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Richard H. Stanley
Stanley Consultants

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Philosophy of Environmental Regulation

RICHARD H. STANLEY¹

INTRODUCTION

The American public has become aware of environment. Our world view has suddenly changed to recognize that our resources are limited and that we live in a closed compartment of destiny with all mankind. This new world view is most graphically dramatized by man's space travels. We have seen pictures of spaceship earth. We have seen proof that our ecological system is a closed one. Aside from solar energy, there are no significant inputs or outputs of energy, resources, or wastes.

This new world view has far reaching effects. Our earlier world view, particularly in the United States, was one of unlimited resources and opportunities. Nurtured by a frontier spirit, we believed that there were always new areas to be conquered. Air, water, and other natural resources were considered inexhaustible. If one area became spoiled, there were always new areas to be discovered and developed.

Now we know that this earlier world view is not, if it ever was, valid. Man and all other life must exist within earth's recycling ecology. There are no passengers on spaceship earth, only crew.

With this new world view, great public pressures are building for pollution abatement. The American public seems willing to devote the resources and efforts needed to begin to deal with environmental preservation. Significant steps are being taken to devise and implement laws and regulations to protect and restore our environment.

Unfortunately, however, the new world view has also created an escalation in rhetoric. Confronted with a difficult and threatening situation, too many have begun searching for a scapegoat. Surely someone has perpetrated the fraud of the old world view upon us. Surely someone is guilty of destroying our environment. Surely if we can find and stop those responsible, our situation will be improved.

This simplistic approach, also nurtured by a frontier spirit, is highly ineffective. It causes non-productive polarization. All citizens are characterized as either heroes or villains. The rhetoric level rises, and we end up bickering with each other rather than constructively dealing with the problem at hand.

NEEDED CONCEPTS

In considering environmental preservation, one must begin with the concept of trade-off. There are no magic solutions and each step taken to enhance the environment has side effects which represent a price to be paid. If we limit installation of electric generating stations, we must be prepared to deal with increasing cost of electric power as a minimum and perhaps even power shortages. If we enforce air pollution standards on industry, we must be prepared to accept closing of marginal plants and resulting job loss.

In simple terms, dealing with the environment often boils down to a question of "who is going to give up what?"

A second inescapable factor is our limited knowledge. The recent reversals on detergents are one illustration. This cycle started with a shift from foaming detergents to phosphates.

Next new detergents were developed containing either the chemical NTA or caustic soda to save us from phosphates.

Finally, last September, the Head of the Environmental Protection Agency, Mr. Ruckelshaus, issued a warning against use of the phosphate substitutes.

This is an excellent illustration of the hazards of precipitous changes in environmental practice.

Environmental preservation presses the frontiers of knowledge in many areas. All who deal with the environment need to be sure that opinions and hypotheses are not labeled facts. The problems of the environment are too great, and the outcome too important, to allow for anything but intellectual honesty.

Third, we need to recognize that environmental preservation will have substantial impact on the economy. Cost estimates have ranged from two to five percent of our gross national product annually. The point of economic impact depends on how the costs are assessed. To the extent these costs are supported by taxation, significant increases in tax levels will be necessary. To the extent these costs are borne by manufacturers and producers, significant price increases in products and services will result. Ultimately, the total cost will be borne by the public. But in the process of passing this cost along to the public, there may be significant shifts in employment, products produced, prices, tax levels, and similar factors affecting economic survival for some and life style for all. Environmental preservation is not free. We must be prepared to pay the price.

Fourth, the costs of pollution abatement rise geometrically as higher levels of removal are required. Ninety-five percent removal of a given pollutant may cost twice as much as 90 percent removal.

OBJECTIVES OF ENVIRONMENTAL REGULATION AND CONTROL

With this background, the objectives of an equitable and effective system of environmental regulation and control can be outlined as follows:

1. The system of regulation should achieve the desired results of an adequate environment. This requirement is obvious, yet the term "adequate" cannot reasonably be defined to mean an environment in which the evidences of man's existence are totally eliminated. No living being can exist within an ecological system without having an impact on that system.
2. The costs of environmental protection should be imposed upon products and processes in proportion to the amounts and undesirable effects of pollutants produced.

Historically, we have considered air, water, and natural resources to be "free." Users pay only the costs of develop-

¹ President, Stanley Consultants, Muscatine, Iowa

ing, but not the costs imposed on society as a byproduct of such use. For example, a polluting combustion process uses air at essentially no cost and fuel at a cost which covers only development and transportation to the point of use. The remaining cost is borne by the general public in the form of cleaning and maintenance costs due to combustion particulates from the process, odors or other problems from sulfur oxides, the problems of smog created by nitrogen oxides, etc. Wherever possible, the cost to the operator of any process and hence the price of the product or service produced should include all costs, not just some of them. This will discourage use of pollution producing products and processes.

3. The system of regulation should encourage sound resource allocation. It should encourage pollution abatement measures on a reasonable priority basis. It should not encourage spending of large sums for relatively minor improvement while little is spent in areas of major need.

Similarly, the system should discourage use of products and materials which tend to exhaust our limited supplies of raw materials.

4. The system of regulation should be geared to our economic system in such a way that it uses economic motivation to encourage sound environmental practice. With some control methods, it is to the economic advantage of the polluter to avoid or violate the control. It is far better if economic self interest is served by steps which preserve the environment.
5. The system of regulation and controls should facilitate timely individual decision making.

Timely decision making requires that the system of regulation and controls be predictable. Major investment decisions have long lead times. A reasonable degree of assurance is needed that the regulatory situation will not change radically in the period between the making of an investment decision, its implementation and amortization.

Similarly, jurisdictional problems must be avoided. The individual decision maker needs to know which agencies have jurisdiction in this particular situation.

TECHNICAL PROBLEMS IN REGULATION AND CONTROL OF THE ENVIRONMENT

To meet these objectives, an environmental regulatory system must cope with a number of technical and administrative problems. A review of the control sequence illustrates these.

1. Establishment of environmental standards is the first step in the regulatory process. An environmental standard is a quantitative definition of the environmental quality to be achieved. What is the allowable level of each impurity in the air or water? In establishing environmental standards, there is first the argument between what is "adequate" and what would be "nice to have." Secondly, there is the problem of conditions and exceptions. With what frequency can a standard be exceeded? A further problem is the fact that we simply do not know the effect of long-term exposure of large percentages of our population to certain environmental situations.

In spite of these difficulties, environmental standards

have largely been set for the United States. The Environmental Protection Agency has established nationwide air quality standards. Its predecessors have required state adoption, subject to federal approval, of water quality standards for all streams and rivers of any magnitude.

2. Effluent standards are the next requirement for environmental control. Environmental standards of themselves provide no control. The amount of pollutants discharged must be controlled. Here, too, there are major problems.

The state of the art simply does not allow a rigorous and provable connection between the quantity of pollutants discharged and the environmental quality particularly in complex metropolitan-industrial areas. This is due to the high variability of nearly every factor in such a determination. Pollutant interaction is variable and unpredictable. The natural regenerative capacities of the watershed or air shed vary widely with temperature, flow, weather conditions, turbulence, and similar factors. Thus, the development of effluent standards is necessarily a trial and error process.

3. The manner in which effluent standards are stated poses problems.

Historically, effluent standards were often stated in terms of concentration in the waste stream. While such statements were simple and easily administered, they were also easily compromised. Some years ago, the author observed a facility in which the sole pollution abatement equipment was a large river water pump. Whenever the plant effluent reached an impurity concentration higher than that allowable, the pump was activated and the pollutants were diluted to reduce their concentration.

However, the statement of effluent standards in terms of parts per million is probably workable in situations where we essentially wish to prohibit any discharge. Toxic materials are often concentrated in the flesh of fish life so that only very low levels can be tolerated.

A more recent approach is uniform treatment standards. This is currently being imposed upon the river cities of Iowa. All river cities are under instruction to install secondary treatment processes to their municipal plants. Again, this regulation is simple and easily administered. However, it has the major weakness that it forces unwise resource allocation. For example, a small city with only primary treatment may discharge substantially less total pollutants than a larger or more industrialized city with secondary treatment. In such cases, sound resource allocation indicates that it would be better for the larger city to install tertiary treatment than for the smaller city to install secondary treatment.

Because of these inadequacies, effluent standards should be stated in terms of the total quantity of polluting material which can be discharged in a given time. This is directly measurable by means of currently available flow and sampling techniques. However, this method of statement leaves open the question of how the allowable discharge amounts are allocated. How much should each of several or several hundred industries on a particular stream be allowed to discharge? Is the total allowable discharge allocated to cities or industries on a first come-first served basis? Is it assigned by the economic system? Or by a regulatory agency?

4. Effluent standards must be variable with location and time. A given environmental quality requires a higher degree of pollution abatement in a heavily urbanized area than in

a relatively unsettled one. Tighter effluent standards are needed in a large crowded area such as Chicago or Cleveland than in areas such as Muscatine or Fort Madison.

Similarly, as population and industry develop within a given geographic area, the effluent standards must become progressively tighter. As new industries begin and older industries expand, the allowable effluent from each must be proportionately reduced.

While uniform effluent standards are more easily administered, they force unsound resource allocation. Such standards require excessive spending in less populated areas in order to provide adequate pollution abatement in congested areas, and they require excessive spending for pollution abatement in the near future in order to achieve levels acceptable in the distant future. Hence, in spite of the difficulty, effective regulation must provide for variation in effluent standards with location and time.

5. There are technical and administrative problems in enforcement. There are countless sources of pollution and it is not possible to monitor each individually. For this reason, blanket pollution abatement requirements for the smaller sources of pollution and individual monitoring and control for the larger and more significant sources are appropriate.

AN APPROACH TO ENVIRONMENTAL REGULATION

Bearing in mind the objectives of environmental regulation and some of the technical and administrative problems involved, the following is a suggested approach to environmental protection in the United States:

1. Education. The first step in effective regulation is education of the American public about our environment and environmental problems. Some sources of pollution, for example litter, can be handled only by broad public understanding of the consequences of individual actions. A sound educational base will facilitate adoption and enforcement of other regulatory standards.
2. Specific legal prohibitions need to be adopted on certain actions with appropriate criminal penalties for violations. Examples include prohibition of open burning of refuse, discharge of poisonous materials, fines for littering, etc.
3. Economic incentives should be established to encourage recycling. For example, it could be made illegal for soft drinks and similar beverages to be sold in non-returnable cans or bottles. A mandatory deposit on returnable containers could be included in the purchase price. Such a deposit would encourage return of the bottles by the original users, or by others who might see it as a revenue producing activity.

A similar approach could be used with automobiles. If the purchase price included a mandatory fee which was refundable in part to the owner and in part to the reprocessing center, when the worn-out car was eventually returned to a reprocessing center, we could effectively eliminate our present situation in which there are four junk cars around for every ten on the road.

4. Uniform nation-wide or regional pollution abatement requirements should be set on smaller sources of effluents. An example is pollution abatement equipment on automobiles. The same approach could be used for marine

toilet facilities, many varieties of combustion equipment, etc. In future years, the initially established requirements would probably have to be tightened. However, this can be equitably handled by requiring the higher level of pollution abatement on models sold after a given date of effectivity.

5. A system of effluent taxes should be established for all major sources of pollution. Major sources should include all which can, with reasonable economy, be monitored. This effluent tax would be assessed on essentially all industries of any size as well as municipalities. A base level effluent tax would assess each major impurity at an established rate per pound discharged per unit time. The base level tax should be sufficiently high that it will be economically sound for the municipality or industry to go at least to the point of secondary treatment for most municipalities and equivalent levels of treatment for industry. The base tax level would be uniform for the entire nation.

In addition, there would be surtax levels which would vary geographically. A water regulatory authority within each major watershed and an air quality authority within each air shed would have authority to levy a surtax at some percentage of the base effluent tax. This would allow higher charges, economically justifying higher levels of treatment in the more congested areas. The less congested areas would probably have no surtax.

Both the base effluent tax and the surtax would vary with time. Each year a determination would be made which would fix the level of tax for the next three years, establish an upper and lower limit not more than 50 percent apart for the following three years, a limit outside of which future deviation would not be allowed, and establish an estimated tax level for the following three years. This procedure would give each individual industry or municipality some target levels against which economic decisions on investment for pollution abatement measures could be judged. It would reduce the level of uncertainty about such tax levels to an order not greatly different from the uncertainty involved in many other business decisions.

The income derived from the effluent taxes would be used to pay the costs of monitoring and enforcement. It could also be used for subsidizing pollution abatement facility construction, research, and education. Such taxes should not be regarded as a major long-term source of revenue, but rather a means of environmental regulation.

6. In the initial years, tax incentives and federal government subsidy for pollution abatement measures are in order. However, this should be temporary to cover the transition to total assessment of the cost of pollution abatement measures on the individual process or product.
7. For sizable new facility installations, a process similar to the so-called "one stop approval" being considered in the U.S. Congress should be adopted. This is a procedure wherein adequate advance notice of intent to construct a facility on a given site is given. After an appropriate waiting period during which full environmental studies can be conducted by those interested in the project, a full hearing is held. Within a stated time period after this hearing, all regulatory bodies having jurisdiction must approve or disapprove the project. Thereafter, the project, if approved, can proceed without further regulatory review except for compliance with the conditions established at the time of approval.

8. The process of establishing watershed authorities and air shed authorities should be continued and completed. The regulatory picture cannot become clear until jurisdictional matters are settled. Undoubtedly, the Federal Environmental Protection Agency will have to take the lead in resolving jurisdictional matters.
9. As soon as practicable, tax incentives which encourage use of exhaustible resources, such as oil depletion allowances, should be phased out. This will encourage conservation of such resources.

This approach to environmental protection meets the objectives of an appropriate regulatory system and copes with most of the technical and administrative difficulties involved. Mandatory pollution abatement measures for minor sources and a proper base effluent tax level for major sources coupled with judicious use of surcharge taxes will achieve the desired results. The tax level will be high enough to encourage adequate pollution abatement for the sources to which taxes are applied. The uniform legal requirements on the smaller sources should provide adequate abatement for them.

The proposed system imposes cost of environmental protection on the products and processes creating the pollutants. As soon as federal subsidies are phased out of the picture, the total cost must be borne by the manufacturer and ultimately the user of the product or process. This will tend to deter use of products and processes having excessive pollution abatement requirements.

The system also encourages sound resource allocation. Decisions on pollution abatement measures will be made individually by the industry or municipality involved. They can be made on the basis of relatively known levels of effluent tax. The break point at which it becomes more economical to install pollution abatement facilities rather than pay the effluent tax will be an individual decision based on the economics of the industry involved.

The use of effluent taxes could be extended to encourage

conservation of limited resources. For example, as the supplies of gasoline become rather limited, a tax on automobiles burning gasoline could be instituted to encourage conversion to electric drive, or other propulsion systems.

With the effluent tax approach, it is in the economic interest of the industry or municipality to install pollution abatement measures as soon as the amount of tax justifies it. This will make enforcement much simpler than a situation in which it is necessary to prove that the facility is producing an environmental nuisance.

Finally, the proposed system with its clearly established jurisdictional areas and "one stop approval" system will facilitate timely individual decision making on new and expanded facilities.

The system is sufficiently flexible to allow adjustment for the unknowns in our environmental knowledge. If the initial abatement requirements and effluent tax levels are not sufficiently high to meet established environmental standards, the proposed system will allow tightening of such requirements, thus facilitating the "trial and error" evolution of effluent standards.

SUMMARY

This paper does not define levels of taxes, pollution abatement requirements, etc. Rather, it develops a philosophy of control, a workable approach.

The paper necessarily discusses the difficulties involved in effective environmental control. Such difficulties are not an excuse for lack of action. The environmental crisis is severe, and substantial resources and effort must be devoted as soon as possible. The difficulties involved merely suggest that in dealing with the environment, enthusiasm is not sufficient. We will not serve the environment by emotional and ill conceived proposals. Rather, we best serve it by calm determination based on the best available understanding of the needs and problems involved.