollution units that might otherwise be exchanged. In addition, the interrelationship of BOD discharges and toxics discharges may mean that the program cannot function well consistent with provisions for toxic water pollutants.

The ability to set and achieve goals has not been demonstrated by this program; the distributional impacts are unexplored; and results have not been predictable. There has been market failure. The program may not have been appropriate given the resource and the types of dischargers.

## WATER POLLUTION ENHANCED MONITORING AND ENFORCEMENT

### NEBRASKA - SPECIAL PROTECTION AREAS

#### PROGRAM DESCRIPTION

A Nebraska pollution prevention program uses an enhanced monitoring and enforcement technique to protect the state's ground water resource. Under the 1986 Nebraska Ground Water Management and Protection Act (the Act), special protection areas (SPAs) are created as part of a prevention-oriented ground water quality protection program. The primary goal of the SPA program is to regulate sources of contamination to protect groundwater, with irrigation water management and proper management of agricultural chemicals as the primary controls. The implementing state agency is the Department of Environmental Quality (DEQ) which in turn works with the state's 23 regional natural resource districts (NRD) on a cooperative basis.<sup>82</sup> Both have legal authority to regulate nonpoint source activities which may contribute to ground water contamination.<sup>83</sup>

Nebraska designed this legislation to protect its groundwater resource from agricultural contamination, focusing on nitrate nitrogen and pesticides. Ground water is the only potable water for 99% of the state's rural population and 85% of the entire population. Prior to the Act, NRDs managed water resources under the Groundwater Quality Management Area regulations. The NRDs' receipt of state funding and technological expertise act as incentives to obtain the SPA listing instead of managing their own Groundwater Quality Management Area projects. In addition to these benefits, NRDs may obtain extra funding through a state approved tax of 0.5 cents/\$100 land value for the entire district in which the SPA is located if the NRD has reached its tax limit of 4.5 cents/\$100 land value.

Under the SPA program, DEQ samples ground water in the area that is being considered for designation as a SPA, identifying potential and current problems with contamination. It is usually the NRDs that detect water quality problems, which are then brought to the attention of the DEQ. Mandatory controls are then implemented by the farmers within the SPA boundaries.<sup>84</sup> The Act also requires that any construction of water wells, installation of pumps, monitoring of ground water levels, or plugging of an abandoned well must comply with the state's water well standards and Contractors' Licensing Act.

According to the Act, the DEQ may obtain information concerning ground water contamination either through: the required reports of any state agency with information of such contamination or studies conducted and available to the DEQ.<sup>85</sup> With this information, the DEQ must conduct preliminary investigations to determine the source for present or likely contamination. The DEQ will also consult the NRD's ground water management plan for that district.

With confirmation of nonpoint source contamination, within 120 days the Director of the DEQ must hold a public hearing to present the study indicating contamination, describe the boundaries, gather any other evidence, and "secure testimony" on whether to designate the area under SPA. The Conservation and Survey Division of the University of Nebraska, the Department of Health, the Department of Water Resources, the Nebraska Natural Resources Commission and the local NRD will offer any evidence relevant to the hearing.<sup>86</sup>

The ultimate designation of an SPA is determined by the following criteria: (1) the presence of nonpoint source contaminants at levels of impairment, concern, or increasing concentration trends, (2) the imminent threat that within the foreseeable future nonpoint source pollutants will impair desired uses of the ground water resource; (3) whether ground water users suffer economic hardships by activities which cause ground water contamination; (4) whether methods are available to control the contamination; and (5) whether the administrative agency can carry out the regulations. SPA designation can take three years from the start to finish.<sup>87</sup>

Once SPA designation occurs, an action plan must be prepared within 180 days by the natural resource district or districts within whose boundaries the area is located. The action plan is "designed to stabilize or reduce the level and prevent the increase or spread of ground water contamination".<sup>88</sup> Next, the action plan must be posted and circulated 30 days prior to the public hearing which must be held within 30 days of the completion of the action plan. Within 30 days of the hearing the NRD must adopt and submit the action plan to the DEQ. These action plans must be approved by the DEQ, which then maintains an oversight role.<sup>89</sup> To date, 10 official SPA studies have been conducted resulting in the declaration of 2 SPAs by the Director of the DEQ. Meanwhile, several of the other studies are in various stages of completion, and could still result in SPA designations. Both of the existing SPAs have NRD-developed, state approved Action Plans that have been implemented to address nitrate contamination of rural drinking water wells.<sup>90</sup> However, it should be noted that if an NRD fails to produce an acceptable Action Plan, DEQ must take over the administration of the SPA.

Farm operators in the SPA must participate in meeting the goals of the action plan. In addition to mandatory participation in NRD courses on nitrogen and irrigation management and restrictions on fertilizer usage, the farmers must perform monitoring. They are required to submit soil samples for analysis by the NRD staff, and to complete annual forms reporting soil testing results, fertilizer usage, and other data. The analysis is usually done by an EPA approved laboratory. Farmer participation has been high in all SPA areas.<sup>91</sup> The DEQ is considering the development of a uniform conservation farming training program for all the NRDs to access.<sup>92</sup> In addition, the monitoring performed at the NRD level is coordinated with any U.S. Geological Service studies or state research.

Monitoring the quality of ground water is essential to the success of the SPA program. Stabilizing contamination and preventing further degradation from nonpoint



sources are long-term projects. Action plans will be continued until the contamination problem is solved. If the action plan is unsuccessful in addressing the problem, amendments can be required by the DEQ. When the NRD can demonstrate that nonpoint source contamination problems have been controlled to the "extent it no longer poses a detriment to the beneficial use of ground water within the area," they may petition for the DEQ to remove the area from SPA designation.<sup>93</sup>

Funding, as expected, has proven to be a limiting factor to the success of this program. Originally, the NRD levied an annual 2 cent tax on each \$100 of all taxable property within the boundaries of the SPA to assist in financing the implementation. Revenues generated were not enough to sustain the program monitoring and implementation because of the small size of the areas affected by SPA status and the value of the lands within SPAs. Now the NRD may assess a tax of 0.5 cents/\$100 land value on all the taxable property within an entire NRD, if the taxes are already at their 4.5 cents/\$100 valuation general tax limit. The generation of more funds is expected.<sup>94</sup>

## EVALUATION CRITERIA

Nebraska's groundwater protection Act attempts to be cost-effective by focusing its measures only on areas of concern. Costs absorbed by the administering agency may be in part offset by the federal Clean Water Act §319 and Water Quality Incentive Program funding. Cooperative agreements with the farm-oriented programs encourage technological innovation for improved fertilizer application and reduction of nitrate contamination. The Nebraska Legislature believes that local control (at the NRD level) is the most effective option for management of nonpoint source ground water pollution.<sup>95</sup>

Because of the distribution of program responsibility between the state and separate district agencies, the program is susceptible to problems under less-than-perfect implementation such as funding constraints and limited staff and information. The state's responsibility as program administrator has been delegated to the 23 NRDs. Nebraska has the appropriate technical expertise to manage the water contamination data, but has the burden of developing efficient farmer education programs and performing regular monitoring.

The program has been successfully integrated into the existing state structure of Natural Resource Districts. The program also responds in part to existing federal legislation, such as FIFRA and SDWA. Nonetheless, the SPA program is unique. If incorporated into a federal model, Congress could safely set and insure goals for such a program if there were a high quality monitoring system to ensure compliance with water quality improvement.

Nebraska's system of taxing the individual district with ground water contamination is fair and also keeps the benefits of the tax - cleaner drinking water - inside the taxpayers' district. An earlier version of the state Act taxed 2 cents on each \$100 of contaminated

property within the SPA. This design created a distributional system that was perhaps more fair by focusing the tax on the contaminated area and hence the contaminators and direct beneficiaries. Due to an inadequate generation of funds, however, the program was expanded to tax the entire district.

Since no SPA designated area has yet been removed from listing, there is insufficient information to make predictions concerning the achievement of improved environmental quality and total costs. The program's use of farm extension services and local NRDs, however, illustrates the flexibility of the SPA Act for meeting rural environmental control goals.

**CHAPTER THREE:**  
**SOLID WASTE PROGRAMS**



## CHAPTER THREE: SOLID WASTE PROGRAMS

This chapter examines nine solid waste programs. Six of these are statewide programs and three are local programs.

Two of the programs, the Maine and Oregon bottle bills, rely on deposit-rebate approaches. New Jersey imposes a tax upon litter-generating products. Florida has a unique incentive system to improve the level of newspaper recycling. Massachusetts has a voluntary program aimed at the same thing - improving newspaper recycling rates.

The three local programs examined in this chapter are variations on volume or weight based fees for solid waste pickup. Examination of these programs emphasizes the importance of planning. Simple imposition of fees without attention to related recycling and ancillary programs is less likely to generate desired results. One state-wide program, that of Arkansas, is a volume-based statewide fee program for solid waste disposal. The program has not had the expected results, and comparisons between it and the three local programs suggest both the importance of targeting fees on the initial disposer and providing alternative and ancillary services.

Solid waste offers the greatest range of state and local innovation, primarily because the field has not been occupied by federal regulation. As yet, there are no generally applicable federal recycling requirements, and the municipal solid waste landfill regulations (which primarily focus on technical issues and monitoring) are not yet effective at the operating level.

The experience of several states with bottle bills suggests that the deposit-rebate approach, while causing initial dislocations, is likely to be feasible in other states, as well as useful for other sorts of consumer products and packages. Some additional deposit-rebate programs are examined in Chapter Four: Hazardous Waste Programs.



## SOLID WASTE POLLUTION CHARGES

### ARKANSAS - LANDFILL REDUCTION

#### PROGRAM DESCRIPTION

An Arkansas pollution prevention program uses pollution charges in the form of disposal fees to fund statewide waste management programs and community grants. The Solid Waste Management Fees and Grants (SWMFG) program, or Regulation 11, is established by state regulation. Beginning in 1989, the program generates landfill fees under provisions in the Arkansas Solid Waste Management Act (Act), exempting only permitted public utility landfills that take ash generated by the combustion of coal to produce electric energy.<sup>96</sup> The Arkansas Department of Pollution Control and Ecology Solid Waste Management Division (Division) administers the program.

At the time of the program's inception Arkansas was threatened with the dumping of massive quantities of out-of-state wastes in both new and existing landfills. The importing of wastes could have easily depleted existing disposal capacity of several localities while in other areas creating a boom in unwanted new landfills specializing in the import of out-of-state wastes. The perceived threat was not only a threat of pollution but a threat to adequate state regulatory controls and adequate local supervision of landfills that would take in new influxes of wastes. The Solid Waste Management Fees and Grants program was designed to lighten the solid waste burden on the state's limited landfill space. The landfill disposal fee is used to fund statewide waste management programs.<sup>97</sup>

The Act also established a grant program to assist in community development of recycling and solid waste management programs. Revenues generated by the fee on solid waste disposal support the State Marketing Board recycling program, a post-closure fund to assist landfills that have reached capacity, and the recycling grant program.<sup>98</sup> It is the Act's intent to create incentives for localities to change from excess solid waste disposal to programs of waste reduction and recycling.<sup>99</sup> In 1993, the legislature amended the Act to require that grant funds be allocated to the state's 17 solid waste districts based on the amounts their facilities pay into the program.<sup>100</sup>

The Division based the disposal fees on projected grant funding requirements and the projected quantities of solid waste deposited at the industrial and municipal landfills. Different disposal fees are outlined for industrial landfills (ILs) and municipal solid waste landfills (MSW) below:<sup>101</sup>

Category of Trash	Municipal	Industrial
Uncompacted cubic yard of waste received at the landfill	40 cents	10 cents
Compacted cubic yard of waste received at the landfill	75 cents	20 cents
Ton of solid waste received at the landfill	\$2.50	50 cents

Factored within this fee structure is a post closure fee for MSWs under the provisions of the Landfill Post-Closure Trust Fund Act. MSWs are charged a rate of: 15 cents per uncompacted cubic yard of solid waste; 30 cents per compacted cubic yard of solid waste; or \$1 per ton of solid waste.<sup>102</sup> Revenues generated under Regulation 11 total \$5 million per year.

Industrial landfill fees are approximately half of the municipal solid waste fees. There are 30 active Industrial Landfills. The Division's original revenue calculations proved over estimations. The Division has received only 20% of the anticipated industrial fees. The Division discovered that industry only sends a small quantity of materials into Industrial Landfills, and that most waste products go to MSW landfills.

When the program began, there were approximately 65 active municipal solid waste landfills. Because of the program, as well as other factors, this number has been reduced to approximately 40. EPA's municipal solid waste landfill regulations are expected to lead to the closure of some of the remaining 40 municipal solid waste landfills.

In order to determine the initial disposal fee, the Division required landfills to monitor landfill waste flows and submit monthly pre-implementation reports. Now, Regulation 11's quarterly landfill disposal fees are based on projections of next quarter's expected waste flow. The Division is required to notify landfill permittees of their assessment rate and permittees are required to keep records of waste flow and submit quarterly reports and payments. When the landfill "permanently ceases receiving waste" it must submit a final quarterly report so that the ADPCE can check the prepayed projected waste flow disposal fee to actual quarterly dumping. Readjustments are then made. Also, a late payment charge of 10% is added to the fee if the full amount is not paid within 15 days after the due date.<sup>103</sup>

Arkansas has not seen a reduction in waste volumes as a result of the program. Indeed, there has been a slight increase over the course of the program. State regulators attribute the increase not to an actual increase in waste generation and disposal, but to better and more reliable reporting by those landfills that remain in operation; marginal operators tended to underreport in order to save on fees. Also, it is possible that some waste that was not going to permitted facilities at all is now beginning to do so due to heightened environmental awareness in the state.



## EVALUATION CRITERIA

It is impossible to assess the cost effectiveness of the program. It has not led to a reported reduction in waste generation and disposal volumes. It has, however, in conjunction with other factors, hastened the closure of marginal operations that were generally those with less sophisticated waste handling and disposal practices. These were less able to pass through all of the costs and still maintain their customer base (which was primarily price-driven). It has also provided a funding source for solid waste planning and recycling programs. In fact, this has been the primary impact of the program.

There are no evident incentives for technology innovation. Fees are not substantial enough to encourage individual source reductions that might drive innovation.

The program may be robust at these relatively low fee levels, but requires more attention if fees were to rise. Specifically: (1) that the fees be set properly to change behavior and to obtain a pass-through to initial disposers (e.g., in a volume-based format rather than a generalized charge), and (2) that monitoring occur to ensure that wastes are not diverted to illegal sites.

There is some administrative burden upon the regulatory agencies, as upon the landfills, but these are not substantial. The program appears to be well integrated with the existing regulatory scheme used by the state.

It is not clear that environmental goals can be reasonably set and met through this program alone. One concern is unlawful disposal of wastes outside the system; another is the low supply and high demand for landfill space that may make the fees trivial in comparison with market-based increases in disposal prices as an influencer of behavior. However, the program does generate needed funds for postclosure and for recycling and does discourage disposal (albeit only in gross). The distributional effects of the program appear to be two-fold -- one, a transfer of funds from disposers to the state and solid waste districts in the form of a tax; and two, increasing the rate of displacement of marginal operators by larger-waste-handling companies.

Although the program did not act precisely as predicted, it has allowed some projections of waste volumes by providing information, and has provided greater assurance of environmentally sound closures (both by providing funds for postclosure, and indirectly by leaving remaining operations in the hands of operators with greater assets). The program may be appropriate in dealing with future large-scale issues of waste reduction, but tends not to produce reduction of waste generation at the disposer level as currently administered. It operates chiefly as a funding source for governmental programs in the solid waste management area.

## SOLID WASTE POLLUTION CHARGES

### FLORIDA - RECYCLED NEWSPRINT

#### PROGRAM DESCRIPTION

A Florida pollution prevention program uses pollution charges to control solid waste and encourage recycling. On January 1, 1989, waste newsprint disposal fees of 10 cents/ton were imposed by law upon every producer or publisher in the state based on the amount of newsprint consumed. These fees were used as an incentive to encourage producers and publishers to increase their use of recycled newsprint up to 50% state wide by October 1, 1992.<sup>104</sup> If this goal had been reached then the product waste disposal fee on newsprint would have been rescinded. However, Department of Environmental Regulation inspections found that producer and publisher compliance fell short of the 50% recycling rate; Florida increased the disposal product disposal fee to 50 cents/ton.<sup>105</sup> Although the disposal fee is assessed state-wide on all producers and publishers if the state-wide goal is not met, individual producers and publishers are entitled to claim a 50 cent credit for each ton of recycled newsprint used in their products. Thus, if a publisher uses only recycled newsprint, it pays no tax.

The administering agency for the program is the Department of Environmental Regulation, Division of Waste Management. The quarterly product waste disposal fee is reported and paid to the Department of Revenue. Florida developed this newspaper recycling legislation to reduce newsprint disposal and encourage recycling in a state that is ranked the fourth largest newspaper producer in the nation. Prior to the legislation, Florida had nearly no newsprint recycling efforts.<sup>106</sup>

The 1991 review of producer and publisher compliance revealed that the level of newspapers being recycled only reached 40% in 32 of Florida's 67 counties. Same year waste-composition studies report that the state generated 1.21 million tons per year of old newspapers, 479,000 tons of which was then recycled.<sup>107</sup> Even after 1992 the fee increase up to 50 cents/ton, recycling was only between 30 and 40% state wide. However, the Tampa and Tallahassee newspaper publishers have managed to get recycling up over 60% in separate programs. The state interprets this as evidence that industry can follow the guidelines of the state recycling plan.<sup>108</sup>

Under the law, any producer or publisher using newsprint in publications must accept reasonably clean newsprint for recycling purposes. Old newspapers are accepted for recycling at the place where they were produced or published or at other "convenient sites offered by the producers or publishers".<sup>109</sup> In 1992, old newspapers were received by processors in the state for \$5 per ton for "loose newspapers" while mills paid \$25 per ton for baled newspapers. A typical charge of \$22 per ton to haul loads of old newspapers adds to the total recycling cost. All the same, the cost of landfilling newsprint is higher and

recycling efforts are reported to save the state money despite the processing and hauling costs. As an added incentive to recycle, producers and publishers receive 25 cent credits for each ton of old newspapers processed into newsprint. Such claims must be made quarterly to the Department of Revenue and must be accompanied by the documentation required.<sup>110</sup>

Despite these various incentives that encourage recycling, the Florida recycled newsprint legislation does not charge high enough disposal fees to discourage dumping. Publishers currently pay between \$400 and \$700 a ton to purchase newsprint. Given these large costs, a 10 cent or 50 cent additional charge is more a token fee than a substantive cost to the publisher.<sup>111</sup> Even with the 40 cent fee hike, disposal fees collected for 1992 were only \$260,000, up from the \$52,000 in 1991. Revenues generated by the fee will go toward grants for local government recycling-related programs.<sup>112</sup>

Three changes in the waste newsprint disposal fees law came about in the 1993 legislative session. First, in order to create more effective legislation, the formerly biennial to triennial reviews of publisher compliance are now made annually. This will provide a more timely determination of the percentage rate for recycled newsprint. With such figures the state can more quickly respond to publishers' compliance or noncompliance. Second, the fee has now been raised to \$1/ton effective January 1, 1994 if the 50% recycling goal is not reached. (The credit for using recycled newsprint was also raised to the same amount). Third, the recycling goal increases from 50% to 60% by October 1999, and the fee for not reaching this goal will be \$2/ton.<sup>113</sup>

The legislature also added a requirement for aggregate consumption of recycled fiber to rise steadily to 30% by the end of 1995. This provision recognizes that recycled newsprint contains varying amounts of recycled fiber. If these goals are not met, individual producers and publishers may be fined \$5 per ton for their shortfall, subject to specified extenuating circumstances set forth in the law.

## EVALUATION CRITERIA

The program appears to have the potential for cost effectiveness in controlling solid waste and in creating a market for recycled newsprint. It also encourages technology innovation, which is necessary to use a high volume of recycled newsprint with modern highspeed presses.

The program's history shows that it is somewhat robust to less-than-perfect implementation, but its longterm success has yet to be demonstrated. The administrative burden upon the DER includes oversight, report reviews, and monitoring; that upon the revenue agency includes tax collection, audits, and reviews. The program is within the capability of the regulated industry, but experience to date has shown that achievement of the goal is not simple. The program is reasonably well integrated with the existing regulatory and taxation systems.

The program demonstrates some ability to set and achieve goals, and the capacity to deal with shortfalls in compliance. The distributional implications of the program are uncertain.

The program demonstrates creativity, flexibility, and appropriateness in using economic tools to attack solid waste generation and recycling market issues together.

**SOLID WASTE  
VOLUNTARY PROGRAM**

**MASSACHUSETTS - RECYCLED NEWSPRINT**

**PROGRAM DESCRIPTION**

A Massachusetts pollution control strategy uses a voluntary program to get newspaper mills to invest in de-inking to increase the demand for old newspapers and to develop a recycling market. The 1992 memorandum of understanding (MOU) between the Commonwealth of Massachusetts and the Massachusetts Newspaper Publishers Association (MNPA) outlines a schedule for increased newsprint recycling. This MOU arose in the context of a regional effort within the northeast states, facilitated through the Northeast Recycling Commission. The initial MOU was signed in 1989. The Commonwealth agrees to facilitate recycling programs through collection and processing program development within the state. In turn the association promises to use more recycled fiber in its product, working to achieve 40% by 2000.<sup>114</sup> The administering agency is the Secretary of Environmental Affairs.

The MOU is the result of the Commonwealth's search for ways to decrease the economic and environmental costs for solid waste disposal. Newspapers comprise approximately 7% of municipal solid waste. Newspapers are also the most commonly recycled household product, and 200 communities in Massachusetts have collection programs for newspapers. Although an earlier MOU between the commonwealth and the MNPA established a higher percent (50%) of recycled newsprint by the year 2000, it was discovered to be a lesser quantity of truly recycled newsprint. The new MNPA's definition of recycled fibers classifies 1991 newsprint as 6.4% recycled content as compared to its earlier calculation of 16.2%. Taking the newer definition into consideration, the updated MOU actually sets a more ambitious goal of 40% recycled newsprint by the year 2000.<sup>115</sup>

In accordance with the MOU, MNPA commits to promoting to the public the development of newsprint recycling programs. The MNPA agrees to meet the following goals for recycled newsprint:<sup>116</sup>

<b>YEAR</b>	<b>% Recycled</b>	<b>YEAR</b>	<b>% Recycled</b>
December, 1993	13%	December, 1997	31%
December, 1995	23%	December, 2000	40%

However, the MOU excuses publishers from not achieving these goals if high quality recycled newsprint is not available at prices competitive with virgin newsprint. The MNPA further agrees to submit annual reports to the Secretary of Environmental Affairs explaining: (1) the total percentage and tonnage of recycled fiber used by members and (2) any

difficulties faced by members in abiding by the MOU. Over the next 10 years MNPA members will purchase by contracts a certain percentage of recycled fiber newsprint with preference for that manufactured in Massachusetts.

The Commonwealth agrees to promote the development of newspaper recycling processes and markets that will meet the quality standards for publishers, de-inking facilities and paper mills converting the old newspapers into a usable product. Also, the Commonwealth commits to "oppose any legislation filed...that would mandate that recycled content of newsprint purchases or that would impose penalties on the use of non-recycled content newsprint in newspaper published in Massachusetts." The Commonwealth further commits to ease the economic burden of publishers by facilitating private investments in the state, including: (1) site searches; (2) offering financial assistance programs; (3) managing the publishers permitting process so to relieve them of "overly time consuming procedures." And the Commonwealth will make annual reports to MNPA and the public addressing the status of the newsprint recycling program.<sup>117</sup>

Eastern North America now has 13 papermills that can process newspapers into recycled newsprint, compared with just one prior to the 1992 MOU. At the agreed to rates of recycled newsprint purchasing, Massachusetts publishers will need twice as much recycled newsprint by 1996 as they currently use. Either the existing papermills will absorb this demand or new recycling industry will develop. The Department of Environmental Protection views the publishers' voluntary agreement to this program as a signal of industries' commitment and leadership in making recycling a significant "part of Massachusetts' management solution."<sup>118</sup> By the year 2000 over 100,000 tons of old papers will have been purchased by MNPA members for making recycled newsprint.<sup>119</sup>

## **EVALUATION CRITERIA**

The program has the potential for cost effectiveness, but there is insufficient information to make a determination at this time. It does provide incentives for technology innovation.

The program, like most voluntary programs is not robust to less-than-perfect implementation. The parties to the MOU may in fact default on their commitments. There is some burden on the administering agency. There is also some burden upon the industry; the program requires some development in technology and an increase in the number of papermills able to supply the necessary product.

There is no particular integration with a regulatory system because of the nature of the program. The key to an effective voluntary agreement is reporting and publicity.

The ability of the system to achieve the desired goals, and predictability of the results, are uncertain. However, goals are more readily met when the program operates with a relatively narrow set of groups with similar interests. With a limited number of

newspaper publishers working with a small number of newsprint mills, there exists a smaller range of paper grades and an easier recycling task to perform. Distributional impacts are not clear. The system appears to offer significant flexibility to all of the parties to the MOU.

## SOLID WASTE POLLUTION CHARGES

### ILLINOIS - WOODSTOCK'S PAY PER BAG

#### PROGRAM DESCRIPTION

A Woodstock, Illinois pollution prevention program uses a pay per bag system to reduce solid waste disposal. Residents are able to choose between having their waste collected and hauled in a plastic garbage-bag or in the larger plastic "toter" barrel. Both units are priced on the same rate structure, which allows for a residence to make a choice of units based on preference. The program is designed to charge residents for the disposal of garbage and provide a subsidized recycling program that will absorb the recyclable waste that residents eliminate from their weekly disposal.<sup>120</sup>

The purpose of the program is to reduce the amount of material to be disposed of in landfills and convert yard waste and recyclables into usable products. Originally established in 1988, the program has been run with much success according to participant surveys and administrative reports. During the first 6 months the 4,000 households (15,000 residents) of Woodstock resisted the new program. They then "began to see the savings and the sense that it makes." After two years of program implementation, 10% of the waste stream was diverted into recycling programs, effectively doubling the volume of recycled goods collected.<sup>121</sup>

The city's contract mandates that the waste management firm collect solid waste and recyclable goods on same day service. The contractor must provide a special 32 gallon capacity/50 lb weight limit bag for sale to residents at a pre-set fee (bags are currently sold for \$2.13),<sup>122</sup> as well as the optional toter service for the cost of 3 bags + \$2.50 monthly rental fee.<sup>123</sup> Containers for recycled goods are initially provided by the City of Woodstock, and replacement containers can be purchased for \$5 each. The program does not cover the collection of bulky items and white goods, which must be borne directly by the resident. A composting program for yard waste is operated separately by the city's Department of Public Works. The annual \$25 charge for this service is to cover all collection and disposal costs.

Initially, the charge per bag in Woodstock's program was a little over \$1.00, less than half that paid by Seattle or Perkasio (New Jersey) residents, two communities with similar programs discussed in this report. Tipping fees in the county were low enough, at only \$15 to \$20 per ton, that the charges per bag provided only modest incentives for Woodstock residents to divert their waste from landfills and into recycling programs.<sup>124</sup> Initial landfill diversion rates were reported at approximately 5%. As fees rose, so did the diversion rate, with 10% to 12% achieved today.<sup>125</sup>



Solid waste authorized for disposal includes: kitchen garbage, general household garbage, and minor construction materials. The curbside recycled goods include: newsprint; glass bottles and containers; aluminum; steel and tin; HDPE plastics and PET plastics.<sup>126</sup> Recyclable products not collected by the contractor, such as cardboard, are accepted at a local not-for-profit dropoff/buyback recycling center.

State assistance with technical and grant aid has been important to the success of the local recycling program. The Director of Solid Waste and Renewable Resources for the Illinois Department of Energy and Natural Resources believes that the economic incentives of pay per bag programs do encourage recycling and waste reduction. The contractor believes that the containers for recycling did more to increase recycling rates than the pay per bag program itself. However, the operators of the dropoff/buyback recycling center point out that they received twice as many goods in the Woodstock area (more than dropoffs from counties without pay per bag programs) after the City adopted the incentives.

### **EVALUATION CRITERIA**

The Woodstock program appears to be operating and achieving a cost-effective reduction in solid waste (with 10-12% of the waste stream diverted into recycling programs), and an increase in recycling.

The program provides limited incentives for technology innovation; much greater incentives for consumer changes in behavior -- source reduction, reuse, avoidance of waste generation.

The program is relatively robust, but concerns exist for the possibility of unlawful dumping (or the mixing of waste with recyclables at the drop-off centers).

Administrative burdens to the government agency are minimal, and the program is not difficult for the consumer. The system appears to be well integrated with the existing framework of laws and programs. The ability to project and achieve results appears good. Distributional impacts are insignificant.

## SOLID WASTE POLLUTION CHARGES

### PENNSYLVANIA - PERKASIE'S PAY PER BAG

#### PROGRAM DESCRIPTION

A Pennsylvania borough's pollution control program decreases the disposal of solid waste through the use of pollution charges. Beginning in 1988, the 3,000+ households of the Borough of Perkasio are required by a city ordinance to participate in a solid waste reduction/recycling program that is based on a per bag disposal fee system. Although this is not the nation's first solid waste per bag disposal fee program, it is the first to provide both incentives and penalties to encourage recycling.<sup>127</sup> The municipality is instructed to collect fines for noncompliance with the mandatory program.<sup>128</sup> The Public Works Department of Perkasio Borough administers the collection program.

Residents must use the program-specific garbage bags, available at any of 10 locations, for the weekly curbside solid waste pickup service. Bag prices are shown below:<sup>129</sup>

Year	20 lb bag	40 lb bag
1988 - 1991	\$1	\$1.75
1992	\$1.25	\$2.00

Prior to the pay per bag system, Perkasio residents paid annual fees of \$120 per household for biweekly solid waste pickup, which averaged \$2.10/week.

In the new program, the Borough does not charge for the collection of recyclable goods. This service includes curbside pickup of: brown, green and clear glass; aluminum; cardboard; plastic and steel cans. These items have different collection specifications shown below:<sup>130</sup>

Collection Time	Glass	Aluminum	Card board	News print	Plastic	Steel
Weekly	x	x				
Monthly			x	x		
Voluntary Drop Off Center	x	x	x	x	x	x

There is also a voluntary drop-off center for recyclables that is open 24 hours daily. The Perkasio Fire Company sorts, cleans and crushes the glass in return for the proceeds from the sale of the glass to a recycling firm.

The Perkasio program also provides for the collection of bulky appliances at the rate of one per household per month. A \$10.00 sticker is required for the removal of motorized appliances. Curbside leaf collection is offered for six weeks in the fall, a service offered (for free) since before inception of the new program. The leaves are used as mulch by two local farmers and a landscape supply company. The Borough of Perkasio also provides for curbside brush chipping if the resident gives a 48 hour advance notification.

The Public Works Department employs nine full time staff who maintain public property areas as well as the solid waste/recycling program. The collection of solid waste requires 1 driver and 1 loader a total of eight hours. The collection of recyclable goods requires 1 driver and 3 loaders a total of 10 hours.

The Borough of Perkasio has identified specific problems in the recycling program. The market for recyclable goods in the Pennsylvania/New Jersey area is limited and there is "little if any offset to costs" from the sale of the recyclables. At times markets are not easily identified for transfer of Perkasio-collected items. The Borough's net revenue comes primarily from aluminum and corrugated board recyclables. The Fire Company generates net revenues from brown and clear glass, but not from the more difficult to market green glass. The Borough reports that it may have to consider a separate charge for the recycling program in the future. The table below reports expenses and revenues.<sup>131</sup>

Finances	1988	1989	1090	1991
Total Revenue	\$183,334	\$207,396	\$216,737	\$210,983
Total Expenses	\$189,357	\$198,242	\$251,212	\$235,459
Net Profit/ (Loss)	(\$6,023)	\$9,154	(\$34,476)	(\$24,476)

At times the periodically unsupervised drop off center receives newsprint mixed with trash. To address this problem, either with extra staff to sort the mix or staff to work evening hours, the increase in labor would add to the recycling costs. Program accomplishments are listed below:<sup>132</sup>

Product	1988	1989	1990	1991
Recycled(Tons)	709	1,202	1,428	1,461
Solid Waste(Tons)	1,160	1,404	1,515	1,546
% Recycled	38%	46%	49%	49%

After three years of program operation over 90% of the residents who responded to a participant questionnaire stated support for continuing the program. The Borough considers the solid waste disposal/recycling program a success that enjoys ongoing improvements. The avoided tipping fee costs of the recycling program are shown below.<sup>133</sup>

Year	Avoided Tipping Fee
1988	\$41,818
1989	\$78,702
1990	\$97,449
1991	\$97,862

The Borough operates the solid waste disposal/recycling program in concert with a biannual newsletter that educates residents on proper disposal techniques. An example of its use is when Perkasio residents requested a yard waste program. The Borough currently has no way to dispose of yard waste, and printed an article in the newsletter outlining the economic and environmental advantages to "grasscycling".

## EVALUATION CRITERIA

The data indicate that this program has been quite cost effective in achieving environmental results.

The program provides little incentive for technology innovation, but significant incentive for changes in consumer and disposer behavior. The program is robust, but there are concerns for possible unlawful dumping or mixing of wastes with recyclables at the 24-hour drop-off center. In addition, the uncertainty of markets for recycled waste may diminish the cost-effectiveness of the program.

Perkasio's experience underscores Seattle's belief that it is important to provide lawful means for simple recycling and for disposal of yard waste if a solid waste program adopts a volume or weight based fee system. While this imposes some additional administrative burden, it is essential for the successful operation of the program.

Compliance with the program is not difficult. The system is well integrated with existing laws and programs, and provides reasonable assurance of achieving desired goals flexibly and appropriately. There are no significant distributional implications.

## SOLID WASTE POLLUTION CHARGES

### WASHINGTON - SEATTLE'S PAY PER CAN

#### PROGRAM DESCRIPTION

A Seattle, Washington pollution prevention program uses pollution charges to control solid waste. In 1989 the City of Seattle adopted the Integrated Solid Waste Management Plan (Plan) which aims to redirect 60% of 1987 quantities of solid waste toward recycling or composting programs by 1998. The program design consists of a curbside garbage collection system and recycling program with a variable source rate structure that will create incentives for participants to recycle and reduce their total solid waste disposal.<sup>134</sup> The municipality contracts the Plan's collection programs out to private waste management firms.

The program was developed in 1988 when the administering agency, the Solid Waste Utility (SWU), in agreement with the City Council, concluded that an "inverted variable can rate" structure was the best strategy to achieve the 60% recycling goal. The system was also identified as the most representative of the true costs of garbage collection. An inverted variable can rate structure sometimes means that higher levels of service (larger waste volumes) are priced higher than the actual cost of service. The variable can rates (per month with four weekly pickups) are as follows:<sup>135</sup>

Can Size	Price per Can
Mini-can (19 gallons)	\$11.50
32 gallon (one can size)	\$14.98
60 gallon (two can size)	\$29.96
90 gallon (three can size)	\$44.94

Residents can choose any level of service for their waste collection. This provides increased incentives to reduce the volume of solid waste disposal. For example, if a customer uses curbside recycling effectively he or she can reduce the subscription from a 32 gallon can to the mini-can and save \$3.48/month. For extra waste they may use another bag, box, or bundle with a SWU sticker (available at the main office, grocery stores, and community service centers). This feature was adopted to enable customers to dispose of occasional "extra" waste beyond their regular service levels. SWU will be introducing a microcan level (10 gallons) later this year at \$9.50.

Curbside collection rates cover the collection of recycled goods, making garbage disposal appear more expensive relative to recycling and composting, which appeared to be free. Since 1989 the SWU has offered curbside collection of yard waste on a fee for service basis.<sup>136</sup>

With fixed recycling fees and inverted solid waste disposal fees the consumer is encouraged to reduce garbage disposal and avoid more costly subscription fees. These costs encourage consumers to increase recycling and waste reduction and understand that garbage disposal has a high monetary and social cost.

Other components of the rate structure include:

- (1) **Compacted Waste** - a new, higher, rate is charged and weight limits are implemented to control the quantity placed in a can.
- (2) **LIEH Subsidy** - provides for subsidized rates for low income, elderly and handicapped customers.
- (3) **Backyard versus Curbside Pickup** - this incentive charges 40% more for backyard pickups than curbside.
- (4) **Extra Waste** - a \$5.00 fee for trash tags permitting extra waste pickup for a bag, barrel or box.
- (5) **Yard Waste** - a \$3.00 fee/month for as many as 20 cans, bags or bundles of yard waste each month.
- (6) **Bulky Item Pickup** - \$25 fee for collection of refrigerators, stoves, and sofas.

Subscription rates for the variable can sizes in Seattle reflect the success of this program, as the following numbers indicate:<sup>137</sup>

	1988 Subscription	1993 Subscription
Variable Can Customers with less than one can	1%	29%
Variable Can Customers with one can	60%	60%
Variable Can Customers with two or more cans	39%	11%

The inverted rate structure, the mini-can service and the yard waste collection program all appear to be aiding the City's progress toward its 60% recycling goal. In 1991 90% of residents used one can or less as compared to only 61% in 1988. At the same time recycling and yard waste collection tonnages have increased since 1988. The table below shows curbside pickup for waste and recyclables:<sup>138</sup>

Years	Curbside Pickup Tonnages for Landfill	Curbside Pickup Tonnages for Recycling/Yard Waste
1985	180,000	0
1988	170,000	10,000
1989	160,000	70,000
1990	155,000	80,000
1991	152,000	85,000
1992	147,000	92,000

Costs for the SWU include three staff members working in the rates section to determine the revenue needed for the collection and structuring the rates accordingly. There are also extra contracts negotiated with companies to sell the variable cans. The administrators believe that the goal of waste reduction can not be met by pricing schemes alone, but must be accompanied by well-designed programs in recycling and yard waste collection.<sup>139</sup>

### EVALUATION CRITERIA

Available data suggest that the Seattle program has been cost effective. Like most solid waste fee programs, it provides little incentive for technology innovation, but it has produced changes in disposer behavior. In turn, this has led to greater demand for products with little associated solid waste and packaging.

The program appears to be robust, but Seattle officials note the importance of monitoring disposer behavior. In particular, it is important to provide lawful means for recycling and to be aware of potential unlawful disposal (or consumer use of industrial dumpsters, etc.) to prevent unlawful disposal from undermining the program.

There was a substantial investment of administrative time and money at the outset of this program; in particular, for establishing prices, conducting planning, and reviewing program performance. The program also requires continued attention to where the waste that is not picked up under the pay-per-can approach is going.

The program is not difficult for disposers, and has been especially easy because of the simultaneous provision of easy recycling and yard waste programs. The program has been well integrated into existing city laws and programs, and has achieved the projected results. Distributional implications appear to be insignificant. The Seattle program is rightly regarded as a success story, but it important to recognize that its success is attributable to more features than simply pricing the "cans" correctly.

## SOLID WASTE POLLUTION CHARGES

### MAINE - BOTTLE BILL

#### PROGRAM DESCRIPTION

A Maine pollution prevention program uses pollution charges to reduce the generation of solid waste. On January 1, 1978, Maine became the third state - following Oregon and Vermont - to adopt a "Bottle Bill".<sup>140</sup> All beverage manufacturers or distributors, are required to collect a deposit, to reimburse the handling fee to retailers or redemption centers, and to collect the used beverage containers. The 1989 expansion of the Bottle Bill to include wine bottles, among other beverage containers, make Maine the first and only state in the nation to implement such a comprehensive system.<sup>141</sup> Maine's beverage container law is administered by the Department of Agriculture, Division of Regulations.

The law was established following a lengthy, expensive and sometimes bitter referendum campaign costing about \$430,000. All but \$26,000 was spent by opponents of the legislation. One year after the initial Bottle Bill, a second referendum was held to repeal it. Voters voted by almost a 5:1 margin to retain the Bottle Bill.<sup>142</sup> The 1978 Bottle Bill stopped about 600,000,000 containers per year from ending up in landfills, 3% of the state's solid waste stream. This deposit-rebate program reduced municipal solid waste by more than 5%. The 1989 legislation expanding the Bottle Bill, the 1989 Maine Waste Management Act, is intended to reduce solid waste going to landfills by 50% by 1994 through regulations affecting many other forms of waste. The Bottle Bill is now referred to as "The Expanded Returnable Beverage Container Law".

Similar to the Oregon Bottle Bill, Maine's legislation placed a minimum of a dealer-initiated 5 cent deposit on soda and beer beverage containers sold in the state. Unlike the Oregon legislation, Maine's beverage redemption centers are paid a 3 cent handling charge (formerly two cents). The distributor must pay the dealer or local redemption center all applicable refunds, deposits, and handling charges no later than ten business days after acceptance of the deposits.<sup>143</sup> Exempt from the deposit-rebate regulations are containers for milk, other dairy products, apple cider, and juice concentrate containers.<sup>144</sup> On December 31, 1990, all non-exempt beverages sold in Maine, including noncarbonated beverages such as juice and bottled water in glass, plastic, and metal containers, needed a 5 cent deposit label.<sup>145</sup>

The legislation has provisions limiting inconveniences to beverage container dealers. Retailers are only required to accept beverage containers of the brand, kind, and size they sell. Furthermore, a retailer may limit the total number of beverage containers which he or she will accept from a person in one business day to 240 containers or more, and may also refuse to accept beverage containers during 3 or fewer hours per day.



Since September 1, 1990, a 15 cent deposit went into effect on all table wines sold in grocery stores. Also on this date, "aseptic" beverage containers, composed of layers of inseparable paper and aluminum, or plastic and aluminum could no longer be sold. Aseptics are banned, except for soy milk, rice milk, juice concentrates, and non-beverage liquids. "Plastic cans" - beverage containers composed of plastic sides with metal tops and bottoms - were also banned. "Flip top" containers - cans with metal tabs which are pulled off and discarded - have been banned since 1978.

Maine's solid waste law prohibits packaging which contributes to environmental problems.<sup>146</sup> Items taking effect in 1991 and beyond include the banning of plastic "six-pack rings", which are harmful to wildlife, and similar devices (July 1, 1991), and the reduction of toxic materials in packaging, including polystyrene manufactured with CFCs, which are harmful to the ozone layer (April 1, 1992).<sup>147</sup> Despite the 1991 legislation banning the sale of plastic "six-pack rings," the effectiveness of the law has been delayed each year by the legislature while a search was conducted for a self-breaking ring.

Although the state reportedly suffered an initial 20% reduction in the supply of beverage products, Maine's Bottle Bill is believed to produce jobs in the state. Estimates by the state attribute nearly \$300 million in economic activity to the state's whole range of recycling efforts, including the beverage container law.<sup>148</sup> Currently, the state has approximately 200 licensed redemption centers operating on a three cent handling fee paid by distributors.

Nearly 100% compliance with the original law was evident by early summer of 1978 as reported by Maine's Consumer Food Inspectors who were responsible for the enforcement. An initial survey by the Maine Department of Transportation and the past Keep Maine Scenic Committee indicated that beverage container litter was reduced 86% and total litter was reduced by 39%.<sup>149</sup> There are penalties for noncompliance; a fine of up to \$100 can be levied on any unlawful sale after September 1, 1990. Voluntary compliance is expected.

## **EVALUATION CRITERIA**

The Maine bottle bill appears to have been cost effective in reducing the solid waste problem and in encouraging reuse and recycling. It has provided some incentives for technology innovation; including improving packaging for reuse, and substitution of redesigned packaging for prohibited package types.

The program appears to be robust. It is easy to detect violations, and consumers are well aware of the program's requirements; they have an economic incentive to assure that it is carried out properly. The administrative burden to the regulatory agency has not been substantial. The burden upon the regulated industries has been more profound. There were some initial dislocations in the industry, but it is clear that compliance is possible and consistent with profitability.

The program was well integrated with existing laws and programs. It is also consistent with a number of other deposit-rebate programs in Maine (some of which are discussed in Chapter Four of this report, Hazardous Waste). This increases consumer compliance and acceptance. Deposit-rebate programs have become something of a norm in Maine, thus encouraging additional uses of this approach.

The legislature's ability to set and achieve its goal was good, and should be equally good in other states. Maine is not a particularly large market; hence, it is a good test case for the ability and willingness of industry to comply. Distributional impacts of the program are not known, albeit much debated.

Predictability of the results has been good, and the program appears to be flexible for meeting a number of alternative goals - including waste reduction and reuse of materials.

## SOLID WASTE POLLUTION CHARGES

### OREGON - BOTTLE BILL

#### PROGRAM DESCRIPTION

An Oregon pollution control program uses a deposit-rebate system to reduce solid waste disposal. Implemented in 1972, the Oregon Beverage Container Act (Bottle Bill) was the nation's first to impose mandatory refund values on all beer and soda beverage containers sold in the state. The "Bottle Bill" was designed to place primary responsibility on the public for achieving program success;<sup>150</sup> to immediately decrease litter and begin a program for conservation of natural resources within the state.<sup>151</sup> The Bottle Bill is administered and enforced by the Oregon Liquor Control Commission (OLCC), with the Hazardous & Solid Waste Division of the Oregon Department of Environmental Quality managing public information programs.<sup>152</sup>

The reason for the state's adoption of the Bottle Bill came from an identified need to solve the "increasingly voluminous litter problem" along state roads and beaches.<sup>153</sup> In addition to the deposit-rebate system, the Act stipulates litter control provisions. The 1972 rules prohibited the sale of containers with detachable metal parts, and 1977 amendments prohibited containers fastened by plastic or metal rings which will not decompose within 120 days.

Oregon had an existing beverage container return system for refillable bottles when the 1972 Bottle Bill came into effect. Distributors, bottlers and breweries only had to expand their current system to include single-use bottles and cans. Consumers were accustomed to returning the empty bottles to the store and had no difficulty with the deposit refund system imposed by the Act.

The initial deposit for containers comes from the brewer or bottler for the refillable container or the distributor for the single-use bottles and cans. Rates for refillables can range from 2-20 cents while single-use containers receive a 5 cent minimum deposit.<sup>154</sup> First the retailer and then the consumer assumes the deposit charge upon purchase. With the return of the empty container to the store or redemption center the deposit is returned. The retailer's empty containers are either picked up by the distributor or shipped back to the brewery or bottling plant. The Bottle Bill also protects against inconveniences to the retailer, allowing for the refusal of excessively dirty containers and quantities exceeding 96 containers/day/person if the site posts hours when these quantities are accepted.

The retailer's handling costs are not compensated for by the Bottle Bill. Some retailers have estimated this expense at 2.5 cents per bottle. Distributors receive some compensation for their transport and handling costs by: (1) selling the aluminum, plastic and glass single-use containers to recycling firms as well as (2) saving on the unredeemed deposits on single-use containers. Breweries and bottlers experience income or cost savings from the reuse of the refillable containers a dozen times or more and from the use of unclaimed deposits and the deposit cash float.<sup>155</sup>

For the most part, Oregon has reached its litter reduction goals through the successful implementation of the Bottle Bill. Beverage container litter had been reduced by 83% by 1974, from 44% of all roadside litter to 7.7%. By 1986 beverage containers contributed only 4% to all roadside litter. The state also enjoyed a 5% decrease in solid waste volume. Despite inflation averaging 8.4%/year and traffic volume up by 20% between 1972 and 1982, highway litter pickup costs only rose by 1.8%/year from 1971.<sup>156</sup> As a result of the program's success, the Oregon Bottle Bill has acted as a cornerstone for public support and involvement in a number of other innovative and equally successful recycling programs.<sup>157</sup>

Distributors report that 92-95% of all beverage containers are returned. Although the number of containers sold dropped from 540 million to 470 million between 1978 and 1981, the average beverage container size rose from 10.7 to 13.8 fluid ounces.<sup>158</sup>

Jobs have been created with a pay roll addition between 1972 and 1982 of \$1.6 million in the transportation, warehouse and handling sectors. This was initially offset with some losses in container manufacturing industries. Because of an efficient program design, the administrating OLCC has not needed additional staff nor incurred significant expenses due to the law.<sup>159</sup>

The Bottle Bill also saves energy in regard to both refillable and single-use containers manufacturing. With the replacement of throwaway containers with refillables during the first years of the Bottle Bill, the state estimates that it saved 1.4 trillion BTUs/year (enough to heat the homes of 50,000 Oregonians). The construction of aluminum cans from recycled aluminum ingot is 95% more energy efficient than from virgin materials. Using recycled PET containers to manufacture other PET goods reduces energy costs by nearly 60%.<sup>160</sup>

Beer and soda sales continue to climb while 90% of the state's residents favor the law and its contribution to reducing litter, energy costs and demand on landfills. The state senate is currently considering amendments to the Bottle Bill to include all beverage containers except dairy products.<sup>161</sup>

## EVALUATION CRITERIA

The data suggest that the Oregon program has been cost effective. The program has also provided some incentives for technology innovation.

The program appears to be robust; administrative burdens on the state have been minimal. Although there were initial difficulties for the industry -- particularly with respect to distribution networks and the establishment of reuse and recycling facilities -- the program appears to be operating with minimal disruption to the industry. The state is considering extending the reach of the bottle bill to other beverages (albeit protecting the powerful Oregon dairy industry).

The program was integrated with the existing legal and program framework, and appears to have achieved the goals set for it. Distributional implications are not known. The success of the Oregon Bottle Bill is largely the result of two factors, 1) the simplicity of design with minimal direct government involvement (and no government revenue) and 2) the design which results in direct public involvement, responsibility, and identification with program success.

The program has operated with good predictability as to environmental results and costs; it appears to offer flexibility and potential appropriateness for other types of consumer goods.

## SOLID WASTE POLLUTION CHARGES

### NEW JERSEY - LITTER CONTROL TAX

#### PROGRAM DESCRIPTION

A New Jersey pollution control program uses product charges to fund programs to reduce the volume of solid waste disposal and litter. The recently extended Litter Control Tax, originally implemented in 1987, mandates that manufacturers, wholesalers, distributors, and retailers must pay the state a percentage of sales of litter generating products. There are various exemptions from the tax. However, the Act provides "for no exemption or deduction for properly disposed of refuse".<sup>162</sup> The Department of Taxation administers the collection of the tax, while the use of the proceeds is administered by the New Jersey Department of Environmental Protection and Energy, Division of Solid Waste Management, through its Clean Community Program. The program will expire in 1995.

The implementation and authorization of the Litter Control Tax facilitates the state's effort to control litter and promote recycling. The purpose of the tax was to generate a tax pool from which state (and local, county and municipal) litter abatement programs can draw funding for litter cleanup projects, litter-related equipment and educational programs. The Litter Control Tax is imposed under the Clean Communities and Recycling Act (P.L. 1985 c. 533) on all businesses that sell litter-generating products within New Jersey.

Litter-generating products means that they are: produced, distributed, or purchased in disposable containers or commonly discarded in public places. The items listed below satisfy at least one of the above conditions.

1. Beer and other malt beverages.
2. Cigarettes and tobacco products.
3. Cleaning agents and toiletries.
4. Distilled spirits.
5. Food for human or pet consumption.
6. Glass containers.
7. Groceries.
8. Metal Containers.
9. Motor vehicle tires.
10. Newsprint and magazine paper stock.
11. Drugstore sundry products.
12. Paper products and household paper.
13. Plastic or fiber containers made of synthetic material.
14. Soft drinks and carbonated waters.
15. Wine.

Taxes are calculated using different percentages for the different businesses affected by the program. A litter control tax imposed on persons engaged in wholesale sales is set at the rate of  $\frac{3}{100}$  of 1% (.0003) on gross receipts from wholesale sales of such litter-generating products. The tax imposed on persons engaged in retail sales is at the rate of  $\frac{2.25}{100}$  of 1% (.000225) on gross receipts from retail sales of litter-generating products.

Taxes are computed by any of three different methods by the manufacturer, wholesaler, distributor, or retailer. The general method applies the tax rate of .0003 or .000225 to gross receipts from all sales of litter-generating products and requires the taxpayer to separately account for its sales with receipts for each of the 15 categories or litter-generating products. The total sales method applies the tax rate of .0003 or .000225 to all sales of all products, both litter-generating and nonlitter-generating. Here, the owner is aware that most, if not all, of its sales involve litter-generating products and avoids the expense of accounting for the individual receipts of the general method. ~~The percentage of sales method~~ applies the tax rate of .0003 or .000225 to that proportionate amount of gross receipts from sales of all products which properly reflects wholesale sales of litter-generating products. This method also relieves the owner of the burden of the recordkeeping needed for the general method.

All records documenting sales used to complete the Litter Control Tax return must be provided to the Division of Taxation, upon request, up to three years following the filing of a return. Any retailer with less than \$250,000 in annual retail sales of litter-generating products is exempt from the program. Also exempt are: sales by a wholesaler or distributor to another wholesaler or distributor; sales by a company to another company owned wholly by the same individuals or companies; and sales by a wholesaler or distributor owned cooperatively by retailers to those retailers. Farmers are not considered a wholesaler or retailer and are not subject to the tax unless they also engage in business as a retailer in either non-food or food litter-generating products not directly grown by them.<sup>163</sup>

## EVALUATION CRITERIA

The cost effectiveness of the New Jersey tax as an environmental measure is unknown. It operates primarily as a funding mechanism for litter abatement programs. There is no real information on changes in behavior or reductions in sales (or product substitutions) resulting from the tax.

The program offers limited potential for technology innovation. There may be some incentives for container-switching, or elimination of some containers. However, the products contained on the list of taxable items cannot escape or reduce taxation by being less litter-generating. Also, because the tax is on the value of the item being taxed (rather than its volume, weight, or potential to generate waste), it includes some elements unrelated to litter-generating potential, thus reducing the incentive effect. The tax is structured to serve more as a targeted revenue source to fund community litter control and education programs, rather than to act as an incentive program.

The program is reasonably robust, as it is linked to the normal sales and use tax mechanisms of the state. The program does require administration, but because it is performed by the taxing agency, this is not a substantial additional duty. The program is somewhat difficult for the regulated industries, but the availability of alternative computation approaches makes the administrative burden potentially lighter. The program is well-integrated with existing tax programs.

The program offers an opportunity to set and achieve goals, but it is not clear what effect the structure of the tax has on behavior.

The distributional effects of the tax are to make certain goods more expensive. Where there are no substitutes for the products in question, the tax may be regarded as regressive, in the same sense as most sales taxes on common consumer goods. Revenue from the Litter Control Tax went toward the following New Jersey Clean Communities Program activities:

- \$9,740,914 was spent by 380 municipalities and counties for clean up activities.
- \$616,083 was spent on enforcement by 359 municipalities and counties.
- \$752,270 was spent on education by 349 municipalities and counties.

This spending included the cleaning of 51,300 miles of road - picking up 77,880 tons of litter and 11,832 tons of recyclables, along with the issuance of 17,134 litter citations and 2,572 illegal dumping citations.

Although there is evidence of improved environmental results from the tax expenditures, the tax itself has not been evaluated as to any related environmental results. The revenue stream has, however, been quite predictable, and the tool of a tax on solid-waste-generating products is quite flexible.



**CHAPTER FOUR:**  
**HAZARDOUS WASTE PROGRAMS**



## CHAPTER FOUR: HAZARDOUS WASTE PROGRAMS

This chapter examines five innovative programs addressing the problem of hazardous wastes.

The hazardous waste field is dominated by regulatory requirements. The Resource Conservation and Recovery Act of 1976 (RCRA) establishes detailed waste definitions, tracking systems, handling requirements, and technical standards. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as well as its state analogues, creates strict, joint and several liability for cleanup of hazardous waste. Nevertheless, several states have found ways to integrate additional approaches.

Alabama's voluntary technical assistance program is one approach that is being tried in a number of other states, including Florida. Maine has led the nation in pioneering several hazardous waste deposit-refund programs. Its pesticide containers and lead-acid battery programs are profiled here.

Massachusetts has adopted a fairly sophisticated Toxics Use Reduction Act. While this might be classed as a multimedia program, its greatest impact is expected to be on hazardous waste handling. The program uses privately employed, publicly certified toxics use reduction planners to integrate reductions into facilities' operating plans and technologies. By building upon the existing informational framework provided by the federal Emergency Preparedness and Community Right-to-Know Act (EPCRA), the Massachusetts program takes advantage of existing knowledge and administrative structures to construct a new program. A number of other states have adopted similar approaches to toxics use reduction, making the Massachusetts program a good candidate for study as representative of an emerging trend.

Stream-lined permitting, while perhaps more of an administrative or fiscal reform than an environmental one, is an area that has attracted substantial interest in public discourse over the course of the past decade. Indeed, consideration of ways to achieve one-stop environmental permitting was a theme even of federal policymakers in the Carter administration. In addition to unified permitting, the states have been examining ways of simplifying the permit process. In this chapter we examine California's new approach to permitting by class of facility. This program shifts some of the administrative burden to the permit applicant, but increases simplicity and flexibility.

There are other possible approaches to hazardous waste policy, including some of those examined in the previous chapters. Fees based on hazardous waste volumes and toxicities, for example, might have a pronounced effect on use of toxic materials. Although a number of states do assess fees on hazardous waste generators, in general these have served primarily to support regulatory and cleanup programs and only secondarily as incentive systems.

Information programs abound. A number of these are discussed in the next chapter as multimedia programs.

## HAZARDOUS WASTE VOLUNTARY PROGRAM

### ALABAMA - WRATT

#### PROGRAM DESCRIPTION

An Alabama pollution prevention program uses a voluntary program to reduce the generation of hazardous and non-hazardous waste in the state. The 1990 Waste Reduction and Technology Transfer (WRATT) program utilizes retired engineers and scientists as inspectors who investigate and recommend waste reduction or recycling techniques for industry.<sup>164</sup> WRATT is structured as a public/private partnership to provide this free service for business and minimize the generation of toxic and non-toxic substances within the state. Administrative support for the program comes from the Alabama Department of Environmental Management (ADEM) with cooperation and consultation by the Tennessee Valley Authority (TVA) and the Business Council of Alabama (BCA). WRATT is incorporated into a not-for-profit foundation that manages the grants and donations which provide the program's financial support.

WRATT began as a general concept during the 1988 South East Hazardous Waste Roundtable discussion on how to achieve the state's goal to minimize hazardous waste. The idea was to employ the numerous retired engineers and scientists distributed throughout the state and have them carry out on-site waste production assessments at appropriate facilities. Support was given to the idea, and TVA in conjunction with ADEM held hazardous waste assessor training and orientation workshops for the volunteer retirees. WRATT uses the term assessor to emphasize the non-regulatory nature of the program.

Through waste reduction and recycling, the WRATT program helps industry identify ways to reduce the amount of waste material generated. WRATT provides "free, voluntary, confidential, non-regulatory waste reduction opportunity assessments" to interested waste generating companies.<sup>165</sup> The program provides industry with the best and most current waste reduction techniques to ease treatment, storage and disposal burdens.<sup>166</sup> All of Alabama's industries (private, public, and military) are eligible to receive the inspection assistance.

Fifty volunteer engineers and scientists have been recruited for the WRATT assessment teams. They are divided into 3 to 5 member teams and conduct a 1 to 4 day plant visit depending on the size of the facility. Assessors are matched with industries according to their experience. Costs are defrayed with a small hourly rate and a per diem allotment paid by donations and in-kind services. Facility assessments include a technical report and follow-up studies. Reductions in waste generation may translate into savings for businesses. They may require fewer costly process chemicals and incur correspondingly fewer regulatory reporting burdens. In turn, the identified cost savings and waste reduction options for business can create research and development opportunities for private consultants, agencies, and universities.<sup>167</sup>

Furthermore, ADEM reports an increasing waste reduction consciousness throughout the state as a result of the program. More facilities perform planning in terms of identifying possible waste reduction practices.<sup>168</sup> WRATT does not compete with other organizations. The WRATT Outreach Program provides assistance to other interested states. The WRATT Outreach Program offers help with recruiting and training assessors, marketing, and program implementation.

A total of 117 WRATT assessments were conducted between 1990 and May of 1993, with 70 requests still pending. The inspection teams are currently completing an average of 6 inspections per month. These volunteer services were estimated at \$270,000 for both 1991 and 1992. Annual program costs are near \$300,000, with \$150,000 coming from direct funding and \$130,000 coming as in-kind services.<sup>169</sup> A privately conducted program evaluation identified the lack of permanent program funding as an obstacle for WRATT's longterm prospects. Placement of the WRATT program into a not-for-profit foundation as well as the financial support from the Business Council of Alabama and the Alabama Chemical Association, has provided some financial security for the program.

Business has rated WRATT a success. In a letter of support to the WRATT administrator, the Business Council of Alabama placed its 2,200 member businesses behind the program. They are pleased with the assessment teams and donate funds to support WRATT.<sup>170</sup>

Ciba-Geigy installed an in-unit treatment system at a waste minimization facility in connection with a voluntary program preceding WRATT. They effectively eliminated 800,000 lbs. per day of acidic wastewater, reduced usage of raw materials, and "realized increased treatment efficiency" for pesticide waste products. The company reports that the system, although costly, has reduced company expenses for acid and lime treatment materials and now saves the facility \$125,000 per year.<sup>171</sup> WRATT is intended to produce similar results for those Alabama companies that may not have similar expertise, or that may not previously have focused on pollution prevention opportunities.

## **EVALUATION CRITERIA**

The WRATT program is potentially cost effective, especially for small businesses operating industrial facilities.

The program provides some incentives for technology innovation, but more incentives for implementation of well-known technologies, and (in either case) primarily where cost savings to the operation can be achieved. WRATT assessors argue that waste reduction is good business with or without immediate cost savings. Indeed, waste reduction plans suggested by the assessment team often require the industry to make capital investments.

Because the program depends upon voluntary expertise, voluntary consultation of the experts, and voluntary implementation, it may produce good results, no results, or

insignificant results. Thus, its robustness even with perfect implementation is difficult to assess. It may provide significant benefits for businesses that poorly understood their own technical and economic interests. The WRATT program has provided significant waste reduction plans even to large companies. Certain waste reduction expertise "may simply not exist in-house."<sup>172</sup>

The program requires minimal administrative commitment from the regulatory agency. It is not difficult for the regulated community, because it is wholly voluntary.

The program can be integrated with existing regulatory programs; however, potential issues arise concerning the use of WRATT findings in connection with enforcement cases. For example, if a WRATT team finds violations and the company does not report the violations as required by its permit, to what extent may the team's finding serve as the basis for civil or criminal action by the state? Issues of confidentiality of audit results also may arise. Although the program is intended to be confidential, as a legal matter it may not be. These issues obviously will affect businesses' decisions to participate. To address these concerns in part, ADEM reports that it does not receive any of the on-site assessment reports and only keeps records on the number and category of companies served.

The program modestly assists in environmental goal setting by the legislature, mostly by facilitating reaching some goals. The program does have distributional implications, albeit small ones. Essentially, it serves as a small subsidy to those industries taking advantage of the consultation opportunity. The WRATT Program's attention to the TRI Top 25 emitters has resulted in assessment for 11 of 25 for Total Air Releases and 13 of 25 for Total Water Releases. Cost savings for the assessed industries have ranged from \$2,000 to \$1,000,000 per year. This illustrates that the WRATT program, for some industries, can create savings that are substantial.

The environmental results and/or cost savings achievable under the program are not predictable. The appropriateness of the program varies with differing types of environmental problems and facilities.

## HAZARDOUS WASTE POLLUTION CHARGES

### MAINE - PESTICIDE CONTAINERS

#### PROGRAM DESCRIPTION:

A Maine pollution prevention program uses pollution charges to reduce the generation of hazardous waste. Statutes governing the State of Maine Department of Agriculture, Food & Rural Resources, Board of Pesticides Control, effective April 1, 1985, regulate the return and disposal of limited and restricted use pesticide containers;<sup>173</sup> this is the U.S.'s first and only such regulation, although other states do have voluntary collection programs. This program has proven to be an effective alternative to unregulated disposal practices which, in the past, had resulted in backyard dumping. The program, part of a regulation known as Chapter 21, works in principle like the state's bottle bill: a refundable deposit paid on each container serves as an incentive for its return and proper disposal.

The reason for this control measure stems from earlier site inspections made by the state. In 1981 and 1982, the Board of Pesticides Control (BPC) inspected over 400 sites contaminated with discarded pesticide containers. Landowners explained that these dumps existed because farmers were not allowed to dispose of the containers at local landfills. Municipalities prohibited them for fear pesticides might leach from the site and result in their facility being closed to all dumping. These findings inspired the legislation requiring deposit-rebate purchasing on glass, metal or plastic pesticide containers. The BPC next met with professional pesticide organizations, manufacturers and dealers to get input before writing Chapter 21.<sup>174</sup>

The rules establish deposit amounts, sticker requirements, triple rinse or equivalent procedures, and refund locations and procedures. The rules are organized according to classification of the pesticide, in particular, whether it was purchased in-state or out of state.<sup>175</sup> There are four key elements in this law:<sup>176</sup>

- (1) All limited and restricted use pesticide containers, excluding those made of cardboard, fiberboard or paper, must be triple rinsed according to regulations promulgated by the BPC.
- (2) Dealers must charge a deposit at the time of sale sufficient to ensure return of the containers. By regulation, the BPC set the deposit at \$5.00 for anything smaller than 30 gallon drums and \$10.00 for 30 gallon and larger drums.
- (3) All containers covered under the Act must bear an alpha-numeric sticker to identify the purchaser and dealer. Normally this would be attached by the dealer and recorded at the time of sale.



- (4) The deposit would not be refunded until the container had been triple rinsed and returned to the seller or an alternate designated site and the affidavit signed.

End of the season collections are conducted at fifteen to twenty locations throughout the state. In the highly concentrated agricultural areas, the collection may take all day but where there are few containers, it can be accomplished in a couple of hours. With careful scheduling, all the collections can be completed in 2.5 weeks. If the containers are clean, the BPC inspectors stamp the affidavit and the owner may then take it back to the dealer for a refund. If the containers are not satisfactorily rinsed, the whole load is refused and the owner must rinse them again before return.

The Maine Department of Environmental Protection (DEP) recognized the effectiveness of triple rinsing and agreed that the containers should not be considered hazardous waste. Instead, they classified them as "special waste" and provided the BPC with a list of 70 municipal and private landfills suitable to accept the returnable containers.<sup>177</sup>

The returned containers can only be buried in eight of the 19 communities where they are inspected. In the other sites, special arrangements are made to get the containers transported to a commercial landfill in the center of the state. In southern Maine where agriculture is on a smaller scale, the dealers take turns transporting the containers in their own delivery trucks. In northern Maine, the three major dealers share the \$1,000 cost of having the landfill send a truck with a "roll-off" 30 cubic foot container to collect at the different sites. The BPC's 5-gallon can crusher is used during this exercise so all the containers will fit in one load.<sup>178</sup>

Farmers and dealers have recognized the collection program as a sure method of compliance with state laws and many have purchased or built jet rinsing systems which are even more effective in cleaning the containers. Maine has seen the compliance rate improve from 4% of the returned containers not properly rinsed in 1985 to only 1% in 1987.<sup>179</sup> In addition to grassroots support, the program is receiving assistance from the manufacturers in the form of product and package reformulation. Many containers that were fabricated with non-recyclable glass and plastic are now manufactured with recyclable, returnable and dissolvable materials.

Aroostook County Soil and Water Conservation Districts (SWCD) and area dealers coordinated a pilot program to recycle plastic pesticide containers voluntarily. Combining rinsing, shredding and shipping to a Missouri based recycling center, the SWCD's recycling pilot freed Maine's landfills of over six tons of plastic.<sup>180</sup>

In 1985, the BPC inspected 7,055 dinoseb containers. If they had simply been drained but not rinsed, 429 pounds of active ingredient would have been deposited into the landfills. However, the triple rinse left only 0.05 pounds of active material that was deposited into landfills.<sup>181</sup>

Program costs are covered under the FIFRA grant to the state. As part of Maine's inspection routine, the BPC inspectors administer the program at little cost to the state. Container identification stickers are costs passed on from the dealer to the farmer buying the pesticide container. The BPC reports that the program success was dependent on support from the manufacturers and dealers, who were instrumental in motivating farmers to comply with the rules and regulations. Use of collection sites by the BPC to facilitate exchanges with hundreds of farms works much more efficiently than the alternative of the inspector driving to each individual farm.

The returnable container program does have shortcomings. For one, Chapter 21 does not apply to general use pesticide containers which far outnumber their restricted and limited use counterparts. Also, while this regulation prevents new releases of pesticide residues into landfills, Maine's landfill crisis still exists.

In October 1991, the USEPA reported to Congress it was studying legislation to reduce the number of pesticide containers requiring disposal. Among the alternatives was a mandatory deposit and return program for non-refillable containers, similar to Maine's program. The EPA study rated refillable returnable containers as the most effective option for the program and also rated the rinsing of containers with jet or pressure rinsing devices as more effective than the triple rinsing because of its speed and ease. Manufacturers of the National Agricultural Chemicals Association have begun organizing recycling programs in 27 states and anticipate collection of 400 tons of plastic annually.<sup>182</sup>

## **EVALUATION CRITERIA**

The data indicate that this program appears to be operating in a cost effective manner to reduce the environmental hazard from improper disposal, as well as to encourage the reuse of containers. The program has provided some incentive for technological innovation, and even more incentive for changes in consumer and dealer practices.

The program appears to be somewhat robust, but it is possible that containers of concern might leave the system despite the inducement of a rebate. Moreover, the program does not apply to containers of general use pesticides, a much larger and more dispersed class of wastes.

There is minimal administrative burden upon the regulatory agency, and the regulated industry does not find compliance to be difficult. The program is well integrated with existing laws and programs, and is consistent with Maine's deposit-rebate approach to a number of waste-generating products.

The program is one in which goals can be identified and progress measured. Results are not necessarily predictable, but have been good to date. The distributional effects of the program, if any, have not been ascertained. The deposit-rebate instrument appears to be an appropriate tool for this environmental problem.

## HAZARDOUS WASTE POLLUTION CHARGES

### MAINE - LEAD-ACID BATTERIES

#### PROGRAM DESCRIPTION

A Maine pollution prevention program uses pollution charges to reduce the generation of hazardous waste. The Act to Encourage Recycling of Lead-acid Batteries (Act) became effective October 1, 1989. Motor vehicle batteries or other lead-acid batteries are purchased and returned with the exchange of \$10, operating on a deposit-rebate type system. Certain requirements are placed on retailers and wholesalers to encourage recycling of these lead-acid batteries. The program is administered by the ~~Department~~ of Environmental Protection.<sup>183</sup>

The reason for the pollution charge on lead-acid batteries comes from the state's need to control the dumping of hazardous wastes from old batteries. In conjunction with the battery deposit bill, Maine prohibited the disposal of lead-acid batteries.<sup>184</sup> Maine's lead-acid battery deposit-rebate regulation is one of two programs in the nation. Rhode Island implemented a deposit-rebate system on lead-acid batteries prior to the Maine legislation, charging only a \$5 deposit fee.<sup>185</sup> Maine placed a higher incentive on the return, with the \$10 deposit representing approximately 30% of the cost of the battery.<sup>186</sup>

Maine's program works by the retailer collecting \$10 with the sale of each new battery. The retailer must return this deposit when the customer returns a used battery within 30 days of the sale of the new battery. In many instances money never changes hands because an old battery is returned at the time of purchasing a new one. Lead-acid battery retailers must hold deposit funds in a separate account from retail sales, and every July 1st any non-refunded deposits (plus interest) will benefit the retailer. A notice must be posted that specifies the conditions for the recycling of lead-acid batteries.<sup>187</sup>

Lead-acid battery wholesalers, upon sale of each battery to a customer, must: (1) accept used batteries in a quantity at least equal to the number of new batteries sold; and (2) remove used batteries from the retail point of collection within 90 days. After return to the wholesaler the batteries are sent for recycling, or sold to a scrap metal dealer.<sup>188</sup>

Part B of the Act provides for a solid waste advance disposal fee for lead-acid batteries. The fee is imposed on the retail sale of the new lead-acid batteries, in addition to the deposit that must be made. Revenues derived from the fee go to the Maine Solid Waste Management Fund and provide money for the administration of a number of solid waste programs including the lead-acid battery program. This separate fee of \$1 is imposed on the retail sale of each new lead-acid battery, effective July 1, 1990.

## EVALUATION CRITERIA

The program appears to provide a cost-effective way of dealing with hazardous waste. The program is not designed to provide any technology incentives, but to regularize disposal practices through use of economic incentive mechanisms. The program appears to be reasonably robust because of the regulatory and economic provisions operating in tandem upon retailers and wholesalers.

There is minimal administrative burden upon the state agency. The program is more difficult for the regulated industry, primarily in arranging for the reuse, recycling, or disposal of returned batteries. The program is reasonably well integrated with existing regulatory programs, and is consistent with the deposit-rebate schemes used in Maine for certain other consumer goods.

The program does provide the ability to set and realize environmental goals with reasonably predictable results. The distributional implications of the program, if any, have not been determined. The program provide an appropriate model for dealing with dispersed hazardous wastes that would otherwise go to landfills or be disposed of unlawfully.

# HAZARDOUS WASTE INFORMATION PROGRAM

## MASSACHUSETTS - TURA

### PROGRAM DESCRIPTION

A Massachusetts multi-media pollution prevention statute uses an information program to control hazardous waste pollution. Called the Toxics Use Reduction Act (TURA), this program plans to reduce the 1987 quantity of toxic or hazardous waste production by 50% by the year 1997 through the use of various toxic use reduction techniques. Facilities will pay approximately \$5 million in toxic use fees annually to support other TURA components.<sup>189</sup> Toxics are those listed by the federal Emergency Preparedness and Community Right to Know Act (EPCRA). The Department of Environmental Protection (DEP) is the administering agency for the 1989-enacted TURA regulation program.<sup>190</sup>

The Act created two other agencies: (1) the Office of Technical Assistance and Technology and (2) the Toxics Use Reduction Institute at the University of Massachusetts at Lowell. These organizations respectively provide technical assistance to the toxics users and develop training programs for those involved in the TURA. In addition to providing training for DEP employees and others, the Institute provides research and development for toxic use reduction methods.<sup>191</sup>

TURA was created to help the state achieve goals of toxics reduction. Voluntary state programs prior to TURA worked to realize many of the same goals, but lacked the legal mandate carried by the TURA legislation.<sup>192</sup> The TURA legislation directs the state and industry to: lower risks to "workers, consumers, the public and the environment"; comply with state and federal toxic regulations; minimize duplication of toxics reporting requirements; provide pertinent data concerning the risks of toxic chemicals; protect the public from toxics; and provide for proper administration of the toxic chemicals.<sup>193</sup>

State assistance components of the TURA create a program that is apparently viewed by industry as somewhat different than the regular "command and control" legislation. The law makes firms aware of: 1) the quantities of toxic chemicals used, "wasted" during production, released to the environment and shipped in product; 2) improvements in the efficiency with which they use chemicals; and 3) money saving opportunities for toxic use reduction and efficiency improvements. The law assumes that awareness of TUR cost-effective opportunities will convince firms to implement TUR techniques. There are no mandates to adopt TUR techniques.

Authorized toxic use reduction techniques are listed in the law as: input substitution; product reformulation; production unit modification or modernization; improved operation and maintenance of production equipment; and recycling or extended use of toxics.<sup>194</sup> Industry has been reporting under the TURA regulations for two years and facilities are required to develop facility plans for toxics reduction use and waste. These plans may be prepared by the individual facilities, but must be signed and certified by a certified Toxics Use Reduction Planner. Because of their confidentiality, plans remain on-site, or summaries

only are submitted to DEP. DEP-certified planners will audit plans for compliance with the regulations.<sup>195</sup>

The "Large Quantity Toxic Users" provision requires that "Large Quantity Toxic Users," as defined by EPCRA §313 and expanded in 1991 to include SIC groups 10-14, 40, 46-51, 72, 73, and 76 and by 1985 all chemicals listed under CERCLA §101 and §102, report on all chemicals used and develop a toxics use and waste reduction plan for each chemical. The DEP will compare this group's reductions with the 50% waste reduction state goal.<sup>196</sup> The following toxics users are exempt from the reporting requirements of TURA: (1) facilities with fewer than 10 employees; (2) all laboratories; (3) pilot production units; and (4) start-up production units. The Act does require that these facilities "maintain on-site documentation supporting all exemption claims."<sup>197</sup>

Other provisions of TURA include: (1) the "self-help" regulation for "Large Quantity Toxic Users" and (2) the establishment of an Administrative Council on ~~Toxics~~ Toxic Use Reduction (Council). It also requires the DEP to: (1) conduct all compliance enforcement work for all environmental statutes on a multi-media basis, (2) make source reduction the preferred approach to compliance with all environmental regulations, (3) identify and eliminate barriers to source reduction, and (4) eliminate any duplicative or contradictory reporting requirements.

The Administrative Council on Toxics Use Reduction consists of the DEP; the cabinet-level executive office of Environmental Affairs, Economic Affairs, and Labor; the Department of Public Health; and the Office of Science and Technology. The Council has an Advisory Board consisting of representatives from industry, environmental groups, and health organizations. It is the Council's responsibility, among other functions, to recommend to the governor the allocation of the Toxics Use Reduction Fund and to designate the "Priority User Segments".

There are toxics use fees for reporting facilities. They are the following:

Facility Size	Base Fee	Per Chemical Fee	Maximum Fee
10-49 Employees	\$1,850	\$1,000	\$5,500
50-99 Employees	\$2,775	\$1,000	\$7,400
100-499 Employees	\$4,625	\$1,000	\$14,800
500+ Employees	\$9,250	\$1,000	\$31,450

The Act set the initial fees. The Council was responsible for a one-time adjustment to the toxic use fees such that the aggregate sum is between \$4 million and \$5.5 million. These revenues go to fund: (1) DEP's program development and enforcement; (2) Toxic Use Reduction Institute of the University of Massachusetts at Lowell training program; and (3) Massachusetts's Office of Technical Assistance support.<sup>198</sup>

There are penalties charged for a facility's: (1) failure to file its annual report and survey and (2) failure to pay fees on time. The late payment fee is 20% of the original fee for payments 7-45 days late, 50% for payments 46-90 days late and 100% for payments over 90 days late. Facilities with fewer than 100 full time employees "may in instances of severe financial hardship apply ... for a waiver of the toxics use fee for that year".<sup>199</sup> The Council may decide to waive that fee in whole or in part and extend the dates for payment of any part of that fee.

The Act provides for temporary waivers and exemptions from any state only regulatory requirements. A toxics user that proposes to comply with reduction regulations through the implementation of "innovative toxics use reduction techniques" may petition the Department for a temporary waiver of any law the Department administers.

Massachusetts residents may assist in the monitoring and enforcement of the TURA as well as access any information reported to the Department concerning facility toxics use. The Department must act on petitions to inspect facility plans and back up data that are submitted by any ten or more residents living within ten miles of that reporting facility.

For the most part, facilities are supportive of the TURA. Massachusetts has far fewer toxics producers than users. If users are shown a way to reduce the use of toxics, facilities will try it. Reducing toxics use will reduce waste, treatment, and disposal, and should save money. Agency personnel advise that although the facility reporting provision is crucial to receive state technical assistance, the program's success depends on more than just a paperwork exercise - companies must implement the toxic use reduction techniques they have submitted.

Several other states have legislation similar to the Massachusetts toxics reduction plan (which was first in the nation), including New Jersey, Oregon, Washington, and Vermont.

## **EVALUATION CRITERIA**

The program appears to be potentially cost effective, and it provides significant incentives for technology innovation.

The program is not highly robust, but by requiring toxics use reduction plans to be certified by accredited TUR planners, the basis for oversight (and later enforcement) is established. This model is essentially the same as ones requiring audits of financial statements or certifications by registered professional engineers. Ultimately, the success of the program depends upon the ability of the governmental agency to do oversight and enforcement, but the first line of review is the accredited "gatekeeper."<sup>200</sup>

There is a potentially significant burden to the state agency, but the heavier burden falls on the regulated industry. If the state forgoes some of its review, it may reduce its administrative costs, but with a likely decline in the success of the program.

The program is potentially difficult and costly for industry, but does preserve autonomy, the opportunity to do long-range plans, and the opportunity to schedule changes in process or equipment. The program also offers the potential of significant cost savings through substitutions for toxics, or alternative handling systems.

The program piggy-backed on EPCRA reporting requirements by duplicating EPCRA regulatory language wherever possible. It differs in that it applies to other industry sectors and chemicals. Thus, initial coordination with existing law is good.

The ability to set and insure the implementation of goals is relatively good, provided that sufficient attention is given to training and certification of planners and to oversight and enforcement of the requirement that firms must develop plans. Firms are not required to implement their plans (although in subsequent plans, they must explain why they did not implement the measures they had planned). The predictability of the results, and of aggregate costs, is low at this time; there is a significant degree of uncertainty, and will continue to be until the plans are prepared.

Distributional implications have not been assessed. The fee program, however, is unlikely to result in toxics use industries leaving the state. The fees are not insignificant, but are graduated; the overall program is likely to have more effect on facilities than the fee component.

The program appears to build in substantial industry autonomy and flexibility in reaching the desired goal; in this regard, it appears to be achieving acceptance as an appropriate tool.



## HAZARDOUS WASTE STREAMLINED PERMITTING

### CALIFORNIA - PERMIT REFORM

#### PROGRAM DESCRIPTION

A California pollution control program uses streamlined permitting to regulate the state's hazardous waste community. The 1992 Wright-Polanco-Lempert Hazardous Waste Treatment Permit Reform Act (AB 1772), effective January 1, 1993, creates a multi-tiered permit system.<sup>201</sup> The provisions of AB 1772 will change the permitting and regulatory structure of the state's previous "Permit By Rule" approach. Permit By Rule represented an earlier attempt to streamline regulatory requirements for on-site non RCRA treatment facilities. The streamlined permitting design will ease the regulatory reporting burden for some industry sectors. The implementing agency is the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC).

The Permit by Rule regulations allowed facilities that are not subject to permitting under subtitle C of the Resource Conservation and Recovery Act (RCRA) and that have approved on-site waste treatment operations the option to file a simplified permit application.<sup>202</sup> The intent of Permit by Rule was to streamline the entire permitting process for those facilities with lower risks. AB 1772 further refined the process by creating permit categories based on volume and the nature of the treatment or storage activity.<sup>203</sup>

The Permit Reform Act establishes a five tiered program for authorizing treatment and/or storage at many businesses that require state authorization to treat or store hazardous waste but do not require a RCRA hazardous waste facility permit under federal law. The five tiers are presented below in their descending order of regulatory burden:<sup>204</sup>

1. "Full" permit tier - the RCRA-equivalent permit will apply mainly to RCRA hazardous waste facilities and to state regulated incinerators and land disposal facilities;
2. "Standardized" permit tier - is required for off-site treatment or storage facilities not required to obtain a RCRA permit;
3. "Permit by Rule" (PBR) tier - is required for on-site non-RCRA treatment facilities. It is the most stringent tier for on-site non-RCRA treatment facilities. Under the Permit Reform Act, many of the wastestreams and treatment technologies formerly Permit by Rule are now eligible for new Tiers 4 and 5;<sup>205</sup>

4. "Conditional Authorization" (CA) tier - is required for on-site non-RCRA treatment facilities with California Health and Safety Code (CHSC) approved wastestreams and treatment technologies;
5. "Conditional Exemption" tier - will place very limited requirements upon certain types of low-risk on-site treatment activities with CHSC designated wastestreams and treatment processes, as well as establish a small quantity treatment exemption,<sup>206</sup> - Conditional Exemption-Small Quantity Treatment (CESQT) and Conditional Exemption-Specified Wastestreams (CESW).

Determination of the proper tier requires consideration of factors such as the type of waste treated, the treatment technology used, and the monthly volume treated.<sup>207</sup> A company's facility at one particular location may have different hazardous waste treatment units, and therefore would be "eligible" for more than one tier, or permit category. The facility could elect to file under the most restrictive tier, and thus pay a single fee for the whole facility; or it may elect to file separately under different tiers for different units. On-site recycling activities are exempt from any permitting requirements if a) the material is recycled and used at the same facility at which the material was generated and b) the material is recycled within 90 days of its generation.

All on-site tiers require that the facility submit a fee ranging from \$100 to \$1140 to the Department with the initial notification that is due April 1, 1993. After the first year, every calendar year thereafter the facility will be billed for 50% of the original fee if it is in the Conditional Exemption tier. The fee will be 100% each year if it is in the PBR or Conditional Authorization tier. Fees collected will be used to cover state costs for implementing the program. Standardized permit fees, which are currently set at the same level as the full permit tier, may be reduced up to 75% by Senate Bill 27 and 28 of 1993, and the Standardized permit notification will be extended to October 1, 1993.

AB 1772 will affect about 5,000 to 10,000 facilities which will be self-classified into the newly created tier system. Facilities must complete an application/notification process that informs the Department as to which tier the facility classifies itself. After completing this notification, each facility is responsible for complying with all the operating requirements associated with the tier or tiers that authorize the activities at their facility. The biggest change for industry is the establishment of three on-site hazardous waste treatment tiers, which have new operating requirements.<sup>208</sup>

California EPA has facilitated industries' adjustment to the new tiered permitting system with information packets, workshops, and user friendly flowcharts. The DTSC sponsored a January/February workshop series regarding Tiered Permitting for on-site hazardous waste treatment. Prior to this series, industries were requested to use the information package and evaluate their facilities. Flowcharts explained the eligible wastestreams for on-site treatment and the different factors of volume, concentration and treatment processes that determine which tier covers the facility's particular activity. After

the industry has identified the tier under which the hazardous waste treatment activity can be classified, it must check the statute or regulation to determine if there are any other eligibility conditions.

To further aid industry compliance with the streamlined permitting regulation, free workshops were provided and fact-sheets were mailed out to a large industry mailing list. Workshops offered guidance to businesses on the appropriate methods for completing all the necessary documentation for the permit tiers. Separate sessions were held for the standardized permit applicants (Tiers 1 and 2) and the lower three permit tiers for on-site waste treatment permit applicants.

Within two years of the facilities' notification of tier classification, the Department (in conjunction with authorized local agencies) will inspect each on-site facility, and then recheck those facilities every two years thereafter.

## **EVALUATION CRITERIA**

The DTSC has not yet performed an internal evaluation of the program. It is their obligation under AB 1772 to make biennial reports to the Legislature on the programs, effectiveness. The planned evaluation will use as criteria: the number of contaminated sites discovered and addressed by the program; the frequency and severity of current year releases at these facilities; and the number and severity of operational violations found during inspection.

The cost effectiveness of this program cannot be determined at this time. Assessment of the program after it has been in operation may allow some comparison of transaction costs, but is unlikely to allow comparison of environmental results per dollar expended. It is anticipated that the program will be cost effective for notifying facilities eligible for the streamlined tiers which would otherwise continue reporting under the full permit review process. Another feature potentially affecting the cost effectiveness of the program is its "post-audit" philosophy, replacing the detailed and expensive pre-review of plans and documents with field inspection and enforcement. The post-audit approach is potentially cost-effective for DTSC and business alike, eliminating the need to complete the expensive and lengthy full permit process.<sup>209</sup> It does, however, presume a high level of voluntary compliance.

The program does provide incentives for technology innovation. The law allows the DTSC to grant Conditional Authorization status to a new treatment technology which meets waste stream, technology, volume, and environmental restrictions.

The program is unlikely to be robust to less-than-perfect implementation because it relies heavily on self-classification and reporting and makes general assumptions about classes of facilities. On the other hand, it eases the process of regulation for both the regulator and regulated entity, thus allowing the process to function more smoothly and

allowing regulators to devote resources to other functions than permitting. However, the program will require significant resources to be devoted to the enforcement and inspection programs. Inspections are required every two years for the businesses classified in the on-site tiers.

Administrative savings are projected to be substantial. While facilities may incur some additional costs with self-classification, there are likely to be savings in permit preparation and processing for many facilities. For businesses subject to the State permit requirement but not to RCRA permit requirements, the lower regulatory and permit process burdens of the AB 1772 streamlined tiers represents a significant lessening of the financial burden for hazardous waste permitting. For the on-site tiers, the financial assurance requirements are relaxed or eliminated, the fees are reduced by an order of magnitude, and the California Environmental Quality Act (CEQA) review and the permit review/issuance process are eliminated. The program is fairly well integrated with the existing regulatory program, but industry training is essential in order for the program to operate effectively.

Distributional implications are uncertain. In general, costs should be lower for both the state and for industry. Changes in environmental quality are not predictable. The program appears to offer flexibility. Its appropriateness cannot yet be assessed given the program's newness.

**CHAPTER FIVE:**  
**MULTI - MEDIA POLLUTION PROGRAMS**



## CHAPTER FIVE: MULTI - MEDIA POLLUTION PROGRAMS

This chapter examines ten programs that deal with pollution problems affecting a variety of environmental media -- air, water, and land. A number of these programs could be classified with those in earlier chapters, but their reach generally extends beyond those discussed previously.

There is a wide variety in the program tools examined here. Several New Jersey programs make use of citizen-based reporting and monitoring to supplement traditional enforcement efforts. One actually allows citizens to issue enforcement citations. A unique Wisconsin program establishes a state-funded office to represent the citizenry on matters of environmental concern, and gives it the ability to file suit and to participate in rulemakings and hearings.

Voluntary programs in New York and Texas are examined. These take somewhat different approaches to education and implementation. The Texas program incorporates an interesting industry "honors" program.

One of the most interesting and effective of the programs examined in this chapter is New Jersey's Environmental Cleanup Responsibility Act (ECRA). Enacted in 1984, ECRA was expected to be the harbinger of a host of similar state laws, requiring the cleanup of industrial sites as a condition for their transfer, closure, sale, or acquisition. While ECRA has had profound effects in securing cleanups and enlisting the expenditure of millions of private dollars on environmental assessments and remediation, it did not produce the expected array of copycat laws. Only Connecticut's Transfer Act, enacted a few years later, approaches ECRA's requirements. Many other states have enacted disclosure provisions, however, drawing on part of the ECRA model. ECRA itself was significantly amended on June 16, 1993, with the enactment of the Industrial Sites Recovery Act (ISRA). ISRA incorporates many of the lessons learned over the years of New Jersey's implementation of ECRA.

Information programs are among the most interesting of the systems being tried by states and localities. ECRA and ISRA have important informational components. The state NEPAs discussed in this chapter are also information programs.

Although not separately discussed in this chapter, one of the interesting information-based approaches is California's Proposition 65, passed by initiative in 1986. Proposition 65 is an information program, and an enhanced monitoring and enforcement program, directed at a variety of media. The measure was unique because it required business to provide a "clear and reasonable" warning to citizens about the toxicity of chemicals in products.

Proponents of the initiative sought to provide incentives for firms to reduce human exposure to toxic substances, to force the hand of government and business to become involved in reducing carcinogens. The law required the governor to publish a list of known carcinogens and reproductive toxins that exceed the level of "significant risk" (defined as one excess case of cancer per 100,000 individuals exposed over a 70-year lifetime). Once the chemicals are listed, a company must not expose an individual to these chemicals without a "clear and reasonable" warning. Furthermore, a company must discontinue the discharge of a listed chemical into drinking water sources within 20 months of the chemical's listing.

To aid in enforcement, Proposition 65 includes a "bounty hunter" provision; citizens are permitted to bring a lawsuit against a firm that fails to comply with the law. The cost efficiency of the program has yet to be established. Providing warnings costs money, and it is not clear in all instances that the provided information is useful to consumers -- particularly where it consists of regular full page advertisements by ~~consortia~~ of oil companies noting that oil refineries produce substances "known to the state of California to cause cancer." Nevertheless, businesses have made changes in product formulations and operating practices because of the law.

A New Jersey multi-media permitting pilot program is reviewed. It operates in connection with the state's pollution prevention initiative.

Two tax-related subsidy programs are examined in this chapter. One, the Oregon tax credit for environmental control equipment, was designed to encourage rapid compliance and environmental innovation. Its record, as assessed by the state itself, has been mixed. The other, the Louisiana tax exemption program, appears to have had great promise. It linked enjoyment of industrial development incentives to the maintenance of a good environmental record. The business community opposed this program, and it was repealed after only a year of operation.

This chapter discusses state laws requiring the assessment of environmental impacts. These state laws are similar to the federal National Environmental Policy Act (NEPA), which requires a detailed assessment of impacts and alternatives to major federal actions having an impact upon the environment. The state laws establish various thresholds of coverage. In general, the state laws that cover private activities appear to have significant effects upon decisionmaking. A number of the laws also improve significantly upon the federal law by including substantive provisions that require the adoption of feasible mitigation measures and other outcomes that are not dictated in the federal statute.



# MULTIMEDIA POLLUTION LIABILITY PROVISIONS AND INFORMATION PROGRAM

## NEW JERSEY - ECRA

### PROGRAM DESCRIPTION

A New Jersey pollution control program uses liability provisions, with informational components, to achieve cleanup of multimedia wastes. New Jersey's 1984 Environmental Cleanup Responsibility Act (ECRA) is regarded as the most comprehensive of the nation's dozen state transactional environmental laws.<sup>210</sup> ECRA mandates that certain identified industries closing, selling, or transferring operations first investigate and cleanup any environmental contamination before they are allowed to complete the transaction. While industrial liability is not new, the requirement that the site be certified as clean before the completion of the transaction is unique. (Among the other states, only Connecticut has a law even approaching this standard). ECRA was replaced in 1993 by a similar law, the Industrial Sites Recovery Act (ISRA).

The administering agency is the New Jersey Department of Environmental Protection and Energy (DEPE). Two DEPE bureaus have been responsible for ECRA compliance - the Bureau of Environmental Evaluation, Cleanup and Responsibility Assessment and the Bureau of ECRA Applicability and Compliance, within the Division of Responsible Party Site Remediation's Industrial Site Evaluation Element.

ECRA was enacted to establish liability for environmental pollution of industrial sites and to harness market forces in obtaining cleanup. Prior to ECRA, inspections of industrial sites after transactions frequently revealed contamination of soil and water as well as abandoned chemical drums. Remedial action was often left for state and federal agencies, costing taxpayers millions of dollars. ECRA established industry as responsible for environmental cleanup by requiring industry to eliminate environmental hazards before any property transaction occurred. New Jersey's legislation essentially provided a buyer protection program for the wide variety of manufacturing operations covered by ECRA. This type of site evaluation and buyer protection has long existed in other contexts, such as termite, electrical, sewage and plumbing inspections.<sup>211</sup> ECRA, however, aimed to protect the environment and public health by ensuring seller liability.

Industrial establishments subject to ECRA are (1) those within the Standard Industrial Classification Code number groups 22-39, 46-49, 51 and 76; (2) that are engaged in operations involving the generation, manufacturing, refining, transportation, treatment, storage, handling, or disposal of hazardous substances and wastes; and that are (3) closing or transferring the ownership of the property or business.<sup>212</sup> All three conditions must be present for ECRA to apply. ECRA required that the industry provide verification of an environmentally clean site either with an approved Negative Declaration or a Cleanup Plan that specifies the necessary remediation to occur prior to finalizing the transaction.

Either the Department or the buyer may void a sale for non-compliance. There are also penalties up to \$25,000 per day for any violation of the Act. Mortgage lenders and other financing institutions involved in transactions provide a unique compliance check. Because of the voidability of transactions, lenders routinely require detailed cleanup and liability reports from clients subject to ECRA. Leases often reflect ECRA requirements, and pre-site audits have become common in property transactions. Fees paid by the industrial establishments for various activities required by the ECRA statute and regulations provide funds for the administration of the Department's program.

ECRA complemented existing federal and state traditional hazardous substance regulatory programs due to its: (1) requirements that private resources pay for investigation and cleanup of environmental hazards; and (2) provisions that achieved cleanups without state enforcement.<sup>213</sup> ECRA regulations compelled industry to respond efficiently and quickly with required site inspections and cleanups in order to finalize the property transaction. Furthermore, when cleanups are necessary, industries' access to funding allows for quicker remediation efforts than state and federally financed programs. ECRA cleanups have uncovered and remedied unknown hazards, and reinforced incentives against unlawful disposal of hazardous waste on industrial properties.

The Department publishes an ECRA newsletter, Site Remediation News, that reports on the number and status of ECRA "cases." Since its inception, some 9000 property transactions have required state notification and the subsequent Negative Declaration or Cleanup Plan reports. The Department also receives between 3000 and 6000 Applicability Determination Requests each year, over 90% of which results in decisions of non-applicability. The following table of aggregate statistics for fiscal years 1991 and 1992 show the number ECRA related notifications, Negative Declarations and Cleanup Plans presented the Department.

	1991	1992
Notices Received	900	816
Negative Declarations Issued	752	705
Cleanup Plan Approvals	149	86
Full Compliance Letters Issued	117	99
Total Cleanup Dollars	\$189,449,655	\$93,354,204

ECRA received its share of criticism during its lifetime, particularly from businesses that experienced delays in property transactions because of the ECRA investigation and cleanup requirements. In response to this early concern with delays, the Department increased ECRA staff and made allowances for the authorization of parties to sign administrative consent orders to perform the cleanup after the transaction. Other critiques

of ECRA have included: (1) the program may unintentionally encourage an industrial establishment to maintain a skeletal work force in order to avoid "closing" to defer any cleanup costs; (2) the program requires that current owners must pay all costs for site remediation, including the cleaning up of contamination caused by previous owners; and (3) the program requires a substantial amount of time and staff from the Department.<sup>214</sup> Industries have also complained about delays in completing transactions, and questioned the need to clean up properties that will remain in industrial use.

The ECRA legislation expiration date was December of 1992. The state extended the rules and regulations while the legislature considered the proposed Industrial Sites Recovery Act (ISRA) (S1070). On June 16, 1993, ISRA was signed into law by the Governor.<sup>215</sup>

ISRA retained the basic approach of ECRA, linking the cleanup obligation to transfer or closure transactions. Failure to comply with ISRA makes the transaction voidable by the transferee or the state, but the transferee must give notice and a reasonable opportunity to cure the defeat. ISRA makes it easier to complete deals with agreements to cleanup. ISRA revamps and streamlines the ECRA procedures, and provides greater flexibility in financing cleanup agreement guarantees. ISRA directs the DEPE to develop cleanup standards. It also allows deferral of cleanup activities if the site has been assessed, the industrial use will not change, and ability to pay for cleanup is certified.

## EVALUATION CRITERIA

From the public's point of view, New Jersey's 1984 Environmental Cleanup Responsibility Act (ECRA) has provided a cost-effective program to cleanup multimedia waste. It placed the burden for environmental cleanup on private industry and not on taxpayers. It also assured buyers that the property purchased will be free from environmental hazards and that they will not be liable for alleviating existing hazards, since the hazards must be remedied by the seller before completion of the transaction. The program harnessed some of the benefits of transactions to achieve environmental cleanup. From January 1984 until March 1993 \$230.4 million have been spent in cleanups while another estimated \$352.3 million are currently underway.<sup>216</sup>

There are limited incentives for technology innovation stemming from possible cleanup obligations. If an industry knows that a current activity is contaminating the environment, then it might turn to an alternative method to perform the activity in order to reduce the contamination and, therefore, reduce the amount of cleanup it will be responsible for at a future date. Pollution prevention is in the long-term interest of industry to avoid the financial burden imposed by a cleanup plan required by ECRA when the industry closes, sells, or transfers its operations. However, many other laws have the same effect.

Since ECRA is self-enforced by mortgage lenders, underwriters, and purchasers, its implementation is quite robust. These parties' involvement ensures seller liability, and hence produces action in environmental cleanup. In addition, there is the possibility of state enforcement because the state may void a transaction for noncompliance. These factors place a profound incentive upon financial interests to protect their interests through site assessments, audits, and cleanups, paid for by the parties to the transaction. There are also penalty charges up to \$25,000 per day for any violation of the Act.

The costs for administrative review of compliance with ECRA requirements are covered by fees paid by industrial establishments for various activities required by the ECRA statute and other hazardous substance regulations. These administrative costs, while quite significant, are, however, less than what a comparable state investigation and enforcement-driven cleanup program would require. Compliance costs for industry, on the other hand, are significant. Private industries are driven to protect their economic futures; it is in their interest to reduce and possibly prevent pollution before closing, transferring, or selling their operations when the liability for cleanup would most likely be greater. Industries' access to funding allows for quicker remediation efforts than state and federally financed programs.

ECRA has been well integrated with New Jersey's pioneering "Spill Act," the model for the later federal Superfund law. It also integrates well with other state and federal pollution control and cleanup programs. The genius of the program, however, is its recognition of how market forces and financial institutions' self-interests could be harnessed for environmental cleanup.

ECRA has had some significant distributional implications. Essentially, it shifts costs from the government to the private sector. Moreover, it induces expenditures from the private sector that probably would not have occurred had the state elected to maintain a strictly inspection-enforcement initiated cleanup program. Essentially this program captures the benefits of transactions (when industries may have sources of cash) and diverts some of those resources to environmental ends.

The results have been quite good, as predicted. However, the extent of environmental cleanup is dependent upon the rate of acquisitions and closures by businesses, which is linked to the business cycle. During the overheated mergers and acquisitions market of the mid-1980s, the program obtained substantial resources. With slowdowns in that type of activity, one issue is the effect of the law upon closures; some facilities may keep themselves barely operational in New Jersey to avoid triggering cleanup obligations. This may be beneficial to the state in terms of employment, but may also require more reliance on traditional enforcement driven cleanups.

Where acquisitions and closures did occur, ECRA ensured environmental cleanup of those industries and provided a source of funds for future reviews by the Department. ECRA was also very flexible in terms of the types of sites it could potentially deal with, but was also inflexible because "cleanup" was always required whether or not the environmental benefit was worth the expenditure.

## MULTIMEDIA POLLUTION LIABILITY PROVISIONS

### WISCONSIN - PUBLIC INTERVENOR

#### PROGRAM DESCRIPTION

A Wisconsin program provides environmental advocacy through an independent office housed in the Department of Justice. Called the Public Intervenor, this state office was given a mandate in 1967 to intervene in agency proceedings to protect "public rights" in Wisconsin's natural resources. The "Intervenor" Office has evolved into an office of general environmental advocacy that initiates, as well as intervenes into litigation and policy matters, and helps citizens help themselves with respect to local environmental problems. More specifically, since 1984, the Public Intervenor is authorized to "initiate actions and proceedings before any agency or court in order to raise issues, including [constitutional issues], present evidence and testimony and make arguments." The Wisconsin office of the Public Intervenor is the only one of its kind in the country.<sup>217</sup>

The office of the Public Intervenor was created as the result of reorganization of state agencies, specifically the consolidation of the Department of Resource Development and the Conservation Department into one new agency titled the Department of Conservation and Natural Resources.<sup>218</sup> Conservationists protested and lobbied for protection of the "adversary process" that the former Conservation Department had exercised in hearings. A 1967 bill was passed that renamed the agency the Department of Natural Resources (DNR) and created the Office of the Public Intervenor. Operated by assistants to the Attorney General, the office was authorized to intervene in proceedings "where such intervention is needed for the protection of public rights in water and other natural resources..."<sup>219</sup>

As a result of recommendations to improve upon the effectiveness of the Public Intervenor, the authority of the office has twice been expanded (more resources and a more clearly defined role of the Public Intervenor as public advocate with the authority to initiate actions).

Some of the Office's changes came as the result of recommendations from a 1975 task force. Resources increased from one assistant attorney general not working quite full-time to two full time Intervenor. A clinical program also provides for 100 to 150 hours per week of law student assistance. A recommendation for two scientific investigators was not implemented. Despite the increase in its work load from 20-30 cases annually to over 300 cases annually, the Office has experienced a reduction of the budget to employ witnesses and consultants.

The statutory status of the Public Intervenor's Citizen Advisory Committee (CAC) was upgraded in 1984. The 1984 Wisconsin statute mandated that the Attorney General appoint 7 to 9 members with environmental backgrounds (with at least one with business

skills and one with agricultural skills) to advise the office of the Public Intervenor.<sup>220</sup> The CAC has done more than advise and has acted as the policy making body for the Public Intervenor.

The issues focused upon by the Public Intervenor are selected by the Public Intervenor Citizens Advisory Committee (CAC). The CAC conducts regular meetings every two months and encourages public participation and written comments. From these meetings the CAC provides the office of the Public Intervenor with current public input, a selection of major cases for potential involvement, and a prioritized listing of natural resource issues and major case strategy decisions. Consultants are hired by the Intervenor to perform research when the needed information cannot be obtained from the agencies themselves.<sup>221</sup>

The 1990 updated list of Public Intervenor program priority areas, as established by the CAC, are:<sup>222</sup>

- (1) Urban Sprawl, including transportation, sewage, water;
- (2) Toxics, including water, pesticides, sediments;
- (3) Public trust;
- (4) Wetlands; and possibly
- (5) Aquaculture.

Currently there are two attorneys in the office of the Public Intervenor. The office performs the following activities:<sup>223</sup>

- (1) Responds to citizens requests for advice;
- (2) Testifies at public hearings;
- (3) Petitions agencies for improved regulations;
- (4) Serves on legislative committees and advocates legislative reforms; and
- (5) Initiates litigation in major environmental cases.

Wisconsin citizens that receive assistance include conservation groups, farmers, businesses, labor groups, local and state government officials, and urban and rural residents.

Approximately 35-40% of the Public Intervenor's case load involves permit hearings and other forums for advocacy, a decrease from the 80-90% prior to restructuring of the program in 1984. Another 20-25% of the cases involve legislation or rule making.<sup>224</sup> The

Public Intervenor has made this shift in emphasis to protect public rights through broader regulation or legislation rather than the alternative of numerous separate public hearings.

Some of the Office's accomplishments include:<sup>225</sup>

- (1) Won a significant case in the U.S. Supreme Court in 1991 upholding rights of local governments to regulate pesticide use. The Supreme Court held that Federal pesticide law (FIFRA) does not preempt local governments from regulating pesticide use.
- (2) Establishing comprehensive regulatory programs for metallic mining and groundwater.
- (3) Creating rules to protect rural residents from unwanted pesticide exposure and promoting integrated pest control.
- (4) Working to obtain access to Wisconsin lakes and preserve free-flowing streams.
- (5) Promoting a healthy workplace environment for Wisconsin's labor force.
- (6) Promoting preservation of urban downtowns and rural farmland while reducing urban sprawl.
- (7) Coordinating a wetlands "dredge and fill" permit surveillance and public participation program.
- (8) Leading the efforts to establish standards for solid waste landfills and urging alternatives such as source reduction.
- (9) Advocating highway alternatives that are less costly and less environmentally damaging.

The Office of the Public Intervenor has taken on additional roles as the result of activities of trade associations, lobbyists, and lawyers representing private interests in environmental development issues. The Public Intervenor has countered these actions by expanding its efforts from solely judicial proceedings to organizer, ombudsman, lobbyist, and educator. Both the CAC and the Intervenor believe that the expanded role on behalf of public rights of the office of the Public Intervenor is "necessary and desirable" to protect the public interest in the face of the counter-activities.<sup>226</sup>

## EVALUATION CRITERIA

Wisconsin's use of state resources to "watch dog" public natural resources appears to be a fairly cost effective environmental quality program. However, there is no clear way to



compare costs and environmental benefits. The Office of Public Intervenor has inside access to monitor and advise other state agencies in regard to their violation of environmental regulations. Such activities, if performed by private "watch dogs," are often reactive in nature and more likely result in costly lawsuits. Operating within the Department of Justice reduces many of the traditional overhead costs for the Office of the Public Intervenor. Public support of the program is high, and the state considers the Office a wise allotment of state resources.

The program functions as an incentive for technology innovation. With the roaming investigative scrutiny of the Office there exists an impetus for those violating environmental regulations to bring their operations into compliance.

The Office of the Public Intervenor is small and with few major overhead costs, and is consequently regarded as robust in implementation. The 1975 review and recommendations concluded that the Office was operating below potential due to funding and staffing constraints; however, it continued effectively handling cases and achieving its mandate. It has been even more effective, without an increase in staff, following the legislative changes that followed those recommendations.

The administering agency is still operating with a low budget, which creates certain burdens for the Office. The program is nonetheless active, and offers public environmental education workshops for concerned and interested citizens. Furthermore, some technical questions can be referred to private consultants, which frees up Office staff for other tasks and which reduces burdens. Other state agencies may experience more of an administrative burden (e.g. by forcing agencies to justify their decisions, conduct research, etc.) as the result of actions taken by the Office of Public Intervenor.

Operations for regulated industries are more difficult given the existence of the Office of the Public Intervenor. Firms otherwise operating in obscurity in rural parts of the state may now be brought to the government's attention. Indeed, with the scrutiny of the Office fixed on the legal/regulatory landscape, industry must take greater care in justifying the public and environmental benefit of their operations; this can lead to wiser planning; but it can also lead to projects being foregone that would otherwise have been initiated.

The Office of the Public Intervenor is well integrated with the existing regulatory and administrative system. Wisconsin created the Office to fill a void the public identified with the closure of the Conservation Department. On a national level, Congress could conceivably facilitate the implementation of similar programs. (Indeed, the Interstate Commerce Commission has long had a public advocate in regulatory proceedings.) Many state public utility commissions also have intervenors for rate cases. The difficulty that would face Congress is the question of who would set the agenda for the regulatory agency. CAC has worked well in Wisconsin, but the issue of "board capture", etc. may arise in other settings.

The chief distributional implication of the Wisconsin program is the empowerment of the state's poor and the general citizenry. With the government footing the bill, concerned citizens can access the monitoring and enforcement levers within environmental regulation, affecting an industrial community that in other states is often beyond the financial reach of the basic citizen.

The predictability of the program's results, both environmental quality and costs, is quite good. The Office operates on a fixed budget and efficiently assists in obtaining compliance, mitigation, and consideration of environmental factors. In addition, the program is very flexible and appropriate for meeting alternative types of goals. Its primary constraint appears to be budget and staff.

## MULTIMEDIA POLLUTION ENHANCED MONITORING AND ENFORCEMENT

### NEW JERSEY (NORTH BERGEN) - CITIZEN TASK FORCE

#### PROGRAM DESCRIPTION

A New Jersey pollution prevention program uses enhanced monitoring and enforcement to control illegal dumping of multi-media wastes. In the Town of North Bergen a volunteer waste management task force has patrolled the community's 8 square miles of lands since 1985. The officially authorized task force searches out violations of New Jersey pollution control laws with the mandate to ticket any offenders.<sup>227</sup> Members of the Health Department have volunteered since 1985 to administer the program. Health Department employees and other residents are authorized by the township to search for and ticket pollution emissions and dumping violations.

North Bergen's volunteer waste management task force was created to assist pollution control work already in place in the town. The Health Department employees had identified numerous illegal dump sites throughout the community. Described as a "job within a job", the concerned public servants decided to clean up and prevent North Bergen's pollution problems; this in turn facilitated the regular work of the Health Department.<sup>228</sup> The task force was created to report any violators. Summonses resulting in fines go the Town for clean up costs.

Illegal dumping was a major problem for the area. Dumping occurred between 300-500 times per year before the volunteer task force began patrolling and ticketing. In the early years of the program, the task force consisted of nearly 35 residents. The Health Department organized the task force into separate squads and assigned each squad its territory. As the program succeeded in its efforts to locate and ticket violators, the task force became more well known and respected. For the last two years, the Town of North Bergen waste management task force has consisted of just two volunteers. The number of illegal dump events is down to 50 dumping violations per year; dumping of tires and construction debris comprise the bulk.<sup>229</sup>

#### EVALUATION CRITERIA:

Cost effectiveness is worked into the North Bergen program. One volunteer notes that the pollution patrol work facilitates his related tasks as a health inspector. Furthermore, the program generates revenues and has few expenses with Health Department employees and other trained residents composing the task force. These citizens of North Bergen simply take note of violations during their leisure or regular working hours and are burdened only with the reporting procedures.

This grassroots effort to control pollution has no incentives for technology innovation.

The program maintains some robustness to less-than-perfect implementation. Because it complements the work of the Health Department, it might be considered an add-on project that has no overhead yet brings additional enforcement. This is a plus to the township even if it is implemented in less-than-perfect conditions. The administrative burden to the regulatory agency is minimal, requiring some training of task force when it consists of a large number of new volunteers, the provision of materials, and also the work to follow up on more serious reported violations.

There is no specified "regulated industry" in this pollution control program. However, the potential violators of pollution regulations are aware of the work of the task force enough that violations have been almost entirely curtailed.

The mission of North Bergen's program coexists with the mandate of the Department of Health. This mutualism in the relationship contributes to the new system of enhanced monitoring and enforcement, providing relatively smooth integration with parts of the existing regulatory system. However, this complementarity only extends as far as local public-health related environmental problems, and is not suited to all types of environmental violations.

As far as the ability of legislatures to set and insure the implementation of similar goals, little can be said on the basis of the North Bergen program. The citizen task force does not provide predictable results, and there are no recognized distributional implications.

Program flexibility, on the other hand, is available in this enhanced monitoring and enforcement citizen-based approach to pollution control. Appropriateness of the program for meeting alternative types of goals is variable, and depends upon the types of behavior detected and the ability of the locality (or the state) to follow through on the more serious problems with other means.

# MULTIMEDIA POLLUTION ENHANCED MONITORING AND ENFORCEMENT

## NEW JERSEY - INFORMATION AWARDS PROGRAM

### PROGRAM DESCRIPTION

A New Jersey pollution prevention program uses enhanced monitoring and enforcement to better control illegal dumping of solid wastes. New Jersey Statute §13:1E-9.2, or the information awards program, encourages residents to report illegal dumping and receive 10 percent or \$250 of the civil penalty collected, whichever is greater.<sup>230</sup> Any information leading to criminal convictions is rewarded with 50% of the penalty collected.<sup>231</sup> Furthermore, the legislation provides for the protection of the identity of those supplying the information to the enforcing authority.<sup>232</sup> The waste types include solid waste, toxic chemicals, radioactive or medical waste. The program is administered by the New Jersey Office of the Environmental Prosecutor.

New Jersey's information awards provisions, which became effective in September 1990, are designed to utilize the concerned public as additional resources supplementing state monitoring and enforcement measures. In addition to the Information Awards Program, which is part of the Solid Waste Management Act, the four following statutes include monetary award provisions:

1. The Major Hazardous Waste Facilities Siting Act, N.J.S.A. 13:1E-49 et seq., at N.J.S.A. 13:1E-67a (50% of any criminal penalty collected for the illegal treatment, storage or disposal of hazardous waste);
2. The Regional Low Level Radioactive Waste Disposal Facility Siting Commission, N.J.S.A. 13:1E-177 et seq., at N.J.S.A. 13:1E-191 (50% of any criminal penalty collected for the illegal treatment, storage, or disposal of low level radioactive waste);
3. The Comprehensive Regulated Medical Waste Management Act, N.J.S.A. 13:1E-48.1 et seq., at N.J.S.A. 13:1E-48.24 (10% or \$250, whichever is greater, of any civil or criminal penalty collected for a violation of the Act);
4. Ocean Dumping Enforcement Act, N.J.S.A. 58:10A-47 et seq., at N.J.S.A. 58:10a-49c (10% of any criminal penalty collected for a violation of the Act).

These information awards programs are aimed at encouraging residents to "blow the whistle on polluters" and thereby strengthen state reporting and enforcement.<sup>233</sup> Implementation of these statutes is coordinated through a single program administered by the Environmental Prosecutor.

In 1991 the Department imposed well over \$50 million in penalties on the regulated community. Penalty levels for environmental violations reach up to \$50,000 per day per violation. In situations concerning extreme violations, the state has authorized several million dollars in penalties per offense. With an increase in penalty levels and more stringent enforcement, certain businesses will be forced to "terminate operations due to their inability to pay penalty assessments".<sup>234</sup>

To date, only two penalties (\$500,000 and \$2,500) have been collected as a result of citizen-initiated investigation and enforcement under the information awards program. Bounties of \$50,000 and \$250 were paid respectively.<sup>235</sup>

## **EVALUATION CRITERIA**

The program appears to be cost effective for the state. It provides no incentives for technology innovation.

The program is robust to less-than-perfect implementation, but not highly robust if the state is unable to maintain the ability to follow up with investigation of citizen leads and prosecution of enforcement cases. There is, accordingly, an administrative burden on the state, not only in terms of the penalties (which would otherwise go solely to the state rather than be shared with the information awards), but also in terms of personnel needed to receive and respond to the tips. The state must devote time, resources, and personnel to the program in order for it to be effective.

There are no additional burdens to the regulated industry.

The program is reasonably well integrated with the existing regulatory, investigatory, and enforcement framework. The program's ability to set and achieve goals is limited, based primarily upon the level of citizen interest, and the state's ability to discern and follow up on those leads that are the most important.

The program's distributional effects are uncertain, but may provide some support to citizen groups that would otherwise have little or no outside funding.

The program does not have predictable results, but does provide greater flexibility to the state and amplifies the investigatory and enforcement presence necessary to create a climate of deterrence that will foster voluntary compliance by regulated industries.

## MULTIMEDIA POLLUTION VOLUNTARY PROGRAM

### NEW YORK - CLEAN INDUSTRIES PROGRAM

#### PROGRAM DESCRIPTION

A New York pollution prevention program uses a voluntary program to decrease the levels of multi-media pollution. New York City's Clean Industries Program (CIP) for 1993 to 1995 is a partnership between the city's Department of Environmental Protection (DEP) and a local industrial extension service, the New York City Industrial Technology Assistance Corporation (ITAC), to provide technical assistance and to facilitate access to available financial resources to assist local manufacturing businesses with the implementation of pollution prevention strategies.

ITAC is not required to report participating company names to the DEP; this encourages industry to view the CIP as a less risky source for pollution prevention information than a traditional program. Funding for this two year effort comes from an Environmental Protection Agency matching grant.<sup>236</sup>

The pilot CIP was set up in 1992 in response to: (1) DEP's \$850,000 fine from the New York State Department of Environmental Conservation (DEC) for a treatment plant capacity violation, with the penalty funds being earmarked for a DEP community based environmental benefits program; and (2) the densely populated Greenpoint/Williamsburg section of Brooklyn, with the environmental impacts of approximately 1,000 manufactures often operating in antiquated plants using outdated equipment. After success with this "pilot" program, DEP and ITAC applied for a U.S EPA grant to expand the CIP citywide.

CIP aims to: (1) reduce environmental and human health impacts of industrial activities; (2) assist industrial firms to integrate multimedia pollution preventions strategies into their manufacturing systems while increasing their ability to compete in global marketplace; and (3) design a program that can be executed citywide.<sup>237</sup> The elements of the CIP services are:

1. Industry Specific Workshops.
2. One-On-One Marketing/Education on Pollution Prevention.
3. Preliminary On-Site Assessments.
4. Referrals to consultants, vendors and other programs for Specialized Pollution Prevention Services.
5. Follow-up/Project Implementation.
6. Assistance in Obtaining Financing.

Beyond direct assistance services, the CIP will draw upon the resources of several other organizations to provide a full range of pollution prevention services:

- (1) The New York State Environmental Facilities Corporation (EFC) which provides technical advisory services for a fee to help businesses and government agencies cut pollution and save money by more effectively and efficiently managing their wastes. Additionally, EFC likely will be designated the New York State technical assistance entity under the Federal Clean Air Act Small Business Assistance Program. The CIP will coordinate with EFC to make free Clean Air Act compliance assistance services available to qualified clients (pollution prevention is considered the preferred approach in addressing Clean Air Act regulatory requirements).
- (2) The New York State Department of Environmental Conservation (DEC) pollution prevention unit which will make available its materials, provide access to its pollution prevention data base, and assist the CIP in developing workshops; and
- (3) Local development organizations which will market the program to their local industrial communities, assist the firms in accessing financing and other governmental programs, and cosponsor seminars and workshops.

ITAC provides the field extension service element of the CIP, supported by other ongoing ITAC programs and building on the good will developed over the past six years of its operation. DEP co-manages the program, carries out ongoing planning, technical support and liaison with state and local environmental regulators (air, water, hazardous materials, etc.). As an integral part of CIP, DEP field staff will perform the role of "Pollution Prevention Ambassadors," educating the regulated communities about pollution prevention and informing them about CIP services.

ITAC supporting programs include:<sup>238</sup>

1. The Industrial Effectiveness Program (IEP) and the Relocation Plus Productivity Program (RP<sup>2</sup>) provide matching grants to manufacturing firms to help them improve their productivity.
2. The AMICI Program assists firms to eliminate waste and apply total quality management to their manufacturing operations.
3. The Linking Academe and Business (LAB) project provides the data base and relationships to supply the intellectual and R&D resources for project implementation.
4. The Manufacturing Service Center provides education, training and problem solving support, funded through the National Institute of Standards and Technology MTC program.



ITAC's and DEP's action plan for the CIP is to perform: (1) 120 initial site visits; (2) 50 preliminary waste assessment studies; (3) 12 comprehensive assessments (Editorial Note: Due to lower than anticipated local matching funds, this figure has been reduced from 24, but may be eventually restored to the original number); (4) 15 projects where CIP will provide pollution prevention project management assistance; (5) referrals for assistance services to other programs/resources; and (6) development of group projects to benefit groups of firms.<sup>239</sup>

Industrial pollution prevention is any practice that reduces or eliminates waste or pollutants at the source. Options are:

1. Material substitution
2. Product reformulation
3. Production process changes
4. Equipment changes
5. Maintenance/housekeeping modifications.

Benefits from the pollution prevention are: (1) financial savings by reducing raw material losses and expensive "end of pipe" treatment technologies and disposal practices; (2) cost reductions by conserving energy, water, chemicals and other inputs; (3) solutions to single media environmental problems instead of shifting problems from one media to the other; and (4) decreased liability risk by reducing hazards to public health and the environment.<sup>240</sup>

Local capacity building is a component of the CIP, in particular educating organizations on how pollution prevention fits in with their objectives of retaining jobs, stimulating the economy, and linking business and universities with environmental research and development capacity.

#### **EVALUATION CRITERIA:**

New York City's CIP initiative is very recent and lacks data for an adequate evaluation of its cost effectiveness. One of the program's unresolved policy decisions involves the question of whether it should attempt to contact many companies on a general assistance level or instead assist a few companies in greater depth. The "depth or breadth" issue is a concern for a great number of pollution prevention programs. CIP is unique, however, with its use of ITAC as the field extension and business contact arm of the assistance project. Because of industries' history of receiving help and not compliance fines from ITAC, they are more likely to consult ITAC for questions on pollution prevention. It appears that an industrial assistance approach will greatly increase the chances of program cost effectiveness.

Providing incentives for technology innovation is a fundamental service of the CIP. ITAC also administers a state program, the Industrial Effectiveness Program, that can

provide matching funds to companies for consulting services, when their pollution prevention activities are linked to productivity improvements. The DEP and ITAC assist industry by identifying the availability of funds for such pollution prevention development. By helping industry overcome the obstacle of financing, CIP goes a long way in encouraging technology innovation. Furthermore, through working together in workshops and on-site assessments, the CIP staff and industry will better understand the others' goals and impediments. This insight may generate the development of innovative technological solutions.

Funding constraints and limited staff and information as well as other factors that cause a less-than-perfect implementation of the program will have an unknown effect on the robustness of the program. Depending on the type of industry and its level of need, such constraints could present little problem or great problems for a realization of the program's benefits. Due to the nature of the EPA grant, the program will have only two years of certain funding and then need to re-secure administrative and project financing.

The regulatory agency does carry the burden of fulfilling the requirements for appropriate data and analytical expertise. In order for successful consultation and referral, quality information is key for the effectiveness of the CIP. The "depth or breadth" question implicates the question of burden as well. Each approach imposes differing administrative burdens.

Equally affected by this question is the level of difficulty of the program for the regulated industry. If the program can offer detailed on-site assessments and recommendations as well as provide avenues for funding, then the regulated industries will experience little difficulty with meeting the pollution prevention goals of CIP.

CIP can be well integrated into the existing regulatory system, but there is an obvious tension in separating the provision of information and problem solving from the detection and enforcement functions of the state agency.

Legislative ability to set and insure the implementation of goals is not assured, but the development of cooperative working agreements between a regulatory agency and business extension services provide a first step in ensuring program effectiveness. The CIP is beginning to focus efforts on "strategic industries" in New York City, which is defined as industries that are well represented in the city that have existing or potential compliance problems, and whose problems have a high probability for solutions through pollution prevention techniques.

Through the use of ITAC as field representative, CIP is inherently "distributional" as a technical assistance program.

The program plans to use \$450,000 over the next two years. Whether there will be predictable improvements in environmental quality through the implementation of pollution prevention techniques is uncertain at this time for lack of data. The program appears to be

flexible and appropriate for meeting alternative types of goals, as evidenced in ITAC's use of similar assistance techniques with business extension programs. Indeed ITAC is promoting pollution prevention as a competitive enhancement for participating businesses.

## VOLUNTARY MULTIMEDIA POLLUTION VOLUNTARY PROGRAM

TEXAS - CLEAN TEXAS 2000

### PROGRAM DESCRIPTION:

A Texas pollution prevention program uses voluntary means to reduce the generation of multi-media wastes in the state. Clean Texas 2000 is a comprehensive statewide environmental program aimed at reducing and preventing pollution and educating all citizens about how their lifestyles affect the environment. Clean Industries 2000, a major component of Clean Texas 2000, invites industrial facilities to voluntarily cut 1987 levels of hazardous wastes and toxic releases by 50% or more by the year 2000.<sup>241</sup> Applications for membership were submitted and 76 charter members were announced in December 1992 by Governor Ann Richards and the Texas Natural Resource Conservation Commission (TNRCC).<sup>242</sup> Membership will be reviewed annually and achievements will be recognized on an annual basis. The TNRCC Office of Pollution Prevention and Conservation administers the program.

The development of this program stems from the Texas Waste Reduction Policy Act of 1991 (Senate Bill 1099). The Act directs the TNRCC to implement a multi-media pollution prevention program. By focusing primary attention on source reduction and waste minimization the TRNCC hopes to make substantial steps to reduce multi-media pollutants, to protect public health and safety, and to preserve and protect the natural resources of the state.<sup>243</sup> The Act requires many industries to prepare multimedia pollution prevention plans (known as 1099 plans) between July 1993 and January 1997 depending on the levels of wastes generated or reported Toxic Release Inventory releases. By developing and implementing these plans, industry will be able to develop strategies to reduce waste generation and to reduce the release of pollutants.<sup>244</sup>

The Clean Industries 2000 program was created to serve as a complement to the 1099 plans by providing specific reduction goals and incentives for achievement of reductions in hazardous wastes and toxic releases over and above the state and federal laws. The program was developed by the TNRCC with guidance from industry and environmental representatives. Participation in the program is based on an industrial facility's commitment to the following requirements.

1. Commit to carry out a pollution prevention plan that will reduce the release of toxics and/or the generation of hazardous wastes at their facility by fifty percent or more from 1987 levels by the year 2000;
2. Implement an internal program for environmental review and management to assure high levels of environmental compliance with state and federal standards;

3. Form a citizens' advisory committee; and
4. Provide for financial or in-kind services for one or more community environmental projects.

The application for the voluntary program requires a facility to state the reduction that can be achieved through either source reduction or waste minimization and the milestones that will culminate in the stated reductions.<sup>245</sup> Projections must be consistent with the 1099 Pollution Prevention plans and the annual reports must demonstrate that the stated reductions are taking place. The compliance history of an applicant is studied before membership is verified. But because the program is voluntary, only when there are unresolved enforcement issues and chronic non-compliance will any facility be asked not to apply. Membership is renewed annually as long as the company appears to be on schedule with reductions. If a facility needs to abort the pollution reduction plan because of financial stress during one particular year, no negative press release will be issued. Industry with records of past violations of any pollution control laws will be more closely monitored, but are not excluded from the voluntary program.<sup>246</sup>

## EVALUATION CRITERIA

The Texas program's voluntary approach to pollution prevention embodies two cost effective strategies to manage for environmental quality. First, the program encourages state industries to participate in pollution prevention projects through the existing environmental Clean Texas 2000 campaign without creating costly administrative regulations. Second, the program's goal of preventing the production of multi-media wastes is, in the long term, far more cost efficient than any future remediation costs. In both the short and long term the elimination of toxics use is a cost savings compared with the companies' likely projected toxics compliance costs - such as storage, handling, treatment and disposal costs. The benefits of the Texas program are similar to those identified in the Massachusetts TURA program, where companies may be financially healthier when they remove toxics from production processes.

The Texas program provides incentives for technology innovation, mostly as the result of the program's voluntary nature. Companies are not limited to upgrading environmental control measures with the adoption of Best Available Technology (BAT) to meet regulatory compliance standards. Instead, as with the Massachusetts TURA program discussed in this text, industry is provided an overall goal of 50% toxics reduction. This removes traditional planning blinders and may inspire the development of better control technologies for industry and the environment.

The Clean Industries 2000 program relies on agency oversight and industrial reporting for smooth operation. The program is packaged under the umbrella campaign, Clean Texas 2000, which provides some robustness as it is both ambitious and well funded. The TNRCC's administrative burden to implement this program may be similarly

inseparable from the work required by the agency while participating in the state's Clean Texas 2000 program. Most of the agency's requirements for data and analysis will come from reports filed by the participating industries.

Difficulty with program implementation for the participating industries will vary, depending on each company's degree of dependence on toxics in production and what is currently known regarding alternative nontoxic processes. Efforts to meet the program's other three requirements (internal compliance review, formation of a citizens' advisory committee, and community environmental projects) will require start-up oversight and then most likely will operate independent from regular planning schedules. For example, a well designed community environmental project can be renewed yearly.

The Clean Industry 2000 program integrates well with the state's existing regulatory system. The toxics reporting system and planning requirements of S.B. 1099 facilitate participation in the voluntary program.

The legislature's ability to set goals is reasonably good, but it is less clear (or predictable) that these will be met, because of the voluntary nature of the program. The Clean Industries 2000 participation criteria provide some basis for assurance, however, because of the performance of internal reviews, the public accountability to citizens, and the requirement to perform community projects.

The TNRCC goal of achieving a statewide source reduction and waste minimization of 50% is dependent on the voluntary program. Regular monitoring by the TNRCC of participant compliance will offer some degree of short-term predictability, but offers no guarantee on voluntary compliance. However, the state has placed a good degree of confidence in the voluntary approach to achieving targeted pollution controls. This is evidenced in the proliferation of similarly designed programs within the umbrella Clean Texas 2000 plan.

Distributional impacts are not known.

The program appears to offer significant flexibility and may be appropriate in a number of settings. Though early in the life of the new industry program, initial results look promising, with 76 of the top 100 hazardous waste generators in the state pledging to reduce hazardous wastes by 57% and toxic releases by 62% by the year 2000. Recruitment goals for the upcoming year are to induct the next 25 on the top generators list into the program.<sup>247</sup>

## MULTIMEDIA POLLUTION STREAMLINED PERMITTING

### NEW JERSEY - FACILITY-WIDE PERMITS

#### PROGRAM DESCRIPTION:

A New Jersey pollution prevention program uses a streamlined permitting process to ease industries' reporting burden and therefore facilitate multi-media toxics reduction. The Pollution Prevention Act (Act), signed into law in 1991, contains two separate, but linked programs: facility pollution prevention planning (FPPP) and the facility-wide permit (FWP) pilot program. The FPPP program will involve roughly 850 New Jersey companies, while the FWP pilot program works with up to 15 companies. The FPPP program is designed to encourage industry to shift toward prevention options that have not been commonly practiced. The goal of the voluntary FWP pilot program is to simplify permitting and to focus industry on facility planning based prevention as opposed to the traditional end-of-pipe pollution control regulatory programs.

The Act requires the Department of Environmental Protection and Energy (DEPE) to implement the pilot facility-wide permitting program<sup>248</sup> involving priority industrial facilities over approximately a 5 year period beginning in 1995.<sup>249</sup> Before the legislation passed, the DEPE's Office of Pollution Prevention started a pre-pilot program which included three volunteer facilities.<sup>250</sup>

The idea for incorporating multi-media permits into the Pollution Prevention Act came from New Jersey's identification of its inefficient, fragmented approach to separately regulating air and water pollution and hazardous waste management and was noted by the EPA Technology Innovation and Economics Committee's study.<sup>251</sup> The single permit will create a more rational and coherent permitting process; however, the process might not be shorter than the previous multiple permit system. The DEPE facility-wide permit program is based on seven key premises:<sup>252</sup>

1. Existing environmental statutes provide more flexibility for pollution prevention than has previously been promulgated through regulations.
2. Increased permitting efficiency and flexibility can be used as tools to provide incentives for pollution prevention.
3. A facility has greater knowledge of its manufacturing processes than a regulatory agency could ever acquire.
4. Pollution prevention is inherently beneficial for a facility and, in many cases, offers financial benefits.

5. A multi-media chemical inventory should be conducted at a process level in addition to at a facility level in order to identify pollution prevention opportunities.
6. Less emphasis on command and control and more emphasis on pollution prevention incentives will motivate continued innovation in preventive methods.
7. Tracking progress using integrated data is the most efficient method of measuring pollution prevention progress.

New Jersey states that a goal of the FWP program is to achieve reductions in the use and generation of hazardous substances and, in doing so, to also bring about more sensible, comprehensive regulation.<sup>253</sup>

The facility-wide permit uses a multi-media approach to regulate single media discharges and interstate pollution prevention planning. The facility-wide permit contains two components: (1) pollution prevention requirements and (2) permitted emission/discharge limits. The pollution prevention requirements in the permit are outlined in the facility's Pollution Prevention Plan. This plan has an implementation schedule for the identified source reductions, implemented at the facility's discretion. The permitted emission/discharge limits ensure compliance with existing single media regulations and eliminate cross media transfers.<sup>254</sup>

The Act mandates facility participation in the development of Pollution Prevention Plans, but seeks volunteers for the facility-wide permitting pilot program. (In response to industry concern, the DEPE has postponed, until 1996, implementing Pollution Prevention Plan requirements into an industrial facility's single media permits as enforceable conditions). The Act's public policy goal is to reduce statewide 1987 amounts of hazardous substances generated prior to release, control, treatment, or recycling by 50% after five years of program implementation. A facility-wide permit enables a facility to focus its resources on achieving this pollution reduction goal rather than completing the burdensome process of obtaining several different permits.<sup>255</sup> The state believes that it is in the best interest of the facility to obtain a facility-wide permit.

The criteria for selecting volunteer priority industries to participate in the facility-wide permit program are the following:<sup>256</sup>

1. Potential for the Priority Industrial Facility (PIF) to serve as a statewide model for multi-media pollution prevention programs.
2. Potential for PIF to meet reduction goals for pollution prevention through use of facility-wide permits.
3. PIF's history of compliance with DEPE regulations.



4. PIF's current number, type, and expiration date of permits.
5. PIF's number and quantity of hazardous substances used.
6. PIF's current requirements under federal and state regulations.

The DEPE may revoke or modify any permit issued to the facility-wide permit applicant in order to issue a facility-wide permit. The pilot program relies on volunteer participants. The law does provide, however, that if no facility-wide permit is issued by the DEPE, all existing permits remain in full force and effect. Although the Act stipulates that facilities must obtain separate permits for chemicals and processes not addressed in their required Pollution Prevention Plan (i.e. chemicals not reportable under SARA section 313 and chemical quantities below 10,000 lbs), the pre-pilot program allowed for inclusion of these chemicals into the Pollution Prevention Plan and therefore the issuance of only one permit. This will provide increased flexibility for facilities. Both the pre-pilot and the pilot program will provide the DEPE with a chance to evaluate the facility-wide permit program and then recommend to the legislature whether it should be expanded.<sup>257</sup> Six months after issuance of facility-wide permits the DEPE must submit to the Governor and legislature a report analyzing and evaluating the facility-wide permit program.

#### **EVALUATION CRITERIA**

Cost effectiveness of the New Jersey facility-wide permitting program is not yet known, since implementation will not occur until 1995. These permits are designed to relieve industry of the burden of multiple single-media permits and therefore, allow for resources to be reallocated into other, more cost efficient projects. Assuming that the new permits provide for adequate monitoring of a facility's regulated processes, the new program will require fewer agency staff while maintaining high levels of environmental compliance. This would create a cost effective program.

With program emphasis on pollution prevention, the facility-wide permit may create potentially significant incentives for technology innovation. However, permit emission/discharge limits are set using Best Available Technology, which does not itself act as an incentive for developing new environmental controls. The pollution prevention planning component may encourage innovation, particularly as the facility is evaluated as a whole.

The administrative burden to the regulatory agency is significant, because the agency can not issue a "standard" permit with "standard" numbers, but must recalculate and redesign emission/discharge standards. Yet, once in operation, the program will provide more order for managers than the previous system of multiple permits. Regulated industry may also experience augmented levels of difficulty in management during the onset of the program. Again, with experience in reworking the many facility operations into one permit will come a greater efficiency and flexibility. The program has great potential advantages for relieving

management burdens while maintaining environmental standards and encouraging innovation.

It is unknown how well the facility-wide permitting system will integrate with the existing regulatory system. The pilot program will report to the state legislature concerning this measure of regulatory success.

The legislature has clear ability to set and insure the implementation of goals for a facility-wide permitting program. The key factor is to link the permit requirements to the pollution prevention plan and to establish milestones within the plan. This creates an internal check on facility compliance with the permitted emission/discharge limits. At this stage in the pilot program, there is no indication of the predictability of the results of a facility-wide permit, not environmental quality nor costs.

Distributional implications of the program are unknown. The program at this point cannot predict likely performance either as to changes in environmental effects or as to costs, although in the long term costs are expected to decline. The program does offer flexibility and may be appropriate in a number of contexts.

## MULTIMEDIA POLLUTION SUBSIDIES AND GRANTS

### OREGON - TAX CREDITS FOR ENVIRONMENTAL CONTROLS

#### PROGRAM DESCRIPTION

An Oregon pollution control program uses subsidies and grants to better manage multi-media waste. The 25 year old Pollution Control Tax Credit Program (PCTCP) has offered businesses the opportunity to write off expenditures on capital investments that meet or exceed compliance standards for environmental regulations.

Tax credits are available to any state taxpayer who makes a capital investment in a pollution control facility and meets either of the following two criteria: (1) ~~the investment~~ is in response to requirements of the federal Environmental Protection Agency, the Oregon Department of Environmental Quality (DEQ), or the regional air pollution authority or (2) the sole function of the facility is for the control, prevention or reduction of pollution, or for material recovery. Within two years of the pollution control facility's completion the taxpayer must file an application with the DEQ for processing, which then goes to the Oregon Environmental Quality Commission (EQC) for approval or denial.<sup>258</sup>

Tax credits are provided for up to 50% of the certified cost of the constructed facility, varying with the actual amount of the taxpayer's expenditure that can be allocated to pollution control. The credit is applied on a pro-ratio basis against income or corporate excise taxes, for a period of 10 years or for the estimated useful life of the facility, if less, unless lack of profitability prohibits its use in which case eligibility can be extended for up to three additional years. Non-profit and cooperative corporations as defined by Oregon Statutes are provided property tax relief for a period of 20 consecutive years.<sup>259</sup>

In 1992, a task force was organized by the DEQ to write a set of recommendations for tax credit program amendments. The task force included a number of tax credit program users, which was reflected in its final report to keep the program but on a scaled down level.<sup>260</sup> DEQ presented the task force report to the EQC and stated that the PCTCP has performed its intended function to help industry attain environmental compliance. However, the EQC voted unanimously to recommend that the program be terminated by the legislature prior to the 1995 sunset date for the tax credit program.<sup>261</sup> This bill was tabled in committee, and no action was taken by the legislature on this recommendation.<sup>262</sup>

Oregon's tax credit program has been criticized for various reasons. One criticism cites the difficulty in determining the effectiveness of the program in achieving either an enhanced level or more rapid pollution control. There is also a perception that the program tends to benefit larger, more capital intensive businesses disproportionately because there are no caps on the amount of credit that can be approved.<sup>263</sup>

The pollution control tax credit is intended to act as an incentive for industry to comply early and completely with the environmental regulations. The program has the strong support of industry and business oriented associations as well as government entities whose task is to stimulate economic growth in the state.<sup>264</sup>

Since 1967 less than one half of the eligible tax credits have been taken by industry (\$384 million in pollution control expenditures certified as eligible; \$176 million in credits taken).<sup>265</sup> However, it should be kept in mind that tax credits remain available for many years after certification has been approved. Moreover, business economics e.g., lack of profitability, bankruptcy etc., impact the use of tax relief.

## **EVALUATION CRITERIA**

Oregon's tax credit program will sunset on December 31, 1995, under current law. Nonetheless, the tax credit program provides some innovative and effective incentives to better control multi-media pollution.

Cost effectiveness of the tax credit program is believed to be lowest when the credits are awarded for capital investments in response to federal, state, or regional pollution requirements. In these instances the company's new pollution control facility may not generate environmental benefit beyond that which would have occurred absent in the program. The tax credit program also applied when the company acts proactively to prevent or reduce pollution. Here the program encourages environmental controls beyond those regulating the company. This is when the program is believed to be most cost effective.

The Oregon program also provides industry with incentives for technology innovation. Because of the tax credit, the company has in effect a subsidy for the development of pollution control technology. However, the regulations do not encourage nor require that the development of control measures reach beyond those of the Best Available Technology that is already developed and available for industry.

The program requires continued management by the state agencies to approve credits and monitor compliance. Because of the requirement for DEQ and EQC approval of all tax credits, the program is dependent on substantial staff review and a sophisticated understanding of eligibility numbers and financial review (return on investment and percent allocable requirements were complicated). During last year's program evaluation, the DEQ-chartered Task Force recommended substituting a flat rate percent contribution for the program's more complex tax credit system.

The administrative burden to the regulatory agencies is directly related to the program problems identified above. Yet, because the program offers industry a choice as to what type of control technology to implement, the DEQ is relieved of certain related burdens.

Integration of the tax credit provisions into parts of the existing regulatory system has worked very well. The necessary structure for such a program exists throughout the nation, facilitating the implementation of any similar program goals set by Congress.

The Oregon tax credit program raises a number of distributional implications. Historically the program has subsidized polluting industries, waste control firms, and industrial development. This allocation of state funds concerned the EQC. Oregon's tax credits for pollution control facilities are also faulted for only rewarding pollution control, and not encouraging industrial redesign to avoid pollution in the first place.

Environmental benefits from the program accrue as companies choose to go beyond regulations to invest in state-of-the-art environmental control facilities. However, there is no predictable relationship between the granting of tax credits and industry proactivity with regard to exceeding environmental quality standards as a result of this program.

The compliance rates of participating companies will be predictably on target because of the tax credit requirement to inspect and certify any program-approved environmental control facility. Nevertheless, the effectiveness of the tax credit program, per se, in achieving its objectives has not been able to be determined. The fiscal impacts are also not as predictable as had been expected, as reflected in the program's 25 year history of industry taking only half the potentially eligible project tax credits.

This tax credit program is flexible enough to cover all pollution media.

## MULTIMEDIA POLLUTION SUBSIDIES AND GRANTS

### LOUISIANA - ENVIRONMENTAL SCORECARD

#### PROGRAM DESCRIPTION

A Louisiana pollution prevention program used subsidies and grants to reduce multimedia pollution in the state. Use of the 10 Year Industrial Property Tax Exemption Program (IPTEP), a development incentive, was reworked so that factories received tax exemptions only to the extent that they practiced sound environmental policy. Reductions of toxic and criteria air pollutants were anticipated due to incentives provided by the environmental scorecard. The program lasted from October 1990 when ~~passed~~ under Emergency Rules and Regulations until January 1992 when the new Governor dismantled it.

The scorecard program was initiated to tie businesses' environmental records to eligibility for, and enjoyment of, the tax exemption. The Department of Economic Development, DED, had operated the Tax Exemption Program since the mid-1930's to attract and maintain business in Louisiana. Tax exemptions were traditionally awarded at 100% for local property taxes, new equipment, and other capital expenditures. In 1990, Louisiana DEQ devised a strategy that evaluated facilities' environmental records on the basis of compliance history and ratio of emissions per job. The resulting score is equal to a percent of the tax exemption awarded. Companies with a score of less than 100% could, however, gain "bonus points" by designing emission reductions plans. Industry objected to the program's "legality, double jeopardy element and hindrance on their profits".<sup>266</sup> The program rewards companies that are job intensive and pollution restrictive.

The environmentally modified tax exemption was a DEQ and DED joint policy initiative. Traditionally, their goals and objectives had worked against each other. However, the ecological and economic benefits derived from the program proved that their agendas did not have to be mutually exclusive. However, during its one year in existence, the program was revised twice by an upset industry that managed to ease the environmental restrictions.

The scorecard formula starts with a base of 50% or (50 points of the total 100) of the tax exemption awarded to the company simply for economic development, upholding the rationale of the IPTEP. The remaining 50% is obtained by the company based on various environmental criteria. A full 25 points can be achieved within the "regular points" category, which has two environmental criteria. The company can earn enough additional points to achieve a 100% exemption by excelling in the following categories: "bonus points", prohibited activities, and exemptions. The "regular points" are derived from (1) the company's compliance record and (2) the company's emissions per job ratio<sup>267</sup> to potentially achieve a total of 25 points. The table below shows the points assigned for compliance violations.

Violation Amount (fine)	Points Subtracted from 25
\$0 - \$3,000	1
\$3,001 - \$10,000	5
\$10,001 - \$25,000	10
Over \$25,000	15
Criminal or felony violations	20

These points are calculated with an aging schedule that allots 100% of the points for 1 year old violations and as little as 0% of the points for 6 year or older violations. The schedule of points assessed for emissions per job is given below:

Lbs. of Emissions per Job	Points Awarded
0 - 500	25
501 - 1,000	20
1,001 - 2,500	15
2,501 - 5,000	10
5,001 - 10,000	5
Over 10,000	0

Bonus points can be accrued to recoup any points lost in the regular points category, but can't raise the company's score beyond 100 points. The five criteria that are eligible for bonus points are: (1) emission reduction plans; (2) recycling; (3) recycling companies or manufacturers of consumer products; (4) new jobs for high unemployment areas; and (5) diversification.

The company's environmental record is evaluated by DEQ with each application for a project. Preliminary scores are given according to the summation of the base score, compliance score and emissions per job score. If a company receives a score of less than 100, it has 30 days in which to apply for bonus points. The score is adjoined to the company's application for Tax Credits and sent to the Board of Commerce and Industry. The Board will approve or deny the application based on its merit as a job producer. The DEQ score is used to determine the actual dollar value of the exemption granted.

During the program's 1 year life, 382 applications were scored and 208 passed through the entire process. Scores averaged 67.5 to 100 points with an average number of points at 94.9. Comparison of the average preliminary score with the final score indicates the ability of the program to initiate pollution reduction through the bonus points program.

The environmental score card program managed to generate \$5.2 million in recouped tax exemptions. Twelve companies submitted emission reduction plans for bonus points that were worth \$7,030,249 in tax exemptions. The program contributed in part to over 36 million lbs in toxic reductions (8.2% of the state's total) and over 140 million lbs in criteria air reductions. These benefits will be recognized over the next five years. Other benefits of the program are: the companies becoming sensitive to high profile score cards and reacting with "green advertising"; the increased economic incentive for companies to avoid violations in regulatory law; and the institution of the policy that the state's tax exemptions should be considered as privileges rather than rights.

Program success might be judged, in part, by noting the awards presented to Louisiana's environmentally modified tax exemption program. Awards won include: (1) "1991 Best Bets Award" from the Center for Policy Alternatives; (2) the National Environmental Awards Council award; and (3) finalist standing for the JFK School of Government award (the Louisiana program was withdrawn from the contest after it was rescinded by the state).

## EVALUATION CRITERIA

By implementing the environmental scorecard program through the existing IPTEP, the state accessed an existing cost effective tax exemption framework. The strategy behind the program was to restrict tax exemptions to promote industrial contributions to the state's environmental as well as economic health. Through this more highly scrutinized system of state allocation of funds, Louisiana was able to maintain a readily calculable (and accessible) economic incentive for industry. In effect, the state got more benefit for its tax exemption approvals.

An additional benefit of the program was the creation of strong incentives for technology innovation. In order to fully realize the points awarded to the criteria "emissions per job" a company must either reduce emissions or increase jobs. Since there exist certain environmental compliance regulations, the incentive is to invest in technology that will better control emissions.

The use of the existing framework for the evaluation and award of tax exemptions not only strengthens the effectiveness of the program, but also helps to keep the program robust to less-than-perfect implementation. The DEQ simply evaluates the industry-completed application for tax credit and then attaches the earned score to the DED's tax exemption paperwork. As such, the administrative burden is on the industry. Industry must gather the appropriate environmental data and improve upon any of their facilities' problem areas if they want to receive a full 100% tax exemption. On the same note, difficulty for the regulated industry is self imposed, since no rules required industry to participate in the environmental scorecard program.



Due to the environmental scorecard's integration into the existing regulatory tax exemption program, it operated with administrative ease.

The ability of the legislature (or Congress) to set and assure the implementation of goals through a program of this type appears to be good. However, the environmental scorecard was terminated in Louisiana because of opposition from the business sector. Political attacks upon the restriction of a previously unrestricted benefit may affect a government's ability to set and insure the implementation of goals for such a program. (That is, the creation of a new incentive program might incur less opposition, although it would lack the administrative advantages of modifying an existing system; conversely, restrictions on a previously enjoyed benefit in the interest of environmental goals may be more difficult). The Louisiana experience may be somewhat informative on the issue of linking investment tax credits to environmental performance.

The distributional implications of the Louisiana program are reasonably clear. The program benefits cleaner industries and reduces the subsidies to dirty industries, while at the same time recapturing certain tax funds to assist the state education and transportation sectors.

The program would have produced somewhat predictable results - resulting improvements in environmental quality and accompanying costs can be estimated. However, an even more predictable result, given the state's political history, is what occurred.

In terms of program flexibility and appropriateness for meeting alternative types of goal, the environmental scorecard program appears to be an excellent pollution prevention tool that can be easily adapted to fit other regulatory agendas.

## MULTIMEDIA POLLUTION INFORMATION PROGRAMS

### STATE "NEPAS"

#### PROGRAM DESCRIPTION

Fourteen states, the District of Columbia, and Puerto Rico have laws similar to the federal National Environmental Policy Act requiring the preparation of environmental impact assessments, statements, or reports as a prerequisite to certain governmental actions affecting the environment.<sup>268</sup> The states are California, Connecticut, Hawaii, Indiana, Maryland, Massachusetts, Minnesota, Montana, New York, North Carolina, South Dakota, Virginia, Washington, and Wisconsin.

In general, these laws require a governmental agency to assess environmental impacts of proposed projects, to engage in a public comment process on the assessment, and to issue a report in conjunction with (or immediately prior to) the governmental decision. Like the federal NEPA (42 U.S.C. § 4321 et seq.), most of the state NEPAs do not dictate a particular decision -- e.g. requiring that the decision favor environmental protection over other values or that it be the least damaging of the possible decisions. The laws operate primarily to assure the use of a procedure that identifies environmental issues and public concerns. Their aim is to assure that the governmental decisionmaker is apprised of the possible environmental impacts of a proposed action, considers appropriate alternatives to the action, examines potential mitigation measures, and hears from the public.

In a few states, however, including California, Washington, and Minnesota, the law requires the adoption of feasible mitigating measures or selection of environmentally superior alternatives.

The coverage of these laws varies widely. In California, virtually all projects -- public or private -- require preparation of an environmental impact report. The governmental interest sufficient to trigger the law's applicability is simply the issuance of a state or local permit or zoning approval. New York and Massachusetts also recognize broad coverage of private actions that require permits; however, in these states, a state permit is usually the trigger. In contrast, Indiana's and Virginia's laws apply only to state-initiated actions, such as state-funded construction projects; moreover, Virginia exempts state highways and roads from the law, thus removing the largest category of potential coverage for its public project-oriented law. The District of Columbia's law exempts projects in the downtown business district.

State NEPAs can have a profound effect on state decisions. Particularly where their scope is broad and procedures are well-developed (as in California, New York, and Massachusetts, for example), the laws have resulted in the reformulation of projects in advance of their proposal, or reconsideration or withdrawal of projects after public review and comment.

## EVALUATION CRITERIA

These programs can be cost effective in identifying potential environmental impacts and potential avoidance approaches or mitigation measures. However, the most effective programs (New York, California, and Massachusetts) also have the highest transaction costs. Information (and particularly good information) is expensive.

The state NEPAs do provide incentives for technology innovation. Because projects can fall below the threshold of significance if they are design for "no significant environmental impact," which in most states can include recognition of mitigation measures, there is a substantial incentive for innovations in design and technology at the proposal stage. Moreover, even the full environmental assessment may identify alternatives and mitigation measures that involve innovation.

These systems are not at all robust to less-than-perfect implementation. They are extremely susceptible to the principle of "garbage in - garbage out;" and they also require decisionmakers to take seriously the notion that reasonable alternatives to a proposed action may be identified in the course of an in-depth analysis.

Administrative burdens are fairly high for these systems. In a number of states, where the law applies to privately initiated activities, the costs must be borne entirely by the private parties.

State NEPAs can produce significant burdens for the regulated projects. However, the burden is a direct result of these laws' premise that public values can only be adequately taken into account and protected by establishing a clear and precise set of procedural steps. Such steps include "scoping" of the problem in some states -- notably Massachusetts (which invented scoping) and California. They include initial studies, public participation, comments and review, agency responses, and in some cases public hearings.

The system can be integrated readily with virtually any permitting system, or system for construction approvals.

The laws can be used to set goals. Many do not do so, beyond the formal procedural requirements to gather and consider information and alternatives. The better laws also require the adoption of feasible mitigation measures and the monitoring of the project's performance to assure that predicted environmental results are achieved (or protected).

Distributional implications are primarily the diversion of certain state and/or private funds (depending on the proponent of the project) to scientific and technical firms; and the support of public access to decisionmaking (through notices, hearings, and other forums).

The results are not readily predictable. In general, however, states with NEPAs believe that better decisions are made, and that even where the same decision is made that

would have been made without the process, that incremental gains in environmental protection (through redesigns and mitigation measures) are achieved.

State NEPAs are among the most resilient and useful of environmental tools. Both the federal and state versions of environmental impact assessment have become the United States' most-copied environmental legislative export to the rest of the world.

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