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Reforming Permitting

Terry Davies

with Robert Hersh, Aracely Alicea, and Ruth Greenspan Bell

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Opposite: This photograph illustrates the results of permit consolidation at Schering-Plough's Kenilworth facility. The binder held by the staff member represents the facility's integrated permit, which replaces all of the permits shown in the open file drawers. (Photograph courtesy of Schering-Plough Corporation and Nat Clymer, Photographer. Used by permission.)

Preface

It has been difficult to limit the scope of this report. Permitting is one part, albeit a key part, of the overall regulatory system for controlling pollution. Permits would be meaningless without such functions as standard setting, monitoring, and enforcement. Drawing the line between the permitting process and these other aspects of pollution control has been a constant challenge. Similarly, it has been difficult to focus only on the permit-related aspects of subjects like market mechanisms, pollution prevention, and watershed organizations. If the discussion or analysis at times seems truncated, it is because we tried to limit the length of the report by keeping the focus on permitting.

Limitations of time and resources have also shaped the report. There were many paths that would have been interesting and probably fruitful to travel but have been left untrodden. Long after the research phase of the work was theoretically completed, we kept finding additional topics, people, and events that were relevant to permitting. There are more people with whom we should have talked, more Web sites we should have examined, and more questions we should have asked. We hope that others will pick up where we left off.

The reader should keep in mind the extraordinary diversity and variability that characterize the U.S. pollution control system, including permitting. Each state and each region of the Environmental Protection Agency handle permitting somewhat differently. Each federal, state, and local permitting program has its own rules, its own history, its own politics. Each major permitted facility has its own characteristics, as does each firm that applies for a permit. All of these variables change over time, and in most areas there are no objective data on which to draw. The result is that there are exceptions to any generalization that can be made about permitting.

The report does not contain any original quantitative data. It is based primarily on two sources. First are the many reports, project descriptions, and other miscellaneous documents that bear on the subject of permitting. The list of references partially reflects this literature. Second are interviews with more than 80 people, most of them direct participants in the permitting process. A list of those interviewed follows the report. Almost everyone we contacted was generous with their time, and we are very grateful to them. Some of these people went to extraordinary lengths to be of assistance, even polling their staffs about questions we posed.

The research and writing of this report were primarily funded by a grant from the Charles G. Koch Charitable Foundation. I am grateful to Kameran Bailey, formerly of the foundation, for having initiated the effort, and to Don Clay, Alex Beehler, and Kelly Young for having encouraged it. Additional funding came from the Bauman Foundation, for which I thank Patricia Bauman.

As with many research projects, a large number of people contributed their time and wisdom. At Resources for the Future, Aracely Alicea did much of the research on state initiatives. Robert Hersh wrote the sections on Dutch covenants and the European Union Directive on Integrated Pollution Control. Ruth Greenspan Bell provided assistance on legal questions. Felicia Day and Jonathan Halperin guided the production and dissemination of the report, and Sally Atwater edited the manuscript.

The following people generously read and commented on a draft version of the report: Alex Beehler, Blair Bower, Don Clay, Kerry Clough, David Hair, Vic Kimm, Debra Knopman, Jan Mazurek, Monroe Newman, David Nicholas, Barry Rabe, Steven Brown, Rena Steinzor, Larry Weinstock, and George Wyeth. Jay Benforado facilitated my access to EPA staff.

Although I have retired from Resources for the Future, I retain the title of Senior Fellow, and RFF has continued to provide me with both tangible and intangible support. For this I am indebted to, among others, Paul Portney, Ted Hand, Marilyn Voigt, and Michael Taylor.

None of the people or institutions named above bear any responsibility for the contents of this report. Both the good and the bad parts of what follows are solely my responsibility.

—Terry Davies

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Executive Summary

The report does three things. First, it is intended to serve as a concise and realistic description of the U.S. pollution control permitting process. Second, the report provides an overview of the permitting reforms that are being tried in the United States, mostly at the state level, and in Europe. Third, it makes policy recommendations to improve a system that is suffering from major defects and weaknesses.

Permits are a crucial link in the pollution control system. They are the nexus between the control authority and the pollution sources. Permitting is the process of making environmental goals and standards operational by specifying acceptable behavior.

The permitting process is characterized by extraordinary diversity and complexity. Each of the many state and federal permitting programs has its own rules, its own history, its own politics. There are differences among the regions of the Environmental Protection Agency (EPA) and among the states. Each major facility that is permitted has its own characteristics. All these variables change over time, sometimes rapidly. Every generalization that can be made about permitting therefore has important exceptions. We can, however, make a few general observations.

Permitting is basically a bargaining process between the permit applicant and the permitting authority. Which side has the advantage depends on a variety of factors, one of the most important of which is whether the applicant seeks a new permit for construction of a facility or a renewal of an operating permit for an existing facility. For new facilities (or modifications of existing facilities), the applicant is motivated to get the permit issued as soon as possible because construction cannot begin without it. There is no such incentive for renewal of existing permits because a facility can continue to operate even if its permit has expired.

Permits are a crucial link in the pollution control system.... The permitting process is characterized by extraordinary diversity and complexity.

The bargaining over the content of permits is less constrained than most other environmental regulatory processes because there is less litigation. Especially when permits for new construction are the issue, industry does not want to sue because it doesn't want to delay issuance of the permit. Because permits are site specific, national environmental groups do not want to get involved, and local environmental groups usually do not have the money or expertise to litigate permitting decisions. Courts are generally reluctant to enter the arcane thicket of permitting law and regulation. The result is that permitting bargains can be struck that do not have any solid basis in law. The bargains benefit the environment when permittees are required to undertake recycling, beautification, environmental education, and other activities that the authors of the permitting laws never contemplated.

Permitting is highly decentralized. Each state has a number of permitting programs, and most localities also issue permits for building construction, septic tanks, and other matters related to land use. The major federal programs—New Source Review and Title V air permits, National Pollutant Discharge Elimination System (NPDES) water permits, and Resource Conservation and Recovery Act base program permits—can be delegated to the states, and about 75% to 80% of the permits authorized by federal law are actually issued by the states.

Both the states and EPA regions have a large backlog of expired NPDES water permits, and a similar problem is likely to occur with Title V air permits. About 30% of the water permits have expired and are waiting to be renewed. This is only one of many problems with pollution control permitting. The system is also opaque, fragmented, and inefficient; it was not designed to deal with nonpoint sources or cross-media transfers, two of the biggest pollution problems; it discourages public participation; and it misses large amounts of pollution from both small and large sources.

In response to those problems, EPA and the states have initiated a variety of reforms and experiments. We discuss these in four categories, based on the major goal the reform is intended to achieve: (1) efficiency; (2) flexibility; (3) decentralization; and (4) pollution prevention and integration.

A majority of states over the past decade have improved the *efficiency* of their environmental permitting. The steps taken, sometimes collectively known as "one-stop shopping," typically include guidance for the permit applicant about what is required, how the process works, and how long it will take; a single point of contact for each applicant; and a reporting mechanism that identifies excessive delays or other problems. In the past few years, states have increasingly used the Internet to implement these changes, and the impact of the Internet on permitting is likely to grow in the future. New Jersey now receives 80% of its air permit applications electronically.

The bargaining over the content of permits is less constrained than most other environmental regulatory processes because there is less litigation.

Small pollution sources, such as printers and gas stations, have generally posed a problem for permitting. Many do not get permitted, and those that do often remain out-of-compliance with applicable pollution control standards. Massachusetts has had success with its Environmental Results Program, which is designed to deal with these problems. Workbooks have been developed so that small-source sectors (e.g., dry cleaners) can self-certify compliance. Some states, such as Oklahoma, have used general permits as a way of dealing with small sources and matching resources with the degree of environmental risk presented by a facility.

Flexibility has been a permitting problem because the requirements contained in the permits may prevent facilities from using the most efficient or effective control methods. Sometimes the inefficiency is created by a requirement to use a specific technology. The remedy for this is to use performance standards that specify a control level or standard rather than a technology, although there are a number of reasons why performance standards are not used more frequently in permits.

Minnesota, Oregon, Wisconsin, and other states, as well as EPA, have instituted tiering systems as a way of giving more flexibility to facilities that agree to "superior environmental performance." The systems differ, but basically, in exchange for superior performance, the facility may enjoy greater choice in how standards are met, reduced oversight, or expedited permitting. It is too soon to evaluate the success of any of these programs, but they have had difficulty attracting industry participants. Also, there is a danger that customizing permits for the best-performing companies will encourage state officials to devote disproportionate attention to the sources that pose the least risk.

Many of the tiering systems require that a firm have an environmental management system in place before it qualifies for one of the preferred tiers. An environmental management system typically specifies a variety of management practices but does not contain any kind of standard or other performance measure. The system focuses on how, not whether, pollution control is achieved. In our view, management practices should be the concern of the firms themselves, and government agencies should focus on whether standards are met.

The Dutch have instituted a system of voluntary agreements between trade associations and the government. The agreements, called covenants, have attracted interest in the United States as a way of supplementing or even replacing permits. Our examination of the covenants system shows it to be more complicated than often thought and not applicable in any direct way to the United States, but interesting as a different approach that could stimulate new U.S. policies.

In the chapter on *decentralization* we cover three types of reform: devolution to the states, public participation, and market mechanisms.

The states already do most of the permitting. The debates are not over delegation of programs but over the extent to which EPA can or should oversee and second-guess state actions. There is a good deal of evidence that the performance of the states is uneven, and that strong EPA oversight is therefore needed. The states, on the other hand, argue that EPA oversight only adds impediments and costs to an already cumbersome system. Many of the incentives for devolution to the states have changed in recent years, and there may be some pressure to reverse the trend.

Public participation has received increasing attention from EPA and the states, but the technical nature of most permits has been a major obstacle to involving any parties other than the government and the permit applicant. Greater use of the Internet will have a positive impact on involving citizens. The wider use of watershed-based organizations has encouraged broader participation in the NPDES water permit process.

Watersheds also have been used as the basis for trading effluent or emissions credits, one of a variety of market mechanisms. It is not possible to generalize about the relationship of market mechanisms to permits, given the wide variety of both, but tradable permits, emissions credits, and similar mechanisms have the potential to significantly improve both the efficiency and the effectiveness of permits.

Integration and pollution prevention go beyond improving the existing pollution control system. Integration, in the sense of regulating the total environment instead of compartmentalizing it by air, water, and land, is being practiced to some degree by most industrialized nations. We examine it for this reason and also because permitting, being central to the pollution control system, is a logical starting point for changing the system as a whole.

The report examines the 1996 European Union directive that requires member nations to adopt an integrated pollution prevention and control system. It is too early to tell what the effects of the directive will be. Experience in Britain, which made the changeover to an integrated permitting system in 1992, indicates that integration has many benefits but is not a panacea.

In 1991, New Jersey passed its Pollution Prevention Act, which authorizes a pilot program of multimedia integrated permits. The permits are based on pollution prevention and on the use of a materials balance method. The materials going into a facility are measured, the amount that goes out in product is measured, and the difference is what has to be controlled or eliminated. More than a dozen diverse facilities have received integrated permits, and by most measures the

program has been a success. Among other results, the integrated permitting process uncovered large amounts of pollution that the facilities did not know about and that were not covered by the traditional permits.

We make a number of recommendations based on our review of the permitting process, the experiments and pilot projects that have been tried, and the many studies that have been done on how to reform the pollution control system. Reforming permitting will require action by Congress, EPA, the states, industry, and environmental groups.

Congress should

- Create a commission to formulate basic changes in the pollution control laws, specifically changes leading to a more integrated (cross-media) system.
- Consider amending the Clean Air Act (CAA), the Clean Water Act (CWA), and the Resource Conservation and Recovery Act (RCRA) to make the permit applicant responsible for writing the draft permit.
- Amend CAA and CWA to make the normal permit term longer—perhaps eight years instead of five.
- Amend CWA and RCRA to add language regarding permitting fees similar to the provisions in CAA.
- Amend CWA to authorize the states or EPA to implement tradable permit systems on a watershed basis.
- Enact legislation providing a statutory basis for experimental pilot programs, such as EPA's Project Excellence and Leadership. The legislation should include a procedure through which state experimental permits could substitute for federal permits.
- Commission the General Accounting Office to examine the extent to which EPA has been using guidance and similar methods to circumvent the formal regulatory process, the consequences of doing so, and what action, if any, should be taken.

EPA should

- Work with Congress, the states, and relevant interest groups to develop a facility-wide, multimedia, performance-based permit for major facilities. The permit should be based on an analysis of the flow of materials in the facility.
- Assist the states in defining categories of sources that can be covered by general permits and in instituting compliance mechanisms for such sources. The Massachusetts Environmental Results Program provides an example.
- Develop a common permit application form covering all programs to reduce redundant paperwork and encourage coordination among programs at both state and federal levels.
- Integrate information systems, including data standards, to make facility-wide information readily available in a useful form.

- Evaluate and mainstream innovations developed by EPA and state pilot programs. This will require that a new or existing office be given adequate resources and leverage over the program offices.
- Develop procedures to ensure that state permitting programs receive adequate oversight, that oversight is not wasted on programs that do not need it, and that the regional offices have current information to distinguish between the two.

States should

- Use the Environmental Council of the States to exchange information about permitting innovations.
- Ensure that the basic efficiency measures instituted in many states are made routine for all state programs. These include making permitting information and forms available on the Internet, providing one point of contact for major permit applicants, and maintaining a system to track and report the status of permit applications.
- Improve ambient air and water monitoring as an input to allowable effluent and emissions levels and as a check on the effectiveness of permitting programs.

Industry should

- Work with the states and EPA to develop more integrated and flexible permits that encourage pollution prevention.

Environmental groups should

- Examine the status of permits of major pollution sources in their area and take steps to ensure that permits are up-to-date and are being complied with.
- Engage in a productive dialogue with Congress, regulators, and industry about ways to increase the environmental benefits of the permitting system while reducing its inefficiency.

The report spells out the details of the recommendations and the rationale for them. There are many opportunities to improve the efficiency and the effectiveness of permitting. The bigger challenge is to change the pollution control system as a whole. There is no better place to start than with permitting.

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Chapter 1

A Challenge

This report is meant as a challenge in several respects. It is a challenge to the reader to understand better the importance of pollution control permitting and the complexities of the system. It is a challenge to policy analysts and permitting agencies to provide better data and analysis so that they can better understand and evaluate the existing system and the attempts to change it. Above all, it is a challenge to policymakers to improve a system that desperately needs to be improved.

Permits are the pivot on which much of the pollution control system turns. If the permitting process is cumbersome, costly, and not effective in controlling pollution, then pollution control also will be inefficient and ineffective. This is, arguably, the situation in the United States today. This report describes some ways that permitting can be improved.

The report has three major purposes. First, it is intended to provide a concise and realistic description of the permitting process. Although permitting is a vital function that has existed for a long time, almost no good empirical descriptions of how the process actually works are available. The study is aimed at partially filling that gap, but there is almost infinite opportunity for future researchers to address unanswered questions.

Second, the report should serve as an overview of the permitting reforms that are being tried. Most of these experiments are being conducted by U.S. states. We have included descriptions of two European initiatives, the Dutch covenants and the European Union's Integrated Pollution Control Directive, because both are potentially relevant to U.S. policy.

This report is a challenge to policymakers to improve a system that desperately needs to be improved.

The third purpose, drawing on the first two, is to suggest changes that would improve permitting specifically and the U.S. pollution control system generally.

The focus of the report, as the title implies, is on reforms to improve permitting. Any analysis of reforms must be guided by a conception of the problems that lead to a call for reform. Based on our interviews, the literature, and prior research, the major problems with permitting are the following:

- Permitting tends to be inefficient. Permits require more information than is needed, individualized permit conditions are used when generic conditions would suffice, and new technologies,

such as computerized filing and reporting of information, are not utilized. Regional offices of the Environmental Protection Agency (EPA) review more permits than necessary to ensure the quality of state programs.

- The pollution sources that have become most important are the ones least amenable to traditional permitting. Permits were designed to apply to major point sources, such as factories and power plants. Permitting of these sources still poses problems, but a major part of the pollution problem is now due to nonpoint sources, such as runoff into streams from farms and grazing lands, and to numerous small point sources, such as dry cleaners and gas stations.
- Existing permit programs are in disrepair. A large percentage of water quality permits have expired and have not been updated (see section 2.1). The more recently instituted program of operating air permits will soon face the same problem.
- Public participation is discouraged. Although the importance of including the broad range of interested parties in government decisions, including the decision to grant a permit, is now more broadly accepted, permits are usually dense, technical, and difficult to access.
- Permits tend to be inflexible and often penalize technological innovation. This shortcoming reflects the rigid and highly prescriptive nature of the pollution control laws that permits are intended to implement. As a result, individual permits also tend to discourage innovation and diversity, even though there is a good deal of flexibility in the permitting system as a whole.
- The fragmentation of the control laws is similarly reflected in the permits. Most permits apply to a single aspect of a single medium. This fragmentation discourages pollution prevention, impedes compliance, and contributes to the inefficiency of the entire pollution control system.
- Permitting is handicapped by work overload and high turnover among state and EPA regional permitting staff. The permitting function, in turn, is viewed by many as a drain on resources.

A short report cannot detail solutions for all of those problems, and for some problems there may be no solutions. However, in recent years, a great deal of thinking and experimentation have been devoted to solutions, and this report tries to capture as much of this new thinking as possible.

Permits are the pivot on which much of the pollution control system turns.

The structure of the report reflects its purposes. Chapter 2 begins with a description of the permitting process. We then describe the major federal permitting programs, attempting to explain how they work in practice as well as the statutory and regulatory provisions.

Chapters 3 through 6 review the large number of experiments that have been conducted in recent years to improve the permitting process. We start with reforms aimed at improving the efficiency of the process. Then, in Chapter 4, we discuss experiments intended to increase permittees' flexibility in meeting permit requirements. Chapter 5 discusses three types of permitting decentralization: devolution to the states, public participation, and market mechanisms. In Chapter 6, we describe changes in permitting intended to alter the entire system of pollution control—to put more emphasis on pollution prevention and to evolve away from the air-water-land compartmentalization.

Where evaluations of the programs described in Chapters 3 though 6 are available, we have given the results. However, it is too soon to tell whether most of the experiments have actually improved permitting. Even for those that have been in effect for some time, data often are not available to allow conclusions about their success.

In describing the various reform efforts, we inevitably get into analysis of how the permitting system routinely works. Subjects like public participation, delegation, and the backlog in permits are touched on in Chapter 2 but dealt with in more detail in later chapters.

The recommendations in Chapter 7 are based on our review of the permitting process, the experiments and pilot projects that have been tried, and the many studies that have been done on how to reform pollution control as a whole. The chapter is structured to parallel the reforms covered in Chapters 3 through 6. However, the reforms are often interrelated, and thus many of our recommendations are not based on any one federal, state, or foreign experiment. Rather, they represent a synthesis of the reforms, the research done by us and others, and inevitably, the values that we bring to the subject.

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Chapter 2

Permitting: Processes and Programs

A successful program to control pollution must have a few basic ingredients: it must know what the sources of pollution are and how much pollution they emit; it must have standards that specify what level of pollution is acceptable; and it must provide incentives to get the sources of pollution to comply with the standards. In most control programs, these elements are linked together by permits. Issuing permits is not a paper-shuffling exercise—it is a crucial part of environmental protection.

Permits are legally binding terms that a control authority imposes on a pollution source as a condition for building or operating the source or for carrying out an activity (such as dredging a river). Ideally, permits identify the sources of pollution; in most regulatory contexts, if something does not have a permit, it is not considered a source. (As we discuss later, some important types of sources are not adequately covered by the U.S. permitting system. Also, there are some sources, such as automobiles, that are more appropriately controlled by other means.) The requirements in the permit are designed to reconcile what the source emits with what the standards allow. The legal enforceability of the permit provides the basis for compliance. Thus, permits are currently the key to pollution control in the U.S. system. They are the nexus between the control authority and the pollution sources. Permitting is the process of making environmental goals and standards operational by specifying acceptable behavior.

As we describe below, there are a variety of pollution control permit programs in the United States. Each of the three major federal statutes—the Clean Air Act (CAA), the Clean Water Act (CWA), and the Resource Conservation and Recovery Act (RCRA)—contains several permitting programs. Several lesser federal laws also contain permit requirements. Each state has its own programs and requirements, and almost all localities issue building and other types of permits that relate to pollution control.

In this chapter, we begin with a general description of the permitting process. We then turn to the individual permitting programs, emphasizing the federal statutes and regulations but also covering state permitting programs.

2.1 The Permitting Process

Since enactment of the landmark environmental legislation of the 1970s, federal law has driven the permitting process. However, this does not mean that EPA is necessarily the decisionmaker.

The federal pollution control laws are a complex mosaic of state and federal authorities and responsibilities. Most of the major permitting programs can be delegated by EPA to state agencies, and EPA has, in fact, delegated such authority in the majority of cases. We discuss the delegation process in detail in section 5.1. Table 1 lists the major federal programs related to permitting and the extent to which these programs have been delegated. It is based on data from the Environmental Council of the States because EPA does not have delegation data in usable form.

Table 1.

Federal Programs Related to Permitting and Their Delegation to the States
(as of July 2001)

PROGRAM	NUMBER OF STATES*		
	DELEGATED	PARTIAL, INTERIM, IN PROCESS	NOT DELEGATED
CLEAN AIR ACT			
Title V**	19	34	0
New source performance standards	37	16	0
National emissions standards for hazardous air pollutants	37	16	0
Prevention of Significant Deterioration	48	3	2
New Source Review	49	2	2
CLEAN WATER ACT			
NationalPollutionDischarge Elimination System	44	1	8
Pretreatment	33	2	18
Sludge management	3	5	45
Section 404 (wetlands)	NA	NA	NA
Stormwater discharge	No data	No data	No data
RESOURCE CONSERVATION AND RECOVERY ACT			
Subpart C base program	48	1	4
Corrective action	38	1	14
Mixed waste	44	2	7
Boilers and industrial furnaces	25	5	23
Toxicity characteristics	39	5	9
Land disposal, California wastes	43	2	8
Land disposal restrictions, 1/3 wastes	43	2	8
Land disposal restrictions, 2/3 wastes	37	4	12
Land disposal restrictions, 3/3 wastes	33	5	15
Subpart D (solid waste)	33	8	12
Subpart I (underground storage tanks)	29	6	18
SAFE DRINKING WATER ACT			
Public water system supervision (sec. 1413)	51	0	2
Wellhead protection (sec. 1428)	13	27	13
Underground injection control (sec. 1422)	29	6	18

Source: Environmental Council of the States (ECOS). The ECOS data are based on reports from the ten EPA regions plus some checking with individual states. ECOS classified the delegation status into 11 categories, which we have condensed into 3. The combination of regional inconsistencies, possible errors in ECOS coding for minor programs, and the condensation process means that readers should consult the original ECOS table rather than rely on this table for individual programs.

NA: not applicable.

* Includes District of Columbia, Puerto Rico, and the Virgin Islands. Thus N = 53.

** Several states, notably California, have used substate regions for Title V permitting. In these states, unless final delegation has been approved in all regions of the state, the state is counted as partial. Also, see discussion later in this section.

Although EPA has delegated much of the permitting authority to the states, it continues to review many state-issued permits, looking over the shoulders of state officials. This oversight may explain what a recent report called "the nagging question of why EPA regions employ just as many people after delegating programs to states than [sic] they did when they ran the programs themselves" (NAPA 2000a, 152). Even after permitting programs are delegated, EPA retains concurrent authority to enforce permit requirements (after notice to the state) and can veto individual state permits.

Whether permitted by a state agency or an EPA regional office (EPA headquarters in Washington does not get involved in issuance of permits except in extraordinary situations), the contents of a permit are typically negotiated between permitting officials and the permit applicant. Matthew Holden, recent president of the American Political Science Association, noted in one of the first political analyses ever made of pollution control, "Successful regulation . . . depends on the consent of the regulated. Such consent is achieved by a process of bargaining—both explicit and tacit—which induces the regulated parties to agree (even reluctantly) to that which the regulator proposes" (Holden 1966, 10–11).

To say that permitting is a bargaining process does not mean that either industry or the regulator necessarily has the upper hand in the negotiations. Much depends on the skill of the negotiators (see below) and on the types of information needed to formulate the permit conditions. For example, some permits are based on ambient environmental conditions, and regulators are likely to know more about these conditions than the permit applicant. There also is a big difference between a permit for a new facility (or an addition to a facility) and renewal of an existing permit. For a new facility, the applicant needs the permit to operate, and so the regulators have a major bargaining advantage. For a permit renewal, the applicant has the opposite incentive—the longer the delay, the longer the facility can continue to operate under the old permit.

The state and federal officials who do the permitting are usually trained engineers. Typically, they are relatively inexperienced because writing permits is, in most agencies, viewed as a tedious and unrewarding chore. Permitting is assigned to newly hired people, and turnover is a problem in many agencies.

The permit writers also are frequently overworked, and as we will discuss in Chapter 3, there is a major backlog of water permits. Sometimes there is a lack of money to hire permit writers. More frequently, the money is available to hire people, but it is hard to attract and retain enough qualified people for the jobs because government pay scales are low. Those who do take the jobs are often soon hired away by industry.

One consequence of the lack of resources and low pay on the government side is that typically there is more competence on the industry side of the negotiating table. Industry can afford to hire more experienced people and often can devote more person hours to permitting issues than can regulatory agencies. Also, typically, the industry people have more familiarity with the particular facility in question and with the industry generally.

The Clean Air Act (sec. 502(b)(3)) requires that states delegated Title V operating permit authority must charge a fee sufficient to cover all direct and indirect costs of the permitting program. The fees can be significant. For example, Arizona in 1999 charged $96,678 for processing a permit for a new power plant, and in 2000 charged $121,424 for processing a cement plant permit. These permits were issued under an experimental program in which the state promised ex-

pedited handling, contracted with an outside contractor for review of the permit, and charged the applicant for the contractor costs (ECOS 2001, 13).

The permits are often long and complex. There is usually a separate permit for each vent and smokestack and for each pipe that leads to a water body or a sewer. Large facilities often require hundreds of permits. Most permits specify limits on the allowable amount of pollution, but in some cases, permits require a particular type of control machinery instead of or in addition to the numerical limits. Maintenance requirements and good management practices (e.g., weekly inspections of shut-off valves) often are specified. The permits also usually contain detailed monitoring, reporting, and record-keeping requirements. A permit application for a major facility can be several feet thick, and most of the application information is incorporated in the permit. A power company official recently estimated that in California, it takes a year and $1 million to gather the 2,500 pages of data needed to apply for a permit for a new power plant, and then it will take at least another one to two years before receiving approval (Tom Williams of Duke Energy quoted in Booth 2001).

The most significant cost of permitting to many firms is the time delay. An executive of the Intel Corporation testified, "We know that we can adapt to reasonable limits on emissions. The real threat to our industry is the slow, cumbersome, and out-of-date system that we use to manage our environment." He continued, "To remain competitive, Intel must make over 50 process changes per facility per year. Although none of these changes involve significant emissions increases—and some actually decrease emissions—they would all be subject to lengthy review and processing under Title V [of CAA] before the change could be made" (Mohin 1996).

The most significant cost of permitting to many firms is the time delay.

As complicated and time consuming as it may be to get a single permit from a single agency, it can be a much more tangled and lengthy process when multiple permits are required from multiple agencies. This is not unusual for a major project. For example, a new power generation facility being built in Wisconsin required 46 environmental approvals. Among the agencies that had to issue permits or approvals were the U.S. Army Corps of Engineers, EPA, the Federal Aviation Administration, the Federal Energy Regulatory Commission, six state agencies, the state historical society, the city, and the county.

The dynamic nature of industrial facilities is a persistent difficulty for permitting. In almost any large facility, the system is almost always being tweaked—changed in incremental ways that individually or cumulatively may have a significant impact on the level and type of pollution from the plant. A sump is added here, a heat exchanger there, a pipe recirculating water over there, a continuous cooker is substituted for batch cookers on one line in a cannery, a new catalyst is used in one part of a process in a chemical plant, a production worker figures out how to increase the output of the machine he's operating. These activities pose the question, how does a permit that may be unchanged for years apply to a facility that may change almost daily? There are no very good answers.[1]

Although laws and institutions provide the context for permitting, as with all political processes, personalities are an essential part of the process. A good example is water permitting in Massachusetts. The state has refused to accept delegation of the National Pollutant Discharge Elimination System (NPDES) program from EPA. This means that the EPA regional office has to write all the NPDES permits, an arduous and expensive task. One would expect the situation

to cause conflict between the state and the EPA region. In fact, relations between Massachusetts and EPA water people are remarkably harmonious, perhaps because the director of the state watershed management program and the head of the EPA regional NPDES program are old friends who play golf together. Conflicts are discussed and settled on the links. Of course, there are also many examples of how personalities can cause conflict and create problems.

2.2 Federal Statutes

Pollution control in the United States takes place in the context of a thicket of uncoordinated but lengthy and highly prescriptive laws. The major federal statutes identify both what the major problems are and how they should be ameliorated, and thus set the environmental policy agenda (see Davies and Mazurek 1998). Permits, being a central part of pollution control, are included in the detailed statutory mandates.

Table 1 (on page 17) lists the major federal permitting programs and related programs. Each of the permitting programs is different (see below), but most of the major programs share a common set of procedural requirements (see 40 CFR part 124). States must adopt these procedures for issuing, modifying, terminating, or reissuing permits if they are to gain EPA approval for becoming permitting agencies. The great majority of permits are issued by state agencies acting under state programs or under federal programs that have been delegated. States that have been delegated permitting authority issue permits for federal and municipal facilities as well as for private firms.

One important but confusing feature shared by the three major EPA programs (air, water, and hazardous waste) is that there is an overall permit program and then there are substantive programmatic requirements that each become part of the overall permit. The best analogy may be with the structure of computer software, where there are folders and each folder contains files. The major "folders" for EPA permits are New Source Review and Title V of the Clean Air Act, the National Pollutant Discharge Elimination System permits for water quality, and the basic Resource Conservation and Recovery Act permits. Within NPDES permits, the "files" for a municipal water waste treatment plant (in agency terms, a publicly owned treatment works, or POTW) would include, for example, a pretreatment program for industries discharging to the POTW, sludge management requirements, and other programs contained in the act. Delegation to states is done by individual program, so that, for example, even if a state has been delegated the NPDES program, it might not have been delegated the pretreatment program. In such a case, the NPDES permit for a facility might be written partially by the state and partially by the EPA regional office.

The major federal programs are described below.

Clean Water Act and Safe Drinking Water Act

The current national water quality permitting system (NPDES, 33 USC 1342) is directly traceable to the 1899 Refuse Act, which was contained in the Rivers and Harbors Act of that year (30 USC 1152). The permits authorized by the 1899 act were primarily intended to prevent obstacles to navigation, but the wording was broad enough to allow the system to be used to prevent pollution. In 1971, Refuse Act permits became the primary vehicle for enforcing federal water quality standards. However, two adverse court decisions undermined use of the Refuse Act. The

hiatus was brief, as the permit requirements were incorporated in the 1972 amendments to the Water Pollution Control Act (Davies and Davies 1975, 208–10).

A separate program, authorized by the Safe Drinking Water Act (SDWA), issues permits for underground injection control (UIC) (42 USC 300h). These permits regulate construction, operation, and closure of wells used to dispose of waste materials. In addition, permits for dredge-and-fill operations are authorized by section 404 of the Clean Water Act. The 404 permits are issued by the Army Corps of Engineers under guidelines issued by EPA.

NPDES and UIC permits share common process requirements (see 40 CFR 123–24). Following receipt of a completed permit application, the permitting authority must prepare a draft permit or a statement of notice of intent to deny a permit and issue a public notice with a request for comments; it must provide opportunity for public hearings; it must provide written responses to comments and make those responses available to the public. Finally, it must approve or deny the permit and allow appeals from its decision.

All facilities that discharge pollutants from any point source into waters of the United States are required to obtain an NPDES permit; discharges without a permit are prohibited. Dischargers can include industrial facilities, publicly owned treatment works, municipal separate storm sewers serving a population of 100,000 or greater, stormwater sewers discharging wastewater associated with industrial activities, and certain agricultural activities (e.g., concentrated animal feeding operations). Only direct point source dischargers require an NPDES permit. Industrial and commercial dischargers to a POTW are controlled by the national pretreatment program. Requirements for the pretreatment program are incorporated in the NPDES permits issued to the POTWs.

More than half a million facilities are covered by the NPDES program, but this number is deceptively high. More than 80% of these have general permits that cover a number of similar facilities with uniform requirements. The large majority of these general permits are for stormwater sewers. Of the more than 500,000 NPDES-permitted facilities, only 68,000 have individual permits, and only 10% of the individual permits are for major facilities (U.S. EPA 1999a, 2-2).

An application for an NPDES permit must be "complete" and accurate; that is, it must provide the minimum necessary information on an approved application form. The permit authority is the judge of application completeness. The required information is designed to identify the applicant and the activities for which the permit is sought. The application must adequately characterize the nature and the quantity of pollutants in the effluent and their impact on the receiving water. The data required depend on the type of applicant—for example, whether the applicant is a POTW or an industrial discharger. The types of information that might be required include a topographic map, identification of all outfalls, and data on priority pollutants, sludge, and toxicity.

Whether the NPDES permit is to be issued by EPA or by an authorized state, it must meet certain basic standards. It must contain conditions to assure compliance with effluent limitations, both those based on technology and those based on water quality standards. It must have monitoring and reporting requirements and may specify additional requirements (e.g., best management practices) necessary to supplement compliance with effluent limits. It must be issued for a fixed term of no more than five years.

The five-year term has come under criticism because there is a massive backlog in issuing NPDES permits. The rate of renewals has not kept pace with the rate of expiring permits. As of

October 2000, 44% of the 644 total EPA permits for major sources had expired; 25% of the 6,115 state permits for major sources had expired. For minor sources, 78% of EPA permits and 31% percent of state permits had expired (U.S. EPA 2001a, II-18; also see section 3.5 below). Although facilities are allowed to continue to operate after their permits have expired, the absence of an up-to-date permit means that any additions or changes to a plant will be unregulated.

The requirements for a UIC permit are very similar to those for an NPDES permit. First, like the NPDES program, an underground injection is prohibited unless authorized by permit or unless the injection is into a well authorized by rule. A well required to have a permit cannot be constructed until the permit has been issued. Regulations require standard permit conditions much like those required for NPDES permits. There are some differences, however. A permit can be issued on an area basis, rather than for each well individually, if specified conditions are met. In some cases, permits may last longer than five years; for example, class I and class V wells can be permitted for up to ten years, and class II and III wells can receive permits for the operating life of the facility. (The classifications are defined in 40 CFR 144.4.) The regulations also authorize the issuance of emergency permits.

Section 404 permits are intended primarily to protect wetlands by discouraging builders, farmers, and others from draining or filling wetlands. They have been controversial for several reasons. First, the process laid out in section 404 of the Clean Water Act (42 USC 1344) is complex. The permits are issued by the Army Corps of Engineers acting "through the application guidelines" developed by the EPA administrator. The Fish and Wildlife Service in the Department of the Interior is entitled to comment on each permit, and states are authorized to issue their own dredge-and-fill permits. "Who's in charge?" has sometimes been a relevant question. Second, EPA has revised the guidelines several times, and most of the revisions have been contentious. The most important underlying issue has been the extent to which the environmental value of the wetland should be considered in designating protected wetlands. Third, implementation of the program has aroused the ire of some who see the 404 program as the prototype of federal government intrusion into private property rights. Much has already been written about the 404 program (see, e.g., Want 1992 and GAO 1988), and therefore this report will not devote much attention to it.

Clean Air Act

The first permitting provision in modern federal law was section 111(b) of the Air Quality Act of 1967 (81 stat 499), which authorized the secretary of Health, Education, and Welfare (the department that then had federal air pollution control functions) to issue permits to federal facilities. However, it appears that this provision was never implemented.

In the 1977 Clean Air Act, Congress gave EPA authority to issue permits for construction of new facilities or modification of existing facilities. The two major permitting programs are New Source Review (NSR) and its subpart, Prevention of Significant Deterioration (PSD). NSR permits are required of major air pollution sources in "nonattainment areas"—places that do not meet one or more of the national ambient air quality standards. PSD permits are required of major sources in areas that already meet air quality standards; they are designed to protect national parks and other sensitive areas and to prevent air quality from falling below current levels. Different statutory requirements apply to NSR and PSD. For example, a new source in a nonattainment area may have to offset its planned emissions by obtaining emissions credits from other

sources in the area. Both NSR and PSD exempt sources built before 1979, although modifications to such "grandfathered" facilities must be permitted.

The permitting programs are supplemented by and in some ways controlled by state implementation plans (SIPs). SIPs are the Clean Air Act's mechanism for assuring that state actions are consistent with attaining national goals, specifically with achieving and maintaining compliance with the national ambient air quality standards. SIPs establish a framework for the permit limits imposed on new sources and also contain provisions for limiting existing sources.

Authority for federal permitting of existing pollution sources came much later than the permitting programs for new sources. General permitting authority for air emissions from the operation of existing sources was not given to EPA until the 1990 Clean Air Act Amendments. Title V of the act, which is called simply "Permits," was included in the 1990 amendments because by that time, the shortcomings of the SIP system had become apparent. The particular requirements that any facility had to meet were extremely difficult to determine. Over the years SIPs had been supplemented and amended. By 1990, the typical state plan was a large collection of state and federal regulations, individual permits, air models, various projections, and other items. It was (and is) not unusual for a plan to take up 10 or 15 file drawers. Some states had stopped accepting delegation of new authority from EPA because federal funding of state air agencies was shrinking rather than expanding to meet new responsibilities.

Some states had stopped accepting delegation of new authority from EPA because federal funding of state air agencies was shrinking rather than expanding to meet new responsibilities.

Title V was intended to address those difficulties by consolidating all air pollution control requirements for a facility in a single, federally enforceable permit. Because almost all states have been delegated Title V authority, at least on an interim basis, and because by law, Title V permits incorporate all requirements applicable to the permitted facility, the states must generally accept from EPA any newly delegatable authority.

All major polluting facilities—EPA estimates there are 22,000 (U.S. EPA 1998)—must obtain Title V permits. The permits title of the CAA regulation contains two major parts. First, there is a set of requirements that a state must meet if it is to administer the Title V program (sec. 502(b), 104 stat 2636–39). These include adequate authority to impose civil and criminal penalties, a requirement that the costs of the program be covered by fees paid by the permit applicants, and assurance that the agency has adequate personnel and funding to administer the program. Permits can be valid for no more than five years. The EPA administrator has the right to veto the issuance of any permit.

The second set of requirements in the act (sec. 504, 104 stat 2642–43) sets forth what a permit must contain. "Each permit issued under this title shall include enforceable emission limitations and standards; a schedule of compliance; a requirement that the permit holder submit to the permitting authority, no less often than every six months, the results of any required monitoring . . . " The section also gives the permitting authority power to issue a general permit "covering numerous similar sources." As we discuss in the next chapter, general permits may be an important mechanism for dealing with nonpoint and small pollution sources.

The major federal requirements that can be included in a Title V operating permit include new source performance standards, technology-based emissions standards applicable to new

sources or modified existing sources; and national emissions standards for hazardous air pollutants. In addition, the permits may include any applicable state requirements, such as toxics standards other than those promulgated by EPA. It is important to note that Title V, by itself, does not give EPA any new authority to establish standards or limits. Thus, any limits on a facility that are contained in a Title V permit derive not from Title V but from federal regulations pursuant to some other part of the Clean Air Act or from state requirements.

All the states have received at least interim delegation of the Title V permitting program. (Interim status is given to states that have submitted complete requests for delegation despite a few remaining deficiencies that must be remedied before the program is finally delegated to the state.) However, actual implementation of the program varies widely. For example, Massachusetts currently has 213 facilities that need to be permitted under Title V. Only 59% of these have received permits, and the state estimates that it will take another seven or eight years before all the required permits have been issued. Under court order, EPA had until December 1, 2001, to either give full approval to each state's Title V program or take it over (for further discussion, see section 3.5).

Solid Waste

The third major set of pollution control legal authorities deals with solid waste. In the wonderland of pollution control statutes, solid waste is not necessarily solid; it can also be a liquid or a contained gas. The basic law is the Resource Conservation and Recovery Act, enacted in 1976, and the major RCRA amendments enacted in 1984, known as the Hazardous and Solid Waste Amendments of 1984 (HSWA).

Unlike air and water permits, RCRA permits do not apply to *sources* of waste. Rather, the permits apply to facilities that are in the business of treating, storing, or disposing of hazardous wastes—typically landfills, incinerators, and storage and treatment facilities. Federal permits are not required for nonhazardous wastes or for facilities that generate hazardous waste as a by-product of doing something else unless they store it for more than 90 days.

RCRA contains 130 pages of complex and convoluted requirements. The statutory permitting requirements combine exquisitely detailed provisions with hugely broad mandates. The details include such quaint items as requiring the EPA administrator to "broadcast over local radio stations" his or her intention to issue a permit (sec. 6974(b)(2)(A)) as well as such gems of legislative draftsmanship as this:

For the purpose of this subsection, the term "aggressive biological treatment facility" means a system of surface impoundments in which the initial impoundment of the secondary treatment segment of the facility utilizes intense mechanical aeration to enhance biological activity to degrade waste water pollutants and . . . (ii) the hydraulic retention time in such initial impoundment is no longer than thirty days under normal operating conditions, on an annual average basis: Provided, that the sludge in such impoundment does not constitute a hazardous waste as identified by the extraction procedure toxicity characteristic in effect on the date of enactment of the Hazardous and Solid Waste Amendments of 1984; or . . . (sec. 6925(j)(12)(B).

In contrast are the two broad mandates contained in the act. First, each permit is required to "contain such terms and conditions as the Administrator (or the State) determines necessary to protect human health and the environment" (sec. 6925(c)(3)). This means that in addition to any specific requirements, the facility must be "safe" before it can be permitted. This places a

huge burden on both the permit issuer and the permit applicant. The second broad provision involves "corrective action"; that is, facilities must clean up past environmental damage before a permit can be issued for current operations. EPA (1996, III-137) estimates that 5,000 RCRA facilities are potentially subject to RCRA corrective action at a cost of billions of dollars.

The difficulties of the RCRA permitting requirements have several consequences.

First, firms go to great lengths to avoid having to get a RCRA permit, and the permitting agency (whether EPA or a state) often sympathizes with this desire. A variety of devices have been developed to avoid getting caught in what one EPA official called "the whole permit machine." RCRA itself gives facilities that were operating before passage of the law "interim status," which allows them to operate without a permit. Definitions are tailored to minimize the number of facilities that need a permit, especially when the facility is a hazardous waste generator that gets caught in the system because it stores wastes and thus becomes defined as a storage facility. For example, EPA has drafted a standardized permit rule (66 Fed. Reg. 52192, October 12, 2001) that would allow a facility that does not ship hazardous waste offsite to get a standardized permit by certifying its compliance with applicable design and operating regulations. The permitting agency reviews the certifications submitted for the facility. Another example is EPA's hazardous waste identification rule (66 Fed. Reg. 27266), which allows sources to avoid cleaning up an entire facility if they are cleaning up parts of it. RCRA also requires that EPA or the states issue a permit approving closure of a hazardous waste facility. A 1998 postclosure rule (63 Fed. Reg. 204) provides that if there is some other enforceable cleanup requirement (e.g., federal or state Superfund rules or corrective action), then the facility does not need a permit.

Most of those rules have been designed to exclude facilities that EPA does not consider to be in the true waste management business. RCRA officials also have made efforts to exempt facilities that are regulated under other laws. For example, underground injection wells are given permits-by-rule because they are covered under SDWA; POTWs are given similar general permits because they are covered by NPDES permits; stored "mixed wastes" (mixed nuclear and nonnuclear wastes) are exempted because they are regulated by the Nuclear Regulatory Commission.

Another result of the RCRA requirements is that getting a permit takes a long time—a minimum of two years. Permits for incinerators typically take more than four years, in part because extensive public hearings and other public participation efforts are usually required. Processing times of ten or more years are not unknown. The delay adds to the incentive to avoid having to get a permit in the first place.

A third consequence is that many facilities have used pollution prevention approaches to reduce wastes or change processes so that they fall outside the limits requiring RCRA permits. Escaping inclusion in the permitting program is thus a powerful incentive to take constructive action, as is true for most of the other pollution control programs.

EPA delegation of RCRA permitting to the states is as complex as other parts of the program. All but three states (Alaska, Hawaii, and Iowa), Puerto Rico, and the Virgin Islands have been delegated the base program. However, EPA also delegates to the states by types or categories of wastes, so, for example, as of the end of 2000 only 25 states had been delegated authority to administer the restrictions on wastes from boilers and industrial furnaces (see Table 1, above). The states have to apply for delegation when the wastes are listed by EPA, and for each state, there is almost always some category of waste that EPA has not yet delegated to it. This complicates the permitting process, although it is still true that states do the bulk of the permitting.

Further complications exist at the level of the individual permit. In cases where EPA issued permits to facilities within a state and then later delegated permitting authority to that state, the EPA regional office has discretion whether to turn over supervision of the earlier permits to the state agency. The regions vary widely in what they do. There also are complex differences in enforcement authority and delegation depending on whether a regulation is promulgated under RCRA or HSWA.

2.3 Federal Regulations

Most of the specific federal requirements that get incorporated in permits are not in the laws but rather in the regulations that EPA promulgates to implement the laws. The laws themselves require this. For example, the 1990 Clean Air Act Amendments state, "The Administrator [of EPA] shall promulgate within 12 months after the date of the enactment . . . regulations establishing the minimum elements of a permit program to be administered by any air pollution control agency" (sec. 502(b)). Almost all the specific standards that a source must meet are found in the regulations, not in the laws.

EPA regulations (40 CFR part 124) establish common or uniform procedures that states must apply when issuing, modifying, or terminating the following kinds of permits: hazardous waste management permits under RCRA; point source discharge permits under the Clean Water Act; state-administered section 404 permits; and injection well permits under the Safe Drinking Water Act. Separate provisions apply to states administering permits under the Clean Air Act. The provisions set a "floor" for public notice and comment, reporting, and similar processes. These minimum requirements are supplemented by media-specific or statute-specific permitting requirements. States are free to establish other requirements so long as the requirements are not inconsistent with the federal program. However, state law or state constitutions may present barriers to certain kinds of permit reforms. For example, a few states have laws limiting who can sue, and this may be an obstacle to broader public participation in permitting.

Regulations must be authorized by and based on the law. People who object to a regulation often argue that EPA regulations go beyond what Congress had in mind. However, the courts are likely to strike down any regulation that clearly goes beyond the statute. Whether specific EPA requirements go beyond what Congress intended is perhaps not a meaningful question, however, because it makes the dubious assumption that Congress had in mind specific regulatory requirements.

A more difficult and frustrating problem is that EPA is increasingly avoiding congressional and, to some degree, judicial review by putting permit requirements in policy guidance to the states rather than in formal regulations. Similarly, the agency puts guidance in documents that are not finalized but are implemented by the states as if they were law.

Neither policy guidance nor unfinalized rules can be legally enforced, but this may not matter, given the dynamics of the permitting process. EPA can make the states incorporate informal requirements by vetoing or delaying approval of permits that do not meet the requirements. Similarly, states can "enforce" an informal requirement when an applicant seeks to construct or modify a facility by refusing to grant a permit until the applicant complies. Thus, many permit requirements might be promulgated and enforced without being subject to judicial scrutiny. As noted above, the dynamic is different for applicants seeking a permit renewal for an existing facility. In this case, delay in issuing a permit is to the advantage of the applicant, who can con-

tinue to operate the facility under the old permit. This is probably a significant factor in explaining the major backlog in water permits.

In fairness to EPA, it should be noted that the line between what should be a rule and what should be guidance is not hard and fast. Furthermore, Congress has burdened the rulemaking process with so many hurdles and requirements that there is a major incentive for agencies to avoid going through formal rulemaking. For NSR air permits alone there are several thousand pages of guidance, and it would not be possible to issue all of that through formal rulemaking. (The Air and Waste Management Association, Pittsburgh, publishes loose-leaf notebooks containing permitting guidance. EPA headquarters and most of the EPA regions have Web sites on which guidance documents are posted.)

It would take a separate research project to quantify and characterize the extent of the "regulating without regulation" phenomenon. There certainly are circumstances when guidance is more appropriate than a rule, but our impression is that circumventing the Administrative Procedures Act and the formal regulatory process has become a standard way of doing business in EPA.

2.4 State Laws

The states administer the federal permitting programs and their own laws and regulations through a large number of programs. As an example, Table 2 lists the pollution control permitting programs currently administered by the state of Maryland.

The Maryland list is typical in the number and type of permitting programs. Some are programs to implement federal authorities, such as the Title V air operating permits. Some are programs that operate within the framework of federal laws but focus on more specific activities contained in the federal legislation; the surface and groundwater discharge permits for oil terminals are examples. Some programs, such as the general permit for construction activity, cover activities outside the purview of federal law.

Air Quality General Permits to Construct
Air Quality Permit to Construct
Air Quality State Permit to Operate
Part 70 (Title V) Permit to Operate (air)
State Refuse Disposal Permit
Ground Water Discharge Permit for Rubble Landfills
Sewage Sludge Utilization Permits
National Wood Waste Recycling Facility Permit
Oil Operations Permit
Oil Operations Permit for Oil Contaminated Soil
Oil Control Program General Wastewater Discharge Permits
Surface Water Discharge Permit for Oil Terminals
Ground Water Discharge Permit for Oil Terminals
Controlled Hazardous Substances Facility Permit
Surface Water Discharge Permit (industrial)
Industrial Wastewater/Stormwater General Discharge Permits
Surface Water Discharge Permit (municipal)
Ground Water Discharge Permit (municipal or industrial)
Toxic Materials Permit
Water and Sewerage Construction Permit
Water Appropriation and Use Permit
Coal Mining Permit
Non-Coal Mining Permit
Well Construction Permit
Tidal Wetlands Permits
National Wetlands and Waterways Permits
General Permit for Construction Activity
Municipal Separate Storm Sewer Permit
Dam Safety Permit

Table 2.

Pollution Control Permits in Maryland

Note: Table excludes numerous licensing and certification programs.

Source: State of Maryland, *1998 Business Guide to Environmental Permits and Approvals*, at www.mde.state.md.us/permit_guide98/index.html, downloaded January 30, 2001.

There are also broad areas related to pollution that are regulated by state and local governments and not by the federal government—land use, for example. Many types of toxic emissions, particularly to water, are not regulated by EPA, and some states have promulgated their own regulations. Also, given the great geographic diversity of the United States, there are environmental problems that are unique to one or a few states. Massachusetts, for example, regulates water withdrawal for cranberry bogs, and lignite-burning power plants are a major air pollution problem in North Dakota.

As federal permitting programs have been increasingly delegated to the states, the line between state and federal permitting programs has become increasingly blurred. In many states, air and water operating permits contain requirements authorized by both state and federal laws. Especially on permits that may be controversial, the state permit writer often consults with his or her federal counterpart while the permit is being written. Early consultation protects the state from being undercut or second-guessed and protects federal officials from being blindsided or having to react to a *fait accompli*.

2.5 Flexibility to Innovate under Existing Law

The detailed and voluminous provisions of federal and state law often seem to leave little room for flexibility. The National Academy of Public Administration (2000a, 60) recently concluded, " . . . specific statutory requirements sharply limit EPA's authority to experiment with some new approaches. EPA has invested so much effort in establishing and protecting legal precedents for regulations that it is now unable or unwilling to authorize significant experiments with alternative approaches. That the innovations the Academy studied could not produce significant environmental gains, is due in large part to the federal constraints." A leading business group, calling for statutory reform, commented, "Businesses have little incentive to try new, more effective approaches to protecting the environment. The rules and laws allow for only limited variances from required programs. Regulatory agencies are also limited in their ability to try different ideas" (American Chemistry Council 2001).

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Although businesses may be constrained by permits that specify the technology they must use, there often remain both room and incentive to try new procedures and processes. The attention paid in recent years to pollution prevention has revealed that even the most sophisticated firms do not operate at maximum efficiency and that pollution prevention steps can often save the company money (for some recent examples, see Deutsch 2001).

The state initiatives described in this report show that much flexibility exists in practice. New Jersey, for example, experimented with an entirely different way of issuing permits (see Chapter 6). However, the New Jersey experiment was never tested in the courts (the pollution prevention planning part of the New Jersey law was litigated and was upheld, but the permitting provisions were never contested) and had EPA support. There are many examples of states exercising broad flexibility, but there also are examples of EPA successfully opposing state initiatives. Generalizations may not be possible—the degree of state flexibility is dependent on the specifics of the initiative.

The flexibility that states have to experiment under the existing system often derives from the circumstances: in the typical permitting situation, no entity has both the interest and the resources to contest the flexibility in court. The applicant for a permit for a new facility or a modification does not want to litigate because it would delay issuance of the permit. The state and federal agencies do not want to sue each other because they are locked into a partnership and must work together in the future. Environmentalists might want to sue, but local groups do not have the resources, and permitting is not a priority for the national environmental organizations. Flexibility—to alter permit requirements, to require actions as a condition for getting a permit, or to do other things that may not even be contemplated in the statutes—exists because of *de facto* legality: if no one sues, the action is legal.

Flexibility exists because of* de facto *legality: if no one sues, the action is legal.

Many of the questions about new ways of permitting lie in a gray area where legal requirements are not the issue; rather, they are, arguably, a matter of EPA discretion. For example, can multimedia permits fulfill the statutory and regulatory requirements for individual medium-based permits? Do self-auditing laws violate the requirements that permits be enforceable? EPA, primarily its Office of Enforcement and Compliance Assurance (OECA), has often objected to state initiatives of this type. The states, in turn, led by the Environmental Council of the States, have made dismantling OECA a primary goal; 42 state environmental agency administrators sent a letter urging this to Vice-President-elect Cheney on December 28, 2000.

Some of the perceived constraints on state action derive from the delegation process. After a program is delegated or approved, the state is no longer free to change it at will. If a change is made, the program is no longer as approved and has to be reviewed again by EPA. The requirement for a rereview is often interpreted as EPA's opposition to the change, when it may be that EPA has no objection but is legally obligated to conduct another review.

EPA program managers, and to some degree state program managers, can be creative in interpreting, supplementing, and bending the statutory requirements. We noted above the variety of devices that the RCRA program has developed to allow facilities to escape getting a permit. The air and water programs employ similar mechanisms. For example, the air program created a "synthetic minor" category—sources that would be major sources and thus required to get a Title V permit if they operated at full capacity, but that have obtained modifications to existing state permits reducing their emissions below the threshold for a major source (Greenway 2000, 1-13-14). The price they pay is that their state permits are now federally enforceable. Other prices facilities may pay for not having to get a permit or for a reduction in stringency can include a wide variety of environmentally beneficial steps, such as conserving water or energy, aesthetically improving a site, or paying the costs of controlling a nonpoint source.

A good example of this type of flexibility is the agreement reached between the New England regional office of EPA, the city of Manchester, New Hampshire, and the New Hampshire Department of Environmental Services. Manchester, like many older cities, has a major problem with combined sewer overflow (CSO). More than 100 million gallons of raw sewage flows into the Merrimack and Piscataquoq Rivers each year when rain or snow overloads the combined storm and sewer pipes that drain the city streets. Fixing the problem by replacing all the combined storm and sewer pipes would cost about $140 million. Instead of requiring this expenditure, EPA New England decided to trade a reduction in its CSO requirements for a variety of

other environmental benefits (U.S. EPA 2000b). The city agreed to spend $52 million to replace some pipes, thereby solving a large part of the CSO problem. In addition, the city will spend $1 million to implement a stormwater management plan for the Merrimack, $1 million for streambank stabilization and erosion control, $1 million to restore urban ponds in the city, $2 million to preserve a rare wetland located within the city boundaries, $500,000 to prevent childhood lead poisoning and asthma, and $100,000 for environmental education. As we said in Chapter 1, the permitting process is a negotiation, and the bargaining process can address many issues, including areas not covered in any law.

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Chapter 3

Efficiency

The varied functions of pollution control permits and the numerous problems that beset permitting have led to a large number of reform efforts. This and the next three chapters describe these reforms and provide some assessment of their usefulness and feasibility. We will distill this information into specific recommendations in Chapter 7.

The four chapters are arranged roughly in order of the scope of the reforms discussed. This chapter deals with reforms designed to improve the efficiency of the existing system. Chapter 4 covers reforms that give more flexibility to permittees. Chapter 5 covers approaches to decentralization. Chapter 6 deals with systems that are markedly different from the current approach: cross-media integration and pollution prevention. However, the world is not as neat as researchers would like, and there are overlaps and interrelationships among the various experiments and proposals. The categories used to classify the reforms are more like open envelopes than airtight boxes.

The reforms covered in this chapter are modifications to the existing permitting system designed to make it function more smoothly or effectively. None of these changes require major adjustments to other control functions, such as enforcement or standard setting, although the Massachusetts Environmental Results Program, discussed in section 3.4, does rely on a different kind of compliance. The small-source compliance efforts are a building block in adjusting the degree of permitting effort so that it correlates better with the degree of environmental risk. In other words, permitting agencies should focus on what is important and not get buried in piles of meaningless paperwork. Efforts like the Massachusetts experiment are important in dealing with this problem.

3.1 Paperwork Reduction

Many reform efforts are aimed at simply reducing the amount of paperwork that must be filed by a permit applicant or permit holder. If nothing else changes, a reduction in paperwork will improve the efficiency of the permitting process.

As Chris Foreman of the Brookings Institution has noted (2001, 10), "Efficiency alone has never been a compelling value to activists or to the public, and it remains politically anemic as a basis for environmental reinvention." However, nothing so annoys those who must be per-

mitted as having to supply redundant or seemingly unnecessary forms or pieces of information to the regulating authority.

Although there is a federal paperwork budgeting system, the total number of hours devoted to applying for permits and complying with the reporting requirements contained in permits is not known. EPA estimates that applying, monitoring, record-keeping, and reporting for Title V operating air permits takes 3.2 million hours per year (U.S. EPA 2000c). This is an average of about one month of a full-time employee per year for each source covered by the program. The RCRA office, in contrast, estimates that each application or renewal of a RCRA permit takes about one year of a full-time employee's time. There are many fewer RCRA permittees than Title V permits.

The high walls separating EPA's program offices lead to duplicative demands on permittees. The air, water, and hazardous waste offices do not like to use each other's data. In fact, there may not be enough coordination within the agency to allow them to exchange data even if they were willing. Several decades of effort have failed to produce a common facility identifier for EPA to use, so there is, for example, no simple way that the water program can match its data with air program data from the same facility. As part of its Integrated Information Initiative, EPA created a facility registry system, which is putting together data for the same facility from different programs. By the end of fiscal year 2001, the agency hopes to have covered about 80% of the universe of facilities (see U.S. EPA 2000c).

The high walls separating EPA's program offices lead to duplicative demands on permittees.

The EPA Permits Improvement Team report (1996, 17) recommended that "the Program offices . . . conduct regulatory reviews that prioritize compliance monitoring, reporting and record-keeping requirements according to the best estimate of their actual value to the environment and determine where different media requirements for compliance information duplicate and/or conflict with one another. The reviews should be followed by proposals and schedules for permit programs to streamline reporting requirements." No action, however, resulted from this recommendation. (The difficulty of making changes in the permitting process is discussed in Chapter 7.)

Some individual EPA programs have taken steps to reduce paperwork and other burdens on the regulated community. For example, there is a RCRA Burden Reduction Initiative that has proposed a variety of changes, including streamlining or eliminating approximately 100 of 334 notices and reports from facilities to show compliance (64 Fed. Reg. 117, 32859–68).

When EPA convened representatives of several manufacturing sectors as part of its Common Sense Initiative (CSI), several groups focused on reducing paperwork. For example, the permits workgroup of the CSI iron and steel sector worked for two years on a model multimedia permit that consolidated the reporting requirements from different types of permits into a streamlined, electronically submitted report (NAPA 2000b, 3.105). The CSI computer and electronics sector undertook a consolidated reporting project that developed a single report to replace 12 reporting requirements, reducing the number of data elements that a facility must report by approximately 60%. This effort covered NPDES reporting but did not deal with air and waste permit requirements (RFD and Associates 1999).

A single EPA permit application form applicable to similar types of facilities should be possible. Paperwork also would be reduced by more radical changes in permitting, such as an integrated multimedia system (see Chapter 6).

3.2 One-Stop Shopping and Technical Assistance

The fragmentation of permitting programs into media (air, water, waste), and then into kinds of pollutants and subprograms within each medium, can make getting a permit time consuming, complicated, and potentially intimidating. An increasingly popular reform intended to simplify the process is known as one-stop shopping.

The concept is not clearly defined, and it even goes by several names—one-stop shopping, one-stop permitting, and permit assistance programs. In his study on environmental permit assistance programs, Kelly Robinson (1999, 245), a research economist with the Economic Development Administration, does not consider the "one-stop" terminology useful. Few of the programs he surveyed "eliminate the need for permit applicants to deal with multiple permit offices," and "there is no discernible difference in services offered among programs that claim to be one-stop and those that do not" (Robinson 1999, 245–46). He therefore proposes the term *permit assistance programs.*

A wide range of state programs use some form of the one-stop approach. At the minimal end of the spectrum are programs like Georgia's. There, when a business decides to establish itself in the state, the Environmental Protection Division within the Department of Natural Resources sets up a preapplication conference involving the permit applicant, the assistant director for programs of the division, and the "New Industry Team." This team comprises a representative from each of the main media branches: air, hazardous wastes, water resources, and water protection. Representatives from other areas, such as radiation, come to the meeting if appropriate. In this way, a permit applicant meets with all the program representatives at once, instead of scheduling several meetings, to learn about Georgia's regulatory requirements and to establish nonbinding timelines, which are different for each media. Once the application is submitted, each branch processes and approves its particular medium permit.

Georgia's Environmental Protection Division also runs the Small Business Assistance Program. This technical assistance program was created in 1993 in response to the 1990 Clean Air Act Amendments, and its goal is to help small businesses, defined as those with fewer than 100 employees, comply with clean air requirements in Georgia.[2] It extends permit assistance only to small businesses and only for permits required by the air regulations. This type of small business program is another increasingly common permit assistance measure undertaken by state environmental agencies.

More comprehensive programs are exemplified by efforts in Mississippi and Maryland. In Mississippi, a permit manager is responsible for all the permits required by a given facility. There are four steps in the Mississippi one-stop program: a preapplication communication; a nonenforceable agreement delineating the permittee's responsibilities and the agency's commitment to timeliness; the preparation of a customized permit application by an agency permit manager allowing an applicant to submit to one person at one time all necessary information; and a public notification process (Hartwell 1999, 7).

In Maryland, the Department of the Environment established its Environmental Permits Service Center in 1994. The center seeks to provide one-stop shopping for environmental permits for a combination of air, water, and waste issues and stresses an integrated, multimedia approach to environmental permitting that encompasses permit coordination, streamlining, and pollution prevention. The center also runs a small business assistance program.

Pennsylvania in 1995 began a program aimed directly at speeding up permit processing. It established time periods for approval of various environmental permits in the state. If the regulators fail to complete review of the permit within the specified time, the applicant's fee for the permit is refunded (PA Executive Order 1995–5, August 23, 1995). According to the secretary of the Pennsylvania Department of Environmental Protection, the program has had a "positive impact . . . on our relationship with individuals, local government and the business community" (DEP press release, February 15, 1996).

A significant weakness with even the best state one-stop programs is that the EPA regional office may have responsibility for writing parts of state-issued permits.

A significant weakness with even the best state one-stop programs is that the EPA regional office may have responsibility for writing parts of state-issued permits. As we noted in Chapter 2, even though overall permitting may have been delegated to a state, specific programmatic parts of the permit may not have been delegated. For example, although all the states write Title V air permits because every state has either final or interim delegation, EPA writes the toxics part of the permit for the 16 states that have not been delegated final authority for national emissions standards for hazardous air pollutants. President Bush's energy plan calls for creating a task force, chaired by the chairman of the Council on Environmental Quality, to "ensure that federal agencies set up appropriate mechanisms to coordinate federal, state and local permitting activity in particular regions where increased [energy] activity is expected" (National Energy Policy 2001, Overview xiii and 3–12–13) The President has issued an executive order creating the task force (Actions to Expedite Energy-Related Projects, EO 13212, May 18, 2001).

The ultimate form of one-stop shopping is an integrated permitting system that issues one comprehensive permit per facility. This kind of system clearly transcends attempts at coordination and technical assistance and will be discussed in Chapter 6.

3.3 Using the Internet

Some of the problems that one-stop approaches are designed to remedy may be effectively solved by new technology. The computer and the Internet are having a major and growing impact on permitting.

Internet technology growth in the 1990s and greater accessibility to the Internet has prompted the government to use the World Wide Web and other electronic means for providing information to the public and consumers of government services. The Internet has proved especially useful for disseminating environmental information, and EPA has an extensive Web site with information about the areas and programs under its jurisdiction. Additionally, each of the 50 state environmental agencies has its own Web site. The permitting information and services that the agencies offer through their sites run the gamut from minimal information about the agency and its permitting responsibilities to detailed permitting information, downloadable

and printable permit forms, and the ability to track the status of permit applications. New Jersey has a mechanism through which certain general air permits can be submitted on-line (Keegan 2000).

The Internet can be used for two distinct but overlapping purposes in the context of permitting. One is to facilitate public participation; the other is to improve the efficiency of the permitting process. Public participation is discussed in Chapter 5. Here we note that there are at least 12 states (Arizona, Colorado, Connecticut, Indiana, Iowa, Kentucky, Maryland, Missouri, Ohio, South Carolina, Vermont, and West Virginia) with Web sites that allow the user to view one or more of the following: the status of permits; permit applications, draft permits, or final permits issued; and a list of companies by location and permit number and summary information about the permit. Information about permit status may be useful to permit applicants, but all three types of information are useful to members of the public who may have comments or objections.

Permit streamlining efforts at the state level have generally used the Internet or some other electronic means to disseminate information about permits and their requirements and to help the agencies process permit applications more quickly and efficiently. The Internet is used to provide basic permitting information and downloadable permit application forms to the regulated community. Many states provide an on-line environmental permitting guide explaining the steps that a business must take to get a permit. Some of these guides are very detailed and include timeframes for each permit. In addition, more than half the states provide downloadable permit application forms for air, water, and hazardous waste permits, and only a few do not offer downloadable permit application forms for any media program. Some on-line permit assistance services, such as California's CalGOLD, identify what permits a business needs depending on its location by answering questions on-line—an example of electronic permitting services that go beyond the one-way provision of information.[3] The service "comprises an extensive information database and a collection of interactive permit application forms that can be filled out and submitted electronically from your computer"[4] (also see ECOS 1998). Connecticut is developing software "that will enable facility personnel to calculate emissions necessary for permit application preparation . . . to monitor compliance with the permit once issued and to provide a consistent method of maintaining records to demonstrate compliance" (ECOS 1999, 10).

Will the trend toward providing permitting information and assistance on-line encourage the move to paperless permit applications via electronic submissions? New Jersey is pioneering the use of the concept for general air permits. California allows some electronic permit applications through its CalGOLD program, and Iowa has a mechanism for electronic submissions through its State Permitting and Air Reporting System. The Iowa agency provides the software on its Web site, with which businesses can prepare an electronic permit application to be submitted via e-mail, FTP, or CD-ROM.[5]

The concept of electronic submission of permit applications and other environmental reports is, in the words of one observer, "an important trend in environmental regulations that has been developing over the past few years with leadership from the U.S. Environmental Protection Agency and the State of New Jersey" (Greenway 2000, xii). In 2000, the New Jersey Department of Environmental Protection received 80% of its air permit applications electronically, and 93% of the annual air emissions statements submitted by industry came in electronically (ECOS 2001, 83).

In the late 1990s, a legislative push for federal agencies to move toward paperless transactions built the foundational steps for making electronic submissions a reality. The Government Paperwork Elimination Act (44 USC 3504), which took effect on October 21, 1998,[6] requires that by 2003, federal agencies, when practicable, must offer the option of electronic submission of information. It also provides for the enforceability and legal validity of electronic records and signatures. An additional push for electronic submissions was provided by the 2000 Electronic Signatures in Global Commerce Act (P.L. 106–229), which extended the legal basis for electronic signatures.

Currently, electronic submission efforts have been targeted at collecting compliance data after a permit has been approved, rather than at permit applications. Most agencies already have computer database systems that manage compliance data, and therefore fewer resources and changes are required to incorporate the new method of receiving information from the regulated party. In the case of permits, however, new systems are required, especially security systems that will ensure the legitimacy of signatures and the integrity of the information provided in the permit application. These obstacles have blocked implementation of electronic permit applications to EPA. Over the next few years, EPA and additional states will probably allow the electronic submission of permit applications once the necessary computer systems are set up.

3.4 Small-Source Compliance

Regulation of large sources has reached a plateau of possible pollution abatement, and further reductions may be costly, not only in monetary terms. The permitting process has generally neglected nonpoint sources and small sources of pollution, which in many places now contribute more pollution than large sources, and often are either unregulated or regulated with little or no enforcement. Examples of nonpoint sources include runoff from agriculture and construction. Small sources include septic tanks, auto body shops, dry cleaners, printers, photo processors, gas stations, schools, hotels, and beauty salons.

Some small businesses are not even on the regulatory radar screen. However, even if they are subject to regulation, small businesses may not be aware of regulatory requirements that cover their business or may not have the resources to comply with those requirements. Given these constraints, the traditional permitting process is not well suited for small sources. "Permit engineers agree that for small sources many permitting duties are little more than paper-pushing exercises" (NAPA 2000b, 54). Some states believe that additional environmental improvements can be obtained from small sources through greater cooperation with industry, increased flexibility in pollution abatement and prevention mechanisms, and simplification and clarification of what environmental agencies require of the regulated community.

In an attempt to achieve greater small-source compliance, Massachusetts has pioneered the use of performance-based standards coupled with a mechanism for self-certification for a limited set of industries. In that way, it is expected that the environmental agency's resources and time will be freed and redirected to higher-priority compliance, monitoring, and enforcement functions (MA DEP 1996, 8).

Massachusetts Environmental Results Program.

In 1997, the Massachusetts Department of Environmental Protection estimated that "nearly two-thirds of the state's small and medium-sized businesses are out of compliance with at least some existing environmental requirements" (MA DEP 1997, 1). In response, the agency established its innovative Environmental Results Program "to develop a new and superior regulatory compliance system for the state's small and medium-sized businesses." The program was " . . . designed to get government out of the business of telling companies *how* to achieve regulatory standards while simultaneously improving compliance and enforcement . . . " (MA DEP 1996, 3). The program has now been designed, piloted, and applied to several commercial sectors.

According to a NAPA study:

The promise of ERP is that it will deliver superior environmental protection, increase flexibility for business, and reduce costs to taxpayers. In practice, it is an innovative compliance-assurance system that uses annual self-certification requirements to shift the compliance assurance burden onto facilities. For the first time ever, senior-level company officials certify annually that they are—and will continue to be—in compliance with all applicable air, water, and hazardous waste management performance standards throughout a facility. [The agency] reviews the certifications with both random and targeted inspections, and appropriate enforcement, when necessary (NAPA 2000b, 9).

The implication of the Environmental Results Program for conventional permitting is that its "ultimate goal is to eliminate the need for some 10,000 small and medium-sized industrial and commercial businesses in the state to obtain, modify or renew environmental permits." In doing so, the agency hopes to become "a more efficient and effective guarantor of the people's constitutional right to a clean, healthy and safe natural environment" (MA DEP 1997, 7). Its agreement with EPA states, "Moving away from traditional permitting and concentrating on compliance assurance, enforcement, and technical assistance will ultimately lead to superior environmental performance across whole sectors of the Massachusetts economy" (Project XL Final Project Agreement for ERP, May 5, 1998, 3).

The permitting process has generally neglected nonpoint sources and small sources of pollution, which in many places now contribute more pollution than large sources, and often are either unregulated or regulated with little or no enforcement.

Program managers began by covering three small-industry sectors—dry cleaners, printing, and photo processing—and compiling as complete a list as possible of the businesses within each. They then set performance standards and created sector workbooks that the businesses would use to complete the self-certification forms. Stakeholders were consulted throughout the process. The sector workbooks were written in simple, clear language and also translated into other languages commonly used in the three sectors, such as Korean for the dry cleaning industry. Once the standards and workbooks were completed, letters were sent out detailing the program and the new regulatory requirements. Businesses were asked to complete the self-certification paperwork through the use of the workbooks. The agency offered technical assistance at the participant's request. It also conducted site checks but did not penalize violations as long as they were corrected within a stipulated grace period.

One of the goals of the Environmental Results Program was to use performance-based standards rather than technology-based requirements (see Chapter 4). April and Greiner, who evaluated the program, found that the agency had a difficult time developing "pure" performance standards, and in fact, the actual standards ranged from those that were truly performance-based to those that more closely resembled technology-based standards. "Many of the 12 demonstration project standards were combinations of emission/discharge limits, material specifications, equipment design specifications, and equipment procedures/management practices" (NAPA 2000b, 1.43). April and Greiner identify five barriers to the attempt to develop performance standards:

- statutory requirements to apply the best available control technology process;
- industry reluctance to give up "guaranteed technology standards";
- insufficient resources to develop and update performance standards;
- inadequate mechanisms to ensure compliance with performance standards; and
- issues of compatibility with federal requirements.

Another important challenge that the agency still faces is the tension between information disclosure and confidentiality. April and Grenier found that some stakeholders (notably environmental organizations) expected that increased public disclosure would be an important check and balance to permit elimination, whereas industry raised concerns about making confidential business information available to potential competitors (NAPA 2000b, 1.48). This problem arose especially in connection with posting an individual business certification on the Web, where it would be easily accessible to competitors.

Massachusetts is currently expanding the Environmental Results Program to focus on industrial boilers and on wastewater discharges in a variety of facilities. Startup program costs and the development of sector standards and workbooks can take substantial amounts of time and resources. One way to reduce these costs is to spread them out among several states cooperating or in partnership with one another (NAPA 2000b, 58).

There is widespread agreement with the conclusion that the Environmental Results Program "has brought a number of relatively unregulated small business sectors . . . to a much higher level of compliance, assuring that compliance will be ongoing . . . " (NAPA 2000b, 1–7), and information on the approach is being disseminated to other states. Rhode Island has created a certification program for the auto body industry modeled in part on the Massachusetts program. EPA headquarters, EPA New England (Region 1), EPA Region 3 (Philadelphia), and the Massachusetts Department of Environmental Protection are currently working to make other states more aware of the Massachusetts approach.

3.5 Extending Permit Terms

NPDES water permits must be renewed at least every five years, and Title V air permits also expire after five years. RCRA permits for treatment, storage, or disposal facilities can be valid for no more than ten years. The fixed terms, particularly the five-year terms for air and water permits, have been criticized as arbitrary and unnecessary. The charge is that both the environmental

agency and the permit holder waste scarce resources in processing unnecessary paperwork.

Several states are considering legislation to deal with the situation. Colorado in 2001 enacted a bill "Concerning the Protection of Water Quality by Increasing the Efficiency of Discharge Permitting" (HB1032, signed by the governor on March 11), whose major purpose is to remove the requirement that state permits for water discharge expire after five years. The Colorado Water Quality Commission is directed to promulgate regulations that "establish a permit process that allows permit conditions to remain in effect as long as circumstances dictate those conditions" (CO Revised Statutes 25–8–501(3)). However, there is also a provision that "In order to comply with Federal requirements such permit process may require periodic renewal of permits where few or no changes in the permit conditions are necessary" (CO Revised Statutes 52a). Since most of the requirements in the permits come from the federal Clean Water Act, and since the five-year renewal requirement is contained in the Clean Water Act, the Colorado law affects only state programs that address problems like septic tanks and groundwater.

It makes sense to require that permits be periodically reissued . . . without a fixed term, permits might remain unchanged forever.

Another approach has been taken by New York State, which established stringent timetables for processing both new permit applications and renewals. For NPDES permits, if the state fails to make a decision within the specified time period, the applicant can send a notice of the failure to the state agency. "If, within five working days after the receipt of such notice, the department fails to mail [sic] a decision, the application shall be deemed approved and a permit deemed granted . . . " (New York State Consolidated Laws, Article 70, Section 70–109, 3(b)).[7] EPA did not allow this approach to be used for RCRA or CAA Title V permits.

There is an undeniable logic to saying that permits should have to be reissued only when there is some change in conditions that warrants a review of the initial permit. However, there are three problems with this approach. First, conditions over five years almost always have changed. Second, without the trigger of an expiration date, how will it be known whether conditions have changed? Third, for some types of facilities, change may come so often that tying the permit to change would cause costly delay. We will consider each of these points.

When asked whether the five-year limit on NPDES permits made sense, a state permitting official replied that any permit writer who didn't have some change to make in a permit after five years "wasn't doing his job." Although this could be interpreted as a bureaucrat's defense of perpetuating make-work, in fact it is an accurate reflection of the ever-changing world of pollution control. In water, total maximum daily loads (see section 5.2) and nonpoint sources have become much more important in the past five years. In both air and water, state and federal regulation of toxics is constantly evolving. The RCRA program is still adding and defining categories of hazardous waste. Given these kinds of changes, it makes sense to require that permits be periodically reissued.

The second point is that without a fixed term, permits might remain unchanged forever. One would hope that significant changes at a permitted facility would be reported by the permittee, whether prompted by the desire to be a good citizen or by fear of state or EPA enforcement, but recent enforcement actions by EPA against a number of power plants for failure to comply with New Source Review requirements show, at a minimum, that there are differences of opinion between permittees and EPA over what constitutes a significant change. Furthermore, if there are

significant changes in regulatory requirements, it is difficult for the permitting agency to reopen an existing permit, although in some programs new requirements automatically become binding on permit holders. Thus, for both kinds of changes, a periodic review and reissuance of the permit on an established timetable is the most effective and perhaps the only realistic way to incorporate changes.

The third problem with reissuing permits only when conditions change is that such a policy could harm rather than help the regulated firm. As we noted in section 2.1, most industrial facilities constantly make incremental changes in processes and practices. For some industries, notably those in high-tech fields, product and production changes occur very frequently, time is of the essence, and having to get a new permit each time emissions change is likely to be economically ruinous. Firms such as Intel and 3M have tried to solve this problem through pilot programs that set general emissions ceilings and allow changes that do not exceed the ceilings (NAPA 2000a, 57). The problem is most acute with respect to the Clean Air Act New Source Review program, and Congress has commissioned the National Academy of Public Administration to study how it can be improved.

In the United Kingdom there is currently a four-year review cycle for permits, but the government is considering different cycles for different sectors. Factors that would determine the frequency of permit review include the expected rate of technological change in a sector, the risk and level of environmental impacts, and the likelihood that operators will undertake improvements on their own initiative. This type of flexibility might work at the state level in the United States in conjunction with the tiered system that some states are developing (see section 4.3).

The five-year limit on NPDES permits has contributed to a backlog in reissuing such permits, and the backlog has become a major issue for EPA. In November 1998, 46% of NPDES permits were not current. By the end of 2000, after a concerted effort by EPA, this had been reduced to about 30%.[8] EPA's goal was to reduce the backlog to 10% of major facilities by the end of 2001 and to 10% of minor facilities by the end of 2004. However, as of December 31, 2000, of the 56 states and territories, only 12 were meeting the backlog reduction goals for majors, and the record for minor facilities was no better (EPA internal memo from Charles H. Sutfin, director, Water Permits Division, to regional administrators, January 12, 2001). It does not seem likely that the permit backlog problem will be solved, and a system in which a third of the permits are out-of-date is seriously flawed.

An example of the corrosive effects of the permit backlog is provided by the Bethlehem Steel Corporation facility in Baltimore. This is the 2nd largest discharger of toxic metals into Chesapeake Bay and the 48th largest discharger of toxic metals to surface waters in the nation. The facility received an NPDES permit in 1985. The provisions of the permit were superseded almost immediately by a consent decree imposing much more lenient conditions on discharges from the facility. The consent decree was supposed to terminate in 1988, and the permit expired in 1990. However, it was not until 2001 that a new permit was issued. In the intervening 11 years, the facility continued to operate under the lax conditions of the consent decree (Steinzor 2000; Steinzor 2001).

It would require a lot of analysis to figure out the causes of the NPDES backlog, but they include lack of money and difficulty in attracting skilled personnel for the unexciting task of writing permits. However, there is also an incentive problem. The applicants who have permits have no incentive to renew them because they can continue operating forever under the old, outdated

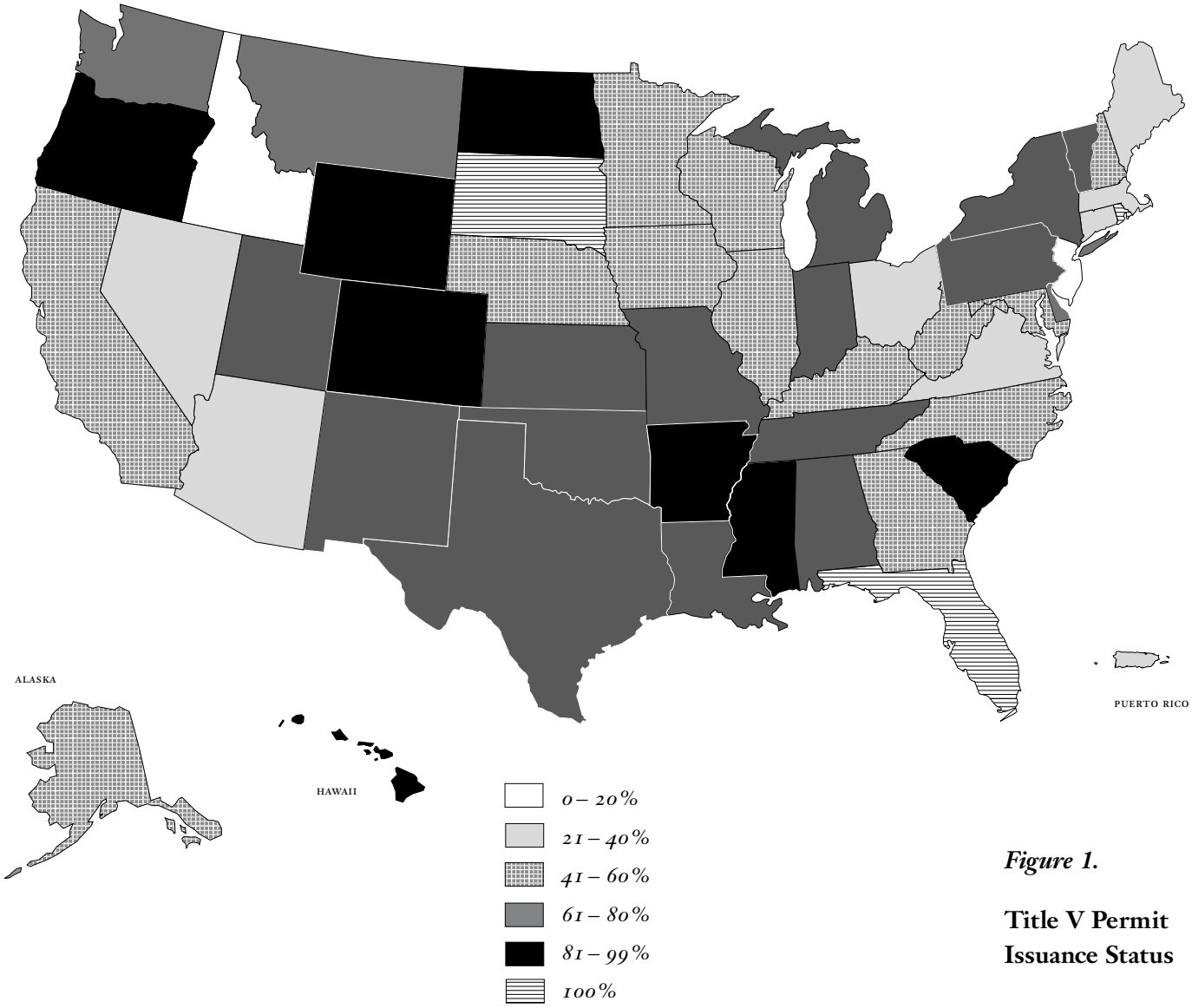

Figure 1.

Title V Permit Issuance Status

Percentage complete (permits issued divided by permits to be issued) as of August 31, 2001.

Figure and text were taken from http://www.epa.gov/ oar/oaqps/permits/maps/index.html, October 11, 2001 (accessed October 22, 2001).

* Note from EPA Office of Air and Radiation Web site: "The information used to prepare these maps is based on data provided by permitting authorities to staff in the EPA Regional Offices. This information is to be used for comparison purposes to symbolize progress in issuing operating permits."

permits. And government workers have no incentive to work fast—except perhaps to be promoted to some job other than permit writing.

It does not take a lot of foresight to anticipate that a backlog problem will also occur with the Title V air permits. The air program already has a problem maintaining updated state implementation plans, and the states are already behind in issuing the first round of Title V permits. As of July 2001, Florida, Oregon, and South Dakota were the only states in the nation to have completed issuing the first round of permits (see Figure 1). Nationwide, less than two-thirds of the permits have been issued. The percentage of permits issued varied widely, with New Jersey

at the low end with 20% issued, Illinois at 48%, Louisiana at 63%, and a number of states with 80% or 90%.[9] However, the numbers tell only part of the story—their meaning depends a lot on whether a state has permitted the largest or the smallest sources first. Some states have taken one approach, some the other, but a knowledgeable EPA official believes that most states have done the easiest permits first.

In many states, the initial Title V permits will begin expiring before all sources have received their first permit. EPA needs to begin thinking about how it will meet this problem. Better methods for prioritizing which facilities need individual permits and which renewals need intensive review are likely to be part of the solution (PIT 1996, 17). In Chapter 7, we discuss more thoroughly various ways that the backlog problem can be managed.

■ ■ ■

Chapter 4

Flexibility

A number of permitting reforms are directed at increasing the flexibility given to regulated firms. These reforms attempt to draw on the knowledge of the private sector about how best to meet pollution control standards. They also try to motivate compliance by placing more trust and responsibility in the regulated firms. The underlying theory is that the highly prescriptive command-and-control system, reflected in permits that mandate exactly what actions a firm must take, squelches private ingenuity, ignores a firm's knowledge of its own facilities, and reduces its motivation to comply.

We begin with a discussion of performance standards, which would provide more flexibility within existing permits. Almost everyone agrees that performance standards should be used, in theory, but in practice there is much less support. We then turn to environmental management systems (EMS), plans and procedures voluntarily adopted by individual firms. Some view EMS as a potential substitute for conventional permitting, but their major policy use to date has been as a prerequisite for firms to participate in state experiments with flexible permitting. We look at the experiments in Minnesota, Oregon, and Wisconsin, which have been inspired in part by the covenants approach used in the Netherlands. We conclude the chapter by examining this approach, which is based on voluntary agreements between the Dutch government and trade associations.

4.1 Performance Standards

Many (probably most) permits specify the technology that a source must install to control its pollution. Unlike such technology standards, a performance standard specifies instead a level of pollution that cannot be exceeded. This is, arguably, the most significant form of flexibility for a permitted source: the facility is allowed to choose how it will meet the standards.

A performance standard may save the company a lot of money—and thereby improve the efficiency of the pollution control system—because at least for larger firms, the operator is much more likely than the regulator to know how to control pollution most efficiently in the particular facility. Performance standards also allow faster process change, which has economic value in industries where technological change is frequent (Wyeth 2001). An additional point is often overlooked: performance standards facilitate reform efforts like pollution prevention and tradable permits. If a firm is required by its permit to install certain equipment, then there is noth-

ing that it can trade. Flexibility in meeting pollution control standards may be a prerequisite for other kinds of flexibility.

There is some mystery about how and why technology standards get into permits, given that both applicants and government officials endorse the idea of performance standards. State permit writers blame federal laws and regulations. Federal officials say there is flexibility but state permit writers want to specify technology. Industry blames the rigidity of the control system and the bureaucrats who run it. As one EPA official remarked, "The technology requirements are a point of departure, but nobody seems to want to depart."

Major portions of federal laws specify some form of technology standard. RCRA mostly does not regulate pollution levels but requires certain technologies and management practices. Thus, RCRA permits almost exclusively contain technology standards. The federal standards for water pollution and for toxic air pollutants are technology based, but the fact that the federal standard is based on a technology does not mean that the permits issued to meet that standard necessarily *specify* a technology. So, for example, the Clean Water Act (sec. 1316(a)(1)) requires that federal standards for new sources be based on "the best available demonstrated control technology." However, the standard in most cases is a numerical limit on a specific pollutant for a given industrial category. The permit for a facility within the category may simply name the numerical limit and allow the facility flexibility in complying with it. With the exception of RCRA, there are few statutory provisions that require permits to contain technology standards.

Two substantive impediments may hinder the use of performance standards. The first, and most common, is that the source cannot monitor its emissions to show compliance with the standard because the monitoring technology may be unavailable or prohibitively expensive. In the former case, government wants a technology requirement in the permit because otherwise the limit is unenforceable. In the latter case, either industry or government will want a technology standard, depending on who pays for the monitoring.

The other impediment is that it may be vastly easier to specify a technology standard than to regulate the emissions. This problem arises because of the type of control (e.g., "keep valves sealed" is simpler than specifying what is allowed to come out of the valves), or because of technical difficulties (e.g., even the most sophisticated chemical analyses can only partially specify the complex chemical content of crude oil, and thus it is difficult to specify what chemicals can or cannot be released to the environment by a refinery).

Those impediments, combined with the greater certainty of compliance that technology requirements give to both the permit issuer and the permittee, raise the question of how much of a constituency exists for performance-based permits. Small sources generally want to be told what technology to install because they may lack the expertise to implement performance standards. Larger sources have the expertise but will usually pay a lot to avoid enforcement actions, and technology requirements provide a stronger guarantee against litigation. For the government, technology requirements are easier to enforce. Associations of large companies, such as the Business Roundtable and the American Chemistry Council (2001), have endorsed performance standards, but the battle to institute them will be uphill.

4.2 Environmental Management Systems (EMS)

Some have suggested that EMS can substitute for permits and other regulatory measures. Several EPA and state programs have linked permitting reforms to EMS. Thus, it is necessary to examine what these systems are and are not and how, if at all, they can relate to permits.

Environmental management systems have attracted a great deal of attention in recent years. They take a variety of forms, but all are a set of rules and procedures voluntarily adopted by individual private firms. The most common EMS is the International Standard Organization (ISO) 14001.

An EMS typically requires managers to establish a corporate environmental policy, assign responsibility for compliance with environmental regulations, allocate resources for environmental functions, and periodically measure and report progress (Nash and Ehrenfeld in NAPA 2000b). The EMS is intended to formalize corporate environmental policy and to integrate the firm's environmental objectives with its general corporate goals. A firm that adopts an EMS may enjoy increased assurance of being in compliance with environmental regulations, thus avoiding surprises, litigation, and adverse publicity; recognition by customers and the public of being a good corporate citizen; and routinization of environmental functions, thus reducing the time that top managers have to spend dealing with environmental problems.

Research to measure the effectiveness of environmental management systems is still in progress, and as yet there is no conclusive evidence that adoption of an EMS results in improved environmental behavior.

Trade associations and international organizations have developed model systems that individual firms can adopt. The Chemical Manufacturers Association (now the American Chemistry Council) made adoption of its Responsible Care program a condition of membership (Moomaw in Coglianese and Nash 2001, 128–29). The European Council in 1993 adopted the Eco-Management and Audit Scheme (EMAS), an EMS that can be adopted by industrial firms operating in the European Union.[10] EMAS requires that firms make a commitment to "continuous environmental performance improvements" in addition to complying with existing regulations. A firm has to be independently audited by an outside party to be registered as being in compliance with EMAS.

The international negotiations that led to ISO 14001, published in 1996, were long and difficult. They left their mark on the final product in at least two important ways. The European negotiators were reluctant to encourage oversight or involvement by the general public. The U.S. negotiators were anxious to ensure that standards did not incorporate substantive European Union environmental requirements. As a result, ISO 14001 does not require public disclosure of specific environmental performance information, nor does it contain any substantive environmental performance standards that must be met.

Research to measure the effectiveness of environmental management systems is still in progress, and as yet there is no conclusive evidence that adoption of an EMS results in improved environmental behavior. Case studies and preliminary observations point out that most firms that adopt an EMS are already motivated and have the resources to meet environmental targets that go beyond compliance. Improved environmental outcomes may not be the result of imple-

menting an EMS; rather, both adoption of an EMS and improved outcomes may be a result of a corporate commitment to environmental goals and the availability of money and expertise to meet them. The Multi-State Working Group on Environmental Management Systems, an organization dedicated to promoting the use of EMS, is working with the Environmental Law Institute and the University of North Carolina–Chapel Hill to compile a national database on environmental management systems (Andrews et al. in Coglianese and Nash 2001).[11] The project is funded by EPA's Office of Water. This effort, as well as other research, should shed additional light on the effectiveness of EMS.

A few people have advocated using EMS to replace traditional environmental regulation. A firm's EMS and its voluntary commitment to achieve society's environmental goals would replace the current regulatory system. This approach raises many questions, especially about the incentives that a firm has for voluntary compliance.

Regulatory systems of almost any kind depend on a high degree of voluntary cooperation. No regulatory program has enough inspectors or police officers to enforce rules if the regulated community is strongly opposed. However, voluntary compliance depends on incentives, and to the extent that the incentive is a fear of being caught and punished, the line between voluntary and involuntary is blurred. Drivers obey speed limits (to the extent they do) more because of a fear of seeing a trooper in the rear-view mirror than because of a respect for the law or a belief that they are safer driving at the speed limit. As Crow et al. have found in their review of the environmental compliance literature, "Absent the plausible threat of enforcement, cooperative approaches to achieving compliance seem to have only limited effect on regulated entities" (NAPA 2000d, 16–27; for an excellent analysis of the need for both cooperation and coercion, see Sparrow 2000.)

What also must be considered in efforts to encourage voluntary cooperation is the incentive to minimally comply with the law or skirt it altogether.

There are numerous incentives for complying with pollution control laws, including the desire not to get caught violating the law and the belief that a clean environment is a good thing for everyone. Companies that sell products directly to the public may find their sales adversely affected by publicity that depicts them as polluters. Some companies, such as Ben and Jerry's ice cream and Patagonia outdoor clothing, have made environmental citizenship a large part of their corporate image.

What also must be considered in efforts to encourage voluntary cooperation is the incentive to minimally comply with the law or skirt it altogether. Private companies have an obligation to their shareholders to try to make money—that is their mission. Voluntarily spending money for pollution control is contrary to this goal, except if reducing pollution can also save money. Many believe that companies also have obligations to society, of which protecting the environment is one, but very few companies view environmental protection as their *primary* mission.

The incentives of government agencies also must be considered because government accounts for a significant amount of pollution (Davies and Probst 2001). For example, more than half the entities listed as significant violators of the Clean Water Act are water treatment works owned by municipal governments (Davies and Probst 2001, Fig. 3–4). Public entities have obligations to taxpayers that are similar to the obligations private companies have to shareholders, and it may be more difficult to raise taxes or charges than to raise private capital. Voluntary coopera-

tion from the public sector may be even more problematic than getting cooperation from the private sector.

Another major difficulty is that EMS is the opposite of a performance-based system. The standard EMS deals entirely with inputs and not at all with outputs. (There are exceptions; see the description of the EPA National Environmental Performance Track, below.) If we have learned anything about environmental policy over the past decades, it is that government should focus on results and leave the means (inputs) to the regulated entities. Having a government agency specify aspects of a firm's internal management does not seem like an improvement over having government specify the technology the firm should use.

An EMS is intended to be an internal management device within a firm or facility. In addition, however, EMS is being used in the United States as a prerequisite for firms seeking to qualify for programs that offer flexibility. We describe these programs in the next section.

4.3 Tiering Programs

Several states and EPA have established programs that would give permittees more flexibility by putting them in tiers—categories that affect not only the specific content of permits but also the context in which permits are enforced and revised. The best environmental performers go in the highest permitting tier and are granted flexibility in exchange for agreeing to "superior environmental performance" (for several discussions, see NAPA 2000a, 43–53; NAPA 2000b, papers 2 and 4; Aspen Institute 2000). Table 3 shows a tiering system developed by the Oklahoma Department of Environmental Quality.

Regulatory flexibility can be granted in a variety of forms or combinations and in various degrees. The forms include a more cooperative relationship with the environmental agency, a single point of contact with the agency for all requirements and dealings, reduced paperwork, expedited permitting, integrated or multimedia permits, decreased governmental oversight, reduced monitoring requirements, greater choice in how standards are met, penalty mitigation, reduced

Table 3

Oklahoma Department of Environmental Quality Regulatory Oversight Continuum

PERMIT TYPE	NUMBER OF FACILITIES IN GROUP	POTENTIAL ENVIRONMENTAL	INSPECTION	REPORTING	NATURE OF COMPLIANCE ASSISTANCE
Tier 3	Very small	Very large	Quarterly	Monthly	Regulatory review
Tier 2	Small	Large	Semiannually	Monthly	Technical assistance
Tier 1	Moderate	Moderate	Semiannually	Monthly	Technical assistance, targeted outreach
General permit	Large	Small	Annually or on indication of problem	Quarterly or annually	Targeted outreach or general outreach
Permit by rule	Very large	Very small	Only on indication of problem	Annually or none	General outreach or environmental education

Source: Adapted from ECOS 2001, 99.

inspection frequency, and public recognition (Coglianese and Nash 2001, 15). Some of these, such as less frequent inspections and public recognition, are not directly related to a permit.

Defining superior environmental performance has been a source of intense controversy. What constitutes the baseline for "superior" is a major stumbling block to many flexibility agreements. The particulars vary in each situation, but the root problem often is that the air permits issued to most sources are based on "potential to emit" and assume that the facility operates all year long at peak capacity. In reality, production levels at almost all facilities fluctuate, most facilities shut down for periodic maintenance, and many facilities (such as food processing and electricity generation plants) have major seasonal variations in output. Thus, the level of pollution allowed by the permit almost always is significantly higher than the level actually emitted by the facility. In defining "superior environmental performance," EPA and environmental groups want to use actual emissions as the baseline, whereas the facility owners, and often the state, want to use what is allowed by the existing permit.

Minnesota, Oregon, and Wisconsin are among the states that have established tiering systems, and EPA has set up its own version. We discuss each of these programs. Other states, including California and New Jersey (see ECOS 1999, 88–89), are considering or establishing similar programs. Each state program has unique characteristics. For example, the New Jersey program would require facilities in one tier to reduce greenhouse gas emissions by a minimum of 3.5% below their 1990 baseline by 2005 (ECOS 2001, 185).

Minnesota permitting reform

The 1996 Minnesota Regulatory Innovations Act seeks "superior environmental performance and continuous improvement toward sustainable levels of resource usage and minimization of pollution discharges."[12] The provisions of this act authorize regulatory staff "to provide certain flexibility to overcome unintended obstacles to pollution prevention presented in other statutes or rules."[13]

Using this legislative authority, Minnesota embarked on a permit reform pilot project with 3M Corporation for 3M's plant in Hutchinson. The company has a long history of cooperation with Minnesota's Pollution Control Agency (Hartwell 1999, 20). In fact, the agency had previously undertaken a pilot project in 1993 with the Hutchinson facility, authorizing a flexible air permit that proved to be a success. The new project entailed negotiations between the agency and the company to develop a flexible multimedia permit.

Around the same time, EPA was instituting its Project Excellence and Leadership (XL), an experimental program in regulatory flexibility intended to reinvent federal regulation by promoting innovation (Miller 1997, 116–20). The Minnesota Pollution Control Agency decided to submit the proposed 3M agreement to the XL process.

By agreeing to guarantee that its performance was "well beyond" what current regulations required, 3M was granted flexibility in its choice of pollution-abatement equipment and was given some leeway in managing its emissions. One of the tangible demonstrations of this flexibility was a reduction in both the number and the time needed for their completion. Under the MPCA/XL agreement, 3M's permit load was reduced from over 22 permits and 300-plus pages to one ten-page permit. The streamlined permit was multimedia based, covering air, water, and waste pollution. Not only would this new permit simplify company reporting and paperwork, the permit's simpler nature made it more understandable to the general public (Hartwell 1999, 20).

In the end, however, conflicting definitions of environmental performance led to the collapse of the agreement. The company was already a leader in environmental performance and had made improvements beyond those required by regulation. 3M wanted its baseline for performance to take into consideration the improvements achieved thus far, but EPA wanted to guarantee that environmental performance under Project XL would exceed what would have been achieved outside XL (Hartwell 1999, 23). Negotiations among 3M, the state agency, EPA's Region 5, and EPA headquarters bogged down because of miscommunication and basic disagreements (see Marcus et al. 1999, 156–67).

Even though the 3M pilot project was unsuccessful, the Minnesota Pollution Control Agency undertook three additional pilot projects under the XL umbrella: Andersen Windows (Bayport), US Filter Recovery Systems, and Steele County.[14] Andersen Windows applied to Project XL in 1998, and a final project agreement was signed in 1999. US Filter Recovery Systems' final project agreement was signed on September 21, 2000, and centers on "recycling of water and recovery and reuse of metals that would otherwise be disposed of on land" (Project XL: US Filter Recovery Systems Fact Sheet, EPA-100-F-00–029, 1). Steele County proposed a community-wide project and obtained its final project agreement on May 31, 2000 (Project XL Communities: Steele County Fact Sheet, EPA-100-F-00–015, 1); it focuses on reducing industrial wastewater effluent from several participating facilities in the community and on implementing water use controls. The three permittees receive varying degrees of regulatory flexibility in the form of discretion in how to achieve discharge limits, reduced reporting requirements, or preapproval of certain actions as long as they stay within emissions limits.

Oregon's Green Permits Program

Oregon's Green Permits Program is a three-tiered performance system to encourage industries to go beyond what is required by existing regulations. The program requires that a firm already have an environmental management system. One of the incentives for participation that the Oregon Department of Environmental Quality offers is regulatory flexibility (Speir in NAPA 2000b, 34).

At each performance tier, the agency "may provide expeditious reviews of proposed modifications to existing permits, modify existing permits for maximum flexibility for process changes which do not negatively impact the environment, extend the duration of permits . . . , modify record-keeping or reporting requirements, coordinate reporting cycles . . . , or provide other benefits that streamline regulatory interactions or benefit the facility" (Speir in NAPA 2000, 34). Furthermore, "the agency may provide waivers of environmental laws, if needed, to make these incentives possible." The rules specify a process for consulting and obtaining EPA approval before granting any waiver or exemption from a federal requirement. EPA-state relations and EPA's reluctance to waive federal regulations have challenged the development of state tiering programs that promise regulatory relief (Speir in NAPA 2000b; Hartwell 1999), but the federal agency and the state Department of Environmental Quality signed a memorandum of agreement in May 2000.[15]

LSI Logic, a semiconductor manufacturer, is one of the first companies in Oregon applying for a green permit. It seeks expedited permitting for its day-to-day operations because the "present system of permitting impedes the company's market flexibility" (Speir in NAPA 2000b, 36).

The firm's goal is to have one umbrella permit for all media with one report for the entire facility, but it does not expect this to happen anytime soon.

Oregon's Green Permits Program is one of the most innovative state-level programs that utilizes EMS. It aims to have companies institute an EMS that at each performance tier goes beyond compliance for currently regulated environmental problems, as well as address unregulated environmental issues. Oregon's environmental agency expects that highest-tier firms, as recognized environmental leaders, will encourage and influence other firms with which they conduct business (Speir in NAPA 2000b).

Wisconsin's Cooperative Environmental Agreement and Green Tier Programs

Under former Secretary George Meyer, the Wisconsin Department of Natural Resources proposed an alternative regulatory approach. A "green tier" performance track would complement, not substitute for, the current regulatory framework—what Meyer (1999) refers to as the "control tier." Participants would be required to commit to four elements: superior environmental performance beyond compliance, environmental management systems, verification of the improvements, and public involvement. The incentives for the voluntary participants would be public recognition, technical assistance, a single point of contact within the agency, inspection reduction, expedited permitting, and other forms of regulatory flexibility that would be negotiated on a case-by-case basis with the agency.[16] In 1997, the governor of Wisconsin included the agency's draft legislation in his budget proposal and the state legislature passed it, labeling it the Cooperative Environmental Agreement Act. It authorized up to ten pilot cooperative agreements over five years.[17] In 2001, a group representing business, agriculture, municipalities, and environmental groups was convened by the state agency to draft legislation making the green tier program permanent. The group reached agreement on a draft bill, which it transmitted to the state legislature in June 2001.

The main problem in environmental policy, according to Meyer, is that current laws have controlled the easiest pollution and that more regulatory flexibility is needed to provide incentives for innovation and multimedia approaches, as well as to take care of unregulated environmental problems.[18] The green tier alternative would be more adaptable to local and global environmental needs while taking into consideration the needs of industry and the obstacles that governments face in addressing environmental problems. It would also increase efficiency in the regulatory system and focus resources on poor environmental performers.

Meyer and his staff studied the concept and philosophy behind the Dutch covenants (see section 4.4), and they wanted to incorporate contract law principles into the cooperative agreement program.[19] A contract was considered a superior instrument because it would be agreed to by both the regulated entity and the agency—unlike the traditional permit, which is an agency mandate. Although the contract idea was important to the staff that created the program, EPA objected. It feared that if the agreements were treated by the courts as contracts rather than being enforceable through the environmental statutes, compliance would be severely handicapped. In negotiating a memorandum of agreement, EPA and Wisconsin discussed the possibility of allowing the agreements to be called contracts but requiring that they be treated as permits. In effect, they agreed that the agreements and any grants for regulatory flexibility or deviations from a legislative mandate would be treated as permit modifications and have to meet all the procedural requirements of that process, such as public notice and comment (Speir in NAPA 2000b).

Wisconsin realized that cooperation from EPA, especially in the area of regulatory flexibility, was necessary to fully implement the program, and in March 1999, the final agreement was signed by both agencies (Speir in NAPA 2000b, 17).

One of the first companies to volunteer for the program, Kohler, withdrew its application after the state agency made its counterproposal (Speir in NAPA 2000b, 23). The agency considered the company's statements in the proposed agreement too vague and wanted to commit Kohler to more specific environmental targets in exchange for the flexibility the company was requesting. Another disagreement that surfaced in the negotiations was whether it was enough to recognize past accomplishments or whether the company had to make commitments to future improvements (Speir in NAPA 2000b, 29).

As of May 2001, six companies had submitted applications to the program, and two agreements had been finalized. Most of the important documents are posted on the Web, including the company proposals, background materials, public notices, and in the case of the two that were finalized, the state agency's counterproposal and the final agreement reached. The first environmental cooperative agreement was signed on February 5, 2001, between the Wisconsin Electric Power Company and the Wisconsin Department of Natural Resources.[20]

The agreement confirms the company's commitment to go beyond current requirements and to pursue "superior environmental performance," primarily by reusing coal ash to reduce natural resource use, improve land use, and reduce the risk of contamination. The company plans to recover ash from landfills, combine it with coal, and use the mixture to generate electricity.[21] The agreement includes specific annual measures for reduced coal usage and electricity generation from coal ash to determine compliance with the goals. Failure to perform at the agreed level will be considered a violation of the agreement. In addition, by removing the coal ash from company-owned landfills, Wisconsin Electric aims to "restore the land for more desirable uses."[22] The company receives benefits in the form of reduced monitoring and data reporting requirements, as well as permit streamlining and an expedited approval process for certain kinds of permits. According to the agency, "The Agreement does not grant any variances to existing environmental standards, emission limits, or pollution control requirements, nor does it exempt Wisconsin Electric from any such requirements in the future."[23] In addition, the company is required to involve stakeholders in reviewing its environmental performance and provide and publicly disclose reports regarding implementation of the agreement.

Wisconsin's voluntary cooperation program faces challenges similar to those faced by other states. In part because of the ambiguities about the states' ability to grant regulatory flexibility, lack of clear and uniform conditions (from EPA) for granting regulatory flexibility, and the uncertainty of achieving "superior environmental performance," the states conducting pilot projects that purport to grant regulatory flexibility have difficulty attracting participants. Primary concerns for environmental agencies and policymakers are how much flexibility to give for what level of performance and how to guarantee that that performance level is achieved.

EPA National Environmental Performance Track

The EPA is trying out its own version of a tiering system that utilizes EMS as a condition for participation. The National Environmental Performance Track is a two-tiered performance recognition program "designed to motivate and reward top environmental performance."[24] The two levels are Achievement Track and Environmental Stewardship. The first was launched in

summer 2000 and counts 228 facilities as charter members.[25] Development of the second, the top tier of performance, is on hold until the Bush administration decides whether it wants to go forward with the program. This EPA program drew from several earlier programs, such as EPA Region 1's StarTrack program and Project XL, and it also parallels state-level tiering programs (Coglianese and Nash 2001, 15).

EPA's program seeks to encourage firms to adopt an EMS in exchange for a variety of promised benefits, including regulatory flexibility, penalty mitigation, expedited permitting, reduced inspection frequency, more cooperative relationships with regulators, and public recognition (Coglianese and Nash 2001, 15; NAPA 2000b). In practice, however, regulatory flexibility is sometimes difficult to deliver. Many of the regulatory flexibility incentives that EPA promises in return for participation depend on rulemaking or administrative actions that have yet to be taken (U.S. EPA 2000f, 9–11). The current program offers mostly public recognition benefits and, in some cases, reduced inspections. In an earlier, smaller-scale version of the national performance track program, EPA Region 1's StarTrack program, the promised benefits of reduced inspections and regulatory flexibility were not always delivered (Nash and Ehrenfeld in NAPA 2000b). That failure reduces the benefits and incentives for participation in such programs.

EPA's program seeks to encourage firms to adopt an EMS in exchange for a variety of promised benefits.

The EPA Performance Track seeks participants' "commitment to quantifiable goals for environmental performance improvement beyond regulatory requirements, over specified time periods, manifested and implemented through an EMS" (NAPA 2000b, 2–18). To qualify, a facility must adopt an EMS, have a strong record of environmental compliance, demonstrate continual improvement, and commit to the public reporting of progress.26 This last requirement for public disclosure differentiates the EPA Performance Track program from ISO in its potential for community and external stakeholder involvement.

As with most of the state experiments, it is too early to draw any conclusions about whether Performance Track has improved the environmental performance of the participants. The number of participants is relatively large, but the second tier has not been started, and the first tier has not been fully implemented. If the program is continued, it will take at least several more years, as well as some careful analysis, to figure out whether it has made a contribution to environmental policy.

4.4 Covenants in the Netherlands

The Dutch covenants have stimulated some of the innovative environmental policy ideas in the U.S. states and have prompted consideration of whether contractual agreements could supplement or replace permits. That they have stimulated innovative thinking should not mislead us into thinking that policies abroad can be borrowed wholesale for use in this country. The United States is different in political culture, geography, and other characteristics. For example, the Netherlands population is half of California's, its area is two-thirds of West Virginia's, its population density is 13 times greater than that of the United States, and it has a very different culture, history, and legal system. These differences suggest great caution in assuming transfer-

ability of any governmental or environmental innovations. However, there are also great opportunities to learn from other nations, and it would be a serious mistake to assume that other countries have nothing to teach us.

Over the past decade, regulators in the European Union (EU), and particularly those in the Netherlands, have relied increasingly on voluntary agreements to improve environmental performance from the most polluting industrial sectors (OECD 1999). More than 300 voluntary environmental agreements have been concluded in the EU to address packaging, waste minimization, pesticide use, energy use, and industrial pollution, with Holland accounting for roughly a third of the total (OECD 1999). In the Netherlands, these written agreements, called covenants, are negotiated between public authorities, usually including several ministries of the national government, and trade associations or individual firms; they specify the timing and implementation of control measures to be taken by companies to achieve pollution reduction targets set out in the latest National Environmental Policy Plan (NEPP). (Since 1989, the Dutch parliament has passed environmental policy plans every four years.) Covenants continue to be a central element in these plans. In no other country have voluntary agreements been used so pervasively to tackle industrial pollution.

Over the past decade, regulators in the European Union, and particularly those in the Netherlands, have relied increasingly on voluntary agreements to improve environmental performance from the most polluting industrial sectors

In Dutch environmental policy, covenants serve two functions. First, they are used as stop-gap measures until regulatory standards are in place so that environmental benefits can be realized as soon as possible. In this regard they serve as a bridge between the government's regulatory interests and company initiatives, and include the elimination of phosphates from laundry detergent, battery recycling, and energy conservation. These product covenants, of which dozens were signed in the mid to late 1980s, confirmed what was both technically feasible and economically acceptable to the participating companies (Glasbergen 1998).

Second, covenants are used to facilitate implementation of the NEPP objectives. The NEPP concluded that even with full application of existing end-of-pipe technologies, it was not possible to prevent further environmental degradation and to create the conditions for sustainable development in the Netherlands. The plan promoted a new model for environmental policy, based on the recognition that government alone could not adequately protect the environment by imposing a set of standards on reluctant industry and other polluting sectors of the economy. Instead, government was to create the conditions by which industry, consumers, and government ministries could realize their obligations to help solve environmental problems.

The NEPP first identifies target groups whose activities have contributed significantly to environmental degradation. These target groups are equivalent to major sources in the United States and include agriculture, traffic and transport, industry, gas and electricity supply, construction, consumers and retail trade, environmental trade, research and education, and societal organizations. The second step in the Dutch model is to focus not on any one medium but on principal environmental problems, or "themes," including climate change, acidification, eutrophication, dispersion, waste disposal, local nuisance, and groundwater depletion. These themes are complex, multifaceted environmental problems that cut across policy and administrative boundaries. For example, acidification involves the effects of nitrous oxide (NO_x) emis-

sions together with sulfur dioxide (SO_2), volatile organic compounds (VOCs), and ammonia (NH_3) on forests, soils, surface water and groundwater, and even cultural monuments.

The NEPP calls for significant reductions in the emission of industrial pollutants. With 1985 as the base year, the NEPP demands reductions in SO_2, NH_3, VOCs, and NO_x of 70% to 90% by the year 2010. To establish baseline data on pollution levels and prospects for emissions reductions, government officials and trade association groups (and in most cases, a mutually agreed upon independent consulting firm) first developed an emissions profile that described the industrial sector's overall waste and emissions for 1985. An economic analysis was then conducted to forecast growth in the sector up to 2010, and a new emissions profile was extrapolated from the predicted output levels. At this point, the government and the trade associations determined the level of emissions reductions that could be achieved by 2010. These agreed-upon reductions became the basis of industry's contribution to the overall target specified in the NEPP. In Dutch environmental policy, covenants are the primary instrument to transform the environmental quality objectives of the NEPP into pollution reduction measures for Dutch industrial sectors, and more broadly, they are the means of integrating innovative national environmental policies into the traditional permitting system.

As of 1997, seven industrial sectors—representing some 1,200 companies and some 90% of the industrial pollution in the Netherlands (OECD 1999)—have concluded voluntary agreements with the government (Glasbergen 1998). To allow for differences among industrial sectors, the government has created two frameworks in which covenants are negotiated. For large companies that employ a range of processes, such as the base metal and fine chemical sectors, the trade association negotiates with the government and ultimately signs a declaration of intent on behalf of the industry. Each company that signs the declaration must draw up individual company environmental plans. For example, the declaration of intent for the chemical industry covenant specifies that the plan for each company must contain, at a minimum, the following provisions: a description of pollution levels from the company in the base year and at the time the plan is published; an overview of pollution reductions achieved in relation to the base year; an outline and schedule of additional planned reductions; details of the measures already taken and planned to achieve pollution reduction; a description of any pollution prevention analysis to be carried out by the company; a statement of problem areas that may inhibit a company's reaching the target; and any statements or assurances from relevant authorities regarding the implementation schedule.

A draft of the plan is submitted to relevant authorities, including the Ministry of Housing, Spatial Planning and the Environment (VROM), the Ministry of Economic Affairs, the Ministry of Transport, the Ministry of Public Works, the Association of Provincial Authorities, the Union of Netherlands Municipalities, and the Association of Water Control Boards. These authorities, particularly the provincial and local permitting authorities, may ask the company to revise its plan. Having endorsed the plan, the permitting authorities, in principle, must indicate how the company's planned initiatives can be harmonized to work within the licensing system.

For more homogenous industries characterized by a limited number of processes, such as gas stations and printing firms, the trade association negotiates what is essentially a model environmental plan on behalf of its members. This model plan, typically less complex than the plans of the heterogeneous companies, is then reviewed by licensing authorities at the municipal level and by individual water boards. Although some companies may have good reason not to sign an

agreement (e.g., costs, plant configuration, different production processes), the compliance rate is typically high because Dutch trade associations have traditionally had a strong hand in industry self-regulation and are able to pressure recalcitrant companies. In addition, companies know that if they do not sign the agreement, they may be singled out by local permitting authorities and face stricter permit conditions than companies that have endorsed the model plan (Hanks and Sillen 1999).

After a covenant has been signed, it is typically administered by a consultative group, a committee of government and industrial representatives. The consultative group serves as a central repository for company plans and receives annual progress reports from each company. It makes these reports public (excluding any commercially sensitive information) and can evaluate progress toward the targets established in the agreements. It also coordinates technical and policy task forces to consider whether target plans need to be modified in light of major economic or technological changes. In addition, the consultative group can negotiate with local authorities and other government signatories of the covenant on behalf of individual companies seeking adjustments to their company targets.

The national government has promoted the use of covenants for a number of reasons. Voluntary agreements, VROM suggests, encourage companies to pursue an active and progressive environmental strategy. Moreover, by requiring all companies that sign a covenant to develop and publish a company environmental plan every four years and progress reports annually, the government believes that the environmental performance of the company, and the company's intent, will become more transparent to the public and to the regulatory authorities. With the publication of company plans and the provisions they contain for each company to monitor its performance, the government, in theory, obtains better information with less cost and effort and can then focus its enforcement activities on companies that have not signed the sector covenant. For the companies, covenants provide greater flexibility than more formal regulation to meet pollution reduction targets, and with more time to plan environmental investments, they are more likely, at least in theory, to develop technologies to meet the targets in the most efficient manner.

Despite the enthusiasm for covenants, they have been the subject of much debate, with concerns focused on three issues: (1) the legal basis of the agreement; (2) the unclear relationship between covenants and the traditional permitting regime; and (3) the central role assigned to company environmental plans to substitute for, rather than supplement, the customary inspection and enforcement activities by the licensing authorities.

The legal basis. Because covenants are written agreements signed by government and trade associations, a number of commentators have concluded that covenants are legally binding private agreements (Harrison 1999; OECD 1999; Ingram 1999). Yet environmental regulations, the Dutch civil code, and Dutch general administrative law contain no provisions about covenants or safeguards for third parties (Hazewindus 2000). Indeed, Glasbergen asserts that the legal basis of covenants is widely misunderstood and that there remains the question of how the agreement, as a contract under private law, relates to environmental regulations and public law. As Glasbergen (2000, 8) notes, in covenants "the parties agree to nothing more than to make an effort to achieve a specified goal. Moreover, the parties are free to terminate the agreement at any

time, through certain procedures. Thus, its legally binding nature is an empty letter—a token expression of legal status."

The relationship between covenants and permits. Local enforcement officials and permitting authorities have in the past expressed dissatisfaction with the legal basis of covenants. According to a comprehensive study of environmental enforcement in the Netherlands, several officials "have cited examples of violating facilities using their covenants as a defense for their violations" (Lauterback 1995, 79). This leads to a more pervasive structural weakness in voluntary agreements: the role of the provincial and municipal permitting authorities in implementing covenants is not stipulated in legislation, but rather emerges from the procedures drawn up by the consultative group of each agreement. At least initially, this caused considerable uncertainty among the licensing authorities, and a number of authorities have been reluctant to agree to the trade-offs implicit in the covenant approach, which they see as excessively lenient to polluting firms. In other cases, this reluctance is reflected in the decisions of local authorities not to apply the stick that the central government holds over companies that do not sign a covenant—to impose on them the full range of sector targets (Lauterback 1995). Recently, however, the government's effort to follow a more standardized procedure for covenants, set out in the Dutch Code of Conduct on Agreements, appears to have allayed some of these concerns (Hank and Stillen 1999).

Inspections and enforcement of covenants. The third area of controversy is how government intends to use company environmental plans in licensing and enforcement activities. To encourage companies to write and implement environmental plans, the government has asked local licensing authorities to make company plans the basis of their permit conditions. The government also has proposed that the rigor of enforcement activities correspond to the quality of a company's environmental management plan. As VROM (1995, 28) has noted, "the better the content of the environmental management system, with companies holding an EMAS declaration of participation leading the way, the more checks can move to being retrospective. The latter form of checking will be based on data supplied by companies via annual environmental reports, audit and accreditation reports or on data held open for inspection."

Rigorous evaluations of negotiated agreements are rare because of limited data and the difficulty of assessing the degree to which the observed reductions in pollution are attributable to covenants. A 1997 government report concluded that significant progress had been made in regard to most target reductions for the year 2000, except for nitrogen oxide and carbon dioxide emissions (VROM 1997). An assessment of the chemical industry covenant conducted by the European Environmental Agency found that the increased flexibility for industrial pollution control measures led to more cost-effective environmental improvements, with most interim targets having been met (the exceptions were NO_x, vinyl chloride, atmospheric lead, and discharges of copper to water). Glasbergen reviewed more than 100 company environmental plans and annual reports submitted by firms in the basic metals, chemicals, and dairy sectors. He found that the companies could achieve most interim targets in the NEPP by applying traditional end-of-pipe techniques and existing technology. In other words, to achieve the 1995 interim targets, companies rarely needed to introduce technical innovations. Moreover, firms tended to incorporate existing permit conditions into their environmental plans rather than use the company plan to revise their permit conditions. On the basis of his analysis, Glasber-

gen (1998, 702) concludes that the first round of company environmental plans lacked a long-range strategic vision, and he predicts that the likelihood of achieving targets in the year 2010 is "still highly uncertain."

The Dutch experience with voluntary agreements is by no means complete. Although the relationship of covenants to permits is still evolving, one can nevertheless see that incorporating company plans into permits opens up interesting possibilities of combining general industry agreements with specific permits. Given the imbalance of information and resources between government and industry, covenants are an important attempt to carry out regulatory responsibilities in a more efficient and effective manner.

Rigorous evaluations of negotiated agreements are rare because of limited data and the difficulty of assessing the degree to which the observed reductions in pollution are attributable to covenants.

The relevance of covenants to U.S. permitting reform probably lies in the general idea of a contractual agreement negotiated between government and industry rather than in the specifics of the Dutch program. There is no equivalent to the NEPP plan in the United States. U.S. trade associations do not have the power and status of their Dutch counterparts, and the formalized structure of U.S. pollution control, enforced by widespread litigation, inhibits informal negotiations and arrangements. These and many other differences between the two countries make it impossible to directly transfer the covenant arrangements. However, the general concept is interesting and useful. U.S. variants are possible, as several states have shown, and the covenants have much to teach us about utilizing industry information and employing environmental management systems. American policymakers can surely benefit from watching what the Dutch are doing.

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Chapter 5

Decentralization

This chapter deals with three very different forms of decentralization. The first section examines options for traditional decentralization, the transfer of authority from the federal government to the states. We evaluate the delegation of permitting programs to the states and the extent of EPA oversight of state actions.

We then turn to public participation, a way of decentralizing power from government officials to a wider group of people. Only in recent years has the inadequacy of public hearings and other commonly used forms of participation become apparent. A great deal more research and experimentation are needed to improve the way in which nongovernmental groups and individuals participate in permitting and other government decisions.

The third part of the chapter covers market mechanisms. This is a broad topic with a vast literature, but its direct relevance to permitting is somewhat limited. Some market approaches do away entirely with conventional permitting. Such approaches are rare and have not been used in the United States. Tradable permit approaches do not eliminate permits but do change their nature. The conditions imposed in many current permits are an impediment to using market mechanisms and thus may prevent what some advocate as the ultimate form of decentralization—transferring authority from government to the private marketplace.

5.1 Delegation and Oversight

A basic tenet of much current thinking about environmental policy is the desirability of decentralization. As stated by the National Academy of Public Administration in 1995, "EPA and Congress need to hand more responsibility and decision-making authority over to the states and localities" (NAPA 1995, 2). Similar recommendations have been made in hundreds of other reports over the past decade. Whether the events of September 11, 2001, will retard or reverse devolution to the states is, at this writing, unclear.

Pollution control permitting is arguably the best litmus test for decentralization because it is a critical function for which the law has laid out both an expectation and a clear procedure for EPA to delegate power to the states. Delegation has occurred as planned. It is impossible to give precise figures on the extent of delegation because of the complex and fragmented nature of the process. However, at least 70% or 80% of the permitting workload imposed by federal statutes is now done by the states (see Table 1, above). If all permits (federal, state, and local) are con-

sidered, probably more than 90% of permitting is done by the states (NAPA 2000a, 136). Despite this record, all is not well with the delegation process.

The assumptions underlying the delegation processes in the major pollution control statutes are no longer as valid as when the laws were passed. It was assumed that state environmental agencies would be eager to control permitting programs. But permitting is tedious and expensive, and especially as federal grants have covered less and less of state environmental expenditures, state agencies have been increasingly willing to let EPA bear the permitting burden. "The largest obstacle to running environmental programs is the lack of sufficient resources" (Scheberle 1997, 2).

It was also assumed that even if state agencies were reluctant to accept permitting responsibility, they would be pressured by regulated industries, which would prefer not to deal with EPA and "the feds." But more and more of the regulated entities are multistate and multinational entities, which would welcome more uniformity and do not feel any particular affinity to the states in which they operate.

The assumptions underlying the delegation processes in the major pollution control statutes are no longer as valid as when the laws were passed.

Despite the changed assumptions, the reality is that once EPA has delegated a program, it almost never takes it back. All the laws that allow delegation also allow EPA to revoke the delegation, and the agency sometimes threatens to do so. However, because both the political and the resource costs would be high, EPA has only once revoked a state permitting program—in 1981, when the Iowa legislature refused to appropriate money for the state drinking water program. EPA returned authority to the state a year later. In 1987, EPA commenced proceedings to withdraw the authorization of North Carolina's RCRA program but decided in 1990 not to pursue the action. According to the Environmental Law Institute, "The sanction of program withdrawal has never been exercised by EPA under any of the statutes providing for such action" (ELI 1987a, 6.19, footnote 20).

The permit provisions added in 1990 to the Clean Air Act (sec. 502(d)(3)) require that if the EPA administrator has not approved the Title V air permitting program for a state, then two years after the date required for submission of a program, EPA "must promulgate, administer, and enforce a program" for that state. When EPA delayed taking any action far beyond the two-year deadline, the Sierra Club and the New York Public Interest Research Group sued the agency. The federal court agreed with the environmentalists and required EPA to take over Title V air permitting by December 1, 2001, for any state that did not have full approval (*Sierra Club and New York Public Interest Research Group, Inc.* v. *U.S. Environmental Protection Agency and Carol Browner, Administrator*, No. 00–1262, D.C. Cir. 2000). The EPA regions worked feverishly to approve state programs by the December 1 deadline. Even though many states are not issuing Title V permits at an adequate pace (see section 3.5), EPA was expected to approve most state programs before December 1.

Even in states that have not received full approval, EPA is not going to run the Title V permitting program. The one state certain to miss the deadline was Maryland, which has a very restrictive definition of who can sue to change a permit, and action by the state legislature is necessary to broaden this definition before the program can be approved. The legislature does not meet again until 2002. Legally, EPA will have to be responsible for operating air permits in

Maryland, but EPA's Region 3 was making arrangements to delegate implementation of the program to the state.

Environmental groups also have been pressing EPA to take back water permitting programs because of perceived shortcomings in the state programs. As of March 2001, there were 26 active petitions, covering 16 states, plus at least 7 lawsuits asking EPA to take back the NPDES delegation, (Rubin 2001). The petition process involves six steps: (1) the petitioner files a formal petition for withdrawal and states the specifics to support it; (2) EPA meets with the state and the petitioner; (3) EPA investigates the petition's claims; (4) if the claims have merit, EPA tries to negotiate a resolution; (5) if the negotiations fail, EPA conducts a more formal investigation; and (6) EPA begins formal proceedings to withdraw the delegation. To date, the process has never gone beyond step 3, but there are far more petitions currently pending than ever before.

It is quite possible that no delegations will be withdrawn in the future. However, since the states lack incentives to run the programs and take on new federal permitting programs as they come along, the ultimate EPA sanction of delegation withdrawal begins to look more like a reward than a penalty.

States have a lot of motivation to do a competent job of permitting without EPA oversight, but the oversight has been important in improving quality, particularly in states with weak environmental records. The resources and commitment of the states run a very wide gamut. State environmental expenditures ranged from $28 million in Hawaii to $2.1 billion in California, almost a hundredfold difference. California spent $66 per capita, whereas Michigan spent only $20 (CSG 1996). The Environmental Law Institute (1987b, 12–13), in an in-depth study of state hazardous waste enforcement, noted, "State permit provisions, both substantive and procedural, vary significantly from state to state. Some states have less stringent substantive and procedural requirements, some more stringent requirements, than EPA's." The U.S. General Accounting Office (1996) found wide disparities, among and within states, in the limits and policies applied to NPDES permits. EPA regional staff, as well as industry people responsible for permitting, agree that there are large differences in competence among the states. A recent study by the EPA Water Office (see below) found wide variations among states in the quality of the permits examined.

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Does the variation in state competency argue against delegation, or at least for stronger EPA oversight? The answer may depend on how important state-to-state uniformity is for the particular program. Arguably, the structure of the water pollution program, which allows states to set their own water quality standards (within the framework of a national "fishable, swimmable" goal), indicates that uniformity is less important for water quality than for air or hazardous waste. A state that issues lenient water pollution permits, it can be argued, is making choices about the quality of the water it wants, and lax permitting is just less visible than the more public process of setting standards. Conversely, where national standards are established—as with air pollutants, for example—leniency in permits may undermine the stated national goal of assuring healthy air quality for everyone. It also may undermine the control efforts of states that are downstream or downwind.

Although most pollution control permits are now issued by state agencies, the EPA regional offices maintain oversight over the adequacy of individual permits and the permitting process as a whole. The EPA regions review an average of 10% of the permits issued. The percentage is higher for state programs perceived to be weak and lower for programs perceived to be doing a good job.

None of the regions studied had explicit criteria for deciding which permits to review. The regional offices typically review all major permits as well as any that are potentially controversial, plus a random sample of minor permits. In most regions, EPA conducts a formal annual or semiannual review of the overall permitting programs in each state.

The extent of review and oversight depends on EPA policy, but like so much of the permitting process, it also depends on negotiation and personalities. The head of one state agency had constant fights with the EPA regional NPDES office and finally got the office to agree to review only 10% of her permits instead of all of them. She did not negotiate similar agreements with the EPA air and RCRA officials, with whom relations had been smooth.

Obtaining data on the amount of resources or number of people devoted to permit review in EPA regions is extremely difficult. The National Academy of Public Administration and others have questioned why delegation of permitting to the states did not allow a reduction in regional personnel (NAPA 2000a, 152). The question is valid, but there are no easy answers. First, most individuals who review permits have other assignments as well. New EPA programs, like Project XL and the National Environmental Performance Partnership System, may be taking up some or all of the time formerly devoted to permit review.

Second, the permit programs are not static. For all three major programs, even after they have been delegated to the states, EPA is continually promulgating new requirements that need to be incorporated in permits. Delegation is, in reality, piecemeal, so often a state will be writing one part of a permit while EPA is writing another part of the same permit. As one EPA headquarters RCRA official said, "Permitting is complicated because, even when delegated, there is almost always some piece [type of waste] that EPA has not yet delegated." The joint involvement of EPA and a state can cause conflict and delay. The applicability, enforceability, and processes pertaining to requirements and their incorporation into permits vary by subprogram.

EPA policy in recent years has been to reduce oversight and give the states more leeway. The clearest manifestation of this is the National Environmental Performance Partnership System (NEPPS), under which EPA and states set priorities jointly, negotiate NEPPS agreements that define their roles and responsibilities, find flexible ways of implementing environmental protection, work together to define a set of core performance measures, and evaluate their success. As of June 2001, 34 states had signed performance partnership agreements.

NEPPS on the whole has probably improved the working relationship between the states and the EPA regions. However, the program has not had a major impact on day-to-day operations in most states (NAPA 2000a, 146) and has had even less impact on permitting. Of the 16 states studied by the National Academy of Public Administration, in only 3 was there a direct link between NEPPS and permitting. In Massachusetts, NEPPS resulted in shifting NPDES permitting and inspection activities to a five-year basin schedule that, among other things, allowed the state to focus on the NPDES backlog. In Missouri and Texas, NEPPS shifted federal funds to devote more resources to the NPDES backlog (NAPA 2000a, 147–48).

In part, EPA's emphasis on more flexibility for the states responds to the general political climate that has favored devolution and frowned on national dictates to the states. In part, it responds to realistic constraints: the states are less willing to look to EPA for leadership, and EPA has less leverage to force them to follow its lead (Davies and Mazurek 1998, 40–41). And in part, it reflects the fact that the EPA leadership in recent years has been increasingly drawn from former state officials.

The devolution trend could, however, swing the other way. In some states, both the quantity and the quality of permits have become a problem. Major backlogs exist in both NPDES permits, the oldest permitting program, and Title V air permits, the newest program.

The EPA Water Office is completing a nationwide study of the quality of permits issued. Initial results show significant deficiencies, many of which would probably not have made it through an EPA review. The EPA Water Office examined 330 permits nationwide, including ones from all states. A large portion of the permits lacked justification for the limits contained in the permit. Many omitted required conditions or contained important mistakes. A few contained elementary but basic errors, such as terms of more than five years (information based on memos from the EPA Water Office to each of the EPA regions provided to the author by the Water Office; the final report of the study is expected to be available in 2002). If hard evidence of state inadequacies continues to accumulate, many EPA regional staff believe that greater oversight will need to be exercised.

In addition to delegating permitting authority to the states, EPA can delegate permitting authority to Native American tribes under CAA and CWA, but not under RCRA (see *Backcountry Against Dumps* v. *EPA*, 100 F. 3rd 147, D.C. Cir. 1996). Those tribes that are sovereign entities can issue their own environmental permits, although data are not available on how many tribes exercise this authority. The entire issue of permitting delegation to tribes is tangled and complex. The question of whether, and under what circumstances, tribes can issue permits to non-Indian entities within the boundaries of a reservation is also controversial.

5.2 Public Participation

One of the aims of permitting reform has been to increase public participation and improve the participation process. Although public participation has received nominal support from almost everyone, like many policy issues it is more complicated and ambiguous than it appears.

Public participation can take many forms and serve different purposes. In the context of permitting, participation most often means submitting comments on a proposed permit. It can also mean public hearings if a permit is controversial, and if the issue is very controversial, it may mean litigation, demonstrations, or a variety of other activities. The purposes that participation is intended to serve can include improving the content of the permit, strengthening democracy, serving as a check on agency "capture," reducing opposition to a decision, and improving the image of the government or a corporation (Beierle 1999).

Participation may actually work against two other major reform goals, efficiency and predictability, and thus it may evoke mixed feelings on the part of both permitters and permittees. It can reasonably be argued that participation improves efficiency and predictability in the long run by allowing questions and objections to a permit earlier in the process and minimizing last-

minute surprises. However, the short-run disadvantages may be more obvious to some participants in the permitting process.

Even from the standpoint of environmentalists and activists, formalized participation may have disadvantages. If the form and timing of participation are determined by the relevant government agency, those who want to oppose a permit or otherwise influence a decision may lose strategic advantages. On the other hand, formal public participation opportunities (e.g., public hearings, comment periods) may allow less sophisticated participants to express opinions that would otherwise never be heard.

The public participation implications of calls for environmental justice have evoked particular controversy in recent years. Since minority populations are often discriminated against in the siting of environmentally hazardous projects, advocates say, special care should be taken to protect them. Controversy arises not only because most matters involving treatment of minorities in the United States are controversial, but also because the proposed solutions could affect the efficiency and predictability of the permitting process. A handbook on environmental permitting comments on the federal government's environmental justice program and its proposed regulations: "Under this program, industrial development can be ordered to stop even after all permits are approved by state and local authorities. This is because the environmental justice regulations give minority populations the right to bring citizen suits to block a project even after permits have been granted . . . This creates immense uncertainty for industrial companies wishing to build or expand in minority areas" (Greenway 2000, 1, 3, 4).

The complexity and relative invisibility of the permitting process are major obstacles to public participation.

The vast majority of pollution control permits, however, are not controversial. The decisions involve permitting or repermitting of ordinary facilities that do not pose any exceptional threat to anyone. Public participation is not an issue because the public is unaware or indifferent. Distinctions do not have to be made among different segments of the public because the only concerned parties are the public agency granting the permit and the permittee.

The complexity and relative invisibility of the permitting process are major obstacles to public participation. As University of Maryland law professor Rena Steinzor (2001, 11,089) says, "The NPDES permit process is incredibly opaque and inscrutable, involving lengthy draft permits and thousands of pages of regulations, guidance documents, manuals for permit writers, and industry-wide studies of regulatory alternatives. All of these characterizations apply with equal force to permitting under the Clean Air Act and the Resource Conservation and Recovery Act. While I have no way to prove it, I would be shocked to find anyone who would disagree with the assertion that public participation in the process of renewing existing permits is virtually nonexistent."

The difficult technical nature of most permits combines with the inherently site-specific nature of individual permits to discourage the involvement of environmental groups in the process. Local groups do not have the technical or financial resources to engage in permitting decisions. National environmental groups do not get involved because they leave site-specific controversies to the local groups. The national groups do sometimes get involved in national permitting regulation issues, however. For example, the Natural Resources Defense Council recently filed extensive comments with EPA on the agency's proposed NPDES standards and regulations for concentrated animal feeding operations (NRDC 2001).

Litigation is a major weapon of environmental groups in many contexts, but not in permitting because of the reasons discussed above. Steinzor (2001, 11,091) observes that the permitting system "places more pressure on the ultimate check and balance—citizen suit enforcement—than it can ever hope to support. It is extraordinarily difficult to raise the funding needed to retain technical experts and impossible to proceed without them . . . [And courts] are justifiably hesitant to trek through the permitting morass . . . " Again, the partial exception is national groups litigating on national issues that affect permitting. For example, the various suits involving total maximum daily loads brought by environmental groups (see below) had a major impact on revising permitting priorities in many states.

A few permitting decisions are quite controversial. Power plants, incinerators, and hazardous waste dumps are almost always subject to controversy, at least within the neighborhood of the site and often more broadly. In the case of something like a nuclear power plant, national issues may be fought out on the basis of a particular permit.

Several specific steps have been taken in recent years to expand and improve public participation in pollution control permitting. EPA's Permits Improvement Team advocated broader participation, and this was the one major team recommendation that was acted upon. In 1995 the RCRA office issued regulations significantly broadening the opportunities for the public to comment on proposed permits.[27] RCRA's Expanded Public Participation Final Rule (60 F.R. 237, 63417–63434) aims to "improve the process for permitting facilities that store, treat, or dispose of hazardous wastes by providing earlier opportunities for public involvement in the process and expanding public access to information throughout the permitting process and the operational lives of facilities."

In addition to the opportunities for public involvement when a permit is granted, denied or modified, the rule expands participation in four ways: [28] (1) a permit applicant must hold an informal public meeting before applying for a permit; (2) the agency must announce the submission of a permit application; (3) the permitting agency may require the facility to make relevant documents publicly available to the community by setting up a central repository for information; and (4) the public must be notified by the agency prior to a trial burn at a combustion facility.

As discussed in Chapter 3, the Internet has had a major impact on public participation. It has allowed for an explosion in the amount of information available to the public. It also facilitates communication among like-minded members of the public, thus making it easier to mobilize opinion, and it may make it easier to transmit comments to permitting officials. No state, so far as we are aware, invites e-mailed comments on permits, but the federal government has experimented with e-mailed comments on proposed regulations. (The Department of Transportation is the most advanced of the federal agencies in accepting e-mailed and electronic comments through its Docket Management System electronic submissions, at http://dmses.dot.gov/submit.) Some EPA offices currently accept e-mailed comments on proposed regulations, and EPA is experimenting with a more comprehensive system for the entire agency. It certainly would be feasible now to have on-line discussions about proposed permits.

Watershed approach.

The Clean Water Act was amended in 1987 to provide grants to states for nonpoint source management programs (sec. 319, 33 USC Sec. 1329). The act reads, "A state shall, to the maximum extent practicable, develop and implement a management program . . . on a watershed-by-wa-

tershed basis" (319(b)(4)). A number of states have begun to use watershed-based organizations as the vehicle for involving the public in water quality decisions, including NPDES permitting, and for a variety of other purposes (for a good overview, see NAPA 2000c). The organizations take many forms, but they generally include all the major stakeholders in a watershed and try to reach decisions by consensus.

Some states have had a long-standing interest in watershed-based efforts, but many of the more recent efforts were started because of the need to apply total maximum daily load (TMDL) limits in the watershed (for a recent analysis of TMDLs, see Boyd 2000). TMDLs have been a basic part of the Clean Water Act for 30 years, but only recently, as a result of court cases brought by environmental groups, have they begun to be applied. TMDLs are required for waters that are not meeting ambient water quality standards (the standards for the stream or lake, in contrast to effluent standards, which apply to the water in the drain or sewer coming from a source) and apply to the pollutants causing the violation of the standards. TMDLs are necessary in many areas, and they usually entail control of nonpoint sources (agricultural runoff, construction, street runoff, and atmospheric deposition, among other sources) because control of point sources alone is not sufficient to meet ambient standards.

Several states review and issue permits on a watershed basis. Watershed organizations have been used to allocate TMDLs among various sources, to arrange trades between point and nonpoint sources, and to link water quality conditions to permit limits, both to establish what the limits should be and to measure the effectiveness of the permits in meeting the ambient standards.

An interesting example of the uses of watershed-based permits is being tried by the Michigan Department of Environmental Quality in the Lake Allegan watershed. To meet the TMDL for phosphorus in the watershed, the agency will coordinate reissuing the NPDES permits in the watershed with a cooperative agreement among participating point source and nonpoint source contributors. The cooperative agreement spells out the limits and steps necessary to achieve the TMDL. The initial reissued permits will not tighten the phosphorus restrictions, but over time the permits will be modified to reflect the more stringent limits necessary to achieve the overall watershed phosphorus limit. The permits will, however, expressly state that exceeding the new limit will not be a violation unless the overall watershed limit is also exceeded. This will provide a major incentive for point sources to assist nonpoint sources in reducing phosphorus discharges and will tie the permit limits to ambient water quality levels. It links stakeholder participation to individual permits because the cooperative agreement was formulated and approved by the stakeholders and because, as the proposal for the project says, the "individual NPDES permits would also be watershed permits" (MDEQ 2000–01). How well the Michigan project works in practice remains to be seen. That implementation will be a challenge is indicated by the findings of Born and Genskow (NAPA 2000c, 7.7) who examined six cases of watershed management approaches and found that "in our cases, state point-source permitting programs are not well connected to collaborative watershed initiatives."

North Carolina has implemented two pilot projects that focus on linking watershed associations with market mechanisms for meeting TMDL water quality limits. In the Tar-Pamlico River basin, the state forged an agreement with an association of dischargers, establishing a total nutrient cap. The state has granted broad power to the association to reallocate allowable nutrient discharges among its members. In the Neuse River basin, North Carolina has proposed

and EPA has accepted a type of watershed permit for nutrients based on a legally binding contract between the state and the watershed association. The contract attempts to meet the TMDL nutrient limits by issuing individual NPDES permits and then waiving the permit requirements if the discharger participates in the group permit (see Stephenson and Shabman 2001; Templeton 2000; for a similar example in Michigan, see ECOS 2001, 194).

Watershed permits can facilitate control of nonpoint sources and protection of wetlands by allowing permittees to trade control or mitigation of damage or pollution caused directly by their activities for control or mitigation at another site. If done properly, this can produce greater environmental protection and lower the cost of control (see Scodari and Shabman 2000).

5.3 Market Mechanisms

Market mechanisms, in which buying and selling substitute for or supplement decisions made by government officials, are another way of decentralizing pollution control decisions. Such mechanisms can change the way permits are used in a control system if, for example, permit limits become the baseline for tradable emissions rights. Market mechanisms can affect the content of permits, and conversely, the content of permits can limit the use of market mechanisms (for good overviews of current market trading systems, see Ayres 2000 and Portney and Stavins 2000).

Political, cultural, and economic changes have exalted the market as a solution, or at least a paradigm for a solution, to many environmental problems. Actual examples of market mechanisms are more rare than theoretical analyses, but in recent years the number of real-life examples has increased. The successful use of emissions trading to reduce SO_2 emissions from U.S. power plants under the 1990 Clean Air Act Amendments has given market approaches more visibility and credibility.

The large variety of market mechanisms makes it difficult to generalize about how market solutions relate to permitting. A basic point is that all market approaches to pollution problems are workable only within a broader, nonmarket, regulatory framework. Pollution is inherently what the economists call an externality—meaning that it is not captured within the ordinary exchanges of costs and benefits that characterize private transactions. Government regulation is more necessary to create the conditions for pollution "markets" than for other kinds of markets.

Within the regulatory framework of permitting, market approaches can be grouped into two general categories. One is like an ordinary permit in the sense that a specific pollution limit on the facility is maintained. Trading is allowed so that the limit can be met by any combination of pollution controls and pollution "credits" purchased from other sources. This is the mechanism used in the SO_2 control program. The other category uses charges on effluents or emissions. There is no restriction on how much pollution an individual source can generate, but for each pound generated a price must be paid. Such charges really replace permits in the usual sense, since allowable limits on pollution are the heart of permits. No clear examples of this approach currently exist in the United States, although tipping fees for trash disposal are based on this principle.

Tradable permits are more flexible than conventional permits, which are granted and limited to an individual source. Basically, tradable permit systems work by allocating or distributing a number of marketable permits with specific caps on emissions to each participating busi-

ness. In the aggregate, the sum of the individual caps equals the maximum pollution level that the system aims to achieve in a specified time. The marketable permit is essentially a property right that can be relinquished by its owner through trading for profit or recovery of costs for pollution abatement. The market encourages firms whose marginal cost of abatement is low to reduce their pollution as much as possible and then sell their resulting excess allowances to firms whose marginal cost for pollution abatement is high. Tradable permits are thus a more cost-effective means of achieving the environmental goal of pollution reduction and address problems of efficiency that plague traditional permit systems.

Tradable permits require performance-based standards (see section 4.1). If a facility has a technology-based permit that requires specific equipment to be installed, then trading is impossible because the facility must install the equipment and there is nothing to trade. Thus, the possibility of trading gives performance standards an additional advantage over technology standards.

On the agency side, a tradable permit system reduces the permit application processing time and burden, freeing up resources and personnel for compliance monitoring and enforcement. In fact, to ensure the integrity of the pollution permit market and the desired environmental performance, the focus of the agency's work under such a system would become compliance monitoring.

A relatively new use of market systems is addressing sources that are difficult to control, such as nonpoint sources of water pollution. As an example, Idaho is conducting an effluent trading demonstration project in the lower Boise River watershed. The project focuses on controlling phosphorus and will allow trades in phosphorus "currency" between point sources and nonpoint sources, as well as among point sources. In theory, a point source may find it advantageous to spend money controlling phosphorus from a nonpoint source (ECOS 1999, 15–16; see also the North Carolina watershed experiments described above).

Unfortunately, a tradable permit system is simpler on paper than in real life (Romstad 1999). In theory, the government sets the quantity of emissions allowed and distributes the permits (whether by auction or by "grandfathering"), the market will set the price, and the firms will trade. Empirically, however, it has been observed that assumptions made in the theoretical models, such as the presumption that all firms will have perfect information both about emissions and about permit values, cannot be taken for granted (Hall and Walton 1996). Foster and Hahn (1994, 28) observe, "There has been no dearth of advice from economists on how such programs should be designed. . . . Yet, the design suggestions have tended to rely more on a general understanding of political economy rather than a deeper understanding of the workings of specific environmental markets." They further point out that in constructing models for tradable permit systems, theory sometimes overlooks the following costs or drawbacks:

- transaction costs for firms to find potential buyers of their surplus credits, for the agency to keep track of the trades, and to maintain a stable system generally;
- uncertainty about actual emissions reductions achieved and the value of a given permit (i.e., imperfect information), about the definition of property rights, and about the conditions under which such rights could be weakened or strengthened; and
- socioeconomic consequences and societal opportunity costs resulting from the institution of the tradable permit system.

The socioeconomic consequences can include "hot spots"—areas where one or more kinds of pollution can be concentrated as an unintended result of the trading system. Trading systems work best when emissions of the regulated pollutant are distributed evenly over a wide area or when the distribution is not relevant, as in the case of greenhouse gases. However, for many pollutants, where they are discharged is a major factor in the resulting degree of risk, and since trading systems generally disregard location of emissions, trading would not work well.

The extent to which the existing permit systems discourage or block market solutions is an ongoing controversy. Kurt Stephenson and Leonard Shabman (2001), professors at Virginia Polytechnic Institute, argue that the Clean Water Act and the NPDES permit system are major obstacles to implementing market trading systems to achieve water quality. Others have pointed to existing experiments as evidence that tradable permit systems or similar market arrangements are possible under the existing laws and regulations. At the least, however, the existing statutes do not encourage market solutions.

California's RECLAIM.

In southern California, the largest experiment in tradable permits has been going on since 1994 (see Mazmanian and Kraft 1999, 77f.). The South Coast Air Quality Management District is the agency responsible for bringing a four-county area into compliance with federal and state air pollution standards. In January 1994, the agency, already known for its innovative approaches to environmental problems, launched a tradable permit program to reduce nitrogen oxide and sulfur dioxide in the Los Angeles area. "The program is designed to provide maximum flexibility to sources while stimulating innovation and advances in technology" (NAPA 1994, 26). The pioneering features of the Regional Clean Air Incentives Market (RECLAIM) are that it allows trading of both NO_x and SO_2 emissions, and it applies to both new and existing sources, with a focus on the latter (NAPA 1994, 55–56).

Currently, "RECLAIM is the broadest-based application yet attempted in that two pollutants are in the market, multiple sources from diverse industries generate pollutants, and the goal is environmental improvement rather than shuffling around existing emissions" (Hall and Walton 1996, 70). Early evaluations draw several lessons from RECLAIM. First, this type of program is not without challenges and is not the panacea that some economists had hoped for. The program needs to be evaluated not just on its economic and market measures but also on socioeconomic grounds and environmental performance measures. For example, do poor neighborhoods end up with more pollution as a consequence of the system? Second, RECLAIM is limited geographically to several counties in California, and we do not know whether such a program can be applied to a state or the nation as a whole. Third, setting up the infrastructure to run a tradable permit system entails considerable up-front costs and time.

Despite those caveats, RECLAIM, like the federal Clean Air Act's SO_2 trading program, has shown that trading regimes, under the right circumstances, can achieve at least as much reduction in pollution as ordinary command-and-control regimes, and can do so at less cost (see SCAQMD 2001). Defining the right circumstances is important. For example, RECLAIM was originally intended to cover VOCs as well as NO_x and SO_2 but found that because of the large number of sources, the dispersion characteristics, and the monitoring difficulties, VOCs could not be included (NAPA 2000, 72).

The RECLAIM experience also shows that implementation of market systems, as with all regulatory systems, can be upset by unanticipated events. The California energy crisis created a large and sudden demand for RECLAIM allowances. The demand could not be met, and the South Coast Air Quality Management District was forced to allow emissions that violated the rules of the RECLAIM market. The agency legalized the excess emissions in return for utility contributions to a fund to pay for emissions reductions from other sources within the Los Angeles basin (Ayres 2000, 108, footnote 146).

The increasing acceptability of market mechanisms has encouraged a number of states to experiment with them, particularly with trading of air emissions rights. Michigan, for example, has had a program of air emissions trading since 1996 (see ECOS 1998). Most of the experiments, however, do not directly impact on permitting, and so we will not examine them in this report.

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Chapter 6

Pollution Prevention and Integration

Most of the reforms discussed in Chapters 3, 4, and 5 are designed to improve the operation of the existing pollution control system. However, if the overall pollution control system is seriously deficient, and there is good reason to believe it is (Davies and Mazurek 1998), then it is important to ask whether streamlining the permitting system is adequate. Political scientist Barry Rabe (2001), after studying permit reform in Colorado, New Jersey, Oklahoma, and Pennsylvania, observed, "Interviews in all four states suggest little if any consideration of ways to link streamlining with attempts to reduce cross-media transfers or promote pollution prevention. Instead, the emphasis is on making traditional permit decisions as quickly as possible. As one state official noted, 'this whole emphasis on streamlining is essentially making the same bad decisions as before but taking less time in making them.'"

Permitting, because it is so central to pollution control, can be used as a lever to fundamentally change the entire pollution control system. In this chapter, we discuss two such fundamental changes, integration and pollution prevention. The two are closely related because adoption of either approach strongly encourages adoption of the other.

6.1 Integration

"Fragmented" is the word that best describes the existing U.S. pollution control system. It is fragmented in a variety of ways, but the most fundamental is the split among media—air, water, and land.

The fragmentation by media has increasingly been recognized as an obstacle to effective pollution control. Research has shown that many pollutants cross media lines. For example, air deposition is a major pathway by which toxics enter the Great Lakes. Almost all the newer problems—acid rain, stratospheric ozone depletion, global climate change—defy categorization along the traditional media lines. All three are caused by air pollution but may have their major impacts on water and land. Solving many pollution problems thus requires an integrated approach.

An integrated approach to pollution control promises numerous advantages (for more detail, see Davies and Mazurek 1998, 16–19; Irwin 1991):

- it is far more effective in obtaining compliance and reducing pollution;
- it allows for the establishment of rational priorities among programs and control measures;
- it encourages pollution prevention;
- it reduces the cost of pollution control and provides more flexibility for industry;
- it allows new problems to be identified more rapidly; and
- it reduces litigation, red tape, and paperwork.

There is empirical evidence to support each of those points, but theoretical systems always can appear better than existing practices. In the United States, there has been some but not a lot of experience with integrated approaches. The medium-based approach is deeply embedded in the current U.S. system. Within a decade, the United States, Canada, and Australia will probably be the only industrialized nations in the world still clinging to the air-water-land approach, and this will force more attention to integrated methods.

Permitting may be the best place to start instituting an integrated pollution control system because the advantages are more obvious than in other functions, such as standard setting or enforcement. New Jersey has shown many of these advantages, and we will discuss the New Jersey experiment below. However, the major experience with integration has been in Europe.

Integrated pollution control in the European Union.

Perhaps the most important recent development in fostering a more integrated approach to the environment was the adoption of the Integrated Pollution Prevention and Control (IPPC) Directive (EU/96/61/EC) by the Council of the European Union, on September 24, 1996. The directive aims to create an EU-wide permitting system that requires large and medium-sized industrial installations to obtain an integrated operating permit. The installations covered by the directive include facilities in the energy, chemical, and mineral industries; producers and processors of pulp paper; facilities that treat and dye textiles; food processing firms; waste management companies; and intensive livestock units. In the directive, "integrated" means that permits must take into account the *whole* environmental performance of the plant. Emissions to air, water, and land must be regulated together by permitting authorities, as well as a range of other environmental effects, such as the use of raw materials, energy efficiency, noise, prevention of accidents, waste minimization, even the decommissioning of facilities and restoration of contaminated sites when industrial activities cease. The directive does not require licensing authorities to issue a single permit covering all emissions from installations regulated under IPPC. Rather, it requires permitting decisions to be coordinated when more than one "competent authority" is involved in controlling releases to air, water, and land. To implement the directive's goal of "a high level of protection of the environment taken as a whole" (Article

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1), permit conditions are based on the concept of best available techniques, which we discuss below (Article 9).

The 15 member states of the European Union were required to transpose the directive into their national laws by October 1999. (As of May 1, 2001, Belgium, Germany, Greece, Ireland, Luxembourg, and Spain had not completed that step.) Since then, the directive has applied to all new installations, as well as to installations that have carried out a "substantial change," defined in the directive as "a change in the operation which in the opinion of the competent authority, may have significant negative effects on human beings or the environment" (Article 2(10)(b)). Existing installations were given an eight-year grace period and will be subject to the IPPC regime by November 2007.

Compared with previous industrial pollution regulations in many EU countries, the IPPC directive is more ambitious. Operators of installations that fall under the authority of IPPC must include in their permit applications detailed descriptions of the following (Article 6(1)):

- the installation and its activities;
- the use of raw materials, other substances, and the energy used or generated by the installation;
- sources of emissions from the installation;
- site conditions;
- the nature and quantities of "foreseeable" emissions from the installation into each medium and identification of significant effects of the emissions on the environment;
- the proposed technology and other techniques for preventing or, where this not possible, reducing emissions from the installation;
- measures for preventing and recovering waste generated by the facility; and
- measures planned to monitor emissions into the environment.

Under the IPPC regime, permit applications can be seen as a means to redress what often are information asymmetries between what operators know—about process emissions, pollution control measures, and the capital and operating cost of various control options—and what licensing authorities would like to know. Depending on how strictly authorities in each member state interpret the directive (for example, will operators need to identify all "foreseeable" emissions into each medium, even trace amounts, and what constitutes a "significant" environmental effect?), permits under IPPC may provide licensing authorities with a more comprehensive picture of plant emissions and their effect on environmental quality, as well as opportunities for cost-effective pollution prevention measures and the adoption of cleaner technologies.

The directive also makes explicit the right of the public to comment on applications for permits and to have access to monitoring results obtained by the competent authority in the course of the permitting procedure. These provisions for public information underscore the policy of the European Union's Fifth Environmental Action Programme, which states that the public must be enabled to participate as fully as possible in the decisionmaking process. The directive recognizes that because integrated pollution control involves making trade-offs among media and appraising many costs and advantages, including waste reduction, energy efficiency and resources

consumption, it is important for the various options to be put before the public with as much transparency as possible.

The directive does not contain long-range pollution reduction targets, as does the Dutch National Environmental Policy Plan, but rather uses permits to achieve emissions limits on the basis of the best available techniques (BAT). Article 18(1) states that the EU Council will set emissions limit values for which "the need for Community action has been identified." In the absence of such values, permitting authorities will apply emissions limits based on existing EU legislation on air and water. Member states have considerable discretion to interpret what set of activities, technologies, and pollution abatement costs constitute BAT for any particular installation. Article 2(11) of the directive defines BAT broadly as "the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values." The article then defines each term more precisely:

Best *means the "most effective in achieving a high general level of protection of the environment as a whole."*

Available *refers to those techniques "developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator."*

Techniques *means "the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned."*

The definition of BAT under the IPPC directive is complex and somewhat contradictory. It is a technical standard that takes into account the technological and economic feasibility of pollution abatement, and yet the directive states that the emissions limits based on BAT must also "take into account the geographical location and local environmental conditions" (Article 9). The directive, in other words, recognizes that emissions limit values are not the sole means to achieve environmental protection and therefore stipulates that environmental quality standards must be taken into account in setting release limits in permits. If the use of BAT is not sufficient to meet requirements in environmentally vulnerable areas, the directive requires additional measures, including limiting the number of polluting firms in a particular region and lowering the output of installations operating in the area. Where the environment is better able to cope with industrial discharges (e.g., if industries are located along fast-moving rivers or tidal estuaries), emissions limit values based on BAT may be eased provided environmental quality standards are met.

Under IPPC, BAT can be seen as the rather ungainly offspring of two permitting traditions in Europe. In developing the IPPC directive, many northern European countries—Germany, the Netherlands, Sweden—wanted to require that all new and retooled installations meet predetermined release standards based on the best available technology. Britain and the southern European countries—Greece, Italy, Portugal, and Spain—argued for greater flexibility to depart from rigid release levels, for case-by-case decisionmaking, and for using environmental quality standards as a means to achieve more effective environmental protection (*International Environmental Reporter* 1995). The resulting directive is a political compromise among countries whose regulatory traditions vary.

To advance the development of BAT throughout the EU, the European Commission established an IPPC bureau in Seville to develop BAT reference documents (BREFs) for the 30 industrial sectors specified in Annex 1 of the directive. Each BREF will be developed by a technical working group comprising regulators from member states, industry officials, and nongovernmental organization participants and will enumerate techniques that qualify as BAT for the sector. Although the system for developing BREFs is often referred to as a technical information exchange, participants have described it as dominated by political interests and lacking clear rules for decisionmaking and conflict management; identifying BAT, they report, is "the result of a bazaar-like negotiating process rather than being fertilized by the wisdom of technical expertise" (Lohse and Sander 2000, 65). Despite the enormous amount of effort that goes into drafting a BREF—each document runs hundreds of pages and on average takes around two years to complete—BREFs are not prescriptive, nor do they make emissions limit values binding on member states. BREFs are intended to serve as guidance. How BREF documents will ultimately be used is an open question, but it is likely they will be an important source for BAT determinations in the future.

It is premature to evaluate the impact of IPPC on the control of industrial pollution in the European Union. However, recent studies of the Integrated Pollution Control (IPC) regime in the United Kingdom, which in many ways prefigured the IPPC directive, can shed some light on how the IPPC directive might be implemented in the coming years. From 1992 to August 2000, some 2,000 industrial processes were regulated in England and Wales under IPC. Like the EU directive, the British IPC is intended to improve pollution control by regulating industrial releases to all three environmental media in a coordinated manner. Like IPPC, it seeks to encourage continuous environmental improvements in industry and increase the transparency of the permitting processes and the accountability of the inspectorate in setting emissions limits.

It is premature to evaluate the impact of IPPC on the control of industrial pollution in the European Union.

In his study of oil refineries in the United Kingdom, Sorrell (2000) finds that IPC created more formal and transparent procedures for consultation between permit authorities and regulated industries, more firmly placed the burden of proof on operators to demonstrate that they were meeting BAT, and generated information that was useful to industry and licensing authorities. However, these were limited victories, and many of the hoped-for benefits of IPC did not materialize. For example, IPC led to more formal consultation between industry and inspectors, but environmental groups and the general public were largely excluded from these negotiations and had little say in influencing permitting decisions. Instead of adopting clean technologies and exploring technological innovations to meet BAT requirements, industry compliance was achieved through adoption of existing technologies—a finding that was not unexpected in view of the large capital costs most such changes would entail. And although the flexible, site-specific approach to BAT led in certain instances to cost-effective pollution abatement, it also led to inconsistencies in permitting conditions between refineries and created suspicions of regulatory capture (Sorrell 2000). Perhaps even more intractable was the fact that interpreting BAT at the site level was highly ambiguous; BAT determinations relied heavily on professional judgment rather than formal analytical techniques. With no formal training in economics, inspectors used cost methodologies devised by industry to determine "excessive costs" in relation to environmental benefits and tended to consider the costs

of pollution abatement not in sectoral terms, but rather in connection to the profitability of individual companies (Sorrell 2001). Similar conclusions are found in Smith's broad study. He found that IPC initiatives were often thwarted by industrial inertia and opposition, and that because of inadequate resources, the level of inspection activity had declined, thus limiting the ability of the environmental agency to take tough enforcement actions (Smith 1997).

On the broader EU stage, the IPPC directive is a framework, and member states will have considerable discretion to interpret its provisions and select the means of implementation. Article 3 of the directive simply requires member states "to take the necessary measures to provide that the competent authorities ensure that installations are operated in such a way that all the appropriate preventive measures are taken against pollution in particular through application of the best available technologies." Although some supporters of integrated pollution control believe that the IPPC directive will provide a "clear regulatory framework and a level playing field upon which industry can operate,"[29] others are more cautious and expect that the compromises worked out in drafting and adopting the directive "could lead to lowering of environment standards and distortion of competition."[30]

For all of the horse trading that accompanied its adoption, the directive offers a cogent and coherent view of integrated pollution control for emissions from industrial facilities. Its main objective is to prevent or solve pollution problems rather than transfer them from one part of the environment to another; it promotes an environmental protection strategy that is more anticipatory and broadens BAT to include energy efficiency and the rational use of resources; and as a community law, it creates a legal obligation for industry to comply with the principles of pollution prevention, the use of BAT, waste reduction and recycling, and energy efficiency.

Perhaps more importantly, by providing a framework for an integrated approach to industrial pollution from stationary sources, the directive has begun an experiment in the 15 member states that is likely to go far beyond integrated permitting. The directive, one can argue, requires member states to seek solutions to many of the most pressing and difficult questions in environmental management: What is the proper relationship between state, citizen, and corporation for sustainability? How should societies set environmental priorities? How much discretion should be built into the regulatory regime? What conditions lead to technological innovations? How can the public participate more effectively in decisionmaking? How can environmental information be linked to a more nuanced and integrated view of the physical world? These questions extend far beyond the mission of most licensing authorities, but integrated pollution control, as a concept and now as a directive in the European Union, will ultimately compel countries to tackle them.

New Jersey facility-wide permitting

New Jersey in the 1990s conducted a pilot permitting program that is the best U.S. example of integrated permitting and also illustrates the close connection between integrated pollution control and pollution prevention. The program was authorized by the New Jersey Pollution Prevention Act, passed in 1991.

The New Jersey program uses a single multimedia permit for a facility (the following description draws on Herb 1997, 17–22; Rabe 1995 and 2001; Helms et al. in NAPA 2000b; and various reports issued by the New Jersey Department of Environmental Protection). The permit is based on production processes and on a pollution prevention plan, which is incorporated

in the permit. The other major element in the program is a materials accounting approach to monitoring. According to Jeanne Herb, who was instrumental in formulating and implementing the program, "Coupling the process-level materials accounting data with air, water, and hazardous waste permitting, monitoring, and reporting data provides a clear and direct link between the plan and the permit—perhaps the single greatest contribution of the program" (Herb 1997, 20).

As described by Herb (1997, 2), "Each company's permit is essentially composed of chapters, one for each of the production processes within the facility. Process flow diagrams produced as part of the facility-wide permit application provide a clear picture of the steps in a production process and the sources of chemical use and generation, as well as environmental releases into all media. The chapters are built up by overlapping the process flow diagrams with actual materials accounting data . . . "

The single permit replaces a multitude of medium-specific permits. For Schering-Plough Corporation, a pharmaceuticals manufacturer, the integrated permit for its facility in Madison, New Jersey, replaced 897 permits required just for air quality (Rabe 1995, 213). For Sybron Chemicals, Inc., a moderately sized facility, the permit replaced 60 permits for air, surface water, and groundwater discharges (Rabe 1995, 213). Huntsman Chemical's 80 permits in 11 large loose-leaf binders were compressed into a single 75-page permit (Rabe 2001, 21). More startling and more important is the fact that the integrated permits provide a readable, understandable, and comprehensive picture of the environmental impacts of the facility.

The transparency of the integrated permits has not always been an advantage for the program. A New Jersey newspaper ran a series of hostile articles about the program based on emissions data in the integrated permits—information that would otherwise have been unobtainable (Rabe 2001, 25–26). Although the articles were negative, they inadvertently illustrated how an integrated approach can facilitate public participation.

The materials balance approach to measuring a facility's impacts is a critical part of the New Jersey program. (This approach was pioneered by Allen Kneese, Blair Bower, Robert Ayres, and other researchers at Resources for the Future in the late 1960s; see Kneese and Bower 1972.) Progress under the permits is gauged by measuring the amount of each type of material or chemical taken into the facility and the amount that goes out in products. The difference is "nonproduct output" (NPO). The rate of NPO per unit of product is intended to provide a consistent, comparable annual measure of environmental performance (Rabe 2001, 12). The rate of NPO in large facilities will vary depending on changes in product mix, changes in demand for products, and changes in the production process. The permit can be based on averages or on total discharges.

The New Jersey permits are thus at the heart of a truly integrated multimedia system. The facilities are analyzed and inspected as a whole rather than as a collection of unrelated pipes, vents, and stacks. Pollutants can be tracked through the entire production process. Monitoring is based on a comprehensive method of accounting for all materials flows. Preventing pollution rather than shifting pollutants from one medium to another is the clear goal.

The program has been criticized by some industry representatives as too stringent, and by some environmentalists as too lenient. However, it has generally enjoyed good political support. Its major drawback has been the resources required to do the analysis and draft permits. The integrated permits have required much more time and effort than the routine medium-based

permits. How much of this added time and effort can be attributed to the newness of the approach is not known.

The costs may be offset by the environmental benefits, however. According to Herb (1997, 17), "These include the identification of previously unpermitted emissions; discrepancies in the various air, water, and hazardous waste permit, compliance, and reporting data; transfers of pollutants from one environmental medium to another; and previously unidentified risks from the facility taken as a whole. These discoveries were not surprising in themselves, but their scope and extent was completely unexpected."

Rabe gives the example of the Frigidaire Company's Edison plant, where permitted VOC emissions to air were 9 tons per year but actual emissions were discovered to be 113 tons. In the same plant, permitted hazardous air pollutant emissions were 2 tons per year, and actual emissions, 43 tons. These were not knowing violations but rather emissions that had gone undetected because of the fragmented nature of the medium-by-medium permits. Based on the New Jersey experience, it is possible that the existing medium-based system misses as much as half of the actual pollution that occurs. The materials balance approach used in New Jersey is an effective solution.

The New Jersey permits are thus at the heart of a truly integrated multimedia system. . . . Preventing pollution rather than shifting pollutants from one medium to another is the clear goal.

Some industry representatives have criticized the materials balance approach because it reveals too much information and thus may give confidential business information to competitors. With materials balance, as with all attempts to open up decisions to the public, it is necessary to strike a balance between transparency and the rights of the public on one hand, and confidentiality and the rights of a company to protect proprietary knowledge on the other. The confidentiality of business information has not been an issue in New Jersey. Many methods have been developed to provide adequate information to the public while also respecting confidentiality, and it seems possible to apply these methods to the materials balance approach.

One other criticism of the New Jersey single-permit approach relates to the workload of large companies with multiple permits. Some companies have told EPA that they prefer multiple permits on different schedules because the workload of the company permitting staff is then evened out. If there were just one permit per facility, renewed every five years, the staff would work for two years on the single permit and then be idle for the next three years. There are two responses to this. First, large companies have multiple facilities. It is likely that different facilities would be on different permitting schedules, so the workload could be evened out in that way. Second, and more importantly, the need to keep permitting staff busy seems a trivial consideration compared with more effective pollution control, better pollution prevention, improved public participation, and the other benefits that derive from an integrated permit.

Over the past 10 years, the New Jersey program has issued 16 integrated permits. The future of the program is unclear. The state is instituting a multitrack program similar to those in Oregon and Wisconsin (see section 4.3 above; for the status of the New Jersey program, see ECOS 2001, 184–85). EPA has yet to decide how the integrated permits will relate to Title V air permits (NAPA 2000a, 55–56). Regardless of its fate, this facility-wide permits program in-

vites debate and research. For example, one report expresses doubts about the impact of the New Jersey multimedia approach, attributing most of the gains under the permit to the flexibility allowed permittees and the resources expended by the state agency (see Helms et al. in NAPA 2000b). Despite the questions, the New Jersey experience provides a vision of what an integrated system would look like, a beacon on the road toward more coherent, efficient, and effective pollution control.

Pollution prevention

In 1990, the U.S. Congress passed the Pollution Prevention Act, indicating that source reduction was "more desirable than waste management and pollution control" and that the EPA "needs to address the historical lack of attention to source reduction."[31] As one researcher has put it, "The concept of pollution prevention, or 'P2,' signifies a new, proactive environmental mindset that targets the causes, rather than the consequences, of polluting activity" (Boyd 1998, ii).

According to EPA's *Facility Pollution Prevention Guide* (1992), pollution prevention "is the use of materials, processes, or practices that reduce or eliminate the creation of pollutants or wastes at the source. It includes practices that reduce the use of hazardous and nonhazardous materials, energy, water, or other resources as well as those that protect natural resources through conservation or more efficient use" (U.S. EPA 1992, 1).

The major advantage of pollution prevention is that by preventing the *creation* of pollutants, it avoids the hazards that result from shifting pollutants from one part of the environment to another. Current pollution control practices often just move pollutants from air to land or from water to air. Prevention, in contrast, eliminates the hazard at the source. Also, in many cases, prevention can save companies money by eliminating the need for end-of-the-pipe controls and by conserving valuable materials.

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A recent study by the General Accounting Office (GAO) found that public availability of toxic release inventory data on a facility's discharges was an incentive for some companies to undertake pollution prevention (GAO 2001, 3). Other factors fostering prevention were having an environmental management system (see Chapter 4), and laws and regulations that allowed companies flexibility in how to comply with standards.

GAO also identified several barriers to P2 implementation. The main barrier involves technical challenges that new or unproven technologies or proposed approaches present to companies. Not all P2 activities are simple, straightforward practices that involve minimal costs and use of resources, such as covering solvent tanks when not in use to minimize evaporation (GAO 2001, 4, 16). Good operating practices are the easiest to discover and usually constitute the first step that a company takes toward pollution prevention. Beyond these, many P2 activities involve changes in raw materials usage and revamping production practices. These may take substantial time and resources to be identified and developed. In the end, even if a practice is developed and proposed, decisionmakers within a firm may reject it in favor of traditional practices known to ensure their product's quality (GAO 2001, 4). Furthermore, businesses may be unwilling or unable to make investments in P2 because of laws and regulations that prescribe specific pollution control equipment and techniques and thus act as disincentives to pollution prevention implementation (GAO 2001, 4).

Other obstacles to implementing P2 activities, especially in the case of small businesses, are financial concerns and lack of technical knowledge (GAO 2001, 8). Technical uncertainties and the considerable risk associated with some P2 alternatives deter some firms, especially if significant up-front capital investment is needed for implementation. In some cases, GAO found that corporate decisionmakers required not only that P2 proposals prove profitable, but that the project's rate of return equal or exceed that of any other potential company investment (GAO 2001). Tellus Institute researchers (1998, 4) and others have argued that conventional cost accounting methods obscure the true costs of chemical use and wastes, and thus are an impediment to implementing P2.

The current medium-specific environmental regulatory framework means that firms have problems reporting and getting credit for P2 activities. Companies that undertake P2 activities may have to expend more time and resources in making duplicate reports to several program offices. More importantly, since pollution prevention is inherently multimedia, under the current system firms may not get full credit for their activities if credits are given only on a medium-by-medium basis. In this case, businesses may not deem it worth the effort to invest in P2 projects (Davies and Mazurek 1999, 17).

EPA's Pollution Prevention in Permitting Program

In 1993, an ad hoc group of staff in EPA Region 10 and the Office of Air Quality Planning and Standards informally discussed the role of the Clean Air Act in P2 implementation. This group recognized that adoption of P2 approaches is partly a response to regulatory costs imposed by the environmental agencies, and that under certain circumstances, regulators can modify these costs to create incentives for P2 (U.S. EPA, P4 fact sheet, August 6, 1998). Subsequently, in November 1993, EPA Region 10, the Air Office, and the Intel Corporation formally initiated the Pollution Prevention in Permitting Program (P4) to incorporate and address those observations.

Intel found the new Title V requirements inflexible and had even considered taking its future plant investments offshore. This was the motive for its involvement in P4 (U.S. EPA, P4 fact sheet, August 6, 1998). With the assistance of EPA's Pacific Northwest Pollution Prevention Research Center and the involvement of Oregon's Department of Environmental Quality, a draft Title V permit for Intel's plant in Hillsboro, Oregon, was developed. The permit promoted pollution prevention, ensured full compliance, and responded to the company's need for operational flexibility (U.S. EPA, P4 fact sheet, August 6, 1998; see also Ross & Associates 1999 and Oregon DEQ draft permit 34–2681). The final permit was issued in 1995, and since then Intel has expanded its operations in Oregon. This flexible permit entailed the preapproval of physical and process changes within set environmental constraints that would otherwise trigger the state's minor New Source Review program (Ross & Associates 1999, 4). The permit also includes an enforceable limit on hazardous air pollutants (Ross & Associates 1999). So far, the permit has given the Intel plant the operational flexibility it needs to compete effectively in the market, while protecting the environment and ensuring compliance with emissions standards.

The pollution prevention section of the permit relates to the preapproved changes that are allowed under the permit. Intel was required to develop and implement a pollution prevention program at the facility. The state Department of Environmental Quality specified minimum elements that the program was to include (Oregon DEQ draft permit 34–2681).

Intel's strategies include reducing VOC and hazardous air pollutant emissions below federal thresholds for major sources.[32] In April 2000, Intel reported that "At [the] Aloha campus in Oregon, for instance, VOC emissions per production unit have dropped 55% since 1995, despite ever-increasing production volumes."[33] As a result, in 1999 the Aloha plant was granted a permit to become a minor source under the Clean Air Act, marking, as Intel stated, "the ultimate success of our P4 program."[34]

Currently, three other companies have Title V flexible permits approved under EPA's P4 program: Lasco Bathware, Merck (model permit for the pharmaceuticals industry), and Imation. Like Intel, these firms have an interest in flexible permitting because the nature of their business requires them to react swiftly to market demands, and the traditional permitting process can result in substantial delays that hinder competitiveness. It remains to be seen whether the P4 program can be successfully implemented on a wider scale, especially with smaller businesses, and whether it will encourage facilities to adopt a P2 program. Has the P4 approach resulted in pollution prevention that would not have happened otherwise? Responding to this question, Tim Mohin, Intel's corporate environmental manager, stated, "It's not a clean answer. We have a very active P2 program. Those activities were underway before [P4] and they continued." Dave Dellarco, the EPA P4 project coordinator, commenting on Intel's VOC reductions, said, "Would it have happened without P4? Probably. But would it have happened as fast as it did? No."[35]

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Chapter 7

Next Steps

We have described a system that is deeply flawed. The permitting system is so fragmented and complex that even specialists cannot tell what the rules are. A large portion of the permits are outdated, leaving facilities with permit requirements that may have little relationship to current operations or government regulations. At the same time, the private sector is weighed down with time-consuming requirements that may hurt them economically and require them to do things that they know can be done better in some other way. Environmental groups and the general public are handicapped by the complexity of the regulations and the opaqueness of the permits.

There are better ways. Permitting can be made both more efficient and more effective. This chapter describes some steps toward reform. What is necessary—and what has been lacking in the past—is the political will to make it happen. The shortcomings of the existing system may now be obvious enough to compel real change.

Our discussion of recommendations parallels our review of what has been tried. We start with a discussion of why past reforms have not been more successful and what might be done to put reform on a more solid footing. We then deal, in turn, with efficiency, flexibility, decentralization, and integration, the values we have already discussed. Finally, we recapitulate the recommendations by organizing them according to who needs to take the next steps.

7.1 Failure of Past Reforms

In some respects, the history of attempts to improve permitting does not give encouragement to those who would make changes. Permitting falls in a gray area. It is complex, unexciting, and undramatic. It does not attract press interest or political entrepreneurs. It is, however, sufficiently important that any attempt to change the process is likely to evoke opposition from some interested parties.

There is a long history of federal attempts to improve permitting. In 1980, EPA issued consolidated permit regulations covering the RCRA hazardous waste program, the Clean Water Act NPDES and section 404 permits, Safe Drinking Water Act injection well permits, and the Clean Air Act PSD program. These provided a single, combined application form, a uniform procedure, and a single set of regulations (ELI 1987a, 3–45; 45 Fed. Reg. 33290). However, the consolidation in actuality did little to consolidate. Some referred to it as a "Dagwood sandwich" be-

cause nothing was dropped from the individual program requirements; they were simply sandwiched between a set of additional regulations. The state programs were not consolidated, either, so the EPA regulations were mostly translated back into individual program requirements by the state permit issuers. The effort was unpopular with both the environmental and the business communities, and in 1983 the regulations were "deconsolidated" (48 Fed. Reg. 14145, 14147). EPA created several internal task forces in the 1980s to improve the way permits were issued, but none of them had any lasting impact.

When the Clinton administration entered office and initiated its national performance review and reinvention initiatives, permitting was on the list of subjects to be examined. In 1994, EPA created the Permits Improvement Team and enlisted Lance Miller, a New Jersey career employee, to head it. The team worked for two years and in July 1996 produced a draft report. However, EPA leadership never endorsed the report, perhaps because of the broad nature of the recommendations.

Following that failure, EPA created another group composed of EPA personnel and interested parties from outside the government. In February 1999, this group issued an "Action Plan for Achieving the Next Generation in Environmental Permitting" (distributed as an attachment to a memo from Peter D. Robertson, acting deputy administrator of EPA). The plan recommended 38 cross-media tasks and 14 program-specific efforts to improve permitting. Two years later some progress had been made on the program-specific efforts, many of which had already been underway. Little progress had been made on the cross-media tasks that were the heart of the action plan. One exception was in public participation, where a handbook on public participation in permitting was written and distributed (U.S. EPA 2000a) and efforts were initiated to make some EPA rules more amenable to participation (see section 5.2).

Despite the failure of many past reform efforts, the importance of permitting and the need to make changes provide incentives to keep trying.

The failures of past reforms are of three types. The first type consists of proposals that have been put forth and then ignored. The fate of the EPA Permits Improvement Team report is a good example. The team's recommendations failed to attract any champions and drew opposition from at least one high-ranking EPA official. In the absence of high-level support, almost any opposition was enough to consign the report to oblivion.

The second type is the failure of even successful pilot programs or field experiments to catch on. They are not applied to additional facilities, and they are not adopted in other states. The New Jersey facility-wide permit program and the pilot projects developed under the EPA Common Sense Initiative are two examples. It remains to be seen whether EPA's XL program also will meet this fate. This type of failure is due to a lack of advocates, a failure to think through how the experiment could or should be more widely applied, and opposition from people whose interests could be adversely affected.

The third type of failure is an obvious category: the reform may just be too costly, too cumbersome, too time consuming, or too difficult to emulate. Caution is warranted before assigning a reform to this category, however, because it is not unusual for those who are threatened by a change to say it is too expensive or difficult when what is really meant is that it is too politically threatening.

Despite the failure of many past reform efforts, the importance of permitting and the need to make changes provide incentives to keep trying. Also, as noted below, some significant improvements have been made to the permitting process. Our suggestions are offered in the hope that they may attract the interest and support necessary to have an impact on the way permitting is done and to make permitting more efficient, effective, and transparent.

Certain steps will increase the likelihood that permitting reform can succeed. As we have shown in Chapters 3 through 6, the states are fulfilling their role as a laboratory for democracy by experimenting with changes in permitting. EPA also is conducting a variety of pilots and test programs. Because the lack of any statutory basis for these programs, especially at the federal level, has weakened many of them (see Davies and Mazurek 1996), Congress should enact legislation providing a statutory basis for federal experimental programs. The legislation also should include a procedure through which state experimental permits could substitute for federal permits. Such substitution could save a great deal of time and reduce friction between EPA and the states. The legislation should be crafted so that it protects the environmental values of the current system.

Successful experiments are of little use if they do not change routine, mainstream policy. The Environmental Council of the States has done a good job of diffusing ideas developed by individual states, and the states should continue and expand their use of the council for this purpose.

At the federal level, EPA needs to be able to evaluate permitting (and other) experiments and mainstream the ideas that make sense. EPA's Office of Policy, Economics, and Innovation has initiated many EPA experiments and has evaluated some of them. It also has made efforts to proselytize some of the successful experiments, including the Massachusetts Environmental Results Program (see section 3.4). However, evaluation is always difficult for a government office to do, especially if the office is the inventor and advocate of the program being evaluated. Even more importantly, the Office of Policy, Economics, and Innovation does not have leverage over the EPA program offices (air, water, hazardous waste) and so has not succeeded in getting them to adopt changes suggested by the pilot programs. Whether any EPA office can influence the program offices is not clear, but it will be difficult for the program offices to change on their own. EPA needs to evaluate experiments (both state and federal) and incorporate good ideas into ongoing programs—capabilities it does not now have. At this point, evaluation and adoption of reforms are at least as important as initiating new pilots and experiments.

An important input to evaluation is ambient monitoring data—information on the quality of the air and water. Ambient data can serve as a check on the effectiveness of permitting programs and be a factor in calculating allowable effluent and emissions levels (see discussion of TMDLs, section 5.2). There is, however, a dearth of relevant and reliable ambient data, and the problem is getting worse (see Davies and Mazurek 1998). Spelling out how to address the problem would require a separate report, but the ambient monitoring problem needs to be addressed for the sake of improving permitting as well as for most other pollution control functions.

7.2 Efficiency

The states have had two decades of experience in improving the efficiency of the permitting process. Although comprehensive data are not available, it appears that these efforts have paid off. In many, probably most, states, permits are issued more rapidly and applicants are more satisfied with the process.

The components of these efficiency efforts are straightforward and were described in Chapter 3: guidance for the applicant about what is required, how the process works, and how long it will take; a single point of contact for each applicant; and a reporting mechanism that identifies delays or other problems. Each state has its own variant, but the majority of states have instituted these basic components. They should be made routine in all states.

The Internet is likely to produce another wave of efficiency improvements. The ease with which volumes of information can be communicated between permit applicant and the permit giver are likely to increase the efficiency of permitting in the same way that it has improved the productivity of the economy as a whole. The next decade should see widespread adoption of electronic application for permits, electronic reporting by permit holders, and real-time availability of information on the status of permit applications.

Electronic processing may encourage the use of a common permit application form, at least for most EPA programs. This would both reduce redundant paperwork and encourage coordination among different programs. In section 3.1, we discussed some of the proposals that have been made to do this.

Despite efficiency improvements, it is likely that the backlog of permit applications and renewals, in both water and air, will continue to be a problem (see section 3.5). Also, the delay caused by some permitting programs, such as New Source Review under the Clean Air Act, will become an even more acute problem. As the pace of technological change accelerates, companies will need new permits more frequently, and as the number of companies whose competitive position depends on keeping up with that pace increases, waiting for a new permit will become more and more intolerable.

As we have noted, the delay problem is to some extent a resource problem. Permitting is not a high priority for many states and EPA regional offices and thus gets short shrift in the allocation of skilled personnel. The 1990 Clean Air Act Amendments specify that approved state permit programs require "the owner or operator of all sources subject to the requirement to obtain a permit . . . [and] pay an annual fee . . . sufficient to cover all reasonable (direct and indirect) costs required to develop and administer the permit program . . . " (sec. 502(b)(3)). Similar language should be added to CWA and RCRA. This would not solve the problem of attracting and keeping skilled permit writers, because government salaries are markedly lower than those in industry, but it would at least be a step in assuring that resources are available for adequate permit writing and review.

Despite efficiency improvements, it is likely that the backlog of permit applications and renewals, in both water and air, will continue to be a problem.

A direct step to reduce the backlog is to extend the terms for which permits are valid. As discussed in section 3.5, we do not think that the requirement of set terms for air and water permits should be abandoned. However, to extend the terms from five years to seven or eight years would probably not make much difference and might encourage compliance with the renewal deadlines. It might be objected that longer permit terms will reduce public participation, but there is an important difference between the frequency of participation and its quality (Wyeth 2001). The quality of participation could be improved more by providing opportunity for earlier involvement and making permits more transparent than by simply increasing the number of times the public can get involved.

The delay problem also can be addressed through greater use of facility-wide permits, such as those given to Intel and others under EPA's P4 and Project XL. These entail one permit per facility (although still by separate medium), an overall emissions cap for the facility, and more frequent reporting of emissions.

The backlog problem also will be improved if general permits, applicable to categories of sources, are more widely used. The Massachusetts Environmental Results Program (see Chapter 3) provides a good model of one type of general permit. Having applicants write the permits (see below) is probably the only way that the backlog problem will be completely addressed.

Another type of general permit is applicable to a watershed and is illustrated by the North Carolina experiments described in Chapter 5. Stephenson and Shabman (2001) urge that "Congress should specifically authorize a large-scale (state or regional) allowance market for a particular watershed, lake, or estuary system." If such a provision followed the North Carolina model, it would be based on a watershed permit issued by the state to a watershed association. The statutory provision could encourage both watershed associations and market mechanisms. Given the poor record of EPA in translating pilot projects into standard procedures, the congressional mandate should be a general authorization rather than a single experiment.

General permits also can be a major element in addressing the mismatch between resources expended and the degree of environmental risk presented by a facility or activity. The problem is summarized well by the state of Oklahoma: "While it would logically follow that in a world of limited resources, a relatively higher level of resources would be dedicated as complexity and thus risk increase, this was rarely the case in our historic structure which . . . was not based on comparative risk. We spent far too much time processing individual permits . . . for facilities that posed relatively small risks . . . Moreover, the level of resources utilized in addressing similar risk needs to be similar across media lines" (ECOS 1998).

General permits, which allow one standardized permit to apply to a large number of sources, are used to some extent by most states. They are an efficient way of dealing with minor sources, and they allow an agency to focus on the higher-risk problems. At the same time, they have disadvantages. Public participation is reduced or eliminated because the public responds to site-specific problems, and general permits are not site-specific. Also, some states are finding that their ability to finance pollution control efforts is being hurt because they cannot charge the same fees for general permits as for individualized permits.

Matching resources with risks entails some type of tiering, with low-risk facilities subject to a general permit or no permit at all, high-risk facilities subject to individual permits with frequent inspection or reporting, and perhaps an intermediate category. This is similar to the tiering systems used in Oregon and Wisconsin, except that the basis of the tiers is different. Under the systems designed to maximize flexibility, the best-performing firms are in the top tier. In a system based on risk, the worst (highest-risk) actors are in the top tier. We need to be clear about the semantics. Programs like Oregon and Wisconsin reward firms that have good compliance records and a positive attitude. These firms may nevertheless operate facilities that pose high risks because of their size or use of toxic materials (Wyeth 2001). It seems logical that the most effort by state environmental agencies should be devoted to those sources that pose the most danger to the environment. In most states today, however, there is little explicit consideration of risk and thus a good chance that the match between risk and resources will be poor.

There is an analogous principle for EPA oversight of state programs. As summarized by the National Academy of Public Administration (NAPA 1995, 2), "Those states that are capable and willing to take over functions from the federal government should have full operational responsibility. In these cases, EPA should stay out of the way, with no second-guessing. In those states without the capability or political will to assume responsibility, EPA should continue to exercise intensive oversight. And for those states falling between the two extremes, EPA should try to enhance their capabilities and help move them toward full delegation." There are two problems with this statement. First, the relevant unit should be state programs, not states. It is not unusual to find marked differences in competence and political will among programs in the same state. Second, the competence and political will of programs change over time, and not just for the better. There needs to be some mechanism, such as an audit every two or three years, that allows EPA to update its evaluation of state programs. With those caveats, the principle of differential oversight is valid and important, and EPA should continue to try to focus its resources on the state programs that are most problematic.

7.3 Flexibility

Efforts to improve efficiency merge into efforts to increase the openness and flexibility of the permitting system. As described in Chapter 4, several states have established tiering systems to give permittees more flexibility. It is too early to tell whether these systems have made any difference. To the extent that they focus on environmental management systems, we believe they are in error. It is fine for private firms to adopt ISO 14001 or any other management system that works for them. However, if the United States has learned anything about environmental policy in the past 30 years, it is that government should focus on outcomes and results, and that trying to tell the private sector how to run its business is a prescription for inefficiency and ineffectiveness. Pushing EMS on firms creates even more inefficiency than pushing a particular technology.

One change that might significantly improve the role of the private sector is allowing permit applicants to submit a draft permit for agency approval (for analogous suggestions, see Clough 2001 and Thunder 1997). In one sense, this is a small change. Frequently, all the information to be contained in the permit is in the permit application. In that sense, applicants write the permit, and in fact, a permitting handbook written primarily for industry notes, "In many instances, permits themselves are merely operating certificates identifying the source . . . Typically, one has to review the permit application itself to identify what emission limits were permitted . . . " (Greenway 2000, 2.77). However, if permits are based on ambient conditions, such as NPDES permits based on water quality, then the information needed for a permit may include data not in the application.

Kerry Clough (2001), the assistant EPA regional administrator in Denver, has taken this idea one step further. He suggests a system of "turbopermits," analogous to the turbotax software used to file tax returns. The responsibility for drafting permits would be shifted to the facility needing the permit. EPA would franchise development and distribution of permitting software to a for-profit company. The software would make the unique requirements of each state's permitting programs accessible via look-up tables. Not all facilities would be able to use the soft-

ware, but most could, thereby reducing the government workload and allowing government officials to spend their time reviewing the truly important parts of draft permits.

If EPA or a state—legally, the entities that issue permits—is also the writer of the permit, it becomes both author and reviewer. In most cases, by the time a permit is made public, the government is committed to defending it because, technically, it is the government that wrote it. Changing the laws so that the applicant submits a proposed permit and the government reviews and approves it could have several advantages. First, it would shift permit writing to the parties that have an incentive to get the permit written, perhaps speeding up the process and distributing the work more efficiently and equitably. Second, it would challenge facilities and firms to develop new approaches and new technologies, thus reducing their costs and improving compliance. Third, it would improve public participation by getting the government out of the role of advocate for the permit, thereby giving comments from outside parties a much better chance of being taken seriously. Fourth, it would make better use of government resources. Instead of writing permits, government officials would concentrate on issuing general guidance as to what should be in permits, reviewing and requiring changes in permits that pose the greatest environmental risk, and soliciting and analyzing public comments.

Changing the laws so that the applicant submits a proposed permit and the government reviews and approves it could have several advantages.

At least theoretically, the down side of such a change is that permit applicants would make the permits more lenient and in various ways deceive or mislead the government reviewers. However, to the extent that an applicant intends to deceive the government, there is already ample opportunity for deception in the application. And again, allowing officials to concentrate on important aspects of a permit would likely improve the chances that the government would obtain the degree of stringency it thought appropriate.

For new facilities or modifications that require permitting, the applicant has incentive to move as quickly as possible to write the permit. For existing facilities, however, the incentive may be to delay as long as the plant can keep operating under the old permit. Thus there would need to be a deadline after which the plant could not operate without a new permit. Alternatively, only new permits might be written by applicants; renewals would be written by the government.

It is not altogether clear that a change in law would be necessary to effectuate the changes discussed above. It might be possible to administratively require the applicant to submit a draft permit as part of the permit application. However, apart from the legal question, it would be desirable to give such a significant change the sanction and force of law.

There may be additional ways to add to the flexibility given permit applicants. For example, technology requirements often are included in permits because the permitting agency believes there is no way to monitor compliance with a performance-based standard. Applicants should be allowed the option of a performance standard if they can provide effective effluent or emissions monitoring. This would give the applicant more flexibility and also provide an incentive to develop monitoring technology.

7.4 Decentralization

It is much too soon to know how the events of September 11, 2001, will affect environmental policy. That the efforts to combat terrorism will increase the power of the federal government is certain. What is less clear is whether the decentralizing trends in environmental policy that have prevailed over the past couple of decades will be reversed. Pollution control, involving innumerable site-specific actions in a large and diverse nation, will always be a somewhat decentralized process; but if devolution to the states is considered a luxury of peacetime and the United States is engaged in a lengthy war, then there is likely to be an impact on environmental policy.

Market mechanisms continue to have significant potential to improve both the efficiency and the effectiveness of permitting (see section 5.3). There is a wide variety of such mechanisms, and many of them go far beyond permitting in their impact. It seems likely that in the coming years the flexibility allowed by many kinds of permits will be greatly increased so that tradable emissions rights and other market mechanisms can be used to improve the efficiency of the pollution control system as a whole.

The effectiveness of permitting can be increased through market mechanisms, especially through trading between point and nonpoint sources. In section 5.3 we gave examples of how this works in watersheds, and more use needs to be made of this kind of trading if water quality standards are to be met. The Clean Water Act should be amended to authorize the states or EPA to implement tradable permit systems based on watershed permits.

Decentralization in the sense of involving a wider public in permitting decisions will continue to be an important theme of permitting reform (see section 5.2). Local environmental groups can and should help make sure that permits for new facilities meet environmental requirements and that permits are renewed on a timely basis. This is demanding and beyond the capabilities of many groups, but the Internet and technical assistance provided by EPA, the state, or a local university could greatly help.

The national environmental groups have had an important impact on permitting programs, whether through litigation (as in the case of TMDLs) or through commenting and lobbying. However, the national groups also have handicapped themselves by becoming the conservatives of environmental policy—the defenders of the status quo. If permitting is in serious trouble, as we have argued it is, the solution is not to defend the purity and untouchability of legislation enacted 30 years ago. Environmental advocates need to join the effort to construct a better system.

EPA, to its credit, has undertaken a variety of steps to improve participation in permitting (see section 5.2). Two important steps remain. It needs to work toward an integrated facility-wide permit to improve transparency of the whole system; and it needs to adhere more to the formal rulemaking process when processing permitting policies of general applicability (see section 2.2).

7.5 Toward a New System

Because permitting is so central to the pollution control system, how one evaluates the total system inevitably influences the kinds of reforms one recommends. There are many people who be-

lieve that the U.S. pollution control laws and institutions have accomplished a great deal, that the environment today is better than it has been in many decades, and that therefore no major changes in the system are needed. The first premise is certainly true, and it is also probably true that U.S. environmental quality has improved. However, the conclusion favoring the status quo does not necessarily follow. The pollution control system may account for only a small part of the progress in environmental improvement, today's environmental problems are different from those of the past, and a careful examination of the current system reveals its ineffectiveness and inefficiency.

The permitting reforms in Europe, New Jersey, and elsewhere described in Chapter 6 point the way to a better system. They illustrate how changes in permitting can be used to fundamentally change the whole pollution control system. Such changes are needed.

There should be a single, multimedia, performance-based permit covering each major process in each facility. Often, this will mean one permit for the entire facility. The permit should describe materials and energy flow through the production process and thus highlight opportunities for pollution prevention. Monitoring should consist of measuring material inputs and the material in the final product and accounting for the difference. Tracking materials will make enforcement of the permit more effective and manageable.

It is likely that the standard use of an integrated, multimedia, facility-wide permit will require congressional action. However, in the interim, EPA can lay the groundwork by experimenting with such permits, encouraging the states to experiment with them, integrating data banks and making program requirements more uniform, and conducting an ongoing dialogue with Congress, the states, industry, environmentalists, and others to clarify how a more integrated system can be achieved.

Integrated permitting, as described here and in Chapter 6, can be both the focal point and the wedge to achieve an integrated, multimedia pollution control system. Such a system should be more effective, flexible, and efficient than the current outmoded system. Formulating, enacting, and implementing a new system is a major undertaking, entailing changes in both federal and state laws. Given the magnitude of the task, the Congress may want to take some kind of intermediate step, such as establishing a commission or temporary committee to recommend specific changes.

We will continue to learn from other integrated approaches to pollution control, especially the European models. Further experiments can be undertaken in the United States. But the time for just experimenting has past. The inadequacies of a system based on air, land, and water as isolated compartments were clear 30 years ago (see Message of the President Relative to Reorganization Plans Nos. 3 and 4 of 1970, July 9, 1970, transmitting the plan that created EPA). The shortcomings have only become more obvious and more damaging. The U.S. system needs to be fundamentally changed now, and permitting provides a good place to start.

7.6 A Plan of Action

We have discussed recommendations that, in our view, would strengthen permitting and pollution control as a whole. To summarize, we categorize those recommendations by who should implement them. In other words, we group the recommendations by the major players in permitting.

Congress should

- Create a commission to formulate basic changes in the pollution control laws, specifically changes leading to a more integrated (cross-media) system.
- Consider amending the Clean Air Act, the Clean Water Act, and the Resources Conservation and Recovery Act to make the permit applicant responsible for writing the draft permit.
- Amend CAA and CWA to make the normal permit term longer—perhaps eight years instead of five.
- Amend CWA and RCRA to add language regarding permitting fees similar to the provisions in CAA.
- Amend CWA to authorize the states or EPA to implement tradable permit systems on a watershed basis.
- Enact legislation providing a statutory basis for experimental pilot programs, such as EPA's Project Excellence and Leadership. The legislation should include a procedure through which state experimental permits could substitute for federal permits.
- Commission the General Accounting Office to examine the extent to which EPA has been using guidance and similar methods to circumvent the formal regulatory process, the consequences of doing so, and what action, if any, should be taken.

EPA should

- Work with Congress, the states, and relevant interest groups to develop a facility-wide, multimedia, performance-based permit for major facilities. The permit should be based on an analysis of the flow of materials in the facility.
- Assist the states in defining categories of sources that can be covered by general permits and instituting compliance mechanisms for such sources. The Massachusetts Environmental Results Program provides an example.
- Develop a common permit application form covering all programs to reduce redundant paperwork and encourage coordination among programs at both state and federal levels.
- Integrate information systems, including data standards, to make facility-wide information readily available in a useful form.
- Evaluate and mainstream innovations developed by EPA and state pilot programs. This will require that a new or existing office be given adequate resources and leverage over the program offices.
- Develop procedures to ensure that state permitting programs receive adequate oversight, that oversight is not wasted on programs that do not need it, and that the regional offices have current information to distinguish between the two.

States should

- Use the Environmental Council of the States to exchange information about permitting innovations.
- Ensure that the basic efficiency measures instituted in many states are made routine for all state programs. These include making permitting information and forms available on the Internet, providing one point of contact for major permit applicants, and maintaining a system to track and report the status of permit applications.
- Improve ambient air and water monitoring as an input to allowable effluent and emissions levels and as a check on the effectiveness of permitting programs.

Industry should

- Work with the states and EPA to develop more integrated and flexible permits that encourage pollution prevention.

Environmental groups should

- Examine the status of permits of major pollution sources in their area and take steps to ensure that permits are up-to-date and are being complied with.
- Engage in a productive dialogue with Congress, regulators, and industry about ways to increase the environmental benefits of the permitting system while reducing its inefficiency.

The opportunities for constructive change are many and run the gamut from minor corrections to revolutionary changes. Small permitting reforms can improve the efficiency and effectiveness of pollution control. The bigger challenge is to use permitting as a lever to change the overall pollution control system. The existing U.S. system has changed little in more than 30 years, and it is in need of major overhaul. Permitting can be the starting point for the conception and implementation of an environmental approach for the new century.

■ ■ ■ ■

Notes

1. We are indebted to Blaire Bower for this point.
2. www.gasmallbiz.org link from www.state.ga.us/dnr/ environ/home_files/mainpage.htm (accessed March 14, 2001).
3. www.calgold.ca.gov (accessed April 3, 2001).
4. www.calepa.ca.gov/PACs (accessed April 16, 2001).
5. www.dnraq.state.ia.us/spars_pages/help.htm (accessed April 16, 2001).
6. www.epa.gov/ngispgm3/nrmp/news/ia0008.htm (accessed February 23, 2001).
7. Available at http://assembly.state.ny.us/leg (accessed July 3, 2001).
8. www.epa.gov/owmitnet/permits/backlog (accessed February 15, 2001).
9. www.epa.gov/oar/oagps/permits (accessed March 19, 2001).
10. http://europa.eu.int/comm/environment/emas/faqs_en.htm (accessed May 17, 2001).
11. Also see www.iwrc.org/mswgroot.about.htm (accessed May 8, 2001).
12. www.pca.state.mn.us/programs/p2-s/index.html (accessed April 26, 2001).
13. Ibid.
14. www.pca.state.mn.us/programs/projectxl/xlprojects.html (accessed June 15, 2001).
15. www.deq.state.or.us/programs/greenpermits/moa.pdf (accessed June 15, 2001).
16. See section 3d. of the outline for Concepts for Green Tier Legislation, www.dnr.state.wi.us/org/caer/cea/green_tier/concept/concepts.htm (accessed May 2001).
17. What Is the Environmental Cooperation Pilot Program? www.dnr.state.wi.us/org/caer/cea/ecpp/what_is_ecpp.htm (accessed May 2001).
18. Wisconsin's Green Tier System for Exemplary Environmental Performance, George E. Meyer, May 12, 1999, www.dnr.state.wi.us/org/caer/cea/green_tier/whitepaper.htm (accessed May 2001).
19. See Wisconsin's Green Tier Initiative, www.dnr.state.wi.us/org/caer/cea/green_tier/factsheet.htm (accessed May 2001).
20. Fact Sheet for Environmental Cooperative Agreement between Wisconsin Electric Power Company and Wisconsin Department of Natural Resources, www.dnr.state.wi.us/org/caer/cea/ecpp/agreements/wepco/summary.htm (accessed May 2001).
21. Environmental Cooperative Agreement between Wisconsin Electric Power Company and Wisconsin Department of Natural Resources, www.dnr.state.wi.us/org/caer/cea/ecpp/agreements/wepco/agreement.htm (accessed May 21, 2001); see section X. Commitment to Superior Environmental Performance.

22. Ibid.

23. Fact Sheet for Environmental Cooperative Agreement between Wisconsin Electric Power Company and Wisconsin Department of Natural Resources, www.dnr.state.wi.us/org/caer/cea/ecpp/agreements/wepco/summary.htm (accessed May 2001).

24. www.epa.gov/performancetrack/about/index.htm (accessed May 2, 2001).

25. Ibid. (accessed June 28, 2001).

26. www.epa.gov/performancetrack/program/index.htm.

27. U.S. EPA's Office of Solid Waste, RCRA Expanded Public Participation Rule, www.epa.gov/epaoswer/hazwaste/permit/pubpart.htm (accessed June 27, 2001).

28. www.epa.gov/epaoswer/hazwaste/permit/pubpart.htm (accessed June 27, 2001).

29. Donald Bryce, head of IPC policy in the U.K. Environmental Agency, quoted in Businesses Told Upcoming Directive Mark's Beginning of New Regulatory Regime, *International Environmental Reporter*, June 12, 1996, 527.

30. Finnish Environmental Minister Pekka Haavisto, quoted in Environment Council Makes Breakthrough on IPPC. *International Environmental Reporter*, 491.

31. Pollution Prevention Act of 1990, www.epa.gov/opp tintr/p2home/p2policy/act1990.htm (accessed May 24, 2001).

32. Intel's Environmental, Health, and Safety Performance Report, Environment Section, April 2000, www.intel.com/intel/other/ehs/1999/prog4.htm (accessed June 26, 2001). For example, the company reports, "One of the ongoing strategies to reduce fugitive VOC emissions has been to switch from using 100% isopropyl alcohol (IPA) for surface cleaning to using a diluted solution of IPA and water. Many of our sites, including our Ronler Acres site in Oregon, have actually eliminated the use of IPA for surface and janitorial cleaning, and are using water-saturated wipes instead."

33. Intel's Environmental, Health, and Safety Performance Report, Environment Section, April 2000, www.intel.com/intel/other/ehs/1999/prog4.htm (accessed June 26, 2001).

34. Ibid.

35. Pollution Prevention Northwest, The P4 Project: A Look Back, a Look Ahead, Spring 1999, an issue dedicated to the P4 program, www.pprc.org/pprc/pubs/newslets/newssp99.html (accessed June 27, 2001).

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Acronyms and Abbreviations

BAT	best available techniques (EU)
BREF	BAT reference document (EU)
CAA	Clean Air Act
CSI	Common Sense Initiative (EPA)
CSO	combined sewer overflow
CWA	Clean Water Act
ECOS	Environmental Council of the States
ELI	Environmental Law Institute
EMAS	Eco-Management Audit Scheme (EU)
EMS	environmental management system
EPA	Environmental Protection Agency (U.S.)
EU	European Union
GAO	General Accounting Office (U.S.)
HSWA	Hazardous and Solid Waste Amendments to RCRA (1984)
IPC	Integrated Pollution Control (U.K.)
IPPC	Integrated Pollution Prevention and Control (EU)
ISO	International Standards Organization
MA DEP	Massachusetts Department of Environmental Protection
MDEQ	Michigan Department of Environmental Quality
NAPA	National Academy of Public Administration
NEPP	National Environmental Policy Plan (Netherlands)
NEPPS	National Environmental Performance Partnership System (EPA)
NH_3	ammonia
NO_x	nitrous oxide
NPDES	National Pollutant Discharge Elimination System
NPO	nonproduct output
NRDC	Natural Resources Defense Council
NSR	New Source Review (CAA)
OECA	Office of Enforcement and Compliance Assurance (EPA)
OECD	Organisation for Economic Co-operation and Development
P_2	pollution prevention

P4	Pollution Prevention in Permitting Program (EPA)
PIT	Permits Improvement Team (EPA)
POTW	publicly owned treatment works
PSD	Prevention of Significant Deterioration (CAA)
RCRA	Resource Conservation and Recovery Act
RECLAIM	Regional Clean Air Incentives Market (California)
RFF	Resources for the Future
SCAQMD	South Coast Air Quality Management District (California)
SDWA	Safe Drinking Water Act
SIP	state implementation plan
SO_2	sulfur dioxide
TMDL	total maximum daily load
UIC	underground injection control
VOC	volatile organic compound
VROM	Ministry of Housing, Spatial Planning and the Environment (Netherlands)
XL	Project Excellence and Leadership (EPA)

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