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LEGAL AND INSTITUTIONAL ASPECTS OF REGULATING INTERMEDIA POLLUTION

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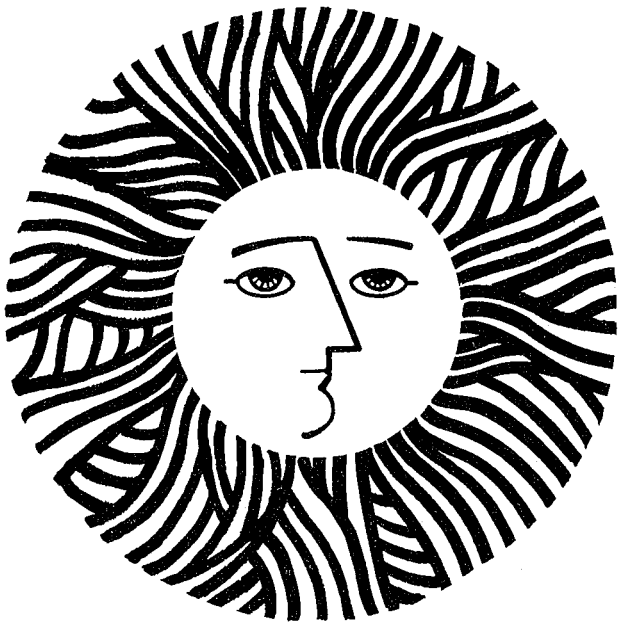

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OF

REGULATING INTERMEDIA POLLUTION

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Executive Summary

This is a report for the Department of Energy about intermedia pollution policy. Intermedia pollution is defined here as the creation of new environmental impacts by controlling existing ones. The Department asked four questions: (1) Do the major environmental laws address intermedia pollution? (2) Does the Environmental Protection Agency (EPA) have rules, regulations, and procedures through which it considers intermedia questions? (3) Do the legislative histories of the laws indicate whether Congress intended for the EPA to consider intermedia issues? (4) In what ways do the existing laws and regulatory procedures exacerbate intermedia pollution?

The answer to the first three questions is yes; much of the report is devoted to amplifying and qualifying that response, the rest to answering the fourth question. The report frames these issues by asking how we can control the adverse environmental i.e., intermedia, impacts of EPA itself. A case study of the intermedia implications of recently issued air pollution standards for coal-fired power plants illustrates the themes concretely. An analysis of policy alternatives for improving intermedia pollution control concludes the study.

The major problems impeding good intermedia policy decisions are: conflicts among and failures fully to implement environmental laws; political pressures; tendencies of EPA to minimize the adverse environmental consequences of its own actions; uncertainties caused by the rudimentary scientific understanding of intermedia pollution; and limitations on EPA's organizational ability to handle whatever complex intermedia information it does obtain.

The final chapter assesses three policy responses to these problems: (1) Do nothing new: allow the environmental policy system to evolve better intermedia decision practices at its own pace; (2) Issue an incremental prod: have top officials make a commitment to improving intermedia awareness and begin reviewing major EPA regulations specifically for intermedia impacts; (3) A new law and EPA office: have Congress pass a law designed to eliminate conflicts among the other statutes, authorize optimum intermedia balancing, and establish an Office of Intermedia Review in EPA to make intermedia decisions. Evaluation of these alternatives depends on how deficient current practices are thought to be.

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CHAPTER I. MAKING ENVIRONMENTAL POLICY COMPREHENSIVE

A. Introduction

Concern about the consequences of uncoordinated pollution control policies provided a major impetus for the establishment of the Environmental Protection Agency (EPA). Officials feared new pollution might be produced by reducing old--fouling of the air to purify the water, despoiling of the land with residues that might best be left to waft out the smokestack. In ordering the creation of the Agency in 1970, Richard Nixon noted that "This consolidation of pollution control authorities would help assure that we do not create new environmental problems in the process of controlling existing ones." The concern persists. In 1979, EPA Administrator Douglas Costle observed: "Practical experience reminds us that certain proposed solutions to one problem may intensify another: solutions to air pollution can increase solid waste problems... and on and on."[1] This study addresses the perplexities of comprehensive policy making as it has evolved under six major environmental laws in the decade spanning these two quotations.

The laws are the National Environmental Policy Act (NEPA); the Clean Air Act; the Federal Water Pollution Control Act as amended by the Clean Water Act; the Resource Conservation and Recovery Act; the Toxic Substances Control Act; and the Surface Mining Control and Reclamation Act.[2]

These laws become concrete policies through the interactions of Congress, the courts, the EPA, and variously organized, unorganized, and even abstract forces like industrial trade groups, the scientific community, technology, and public opinion. Together these groups comprise the environ-

mental policy system; they forge environmental policy, give it whatever comprehensive scope it has.

A socially and economically rational pollution control policy would take a "materials balance" approach.[3] It would recognize that energy and matter are never truly eliminated from the Earth, only transformed. Policy makers need to figure out the most effective ways to reduce total pollution damages, always taking into account the possibility that control alternatives vary in their net costs and effects on the environment.

The problem is that neither the laws, nor the regulatory process, nor the state of scientific knowledge and capacity to process information make this an easy task. Comprehensive environmental decision making is impeded by pervasive uncertainty and inherent tensions between and among policy means and environmental ends. That is one one of the major themes of this report. But another is that the policy system has undergone a gradual learning process. Decisions are more comprehensive in 1980 than they were in 1970. Yet uncertainty remains: we do not know if current practices are good enough. If they are, will they remain so as political, economic, technological, and environmental conditions evolve? Depending on one's faith or fear, the proper policy response now may appear to be do nothing more, or a little more, or a significant amount more, to insure balanced environmental policy making.

B. Study Outline

The study will start with some matters of terminology; move to a consideration of the laws and their evolution under the simultaneous im-

pact of the three branches of government; consider the process and problems of comprehensive decision making at EPA; provide a case study of the environmental implications of regulating air pollution from coal-burning power plants; and conclude with an assessment of recommendations for improved policy making--solutions that take a comprehensive perspective.

C. The Problem Defined: Intermedia Pollution

One formal name given the problem considered here is intermedia pollution--literally, the transfer of pollutants from one of the three media (air, water, land) to another. (The food chain, sometimes contaminated with a pollutant, may also be considered one of the media.) This study concentrates on pollution in a new medium produced as a result of laws, regulations, administrative practices, decisions, and/or technology intended to reduce existing pollution in another medium.

Intermedia pollution may arise from pollution control actions either directly or indirectly. An example of the direct variant would be the possibly toxic residues of electrostatic precipitators. These machines collect the ashes from burning coal that would otherwise pollute the air. If disposed of improperly (or perhaps even properly), the residues may contaminate water. Uniform national emission standards for automobiles provide an example of indirect intermedia pollution. The use of mileage-reducing catalytic converters on cars even in well-ventilated rural locations may unnecessarily increase consumption of gasoline. The refining and transport of that gasoline causes extra water and air pollution, often in industrialized areas that can afford it less.

This latter example reveals that "intermedia" pollution does not always have to involve transfers from one medium to another. Although technically, worsening air pollution in one aspect or area to improve it in another should be called intra-media pollution, the term "intermedia" will be used generically here to cover the creation of new pollution by controlling existing pollution.

The first question is just what the law has to say about intermedia pollution. Chapters II and III will show that the courts, Congress, and EPA, with the participation of affected parties' and public comments have moved the body of law from neglect of intermedia issues to intermittent but genuine concern.

CHAPTER II. INTERMEDIA MANDATES OF NEPA AND THE AIR AND WATER LAWS

A. Introduction: Growing Recognition in Theory, Difficulties in Practice

The environmental legislation of the last decade and the litigation it has spawned comprise a complex mass of law. Though long and complicated, the laws are often vague at crucial junctures, and some contain inconsistent goals. There are also conflicts between the laws. This situation has invited judicial involvement.

1. The Legal Picture in Summary

Here are conclusions on all six laws, in summary:

o Each of the laws does address intermedia issues, some statutes more explicitly than others.

o The history of the major environmental laws shows an evolution in awareness of intermedia pollution. The 1970 air act did not mention other media; NEPA (1969) did, albeit implicitly. But the Clean Water Act of 1977 (amending the Federal Water Pollution Control Act (1972)) did include "non-water" environmental impacts, and the Clean Air Amendments of 1977 inserted analogous language. The resource conservation, toxic substances, and surface mining acts, passed in 1976 or 1977, are inherently intermedia in approach.

o Implementation is another story. Parts of the statutes give the administering agencies authority to assess environmental impacts. But none of the laws explicitly requires that the final decision be made on the basis of such an assessment; and the air and water laws have provisions that seem

to work against overall environmental balancing even as they voice intermedia concerns.[4]

o In the major cases which include intermedia issues, the courts have been relatively deferential to EPA's authority and expertise. This deference has been based on confidence in the EPA's ability to process intermedia information comprehensively and rationally.

o Because implementation of the more recent laws, especially the Resource Conservation and Recovery Act covering land disposal of pollutants, has not begun in earnest, all the legal conflicts and political and organizational barriers to intermedia law enforcement have not been exposed.

2. Legislative Intent: Difficult to Specify

The "legislative intent" of Congress regarding intermedia pollution is difficult to discern. Literally, "Congress" has no singular, discoverable "intent" in passing a law. Different members vote for (or against) a bill for widely varying, even diametrically opposed reasons. But to interpret frequently vague statutes, courts have developed ways of discerning the underlying meaning of the words Congress uses. The reading of courts, not the author of this report, are most important here: the judicial interpretations are the ones that set policy.

A detailed discussion of House and Senate Committee reports, floor debates and other evidence would therefore not be very productive. In fact the shape of Congressional intent will become visible in the rest of this chapter and the next. Nobody believes Congress would intend for EPA to make environmentally perverse decisions. But rational intentions have not

prevented Congress from passing air and water laws that may yield less than optimal decisions, and the nascent recognition of intermedia problems in the late 1970s has not led Congress to grapple explicitly with the complications an intermedia perspective raises for the nation's environmental policy. Furthermore, there are some recent indications (discussed in Chapter III, Section B.4) that Congress is retreating in some respects from such a hard look. For now, the main actors are EPA and the courts.

B. NEPA: A Vague Mandate to Balance

The National Environmental Policy Act of 1969[5] (NEPA) contains language that seems sensitive to intermedia pollution. The very first sentence of Title 1 says the Congress "recognizes the profound impact of man's activity on the interrelation of all components of the natural environment...."[6] The law directs federal agencies to "utilize a systematic, interdisciplinary approach" in considering environmental impacts of major federal actions.[7] NEPA applies only to actions of the federal government--a more amorphous limitation than at first apparent, since there are many joint or indirectly funded ventures.

1. NEPA's Administration

Under this statute, the Council on Environmental Quality (CEQ) issues the regulations that federal agencies must follow under NEPA. "As presently stated, the regulations clearly do not require an agency to opt for the environmentally preferable alternative in every instance. The

provisions may nonetheless lead a reviewing court to inquire into the agency's substantive decision not to adopt that choice in order to assure itself that the actual balance struck was not arbitrary and capricious."[8] Thus the law relies on judicial action for the enforcement of its high-sounding but vague mandates. (As a last resort, if the CEQ feels action will be environmentally unsound, the Council can take its determination to the President and ask that the project be modified or abandoned.[9]) In general, the Supreme Court has been satisfied when the federal agencies appear to have considered various alternative courses of action and their environmental impacts; the Court has not disturbed agency decisions except when they appeared arbitrarily and capriciously to ignore an environmentally preferable alternative.[10]

The result can be to allow neglect of the intermedia aspect of a decision. In Vermont Yankee v. N.R.D.C. for example, the Supreme Court rejected a contention that one of the alternatives the Atomic Energy Commission (AEC) should have considered before licensing a nuclear power plant was conservation.[11] From an intermedia perspective, conservation is an important alternative for environmental protection, one with low net impacts. The Court ruled, though, that "Time and resources are simply too limited to hold that an impact statement fails because the agency failed to ferret out every possible alternative, regardless of how uncommon or unknown that alternative may have been at the time the project was approved."[12] But this case concerned the AEC; research has uncovered no major cases brought under NEPA challenging an EPA decision.

2. EPA Writes Some "Environmental Impact" Statements

And the main question here is the applicability of NEPA to EPA's own pollution control decisions. NEPA's major concrete requirement is the production of environmental impact statements for federal actions. Is EPA required to compile formal environmental impact statements for its decisions? The answer is no. Courts have consistently ruled that a proper EPA decision procedure entails the "functional equivalent" of a statement, making a formal one unnecessary.[13]

Nonetheless, during 1973 some pressure developed in Congress to have EPA prepare environmental impact statements under NEPA just as all the other Federal agencies do.[14] Despite court rulings, the Agency, probably in response to Congressional critics, issued a statement of policy promising to write such statements when it promulgates the following regulations under the Clean Air Act: national ambient air quality and hazardous pollutant hazards; major regulations for State Implementation Plans; and new source performance standards.[15] The statements are supposed to include consideration of alternatives and their adverse as well as beneficial impacts on both the primary medium and the other media. The agency also prepares impact statements for the construction of the municipal water treatment plants it funds and for discharge permits issued to new sources of water pollution, as well as for occasional activities under the other laws. Sometimes the statements are separate reports. In other cases they are included with documentation supporting regulations published in the Federal Register.

3. A Statement for a New Air Standard

The Environmental Impact Statement filed for the new source performance standards EPA issued on June 11, 1979 for electric utility steam generating plants[16] provides an example of the nature and quality of EPA impact statements.[17] These new standards are substantially more stringent than the original ones promulgated under the Clean Air Act in 1971. With the country moving toward rapid expansion of its use of coal for generating electricity the regulation is one of the most economically significant actions EPA has taken recently.

The statement is eight pages long. Much of the document is simply an index to a series of 21 reports the EPA commissioned to probe alternative standards and their effects. The statement shows where particular issues (such as "alternatives to the action taken," "costs and economic impacts," "water impacts" and "solid waste impacts") are addressed in the 21 reports.[18]

The statement's own analysis of environmental impacts is brief indeed: it consists of one verbal table reproduced below and two sentences.[19]

Matrix of Environmental and Economic Impacts of Regulatory Alternatives Relative to a Baseline of No Control[20]

Administrative Action	Air Impact	Water Impact	Solid Waste Impact	Energy Impact	Economic Impact
[originally] Proposed Standards [Sept. '78]	+4**	-1**	-3**	-3**	-3**
Final Standards: Wet Control Systems Only	+4**	-1**	-3**	-2**	-3**
Final Standards: Wet + Dry Control Systems	+4**	-1**	-2**	-2**	-2**
No Revision to Current Standards	-3**	-1**	-1**	-1**	-2**

Key:

+	Beneficial Impact	0	No Impact	*Short-Term Impact
-	Adverse Impact	1	Negligible Impact	**Long-Term Impact
		2	Small Impact	***Irreversible Impact
		3	Moderate Impact	
		4	Large Impact	

This is not a true environmental impact statement. Its main function is to index the voluminous background literature supporting the regulation. Any outsiders seeking information about the EPA's consideration of the environmental effects of this regulation would have to construct their own statement from these documents. It would be incorrect, however, to conclude that the failure of the EPA to produce one integrated environmental

impact statement reveals a wholly unintegrated decision-making process. More on that process later. The point here is that, from this example and others unearthed in this investigation, the EPA does not compile authentic, self-contained, comprehensive environmental impact statements for its new regulations.[21]

In any case, it is one (relatively easy) thing for the EPA to write an environmental impact statement or its equivalent; it is quite another for the agency actually to make its decisions on the basis of net environmental effects. Important court rulings on this matter have come not under NEPA but under the major substantive statutes, the Clean Air and Water Acts.

C. The Clean Air Act: Belated and Mixed Intermedia Mandate

1. Conflict in Statutory Goals

The original act passed in 1970 had "a single-minded goal of improving air quality."[22] It took no explicit account of other media. The amendments of 1977 reflected an increased awareness of intermedia impacts. One provision directed EPA to establish new stationary source emission standards that "reflect ... the degree of emission reduction achievable through the application of the best system ... which (taking into consideration any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated...."[23]

Notice the relative weakness of this wording. It requires "consideration" of non-air quality but not a particular weight in final decisions for the information considered.

Furthermore, there are conflicts between the goals of the Act and the vague mandate to consider non-air quality environmental impacts. Thus, for one example, "the prospect of serious water pollution generated by air pollution control devices such as stack scrubbers, would apparently not be grounds for an extension of the deadline for achieving the primary ambient air standards...."[24] Another example of a conflict within the Act is the uniformity of emission standards. As the example of automobile exhaust control indicated earlier, failing to adjust the level of treatment for local conditions may produce excess energy consumption and additional intermedia pollution. A third example might be the Act's reliance upon the states to establish and enforce their own State Implementation Plans.[25] Specific regulations and enforcement decisions can raise intermedia issues that state officials facing political pressures, manpower limitations, or information deficits may neglect.

2. Court Rulings Give EPA Discretion on Intermedia Issues

The major intermedia case under the Clean Air Act is Portland Cement Association v. Ruckelshaus.[26] There the D.C. Circuit Appeals Court held that EPA's decisions should weigh net impacts, saying "we cannot imagine that Congress intended that 'best' [control technology] could apply to a system which did more damage to water than it prevented to air."[27] But the ruling also said that courts would not intrude into the substantive decision EPA reached as long as the proper procedure, including such a net analysis, seemed to be followed. The court noted that "To the extent that EPA is aware of significant adverse environmental consequences of its proposal [of new rules],

good faith requires appropriate reference [to those consequences] in its reasons for the proposal and its underlying balancing analysis."[28]

The court issued a firm prod by remanding the decision back to the EPA for further evidence that relevant information, including data on intermedia effects, was actually examined. This major decision certainly taught the Agency that it would have to support its regulations with recorded evidence that it did consider counterproductive environmental effects. Judicial review seems to stop with that procedural requirement. For after the remand, the Portland Cement Association sued EPA again, claiming among other things that there would be increased water pollution from larger piles of kiln dust caused by the tight air emission standards. The court deferred to "the judgment of the Administrator that the problem of water run off from collected piles of particulate matter is less than the problem of uncontrolled releases of particulate matter into the atmosphere."[30] It was enough that the Administrator had considered this problem; the court did not probe into the details of whether the decision was correct. A similar pattern of deference after a decision was remanded for insufficient intermedia evidence occurred in a suit of chemical manufacturers and petroleum refiners against the Agency, Essex Chemical v. Ruckelshaus.[31]

A combination of Congressional uncertainty and ambivalence makes the amended Act a problematic tool for intermedia policy making. Congress has exempted the EPA from the need to prepare an environmental impact statement for actions under the Clean Air Act.[32] This was done, according to the legislative history, "to avoid any procedural delay" in imple-

menting clean air mandates.[33] Yet the EPA writes statements anyway. The more important result of this provision is that it seems to signal EPA that achieving the specific individual goals of the Clean Air Act merits higher priority than carefully deciding on and pursuing what it believes to be on balance the best overall policy.

3. Conclusion: Court Rulings Stimulated Intermedia Attention

Since the Portland Cement and Essex cases, courts have applied a fairly deferential standard of review, hesitating to delve into the particulars of EPA's environmental balancing. The relatively weak wording of the 1977 amendments indicates that Congress has been loath to require that EPA's final decisions be the ones that are on balance most environmentally beneficial. Both institutions seem convinced that decisions about how to use intermedia data in EPA decisions should be left to the Agency. The difference is that whereas the statute contains somewhat conflicting messages as to Congress's intent, the courts have clearly transmitted their desire for the Agency at least to consider potential adverse environmental impacts. The Agency has responded in some measure to this judicial preference, as the case study in Chapter V will show.

D. The Federal Water Pollution Control Act (1972) and Clean Water Act (1977): A Similar Story

1. Developing But Ambivalent Awareness of Intermedia Effects in Congress

A parallel sequence characterizes the evolution of clean water legislation and judicial holdings. The water statute exempts EPA from the requirement of filing environmental impact statements for its water protection actions

under the Act.[34] Again, Congress seemed to fear unreasonable administrative delay if statements were mandated.[35] Recent amendments, the Clean Water Act of 1977[36], encoourages consideration of intermedia effects. The law directs EPA to identify the best pollution control technology currently available in setting emission standards. To make that determination, EPA "shall also take into account... non-water quality environmental impact (including energy requirements), and such other factors as the Administrator deems appropriate."[37]

But again Congress issued conflicting signals. For the amended law still contains "the national goal of eliminating the discharge of all pollutants" into water.[38] Such a stricture may work against environmental balancing; it fails to acknowledge the possibility that reducing water discharges to zero might unnecessarily burden land and air, and cause violations of laws covering those media. And the wording of the intermedia provision is vague--EPA must "take into account" non-water quality, but it is not compelled to use the information in any particular way.

2. Judicial Holdings Exepct Intermedia Decisions But Leave Specifics to EPA

Probably the leading court case that interprets these matters is Weyerhaeuser v. Costle.[39] The court found the law does not require EPA "to use any specific structure such as a balancing test in assessing" non-water quality and other factors.[41] Rather, the court argues, "Congress was resolved to rely on EPA's own internal structure and personnel attitudes to

ensure that the net result of all its programs would be a substantially enhanced environment."[41]

In refusing to disturb the EPA's decision in the specific case under review, the court concludes that the Act's "listing of environmental impacts as a factor encourages the Agency, if more incentive is necessary, to seek information from relevant sources outside the Agency and from personnel in sections of the Agency devoted to non-water matters. Once that communication is assured, the likelihood that the expected inter- and intra-agency sensitivity to the environmental benefits and impacts will not occur is slight indeed."[42] But notice the basis for this assertion, provided in a footnote: "In the course of EPA's internal review of its effluent limitations, personnel with non-water environmental responsibilities presumably have a part in assessing the limitations and their impacts."[43]

These are rather large (though not necessarily inaccurate) presumptions. They gloss over both the potential conflicts within and between the laws regulating the different media and the administrative difficulties facing EPA in considering intermedia impacts. More on the latter shortly. Meanwhile it is enough to notice another instance of judicial deference to EPA's discretion in assessing intermedia pollution.

In a more recent case that explicitly concerned conflicts between statutory provisions, the relatively deferential stance was maintained.[44] The court found that the Agency had properly harmonized conflicting mandates while staying within its statutory authority.

No judgment about the desirability of such deference should be inferred from the above discussion. Judicial faith in the EPA may be substantial, there is reason to doubt that an interventionist judiciary could do any better in unraveling the complexities of intermedia balancing. One major deficiency that would diminish the quality of their intermedia decisions is judges' lack of scientific expertise. Were courts to begin commissioning multi-year, multi-author technical studies of the sort sponsored and used by EPA for its decisions, they would quickly become bureaucracies themselves. Constitutional tradition, the precedents of administrative law as a whole, and judicial temperament set a boundary to intervention in bureaucratic decisions.[45]

3. Forthcoming Consolidation Plan Could Enhance Intermedia Decisions

An initiative that should enhance intermedia awareness is the Consolidated Permits Application Program being developed by the Office of Water Enforcement.[46] It is bringing together in one form the applications for National Pollutants Discharge Elimination System permits under the Federal Water Pollution and Clean Water Acts; hazardous waste management permits under the Resource Conservation and Recovery Act; Underground Injection Control permits under the Safe Drinking Water Act[47]; and Prevention of Significant Deterioration permits for new sources under the Clean Air Act. According to Fanny Knox of the Office of Water Enforcement[48], this form will channel information about all of the media to air, water, and solid waste program administrators, and should therefore induce some pressure to attend to intermedia problems in the administration (as opposed to the development) of the relevant regulations.

CHAPTER III. THE INTERMEDIA MANDATES AND PROBLEMATIC IMPLEMENTATION OF RECENT LAWS

This chapter will show that the more recent environmental laws are inherently sensitive to intermedia pollution. But it is too soon to know whether this spirit will be carried out in concrete decisions. The laws have engendered considerable political pressure at a time when support for additional investment in environmental protection over such objectives as product in or energy production is waning. And the complexity of the tasks they set for EPA has delayed implementation considerably.

A. Toxic Substances Control Act: A Complicated, Developing Policy on Dangerous Chemicals

The Toxic Substances Control Act directs the EPA to oversee testing of chemicals and to regulate those that might harm human health or the environment. The law says, "The term'environment' includes water, air, and land and the interrelationship which exists among and between water, air, and land and all living things."[49] The definition is an intermedia one. And in promulgating rules under this Act the EPA is supposed to publish a statement that reflects consideration of the effects of its decisions on the "environment."[50]

These provisions encourage sensitivity to intermedia pollution in decision making. The Administrator must survey all the environmental laws that grant him authority and decide which would provide the most

efficient and least costly path to regulating a dangerous chemical. He or she must also "coordinate actions taken under this Act with actions taken under other Federal laws administered in whole or part by the Administrator."[51]

The basic air and water statutes generate mixed, occasionally conflicting messages; so it is not certain precisely how the EPA will or can adhere to these intermedia mandates. In any case, the Agency has thus far done very little regulating under the toxics law.[52] Whether the intermedia provisions will actually be followed in administering the law remains to be seen. The burden of regulating over 40,000 chemicals, discovering which to test and which are hazardous, is enormously complex in itself.[53] The added need to assess the net environmental effects of banning a chemical (e.g., are its substitutes and the process of producing them worse?) increases the load on the Agency.

B. Resource Conservation and Recovery Act of 1976: Future Keystone?

1. Introduction: Clear Intermedia Consciousness

In the findings that introduce the Resource Conservation and Recovery Act of 1976, Congress made notes that "as a result of the Clean Air Act, the Water Pollution Control Act, and other ... laws respecting public health and the environment, greater amounts of solid waste (in the form of sludge and other pollution treatment residues) have been created.... Environmentally unsound practices for the disposal or use of solid waste have created greater amounts of air and water pollution...."[54] The Act's objectives include "promoting ... solid waste management, resource recovery, and re-

source conservation systems which preserve and enhance the quality of air, water and land resources...."[55] Finally, the law directs EPA to "integrate all provisions of this Act" with the other environmental laws.[56]

2. Delayed Implementation

Thus the law evinces awareness of the problem of creating new pollution by controlling old, explicitly recognizes the need to promote environmental quality in all three media, and requires integration with each environmental statute. The final promulgation and implementation of regulations under this law have not yet occurred. Until now it has been relatively easy for polluters and regulators alike to see that air and water pollutants were turned into a solid waste and then to forget about them. A complicated system of "cradle to grave" management of solid wastes is scheduled to replace this neglect beginning later in 1980. Intermedia tradeoffs and conflicts between the air, water, and land laws should then become clearer.

Regulations issued so far indicate a substantial commitment to integrating this law with the water[57] and air[58] statutes. In addition, the Agency will issue an environmental impact statement for its hazardous waste regulations once they are all in final form.[59] Since these regulations will involve packaging and transporting waste, constructing new facilities, and other actions using energy and causing environmental impacts, this statement should indicate the degree of intermedia balancing the Agency will employ in following the Resource Act.

3. Political and Economic Pressures May Stifle Implementation

There are some reasons to doubt the law will be fully implemented any time soon. One is the intense political opposition that often confronts efforts to establish new solid waste disposal sites.[60] Shortages of sites even now constrain EPA options. They could lead to tacit agreements to delay enforcement of new regulations. Another problem is the limited resources of many states: the statute provides that non-hazardous waste is to be handled by state governments. The considerable expense to the polluter of environmentally benign land disposal may also work against an optimum use of land in pollution control.

4. Amendments Weaken Original Act

Recently-passed amendments to the Resource Act provide a striking example of political pressure. By 386-10, the House of Representatives in February 1980 approved changes, similar to those accepted by voice vote in the Senate in June 1979, that would reduce the Act's intermedia ambit. (The bills, now in conference, are H.R. 3994 and S. 1156.) The House bill directs the EPA to conduct a study to determine if the waste produced by burning coal and by the air pollution control systems attached to coal-fired power plants are hazardous. Until the hazards are proved, EPA would be prohibited from regulating the disposal of these wastes under the Act. Notice that these provisions go directly against the findings that introduce the original Act (quoted in Section B.1 above).

The reasons the sponsors give are that such regulation would increase the cost of using coal to generate electricity by an estimated $1 billion

for the first three years of implementation, without any assurance that the coal wastes are dangerous; and that the regulations would discourage use of coal and innovative reuse of coal waste products (e.g., for cement or road base).[61] Without debating the merits of these contentions, one point stands out: as will be shown in Chapter V, the Agency and others have been studying coal waste. The scientific problems are complex; it is unlikely that any definitive proof of the benign or hazardous impacts of coal waste will be found soon. The Congress may be placing too much faith in quick and easy science.[62]

As a practical matter, these amendments could allow solid waste from coal-fired plants--which could turn out to be quite dangerous--to go largely unregulated for many years. The amendments also exempt other wastes, including those from existing municipal water treatment plants, cement kiln dust, and oil and gas drilling. Clearly, political pressures are reducing the intermedia scope of the Resource Act. Given competing objectives like energy production and economic growth, this might be necessary or inevitable. The point here is that implementation of this law will take a long time; ultimately, it may not serve as the intermedia centerpiece it might have been.

5. The Congressional Mood May Be Changing

A more general lesson might be that sentiments in Congress are entering a third phase. The first was total neglect, the second vague appreciation of intermedia pollution. The new one may be clear awareness and retreat. Now that the Resource Act has made certain intermedia tradeoffs explicit,

Congress may be backtracking, deciding that the costs of comprehensive environmental management are too high. In the coal-burning instance, the legislators have implicitly decided that, at least for a time, dirtier land and water (from air pollution control system wastes) are acceptable costs for cleaner air. The vote could be a harbinger: Congress may start to inject itself more directly into intermedia policy making, perhaps in a way that discourages net balancing.

Notice that this decision might have perverse effects from the point of view of those who seek enlarged use of coal and/or less stringent environmental protection. A weakened Resource Act could lead EPA's air and water offices to impose stricter--more costly--regulations because the intermedia impacts on land will no longer be under the Agency's jurisdiction. If coal wastes were covered by the Resource Act, the air and water regulation writers would have to consider the costs of legally disposing of the solid wastes their rules will generate; that consideration could lead to less ambitious air and water cleanup goals. (More on these matters in Chapter V.)

C. Surface Mining Conservation and Reclamation Act of 1977: Political Pressures Confront an Intermedia Law

1. EPA Takes Secondary Role

The Surface Mining Act is the only major environmental law not directly administered by EPA. The Act establishes an Office of Surface Mining and Enforcement in the Department of the Interior. Its major purposes are assuring that surface coal mining will not cause any serious damage to

the environment; requiring reclamation of mine sites; and preventing mining on land that cannot be restored to approximately its original ecological, aesthetic, agricultural, or silvicultural character.[63]

The Act requires the Office to obtain "the written concurrence of the Administrator of the Environmental Protection Agency with respect to those regulations ... which relate to air or water quality standards promulgated under the authority of the Federal Water Pollution Control Act ... and the Clean Air Act...."[64] By explicitly mandating compliance with the air and water laws and consultation with EPA, the Act seems to guarantee that both agencies will consider the intermedia aspects of controlling pollution. Again, however, conflicts within and between the air and water laws may hamper intermedia decision making.

2. Coordinating the Two Agencies May Be Difficult

There is also the problem of coordinating Interior and EPA, two agencies with somewhat different historical traditions and tasks. The Interior Department is likely to be more responsive to the Carter Administration's commmitment to increase exploitation of easily (surface) mined Western coal. It may be relatively easy for the Office of Surface Mining to fall into the habit of neglecting complications raised by intermedia aspects. Court rulings on the authority of the Secretary of Interior to regulate water pollution under the surface mining law indicate he or she has wide discretion to set rules on matters not explicitly addressed by the water acts. But on issues directly covered by water law, the Secretary is bound by its provisions and must coordinate with EPA.[65] The po-

tential for lengthy negotiations between the two agencies seems substantial; one court has ruled that delay in issuing regulations because of such bargaining is acceptable.[66]

Whether and where the intermedia aspects of surface mining will receive significant attention is not yet clear. The law was a highly controversial one. It took a long time to pass and remains a subject of considerable debate and pressure in Congress.[67] Its implementation has not yet truly been tested.

D. Caveats on the Future

1. Judicial Review Could Become More Intrusive

Litigation on intermedia issues seems to be in its infancy. A larger volume of cases involving more costly policy choices could change the tenor of court rulings. A major court like the U.S. Court of Appeals for the D.C. Circuit (which hears most important cases) could change its stance and take a closer look at EPA's or the Office of Surface Mining's intermedia decision making. The court could require the agencies to establish formal operating procedures for explicit net environmental balancing. It might also put some pressure on Congress to clarify conflicting statutory provisions that exacerbate intermedia problems. The Supreme Court's position towards such developments is impossible to predict.

2. Potential Legal Conflicts Are Masked By The Slow Pace of Promulgating Regulations

Regulations for disposal of pollutants on land have yet to be fully promulgated. The land is the final repository for many pollutants and for

the waste products generated by pollution control. The Resource Conservation Act is the law governing land disposal, but its implementing regulations will not be finalized until sometime later in 1980. The vacuum has retarded intermedia decision making. Without firm regulations, neither the economic cost nor legal feasibility of actions taken under the other laws that might affect land are fully discernable. The Toxic Substances Control and the Surface Mining Control and Reclamation Acts are also just getting started; the impact of their regulations on the other programs cannot be ascertained yet, either.

And even under the better established air and water programs, regulations do not cover all contingencies. For example, one way of disposing of solid and liquid waste from coal power plants is in ponds. Chemicals may evaporate from them, moving from water to air. No regulations govern these emissions, whose seriousness and precise chemical composition is not known. Thus other potential conflicts between laws covering the different media will be hidden until scientific knowledge advances and the agencies take cognizance of that new information.

CHAPTER IV. INTERMEDIA DECISION MAKING IN THE EPA

According to environmental law professors Richard Stewart and James Krier, "The ideal of integrated environmental management has not been achieved in practice at EPA, in part because of the agency's internal organization, in part because of the statutes it administers, and in part because of the exigencies of effective regulation.... Systematic study of the effects of regulation in one medium (such as air) on environmental quality in other media (such as water and solid waste) is rare and consideration of such effects does not play a basic role in the design of regulations."[68] Yet the EPA has three opportunities to generate intermedia information and use it in writing regulations. First are the internal procedures of regulation creation and assessment; second, the comments of affected parties solicited by the Agency; and third, the litigation that often follows the issuance of rules. This chapter will show that the EPA does take some advantage of these opportunities for intermedia cogitation. The case study in the next chapter will help to illuminate the strength and shortcomings of the process in more depth.

A. EPA's Process of Forming Regulations Allows Some Consideration of Intermedia Pollution

1. EPA's Prescribed Decision Process Involves All Media Offices

In May 1979 the EPA published a guide to its standard process of regulation formation. According to that document, the Agency does have procedures allowing examination of the intermedia implications of its regu-

lations. The EPA considers about 200 of its regulations to be "Significant." It classifies these as "Major" or "Routine." The Major ones are defined by several criteria including whether they "cause a substantial impact on another Federal agency or program," address "a major health or ecological problem," or "result in a major health, ecological, or economic impact."[69]

Most regulations involving energy-related environmental pollution are classed as "Major"--12 of 19 listed in a recent compendium of EPA regulations currently being developed.[70] Any EPA regulation substantially affecting energy production and use will be classified Major and should go through the following procedure. Even the Routine rules receive similar treatment, although with less attention from high-level Agency management.

Regulations develop in four stages: starting work, preparing a development plan, preparing a decision package, and conducting an internal review. First a work group forms. Depending on the issue involved, it may have staff from different media offices, but it is supervised by a lead office--the one with primary responsibity for the law mandating the regulation. The development plan put together by the work group indicates the regulatory alternatives available, and includes a plan for internal EPA coordination on the regulation and for consultation with interested external parties. According to the guide, these plans are reviewed by the Agency's six Assistant Administrators, the General Counsel, and other top staff members. The decision package is substantive. It describes the "alternatives considered, environmental, economic, and resource impacts

... and recommended action."[71] The package also includes "support documents that lay out the major issues and show how alternatives were analyzed. These analyses identify (where possible) the regulation's environmental effects.... An Environmental Impact Statement is written when necessary to comply with Agency policy."[72]

The first three processes are identical for Major and Routine regulations. The final phase, internal review, is differentiated. Both types of rules are inspected by a Steering Committee on which the six Assistant Administrators (covering the different media) are represented. The committee is supposed to resolve any issues on which the work group did not achieve consensus. "Red Border Review" by all Assistant Administrators, the General Counsel, and chief Staff Office Directors follows. For Routine regulations this appears to be a rubber stamping process. The high level officials go over Major rules in more detail, checking for comprehensiveness and presenting still-unresolved issues for resolution by the Administrator. After the Administrator decides, the regulation moves to publication as a proposal in the Federal Register.

2. Real Decisions Do Not Always Conform

It should come as no surprise to learn that this textbook procedure is not always followed precisely; nor does it necessarily produce good intermedia information or decisions. An EPA attorney writing before the above document was issued but describing largely the same formal process, cites numerous shortcomings. Even if they are a forum for ventilating grievances of other offices, work groups are often dominated by the lead office, the

author asserts. And internal review is contaminated by intra-organizational politics. Offices, he claims, often hesitate to criticize each other's rules for fear that the table will be turned next time around. In any case, truly sticky issues generate political pressures, which draw in the Agency's highest managers. The author believes these officers may make their decisions on the basis of extraneous matters such as which staff members they trust most or which are the most articulate.[73]

3. Conclusion: The Process Varies

In some instances there may be considerable truth to this less-than-ideal picture. But the officials interviewed for this study would deny it applies to them. Several maintain that offices in charge of other media are regularly consulted and that their views do carry weight. They contend that the review process, if not the work group, does identify intermedia problems. There are some reasons to think these assertions increasingly true: the intermedia language in recent Acts and amendments; judicial admonitions to check for intermedia effects; slowly increasing scientific knowledge about the transfer and fate of pollutants in different media; and a maturation of the program offices that encourages them to protect their own turf--especially, the growth of the Office of Solid Waste, which is no longer always content to allow land to be the final repository for materials controlled by the Air and Water programs.

The most accurate conclusion would probably be that while the schematic of Agency decision making laid out in the Federal Register does not obtain in all particulars or all cases, its spirit is honored to a varying degree in most decsions.

B. Public Comments May Inject Intermedia Information

1. Participation Through Varied Avenues Provides Data

After regulations are proposed in the Federal Register, public comments are invited. The EPA takes these comments quite seriously, if only to minimize the likelihood of successful lawsuits. In addition, under judicial guidance or prodding, the Agency has developed a series of "hybrid" procedural mechanisms for external participation, including notice and comment with public hearings and rule making on a trial-type hearing record.[74] These processes may bring out intermedia implications of regulations. Affected firms can be counted on to argue against regulations they feel will lead to violations of other laws or to additional disposal or treatment costs in a second medium not accounted by EPA.

After the comment period of two or more months (it varies) or other external input, the regulation is reconsidered, passing again through the third and fourth stages described in Section A above before final promulgation.

2. The Example of New Air Standards for Power Plants

The Background Information Document prepared for the new air pollution regulations for power plants lists several hundred commenters. Some complained that the Agency did not investigate intermedia impacts fully enough.[75] The EPA's response was quoted in Chapter II, Section B.2. In the final regulation document published in the Federal Register, major comments are also answered. The response on intermedia effects was: "A few commenters criticized EPA for not considering amendments to the Federal Water Pollu-

tion Act (now the Clean Water Act), the Resource Conservation and Recovery Act, or the Toxic Substances Control Act when analyzing the water pollution and solid waste impacts of FGD [air pollution control systems]. To the extent possible, the Administrator believes that the impacts of these Acts have been taken into consideration in this rule-making."[76]

Despite the terseness of this particular reply, the Agency frequently modified its original regulation proposal in reaction to commenters. Whether this responsiveness promotes or retards intermedia balancing depends on the particular decision. In some cases the modification may have a beneficial net effect, in some a detrimental one. Since the EPA's reactions to comments often involve political bargaining and compromise as much as policy analysis, intermedia implications may frequently obtain only passing attention. For example, in response to a barrage of comments, the Agency changed the time period it would use to evaluate average sulfur dioxide emissions from 24 hours to 30 days.[77]. To be sure, the Agency gave a number of analytical reasons for the slackening of the standard (which now allows a utility to emit high levels of pollution on many days in a month as long as the average is low enough). But plain old political arm-twisting also may have played a part in the decision, with its effects on air quality, acid rain, smog levels, and the amount and flow of waste from the pollution control process.

C. Litigation Often Has Intermedia Consequences

The Agency is frequently sued whatever its efforts to balance conflicting public desires and legal mandates. As the court cases discussed in

Chapter II illustrate, the plaintiffs sometimes include an intermedia attack in their complaint. This action has two functions. It ensures that intermedia balances will have some influence on the judicial decision that shapes the final policy. And it gives the Agency an incentive to pay attention to intermedia pollution before issuing regulations.

These judicial contributions to intermedia decision making were discussed in Chapters II and III. Here a more negative side to the role of the courts merits mention. Environmentalists have frequently sued the EPA charging unreasonable delay in enforcing laws. In some cases, the courts have responded by laying down detailed, accelerated schedules for EPA rule making. Certainly these orders have reduced environmental damage that might otherwise have taken place during a longer period without regulations. But rushed decision makers may neglect to probe the usually complicated, and thus delaying, questions of intermedia effects.

CHAPTER V. THE CASE OF COAL

By what criteria are intermedia issues judged? How frequently are they discussed directly? Do intermedia effects ever alter EPA decisions? A case study of the new air pollution standards for coal-burning power plants will help answer these questions, and illustrate the major problems of intermedia policy making. The case will illustrate that, like other governmental and private organizations, the EPA may have incentives and tendencies not to explore fully and critically the environmental consequences of pursuing its objectives.

The three targets of the revised new source performance standards are sulfur dioxide, solid particulates, and nitrogen oxides. Uncontrolled, these pollutants would have serious ecological, aesthetic, economic, and human health effects. The chapter looks only at the intermedia ramifications of controlling the first two. The process of reducing nitrogen oxides seems to have no significant environmental consequences.[78]

A. Developing Standards Entailed Imperfect Intermedia Balancing

1. The Omnipresence of, But Need to Resolve, Uncertainty

Intermedia work groups and committees did formulate this regulation (see again Chapter IV, Section A). But the law of the primary medium, the Clean Air Act, propelled and dominated the process. There were numerous uncertainties about the intermedia effects of the new standards. While EPA's attempt to resolve them was considerably more than token, it settled uncertainties in favor of pressing ahead with the primary (air) mandate.

2. A Second View of Coal's Effects

An independent study commissioned by the Department of Health, Education, and Welfare--the Rall Report[79]--on the environmental aspects of accelerated use of coal makes the EPA's analyses of the intermedia unknowns appear relatively sanguine. The Agency's intermedia judgments are based on optimistic predictions--about implementation of all environmental laws and about the impacts and costs of handling the waste products of the newly mandated pollution control techniques. The Rall Report emphasizes how little is known[80]:

> ... the Committee members unanimously expressed reservations about the data and tools available for effective forecasting. Data on future coal consumption, on emission inventories, and on current and future ambient air quality are often incomplete, discontinuous, conflicting, or unavailable for specific pollutants and for specific locations. Methods for converting emissions into concentrations of substances in air and water (modeling) are controversial and sensitive to initial assumptions. Monitoring systems, which could generate data and verify modeling forecasts, are inadequate as to number, location, uniformity and reliability. Often, these systems measure the wrong pollutants at the wrong time.

3. The New Standards Had Political Origins

Congress stimulated the revision of the air standard in its debate over the 1977 Amendments to the Clean Air Act. The House Report shows that many members of Congress felt the standards based on the 1970 law had discriminated against Eastern states since they could largely be met simply by burning low sulfur (Western) coal, without any control devices. This situation also reduced the market for new pollution control systems; research and development for innovative technology was thereby slowed.

Yet innovations (and their widespread use) are needed if more and more high sulfur coal is to be burned without causing environmental deterioration.[81] External political decisions help to shape the Agency's agenda and incentives for intermedia balancing.

4. Instances of Intermedia Decisions

Intermedia aspects of pollution were not deliberately, consciously downplayed by any means. They were and are being studied by EPA scientists and policy analysts within the constraints of available knowledge and technology. The Agency commissioned several reports on the subject.[82] A more concrete instance: as EPA was developing the new standards, engineers were perfecting new, "dry" methods of reducing sulfur dioxide. The Agency modified the new regulations in order to encourage the employment of dry rather than traditional wet techniques. Among the reasons were that dry treatment costs less, uses less water and energy, and produces a "waste product ... more easily disposed of than wet sludge."[83]

Further, consonant with the decision making guidelines summarized earlier, water and solid waste officials were consulted and gave their approval for the air regulations.[84] But here organizational factors may have played a part in reducing the weight given intermedia effects. The solid waste regulations had not been issued, so the Office of Solid Waste would have had trouble arguing their regulations would be violated by the air standards; nor could that Office offer completely reliable figures on the costs of meeting their not-yet-promulgated standards. (The amendments discussed in Chapter III, Section B.3 had not been

passed.) The Office of Water Enforcement is only now about to tighten its regulations for utility plants under the Federal Water Pollution Control and Clean Water Acts.[85] It may not have been in the position to focus clear attention on water impacts in 1978 and 1979 when the air standards were being developed. Organizational circumstances, then, also affect the depth of intermedia analysis.

B. Major Criteria for Decisions Are Technical, Economic, and Legal

When EPA confronts intermedia tradeoffs and effects, the major criteria for assessing them are technical feasibility, cost effectiveness, and compliance with existing regulations. The Agency begins with a legal mandate. It looks at the technological alternatives demonstrated and available for reducing pollution, at the total costs of attaining different levels of control, and at whether the control processes will create wastes which themselves violate environmental regulations. The costs of disposing of wastes from the treatment processes are evaluated simultaneously with compliance regulations, since the cost varies with the stringency of the rules. If two alternatives offer an equal reduction of air pollution but unequal costs of disposing wastes in compliance with other laws, the less expensive is chosen.

The Agency does not conduct cost-benefit analyses comparing the environmental damages of disposing of a pollutant in, say, air or land--i.e., the monetary benefits of control--with the economic costs of the two disposal alternatives. The main reason is that the Agency knows too little about damages--about how to price the benefits of control. This cru-

cial lacuna forces the EPA onto the grounds of technical, economic, and legal feasibility.

C. Controlling Sulfur Dioxide Produces Its Own Uncertain Environmental Impacts

1. The Intermedia Tradeoffs

Flue gas desulfurization (FGD) or "scrubbing" is the process used to cleanse the sulfurous gases formed by burning coal. The technique yields solid or liquid waste called scrubber sludge, and sometimes produces wastewater.

Had the earlier standards remained in effect until 1995, the EPA estimates that by then about 24 million tons of sulfur dioxide would have been emitted and 23-27 million tons of scrubber sludge generated annually.[86] The new stricter standards will mean about 3.5 million tons less sulfur dioxide and about 21 million more of scrubber sludge each year by 1995. These estimates are subject to almost innumerable contingencies. Already, for example, the oil prices used in EPA's projections have been exceeded, so that coal usage and pollution may be greater than assumed. But the estimates will be employed here.

The effect of the new standards on sulfur dioxide is relatively small because they apply only to new or reconstructed power plants that will come on line beginning around 1983. Existing ones remain under less stringent rules. By 1995, it has been estimated, fully 77% of the plants will still be on the older standards.[87]

These then are the intermedia exchanges: Most importantly, there will be less environmental damage by airborne sulfur dioxide (and its by-products, such as acid rain) but more sludge and wastewater. Each year, the average plant may produce enough scrubber sludge to cover 20-30 acres at a depth of 20-30 feet.[88] Also, the most common, "wet" desulfurization process uses a great deal of water. Even where water quality is not affected, the quantities involved may contribute indirectly to a need for dams, pumps, and other projects with their own environmental impacts. The pollution control systems also reduce the amounts of usable energy--by about three to four percent--generated by the power plant.[89]

The present value (1978 dollars) of the utility expenditures needed to meet the new standards between now and 1995 is estimated at $35 billion.[90] The EPA made no explicit attempt to show that this $35 billion outlay would result in benefits worth that much. Nor did the EPA assert that this was the most environmentally beneficial way to spend $35 billion. Further, the Agency did not establish that the tradeoff between reduced air pollution and increased water and land pollution was optimal. It did not eliminate the possibility that a slightly less stringent air standard would have resulted in significantly lower water and land impacts.

The new standards instead seemed to have been rooted mainly in Congressional pressure, Clean Air Act mandates, and the availability of technology for reducing air pollution further. There are many arguments in favor of the standards. The serious effects of acid rain,

smog, nitrosamines, atmospheric carbon dioxide, and other suspected or proved products of coal combustion are examples. But the evidence suggests that the decision was not made on the basis of a comprehensive balancing of costs, benefits, and intermedia tradeoffs, even within the constraints of available scientific knowledge.

2. Uncertainties About Waste Effects

The scrubber sludge and wastewater from pollution control have to be treated and/or disposed of, and this is where we run into the different emphases mentioned earlier. On the one hand, the Rall Report notes that while the sulfur by-products in sludge are "not particularly toxic" as solid wastes, "Preliminary evidence indicates that radioactive material in coal is primarily trapped in solid wastes.... There is, however, little experience with [waste] disposal on such a large scale and little evidence to indicate the leaching and migration rates [into land and water] of toxic trace elements."[91] There are many other uncertainties, as EPA scientist Julian Jones points out, about the physical and chemical properties of scrubber sludge and the results of its disposal.[92]

Further, in regard to sludge and wastewater, "It is apparent that each disposal site and the material placed in it have individual characteristics different from most others. These include waste material properties [which depend on the type of coal, generator, and scrubber used], weather, topography, soil characteristics, and nearby stream quality and flow characteristics. Therefore, the disposal method chosen for any site

will generally be selected on site-specific conditions. Because of this, the establishment of a single criterion for all cases may be overly conservative in one location and not stringent enough in another."[93]

The specific environmental effects clearly depend also on the quality of management of the power plant, the degree of cooperation its executives and engineers exhibit with the letter and spirit of EPA's regulations, and the competence and stringency of local enforcement. Thus there are numerous scientific and compliance uncertainties about the impacts of scrubber waste under widely varying conditions.

3. EPA's Responses to Uncertainty

Contrast this puzzlement to the optimistic assertions in two reports EPA commissioned to evaluate its proposed new standards. One says "All effluent streams can be treated to acceptable levels using proven, commercially available technologies."[94] It assumes "closed loop solid waste disposal systems"--i.e., those that allow no waste to come into contact with the external environment.[95] The report was written before the Resource Conservation and Recovery Act amendments exempting scrubber waste were passed.

If wastewater is discharged, the report notes, "Because adequate water treatment is available, no ... control system effluent need be discharged at concentrations harmful to the environment. The degree of treatment will be determined ... by the combined federal effluent discharge limitations and the water quality standards placed by the state on receiving water. Thus, no adverse water quality impact should

result from the implementation" of the new air standards.[96] Similarly, another report says flue gas desulfurization systems "need not have effluent discharges that would impact existing water quality.[97]

The final regulation document addresses this issue as well, in a heavily qualified, but equally optimistic vein:[98]

> A few commenters stated that closed-loop operation of an FGD system could not be accomplished [under certain conditions].... It is important to note that neither the proposed nor the final standards require closed loop operation.... The commenters are primarily concerned that future water pollution regulations will require closed-loop operation.... Most U.S. systems operate open-loop ... because they are not required to do otherwise.... The Administrator continues to believe that although not required, closed loop operation is technically and economically feasible if the FGD and disposal system are properly designed.

These quotations depict the operation of the technical, legal, and economic criteria for evaluating intermedia pollution. The main one is technical: can the additional pollution produced by increasing control of sulfur dioxide be continued using known techniques--contained, that is, within legally acceptable levels? Availability and legality alone are not enough, though. The cost of treatment must also be thought reasonable, as three different interviewees stressed.[99]

D. Controlling Particulates Also Poses Environmental Questions

A briefer but similar story can be told of the standards for particulate emissions. These are controlled by electrostatic precipitators or "baghouse" filters that collect what is called "flyash"--the ashes from burning coal that would otherwise escape into the at-

mosphere. Flyash contains trace elements such as mercury, cadmium, and lead, the environmental concentrations of which are already "near tolerable human health limits,"[100] and the suspected carcinogens chromium, nickel, and arsenic. Scientists know little about what happens to these trace elements in flyash, although the Rall group warned that the "elements have a definite potential for runoff to surface waters and leachate intrusion into ground water."[101] What is worse, the committee notes, "... control measures which remove only the larger non-respirable particulates may cosmetically lower the level of [particulates] without having any impact on health effects. In fact, it is conceivable that reliance on such control measures (e.g., electrostatic precipitation) could lead to an unrecognized increase in respirable particles and hence more of an adverse effect."[102] The smaller particles may carry the carcinogens deep into lungs.[103]

One of the Agency's own reports notes that particulate control "tends to increase the water pollution potential of fly ash because smaller particles leach more readily" into water. But it adds that "Any water pollution which might be caused by collection of smaller particulates can be prevented" by closed system operation.[104]

Here as in the sulfur dioxide choices, optimism crowds out uncertainty. The chance raised by the Rall Report that electrostatic precipitation may increase the hazards of particulate pollution is not mentioned in the final regulation document published in the Federal Register. Note: the possibility is just that, a hypothesis, not necessarily a truth--we do not know. The EPA, following its mission

and mandates, went ahead on the assumption that electrostatic precipitation does more good than harm.

E. Politics and the Courts Keep the Story Going

The coal case is a continuing saga. A few months after the final standards were issued, the industry's Utility Air Regulatory Group was asserting that "the final NSPS [new source performance standard] is based on faulty information and data"--i.e., cannot be met except with low sulfur coal. Environmentalists, on the other hand, argued the standard should have been tighter.[105] They charged the Agency had allowed itself to be "unduly influenced by outside interest groups and political power."[106] When EPA Administrator Costle denied the petitions of both the Utility Air Regulatory Group and the Environmental Defense Fund to review the standards, the groups each filed suit and the matter is now before the courts.[107]

Because the Agency built up an unusually detailed supporting case for these standards, "any court would be hard pressed to sift through the file."[108] On the basis of previous rulings discussed in Chapter II, the courts would be expected to accept the intermedia aspects of such a well-documented EPA decision without much sifting. On the other hand, this case involves crucial energy goals and additional pollution control expenses in the tens of billions. As noted in Chapter III, Section D, such stakes have not been present in other intermedia cases and could induce courts to take harder looks at EPA's choices.

The more general point is that important intermedia decisions in the environmental policy system will continue to involve the courts, Congress, interest groups, competing national policy objectives, and other forces. Since all of these are in continual flux, the intermedia effects of air pollution standards for coal-fired power plants will be changing as well.

F. Conclusion: The Quality of Intermedia Decisions Varies

According to Air/Water Pollution Report, "EPA built up one of its strongest and largest supporting dockets in developing" the coal standards.[109] This study of intermedia decision making is a best case analysis, then. The Agency conducted unusually detailed and comprehensive investigations. In less costly and politically sensitive realms, EPA may well generate less information on intermedia impacts.

1. A Brief Example of Intermedia Analysis of Water Pollution Standards

One example will be quoted at length because the language seems standard. The discussion of the impact of petroleum refining point source effluent limitations (under the Water Pollution Control and Clean Water Acts) sounds almost identical to the discussion of water standards for paint and ink manufacturing and for electroplating.[110]

> The elimination or reduction of one form of pollution may aggravate other environmental problems.... EPA has considered the effect of these regulations on air pollution, solid waste generation, and energy consumption. This proposal was circulated to

> and reviewed by EPA personnel responsible for non-water quality environmental programs. While it is difficult to balance pollution problems against each other and against energy utilization, EPA is proposing regulations which it believes best serve often competing national goals.... Imposition of ... standards will not create any additional air pollution problems.... Proposed [standards] will increase [solid] wastes by as much as 15,000 metric tons per year.... These sludges will contain additional organic toxic pollutants and some additional metals. On the other hand, EPA estimates that the proposed pretreatment standards will result in POTW [publicly owned wastewater treatment works] sludges having lesser quantities and concentrations of toxic pollutants. POTW sludges will become more amenable to a wider range of disposal alternatives, possibly including beneficial use on agricultural lands. [The standards] ... will result in a net increase in electrical energy consumption of approximately [30] million kilowatt-hours per year.

Those are about half the words contained in the analysis of "non-water quality" and energy requirements. The published analysis is brief, if not cursory. Air pollution is simply declared to be no problem. The somewhat indirect agricultural benefits of less toxic municipal treatment plant sludge are optimistically proejcted to outweigh the additional solid waste disposal impacts. Indeed it is possible to believe that the standards for the best available technology were determined, stringency levels set, and then other environmental impacts assessed largely as an after-thought. This observation is not a criticism of EPA. There is probably not enough knowledge to judge whether the more toxic solid waste that will result might have been rendered substantially less harmful by a relatively small relaxation of standards and whether that tradeoff would have been beneficial. In any case, this example seems typical of examinations of non-water impacts.

2. The Future

In the coal case, gaps in scientific knowledge and variations in local conditions, utility management practices and attitudes, and en-

forcement of water and solid waste laws constructed a perimeter around the possibility of true net balancing. The mandates of the Clean Air law and the political and organizational context reinforced the boundaries. Hunches, habits, and faith played a substantial part in the decisions... inevitably. The EPA performed diligently under trying conditions. At this time nobody can tell if EPA's choices were the best of all possible ones, whether it took the wisest course in these difficult circumstances.

Chapter VII will consider the importance of optimism about the future in selecting policy alternatives for improving intermedia policy making. Before that, Chapter VI offers a brief discussion of some other obstacles the Agency confronts in making intermedia decisions.

CHAPTER VI. OTHER PROBLEMS IN INTERMEDIA DECCISION MAKING

A. The Need to Integrate Science with Policy Analysis

The coal case illustrated that the range and limits of scientific knowledge significantly constrain comprehensive environmental balancing. Another concern is that even where scientific capability is available, its use in EPA policy analysis often seems limited. Some research projects seem to be of little practical use; others, though potentially helpful, do not get communicated to policy analysts. A National Research Council study noted that integrating science is particularly needed for intermedia policy--for "determination of the net effects of pollution on the ecological balance, and ... the distribution and fate of pollutants discharged into air and water."[111] Yet they found the linkage between scientists and decision makers insufficient, a charge that has been echoed in Congress.[112]

One reason for these problems may be that the scientific laboratories are scattered all over the country; another, the different professional jargons and reward structures for scientists and policy analysts; a third, the early stage of most intermedia investigating, a rudimentary state that provides few hard facts for policy making. These obstacles should not be insurmountable. Indeed, Stephen Gage, Assistant Admnistrator for Research and Development, told Congress one of his top priorities is "the continued integration of research and development planning into the mainstream of the group's regulatory and enforcement activities...."[113] Success at this goal would enhance intermedia decision making.

B. The Mixed Impact of Turf Disputes

Turf rivalries can operate either to enhance or restrict analysis of intermedia problems. Jurisdictional tensions can place intermedia information onto the agenda; they can also prevent those data from determining final decisions. Intra-organizational power struggles often ensure that the effects of regulations in one medium on another are forcefully brought to the Administrator's attention--turf protection. (On the other hand, far from fearing a loss of control, some overworked administrators may want to avoid the extra work imposed by the need to worry about all EPA regulations rather than just those in their own medium.) Making the agenda is not the end of the story. Turf tensions can inject an organizational-political element into final decisions. Choices may be rooted in the greater clout of one office with the Administrator, or in a top official's desire to accommodate two offices with a compromise of their claims rather than a decision on the intermedia merits.

C. Enforcement May Raise Intermedia Problems

This study concentrates on laws and regulations. Briefly, though, it should be noted that carrying out these instructions in the field may also cause intermedia pollution. Specific instances of program funding, permit granting, and standard administration may require judicious balancing among media. The level of integration of mandates in the field

is unknown. The EPA Administrator does feel that there is little integration of the Agency's program grants and has proposed an Integrated Environmental Assistance Act to promote coordination. Chances for passage at this writing do not, however, appear promising.[114] Intermedia problems at this level require more study. Certainly one way to minimize them would be improving intermedia decision making in Washington.

D. Intermedia Pollution and Energy Policy

Another set of problems and solutions arises for those affected by environmental policies, and specifically the Department of Energy (DOE).

o How can it plan projects or promulgate regulations under the uncertainty posed by EPA's (and Congress') incomplete attention to intermedia pollution?

o Is there a conflict between DOE's mandate to increase energy production and its duties to obey environmental laws (especially NEPA) and EPA policies? That is, does DOE have the same incentives to ignore intermedia implications that a private polluter would--e.g., to externalize intermedia costs when calculating cost-benefit ratios for energy production projects?

o Should DOE undertake its own research into processes like cogeneration, recycling, reuse, and conservation that could minimize intermedia costs; or should it wait for EPA's lead?

o For DOE the implication of the limited attention of Congress and relative deference of courts is that the intermedia action is largely at EPA. If it is concerned about the intermedia ramifications of its

own decisions and projects, DOE should directly seek the advice of EPA officials and not worry too much about the intermedia content of laws or holdings of courts. But because of the limitations on comprehensive environmental decision making discussed throughout this study, DOE may get shifting, unclear, or conflicting responses. The resulting uncertainty may disrupt DOE's planning. The Department might profit from initiating talks with EPA (and the Office of Surface Mining) in order to discover (1) which DOE activities might cause intermedia pollution under current environmental regulations; (2) whether such impacts will themselves entail economic, political, or legal difficulties; and (3) what DOE can do if faced with conflicting environmental mandates.

The Department could attempt to evaluate and solve intermedia problems on its own. But that strategy would have a major drawback: what DOE considers a solution might not be perceived as such by the EPA. Some form of coordination between the two bureaus seems wise.

CHAPTER VII. IMPROVING INTERMEDIA POLICY

A. Summarizing the Problems of Intermedia Policy Making

In brief summary these are the major difficulties confronting the environmental policy system in coping with intermedia pollution.

o The EPA, like most other federal agencies and private organizations, has a pronounced tendency to be optimistic about the environmental consequences of its own actions, and about the efficacy and worthiness of its programs and decisions. The tendency can dampen Agency enthusiasm for developing and using intermedia information.

o Scientific understanding of intermedia impacts is far from advanced. This situation prevents the employment of genuine cost-benefit analysis in intermedia decision making. Many choices are thus based on qualitative evidence; and some involve only passing reference to intermedia consequences that are largely unknown.

o The Agency's ability to process the scientific information it has is limited. Integrating its research with its policy analysis is difficult; going through all the contingencies, tradeoffs, and uncertainties and coming up with an optimum decision is even more so.

o Environmental laws have provisions that conflict with each other, giving EPA an unclear intermedia mandate.

o Because regulations for the more recent laws have not yet been fully implemented, some of the conflicts between the legal requirements remain latent. They will surface only as EPA (and the Department of Interior) put all regulations completely into effect.

o Some aspects of the laws reinforce traditions that focus all expertise and attention in EPA program offices on individual media. Misunderstandings and rivalries can result. These can work against intermedia balancing, although turf conflict also can promote a comprehensive accounting of environmental impacts.

o Political pressures may now be against comprehensive environmental management. In an epoch of low economic growth, it may become attractive to resubmerge the long-invisible and unaccounted intermedia effects that the laws and amendments of the later 1970s highlighted. The Resource Conservation and Recovery Act Amendments of 1979 could be a harbinger.

Inexorably, technology, politics, law, the economy, and the ecosystem change. Because each component affects all the others, intermedia pollution problems will change--both subjectively (how we perceive them) and objectively as time goes by. No once and for all answer to intermedia problems should therefore be expected or even desired.

B. Intermedia Gambling: The Decisive Role of Optimism and Risk Aversion

The environmental policy system has evolved from blissful ignorance to a modicum of concern and understanding of intermedia issues. The present state of affairs can be viewed with sanguinity, with cautious optimism, or with alarm depending on how serious one thinks the intermedia impacts of current and future environmental policies will turn out to be. As this study shows, EPA implicitly assumes the best.

The optimistic wager is that there will be relatively few truly severe intermedia pollution problems, and that even these will be manageable. If so, a good case can be made for doing nothing new--for allowing intermedia policy making to mature at its own pace. The pessimistic view is that we are recklessly committing ourselves to enormous resource expenditures that could turn out to be wasteful or even, on balance, environmentally destructive. Such a case calls for major policy measures to enhance intermedia information and decision making now. The in-between approach says that the EPA probably knows enough and takes enough care that it will not make too many grievous errors. But the difficulties summarized in the previous section indicate that an incremental prod to the EPA might lessen the risk of costly mistakes.

These three views form the foundation for the three intermedia policy alternatives discussed next.

C. Present Practices Are Sufficient: Do Nothing New (Alternative I)

1. Intermedia Policy Making as a Learning Process

EPA's current intermedia decision-making process may be best characterized as one of delayed iterative learning. A regulation will be written for one medium, its effects on other media duly but often superficially noted. Only after the rule is put into effect will the full impacts on other media become known. At that time, any new environmental problems and the old regulation may enter onto the agenda, and they will go through the same cycle, perhaps with a little more attention being paid to intermedia effects on the second round.

All the forces discussed so far contribute to this learning process. Congressional oversight and criticism can be potent--as the Agency's 1974 decision to prepare environmental impact statements revealed. Legal action by affected parties brings intermedia impacts to EPA's attention; judicial rulings force the Agency to consider them with some minimal care. Scientific knowledge about fate and transfer of pollutants advances, and new, less damaging technologies develop. The history of turf fights over intermedia effects becomes part of Agency lore and custom; raising intermedia issues may become a conditioned reflex--perhaps intraorganizational conflict becomes the major mode of resolving intermedia tradeoffs.

2. Drawbacks

Relying on organizational bargaining to settle intermedia conflicts does have pitfalls: political infighting, coalition formation, and logrolling could replace the sober weighing of alternatives. Yet such a process of vote trading would force offices to decide on their priorities. Arguably it might result in "partisan mutual adjustment"--optimum choices under conditions of complexity, bounded organizational rationality, and uncertainty.[115]

The Agency's learning process is just now becoming institutionalized, as it matures and regulations for the more recent laws and amendments are written and implemented. So it would be quite inaccurate to conclude that we are approaching the intermedia millenium. The quality of intermedia issue assessment varies considerably from regulation to

regulation, with the varying availability of scientific information, experience, and positive incentives and pressures. As a result, those subject to EPA regulations are occasionally faced with confusing and uncertain obligations.

Intermedia decisions are still constrained to the criteria of technical availability, cost, and legality. Knowledge about the extent and monetary value of environmental damages, especially intermedia ones, remains primitive. This gap prevents true net environmental balancing. And Congress may be moving away from its intermedia initiatives. But surely awareness of and commitment to solving intermedia problems within EPA has grown markedly over the 1970s, and the 1980s could see substantial progress.

D. Improve Current Practices Incrementally (Alternative II)

While recognizing the EPA's learning and improvements, a second approach would call for a more direct but modest attack on the forces that constrain intermedia policy making. The goals would be to strengthen EPA's incentives for taking hard looks at all environmental consequences--for developing intermedia information as deeply, and using it as fully, as possible.

1. Top Level Commitment

Such incentives might be produced by explicit declarations by the President and the EPA Administrator similar to the ones quoted at the outset of this report. But this time the announcements must have sub-

stance. They must say that intermedia effects will be as important to final policy choices as other major goals. All offices should be put on notice that the dictates of their individual media programs include minimizing pollution in the other media--even if that means a bit less protection of their own bailiwick than might otherwise be achievable.

2. Special Intermedia Review

These pronouncements should be backed up by a new standard procedure inserted into the internal review stage of regulation development (see Chapter IV, Section A). There would be a set of relatively solid criteria for triggering a special intermedia review. Regulations would be subject to this review if they mandated control processes that produced greater than some threshold amount of waste; if the waste contained chemicals from a pre-established list of substances believed to pose serious hazards; if the costs of properly disposing of the waste, or of controlling the intermedia pollution, exceeded a certain level; or if readily predictable indirect intermedia effects would exceed an economic limit.

The process would not require advances in scientific knowledge (although it might benefit from them). The triggering criteria could be agreed upon now, so discerning whether a given regulation met them should be relatively straightforward. The special intermedia board would be distinguished from the Steering Committee and Red Border Reviews in several ways. It would have a continuing membership so those who serve could develop expertise in intermedia analysis. It would have an

explicit mandate to focus exclusively on intermedia impacts. Steering Committee and Red Border Review Committees have more general review missions. And the intermedia committee would be expected to call for work groups or the Steering Committee to revise regulations where necessary to achieve the best intermedia balances, insofar as available information allows. Final authority would still reside in the Administrator, of course.

In making its decisions, the intermedia group would face all the problems analyzed in this report. But its existence should improve the Agency's intermedia analytical capabilities, enhancing its incentives for more careful and comprehensive policy making. A better-prepared Agency might be more able (and willing) to counter political pressures of the sort that may weaken the Resource Conservation Act (Chapter III, Section B.4) and thus reduce protection from intermedia pollution.

These two actions--a public commitment by top officials and a new intermedia review procedure--are incremental changes. They should not be controversial; they appear to be, and are, logical extensions of previous practice.

E. A New Law and A New EPA Office Are Needed (Alternative III)

The most pessimistic view of current practices could lead to a call for some larger changes. One would be an intermedia pollution law, the other an intermedia decision making office.

1. The Integrated Environmental Protection Act

A new law might empower the Administrator of EPA to resolve conflicts among legal mandates in the way that maximizes environmental quality at minimum cost. Call it the Integrated Environmental Protection Act (IEPA). Such a law could be relatively uncontroversial. Nobody could argue with its intended goal, which might be dressed up as a fashionable "regulatory reform." It would not require detailed Congressional hearings, review, or consideration of specific tradeoffs.

Some members of Congress might balk at vesting such authority in the Administrator. Certain EPA decisions might be contrary to Congressional wishes. Should this occur, Congress could--just as now--correct the situation legislatively.

In many instances the Administrator exerts control over intermedia tradeoffs now, only de facto. The IEPA would codify the coordinating authority. Most significantly, it would prevent EPA from neglecting the potential counter-productive environmental effects of its actions, removing the excuse that it is only following the orders of the primary statute. This law would prod the Agency much more vigorously than the current relatively vague instructions, in the air and water acts, merely to "consider" non-air or nonwater quality. It would also give teeth and specificity to the mandates of more recent laws for integration with air and water laws. That task is now impeded by the lack of guidance in the latter two on what to do about intermedia conflicts.

IEPA could provide openings for additional suits brought by environmentalists or polluters emboldened by the addition of a new goal whose

achievement would be easy to debate. Although it should not be minimized, the legal dilemma should not be overdrawn. The incentive to litigate might be no greater under a new law than under the more amorphous intermedia admonitions and grants of authority in current statutes. Moreover, courts have shown a disposition to judge intermedia decisions for proper procedure rather than for their substantive merits. A properly comprehensive evaluation of environmental alternatives and impacts should stave off most harassing suits or disruptive judicial intervention.

2. The Office of Intermedia Review

The regulations issued under the IEPA would set up an Office of Intermedia Review (OIR) with specific authority over intermedia decisions. Its mission would be of considerably greater scope than the current Steering Committee or the special intermedia board recommended in the previous section. Its major duty would be to review all proposed regulations to ensure they were based on careful intermedia balancing (within limitations of available knowledge). Where statutes seemed to prevent optimum choices, the Office would recommend to the Administrator overriding the damaging provision under his IEPA authority. Having no particular medium to protect, but rather explicitly chartered to balance all media and come up with the best overall policy, this Office should help overcome the turf conflicts that sometimes retard intermedia policy making now.

The Office would also have the central responsibility for processing intermedia information and could better coordinate scientific research out of the Office of Research and Development with policy analytic needs. In

order to fit best within the current Agency regulation-developing process, OIR should do its reviewing and approving or revising before the Steering Committee does, and it should be allowed to do the same again after the public comment period. It should have clear authority to make its own separate report to the Administrator where it disagrees with the final products of the Steering Committee and Red Border Committee.

The new Office would have to develop internal and external clout. The OIR would, after all, have the authority to overturn or modify the work of other Agency offices with years of experience in their particular media and perhaps strong habits and fragile egos. The new Office would be viewed as an obstacle by the experienced sections; getting by the OIR inspection could come to be seen as just another delaying bureaucratic hurdle. A prestigious Office, fully backed--and heeded--by the Administrator would be necessary to overcome this internal resistance. External clout would be helpful to the OIR in handling criticism from Congress.

Still, potential problems of delay and conflict within the Agency persist. The OIR's very existence might generate conflict by providing a perverse incentive to the individual medium offices to concentrate myopically on their own mandate and ignore the other media. Such a stance would complicate the OIR's task considerably, for it would depend upon the intermedia information developed by other offices to do its job expeditiously. The latter would be able to sabotage the OIR by withholding information.

It must be acknowledged that on any given regulation, conflict and delay might occur. Rather than being eliminated, turf fighting might only

be displaced from among the different media offices to between OIR and the rest. The OIR might well develop its own turf fetishes, becoming incapable of resolving difficult tradeoffs. It could refuse to act until certainty were achieved about all intermedia impacts--a chimerical hope that might delay or block a number of regulations needed to protect individual media. The central problem of intermedia policy making would remain: scientific uncertainties. OIR might have more authority than knowledge for using it wisely, and that is an invitation to abuse.

F. Market Strategies, Regulatory Reform, and Intermedia Pollution

In the environmental policy system as a whole, many actors are pressing for "regulatory reform:" practices that use market mechanisms to decrease burdens of centralized information processing, inefficiency, cost, and other banes of big government. The economic answers to these woes include fees or taxes on emissions or auctioning of marketable rights or permits to emit pollutants. These would replace current standards that treat all sources in a category identically.[116]

Although market schemes are designed for individual media, extending them to intermedia pollution seems straightforward at first glance. Delegating the chores of information processing and choice to individual polluters as market mechanisms promise to do would appear highly beneficial. The method would simply be to apply the tax, fee, permit, or right to all three media simultaneously. Individual firms would choose the combination of emissions that would minimize their costs. A coal-burning utility would choose to scrub sulfur dioxide from smokestacks until the

marginal costs of cleaning the air was exceeded by the marginal costs of the water and land pollution generated by wastes from the scrubbing process (all else equal). Theoretically, cost effectiveness and allocative efficiency would be achieved by a fee system: the nation's total control costs would be minimized and the optimum combination of pollution levels in air, water, and land would be reached.

The real world poses some knotty problems here. Allocative efficiency cannot be achieved without the knowledge to equate the marginal social cost of the damage of an additional unit of pollution with the marginal cost to polluters of that unit. But we do not even know how to price the social costs.

If cost effectiveness alone were the major goal, authorities would have to be able to alter the charges or permits as they learn (imperfectly) about polluters' behavior in response to the new market's signals, and as the economy grows. But such mutability would confront firms with uncertain incentives for control investment; the limited information, political bargaining, and litigation that characterize the present regulatory scheme would likely persist, distorting what should be the purely economic calculations of fee or permit-setting and re-setting; and firms' opportunities and rewards for cheating on fees and colluding and monopolizing in acquiring permits would probably increase. Perhaps the most trenchant criticism is that political opposition among powerful lobby groups and officials has prevented the enactment of any pure market scheme in the U.S.,[117] although this position could certainly change in the future.

The intermedia perspective deepens the complications for market schemes: the difficulties of adjusting charges or permits are geometrically multiplied. Increasing a water effluent charge, for example, would presumably cause an increase in level of waste treatment. That would yield more sludge to be disposed of in landfills. Such an increase in turn might stimulate a rise in the land effluent charge. As the latter escalated, firms might diminish the level of water treatment--although those who have invested a lot of capital to treat water at the higher levels may get stuck. Such stickiness and see-sawing would engender a great deal of (justifiable) complaining by firms. Officials would be confronted with an extra layer of information to process, pressure to bear, decisions to make.

Forces within the Agency and outside might well press for a stabilization of fees or rights at far from optimum levels just to inject certainty and decrease conflict and information costs. But then, arguably, we might be back somewhere near to where we were under the traditional regulatory system. While market strategies would clearly be superior in a friction-free world, their genuine political and administrative difficulties force us back to standards. That is why the suggestions above concentrate on changes within the present regulatory regime.

G. Concluding Recommendation: An Incremental Prod

The evidence in this report does not lend a great deal of support to the most optimistic view of intermedia decision making. The EPA's tendencies to minimize the adverse consequences of its policies seem deeply

enough rooted to merit a new, non-disruptive injection of concern. The third alternative may be too advanced at this time, given the state of scientific knowledge. Its principles should, however, be put on the back burner for future consideration if the intermedia gamble turns out very badly. Meanwhile, the second alternative does not overstep the environmental policy system's capabilities. Perhaps its major contribution is both symbolically and practically affirming that intermedia balancing is as much a goal as--is inseparable from--clean air, pure water, and unspoiled land. It would be a good way to begin improving intermedia policy making.

FOOTNOTES

1. The first quote is in Richard B. Stewart and James E. Krier, Environmental Law and Policy (Indianapolis: Bobbs-Merrill, 1978), p. 799; the second, in Costle, "Environmental Planning for the 80s." U.S.E.P.A., Office of Public Awareness, September, 1979. See also Ralph Stone and Herbert Smallwood, "Intermedia Aspects of Air and Water Pollution Control." EPA-600/5-73-003 (August, 1973); also Roger Shull, "Intermedia Considerations in Environmental Quality Management," draft report, EPA, c. 1975.

2. These statutes are, respectively, Pub.L. 91-190, 42 U.S.C. 4331; Pub.L. 95-95, 42 U.S.C. 466; Pub.L. 92-500 and 95-217, 33 U.S.C. 466; Pub.L. 94-580, 42 U.S.C. 6901; Pub.L. 94-469, 15 U.S.C. 2601; and Pub.L. 95-87, 30 U.S.C. 1202.

3. Allen Kneese, Robert U. Ayres and Ralph D'Arge, Economics and the Environment: A Materials Balance Approach (Washington, D.C.: Resources for the Future, 1970).

4. Cf. Stewart and Krier, pp. 799-800.

5. Pub.L. 91-190.

6. Sec. 101(a).

7. Sec. 102(A).

8. "New Rules for NEPA." 9 Environmental Law Reporter 1008.

9. See 40 Code of Federal Regulations Part 1504. For a general discussion of NEPA enforcement see Council on Environmental Quality, Environmental Quality, The Tenth Annual Report of the Council on Environmental Quality (Washington, D.C., 1979), Chapter 10.

10. See Stewart and Krier, Chapter 8.

11. 435 U.S. 519 (1978).

12. Ibid., p. 551.

13. Portland Cement Ass'n. v. Ruckelshaus, 486 F.2d 375 (D.C. Cir. 1973), at 384, cert. denied 417 U.S. 921 (1974); State of Md. v. Train, 415 F.Supp. 116 (D. Md. 1976), collecting cases.

14. See Richard Liroff, "Impact Statement Preparation by the U.S. Environmental Protection Agency." In National Academy of Sciences, Committee on Environmental Decision Making, Decision

Making in the Environmental Protection Agency Vol IIb (Washington, D.C., 1977), pp. 286-306. Also, Diane P. Wood, "Coordinating the EPA, NEPA, and the Clean Air Act." 52 Texas Law Review 527 (1974), for a different view.

15. See 39 Fed. Reg. 16186-87, May 7, 1974; 39 Fed. Reg. 37419-422, October 21, 1974.

16. 44 Fed. Reg. 33580, June 11, 1979.

17. See EPA, "Electric Utility Steam Generating Units. Background Information for Promulgated Emission Standards." EPA-450/3-79-021 (June, 1979), Chapter 6.

18. Ibid., pp. 6-6, 6-7.

19. Ibid., pp. 6-4, 6-5.

20. Ibid., p. 6-8.

21. See also, for examples, the environmental impact discussions in some recent water effluent guideline documents: for oil refiners (44 Fed. Reg. 75936-39, December 21, 1979); paint and ink manufacturing (45 Fed. Reg. 920, 934, 935, January 3, 1980; and electroplating (44 Fed. Reg. reprinted pp. 13, 22, September 7, 1979).

22. Stewart and Krier, p. 800.

23. Sec. 111 (1) (C); similar references to non-air quality may be found in Sec. 108 (a) (c) (B); Sec. 111 (g) (4) (B); and Sec. 111 (h) (1) as well. Emphasis added.

24. Stewart and Krier, p. 800.

25. Clean Air Act, Sec. 111 (c) and (d). The Administrator can and does reject unsatisfactory implementation plans, in which case EPA enforces its own regulations. This is true currently in about 13 states.

26. 486 F.2d 375 (D.C. Cir 1973), cert. denied, 417 U.S. 921 (1974).

27. 486 F.2d 386, note 42.

28. Ibid.

29. 513 F.2d 506 (D.C. Cir. 1975), cert. denied, 423 U.S. 1025 (1975).

30. Ibid. at 509.

31. 486 F.2d 427, (D.C. Cir. 1973), cert. denied 416 U.S. 969 (1974). Wood, supra, note 14, p. 555, believes the D.C. Circuit in both these cases undertook detailed substantive review of EPA actions. The disagreement between her interpretation and the one here highlights the difficulty of distinguishing "procedural" and "substantive" review of technical, scientific decisions. On specifically intermedia matters, the court appears relatively deferential, sticking to evidence of correct, comprehensive decision making procedures at EPA.

32. In the Energy Supply and Environmental Coordination Act of 1974 (Pub.L. 93-319, 88 Stat. 246) Sec. 7 (c) (1).

33. U.S. Code, Cong. and Admin. News, 1977, Vol. 2, p. 600. A major court ruling on this exemption is Amoco Oil v. EPA, 501 F.2d 722 (D.C. Cir. 1974).

34. Sec. 511 (c) (1).

35. See Weyerhaeuser v. Costle, 599 F.2d 1011 (D.C. Cir. 1978), at 1050-51.

36. Pub.L. 95-217, 91 Stat. 1566.

37. Sec. 304 (b) (1) (B), emphasis added.

38. Sec. 47.

39. 559 F.2d 1011 (D.C. Cir. 1978).

40. Ibid. at 1051.

41. Ibid. at 1051.

42. Ibid. at 1053.

43. Ibid. note 69, emphasis added.

44. Citizens to Save Spencer County v. EPA, 600 F.2d 844 (D.C. Cir. 1979).

45. Although the boundary has become more permeable in recent years. See Richard B. Stewart, "The Reformation of American Administrative Law." 88 Harvard Law Review 1667 (1975).

46. EPA, "A Guide to the Consolidated Application Form." Office of Water Enforcement, U.S.E.P.A., Pamphlet C-7, June, 1979.

47. Pub.L. 93-523, 88 Stat. 1660.

48. Interviewed March 17, 1980.

49. Sec: 3 (5).

50. Sec. 6 (c) (D).

51. Sec. 9 (a) (3) (b); see also Sec. 6 (c).

52. Then-Senator Edmund Muskie (D-Me.), for example, said there is "a general impression that the act has had little effect, and that industry is proceeding at best under a 'business as usual' approach." Quoted in "Slants and Trends." Air/Water Pollution Report, January 28, 1980, p. 31.

53. David D. Doniger, The Law and Policy of Toxic Substances Control. Baltimore: Johns Hopkins University Press, 1978.

54. Sec. 1002 (b) (3).

55. Sec. 1003 (7).

56. Sec. 1006 (b); cf. Sec. 1008 (a) (2), and Sec. 8001 (a) (1), (12), and (13).

57. 44 Fed. Reg. 53444-45, September 13, 1979.

58. Ibid. at 53457-58; cf. 43 Fed. Reg. 58993-94, December 18, 1978.

59. 44 Fed. Reg. 12723, February 26, 1980.

60. Interview with Penny Hansen, EPA Office of Solid Waste, March 26, 1980.

61. Congressional Record, February 20, 1980, pp. H1086-1118. See also "Senate Extends Solid Waste Disposal Act Through 1982," Congressional Quarterly, June 23, 1979, p. 1244, and "Bill Increases Federal Powers Over Hazardous Waste," Congressional Quarterly, March 8, 1980, p. 670.

62. Ironically, two months earlier, U.S. District Court Judge Gerhard Gesell ordered EPA to speed up issuance of solid waste regulations. "Court Directs EPA to Write Timetable for Completing Hazardous Waste Rules." Air/Water Pollution Report, January 7, 1980, p.6. Thus the Agency is told to act cautiously and studiously by Congress and with great dispatch by a court. Both wishes are laudatory, but it is doubtful both can be achieved simultaneously.

63. Sections 102 and 522.

64. Sec 501 (a) (B).

65. In Re Surface Mining Regulation Litigation, 452 F.Supp. 327 and 456 F.Supp. 1301 (D.C. Dist. 1978).

66. Consolidation Coal Co. v. Costle, 9 Environmental Law Review 20511 (4th Cir. June 25, 1979).

67. "The 1977 Surface Mining Act Revisited: National Regulatory Program Surmounts Judicial and Legislative Challenges," 9 Environmental Law Review 10199 (November, 1979).

68. Stewart and Krier, p. 799.

69. 44 Fed. Reg., 30990, May 29, 1979.

70. 45 Fed. Reg. 16832, March 14, 1980.

71. 44 Fed. Reg. 30992, May 29, 1979.

72. Ibid.

73. William F. Pederson, Jr., "Formal Records and Informal Rulemaking." 85 Yale Law Journal 56-58 (November, 1975).

74. Ibid., passim; also, Stewart and Krier, pp. 660-72, and 44 Fed. Reg. 30993-94, May 29, 1979.

75. "Background Information for Promulgated Emission Standards," supra note 17, pp. 2-204 ff.

76. 44 Fed. Reg. 33594, June 11, 1979.

77. Ibid. at 33595.

78. On health and environmental effects, see S. Schurr et al., Energy in America's Future (Washington, D.C.: Resources for the Future, 1979), Chaps. 12, 13, and 14. On impacts of nitrogen oxide control, see EPA, "Electric Utility Steam Generating Units. Background Information for Proposed NO_x Emission Standards." EPA-450/2-78-005a (July 1978), p. 7-6. Note that the standards also cover power plants that burn oil and natural gas, but those fuels produce relatively little air pollution. Coal combustion is by far the most significant source of air pollution from power plants.

79. Department of Health, Education, and Welfare. "Health and Environmental Effects of Increased Use of Coal Utilization," 43 Fed. Reg. 2229, January 16, 1978. Hereafter, "Rall Report."

80. Ibid. at 2230.

81. House Report No. 95-294, May 12, 1977, pp. 187-92.

82. See footnote 18, supra.

83. 44 Fed. Reg. 33582, June 11, 1979.

84. Interview with Larry Jones of EPA's Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, April 23, 1980.

85. Interview with John Lum of EPA's Effluent Guidelines Division, Office of Water and Waste Management, March 26, 1980.

86. 44 Fed. Reg. 33608, June 11, 1979.

87. Peter M. Cukor, et al., "Integrated Technology Assessment," in Energy/Environment III. EPA-600/9-78-022 (October, 1978), pp. 364-365.

88. Schurr et al., supra note 78, pp. 372-373.

89. EPA, "Electric Utility Steam Generating Units. Background Information for Proposed SO_2 Emission Standards." EPA-450/2-78-007a (March, 1978), pp. 6-15, 16 on water use; DOE/EPA, "Energy/Environment Fact Book." EPA-600/9-77-041 (March 1978), p. 43, on the energy penalty.

90. 44 Fed. Reg. 33609, June 11, 1979.

91. Rall Report, p. 2233.

92. Interview with Julian Jones of EPA's Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, March 26, 1980. Also Julian Jones, "Disposal of Power Plant Wastes" in Energy/Environment III, supra note 87, 276, 282, 286.

93. EPA, "Controlling SO_2 Emissions from Coal-Fired Steam-Electric Generators: Solid Waste Impact. Volume I. Executive Summary." EPA-600/7-78-044a (March 1978), p. 36.

94. EPA, "Controlling SO_2 Emissions From Coal-Fired Steam-Electric Generators: Water Pollution Impact. Volume I. Executive Summary." EPA-600/7-78-045a (March, 1978), p. 3, emphasis added.

95. Ibid., p. 15.

96. Ibid., emphasis added.

97. "Background Information for Proposed SO_2 Emission Standards," supra note 88, p. 6-17, emphasis added.

98. 44 Fed. Reg. 33592-93, June 11, 1979.

99. Don Walters and Ken Durkee (March 17, 1980) and Larry Jones (March 26, 1980), all of EPA's Office of Air Quality Planning and Standards at Research Triangle Park, North Carolina.

100. Rall Report, p. 2237.

101. Ibid.

102. Ibid., p. 2236.

103. Ibid., p. 2238.

104. EPA, "Electric Utility Steam Generating Units. Background Information for Proposed Particulate Matter Emission Standards." EPA-450/2-78-006a (July 1978), pp. 7,8; emphasis added.

105. "Slants and Trends." Air/Water Pollution Report, January 7, 1980, p. 1. "Environmental Groups Push for Review of NSPS for Coal-Fired Power Plants." Air/Water Pollution Report, December 3, 1979, p. 484.

106. "Slants and Trends." Air/Water Pollution Report, January 14, 1980, p. 11.

107. "Slants and Trends." Air/Water Pollution Report, February 4, 1980, p. 41, and February 11, 1980, p. 51.

108. "Slants and Trends." February 11, 1980, p. 51.

109. Ibid.

110. All cited in note 21, supra.

111. National Research Council, Committee on Environmental Decision Making. Decision Making in the Environmental Protection Agency. Volume II. (Washington, D.C.: National Academy of Sciences, 1977), p. 65.

112. Ibid., p. 62; "House Subcommittee Criticizes EPA Research Effort." Air/Water Pollution Report, February 25, 1980, p. 73.

113. Ibid.

114. "Integrated Environmental Grants Bill Cure for 'Hardening of the Categories' Costle Says." Air/Water Pollution Report, January 28, 1980, p. 35.

115. See Charles E. Lindbloom, The Intelligence of Democracy (New York: Free Press, 1965).

116. See Allen Kneese and Charles Schultze. Pollution, Prices, and Public Policy. (Washington, D.C.: Brookings Institution, 1975); Stewart and Krier, supra Chapter 6.

117. Some useful critiques of the market approach are: Susan Rose-Ackerman, "Effluent Charges: A Critique," VI Canadian Journal of Economics (November, 1973); Lettie F. Wenner, "Pollution Control: Implementation Alternatives," 4 Policy Analysis (Winter 1978); Edwin B. Clark II, "Comment." In A. Friedlaender, ed., Approaches to Controlling Air Pollution. (Cambridge, Mass.: MIT Press, 1977), pp. 220-230; and William Drayton, Jr., "Comment," in ibid., pp. 231-39.